Poster Presentations

POSTER SESSION I

HEALTH CARE USE & POLICY STUDIES— Adherence/Compliance

PHP1

EFFECT OF PRESCRIPTION COPAY ON MEDICATION UTILIZATION

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OBJECTIVE: To assess impact of change in prescription copay on change in medication utilization among patients taking three common brand name medications: atorvastatin for dyslipidemia, pioglitazone for diabetes, or valsartan for hypertension. **METHODS:** The Medstat MarketScan database was used to identify patients taking a study drug (atorvastatin, pioglitazone, or valsartan) in both 2003 and 2004. Patients had to have continuous pharmacy coverage, at least one fill in each year, and be <65 years of age. The total copay for study drug was divided by the total number of prescription fills to calculate average copay for each patient in each year. Regression and partial correlation analysis was used to estimate the association between changes in copay and days supply, adjusting for age and gender. **RESULTS:** Among 9342 valsartan patients, 4622 (49%) patients had an increase in average copay and for these patients there was on average 32 fewer days on drug in 2004 compared to valsartan patients without an increase in copay (Spearman Rho = –0.14, p-value < 0.01). There was also a negative association between copay and days supply in patients receiving atorvastatin or pioglitazone: 15 days less on pioglitazone and 18 days less on atorvastatin for patients having an increase in average copay for 2004. Among patients using mail order prescriptions with fills for >30 day supply the impact of copay on days supply was less but still statistically significant. **CONCLUSION:** Policy and benefit decision makers need to consider the impact of patient copay on persistence for chronic diseases such as diabetes, hyperlipidemia, and hypertension.

PHP2

ADHERENCE TO EVIDENCE-BASED GUIDELINES AND MEDICATION COMPLIANCE FOR MULTIPLE CHRONIC DISEASES IN A MANAGED CARE DATABASE

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OBJECTIVE: To examine both adherence to treatment guidelines and medication compliance for commercially insured patients with common chronic conditions including asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), coronary artery disease (CAD), depression, diabetes, hyperlipidemia, and hypertension. **METHODS:** A retrospective cohort analysis of claims data was conducted using the IHCIS Impact National Benchmark database representing >45 million lives. Patients were selected with evidence of disease condition(s) between 2002 and 2006 who had ≥6 months of data available post identification with coverage through December 31, 2006. All analyses were conducted in 2006 and all costs were annualized. Proportion of Days Covered was measured to calculate compliance (between first and last fill) and persistence (first fill through end of year) using an 80% cutoff. **RESULTS:** For diabetes patients, 54% received no HbA1c test in 2006 and only 33% received the ADA recommended 2 tests (measure required patients to be continuously eligible during 2006 and have prior evidence of diabetes). The percentage of patients filling any acceptable disease specific prescription in 2006 was 80% for CHF, 68% for CAD, 60% for diabetes, 57% for depression, 44% for asthma and 36% for COPD. Of patients filling medication, compliance ranged from 75% for diabetes and CHF down to 49% and 36% for COPD and asthma respectively. Persistence rates ranged from 77% for CAD to 23% for asthma. CHF, COPD and CAD had the most expensive per-patient-per-year total medical and pharmacy costs averaging $24,540, $14,169, and $13,627 respectively. **CONCLUSION:** Across all eight conditions, the percent of patients filling any acceptable medication per treatment guidelines was low. Of those filling medication, compliance and persistence rates were sub-optimal. With the prevalence of chronic diseases increasing and the cost associated rising dramatically, improvements in care per guidelines and medication compliance could potentially benefit patients, reduce costs and improve outcomes.

PHP3

IS THERE AN ACCEPTABLE LEVEL OF MEDICATION ADHERENCE? A REVIEW OF RETROSPECTIVE ADHERENCE EVALUATION STUDIES

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OBJECTIVE: The rationale for selection of a cut-point between acceptable and unacceptable medication adherence has not been previously evaluated. The objectives of this study were to describe the dichotomized measures for medication adherence and assess the rationale for selection of the cut-point. **METHODS:** A systematic Medline review and examination of studies assessing adherence using pharmacy claims from January 1997–June 2007 was performed. Studies containing partial or incomplete methods for measuring adherence were excluded. A sub-analysis of articles was conducted to determine the rationale for selection of the cut-point. **RESULTS:** The review identified 98 studies with 103 measures of adherence. These studies investigated adherence to cardiovascular drugs (39.8%), hormones and synthetic substitutes (33.0%) and others (28.2%). The following types of measures were used: medication possession ratio (MPR) (45.6%), fixed gap between refills (38.8%), proportion of days covered (7.8%) and others (7.8%). Dichotomous measures were used by 32.0% of the studies. A cut point was specified for 35.9% measures of adherence. The mean cutoff value was 76.0% ± 12.9%; with a median of 80.0%, and a range of 20.0%–90.0%. The sub-analysis contained 28 articles of which 35.7% refer to cut-points derived from previous clinical studies, 21.4% selected the cutpoint arbitrarily and 14.3% offered no explanation, 7.1% provided clinical evidence, and 7.1%

mentioned a reference that actually indicated that dichotomization of the continuous adherence variable was inappropriate. **CONCLUSION:** MPR and gap between refills were the most commonly used measures of medication adherence. Almost one third of the studies used dichotomous measures. A medication adherence of 80% of the therapy was typically indicated as the cut-point between adherence and non-adherence. There is no accepted clinical or pharmacological rationale for medication adherence threshold selection. The use of continuous variables to measure medication adherence is recommended.

PHP4

THE IMPACT OF COPAYMENTS OR BRAND NAMED DRUG ON MEDICATION PERSISTENCE

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OBJECTIVE: To examine the impact of copayments or brand named drug as well as other factors on medication persistence from a large U.S. employer. **METHODS:** We analyzed medical and pharmaceutical claims data from 2002 through 2006 for new users prescribed a single agent for either three antihypertensive (angiotensin converting enzyme inhibitors, beta blockers, and calcium blockers) or two anti-diabetic (biguanides and sulfonylureas) therapeutic classes. Nonpersistence with medication was measured using three methods: medication possession ratio (MPR) <0.8; number of days to the first drug coverage gap of ≥15 days; and number of days to drug discontinuation (≥90 days gap). Logistic regression and Cox proportional hazard models were performed to evaluate the association between the potential risk factors and the likelihood of medication nonpersistence. **RESULTS:** A total of 1422 members with 12 months claim data following the first drug filled were identified. Fifty-four percent were male with a mean age 52.8 ± 8.0 years, and 44% initially used a brand named drug. The logistic regression results revealed that increasing age per year (OR = 0.966; 95% CI = 0.952–0.979), PPO (OR = 0.424; CI = 0.261–0.689) or HMO insurance (OR = 0.440; CI = 0.262–0.739) as compared to conventional fee for service coverage were less likely to have MPR < 0.8. Management workers (OR = 1.475; CI = 1.113–1.954) were more likely to have MPR < 0.8. MPR < 0.8 was not associated with use of an initial brand named drug, comorbidities, or health care utilization in the six months prior to initiating medication therapy. The Cox models showed that the risk for a gap increased 1.1% (HR = 1.011, CI = 1.004–1.019), and medication discontinuation increased 0.9% (HR = 1.009, CI = 1.003–1.014) with each $1 increase in initial drug copayments. **CONCLUSION:** Younger employees, management workers, conventional fee for service insurance coverage, and an increase in initial copayments are factors predictive of greater risk for noncompliance with medications. These data may be helpful for employers when making drug benefit design decisions.

PHP5

ADHERENCE AND SWITCHING WITH DRUGS USED FOR THE PROPHYLAXIS OF ORGAN REJECTION

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OBJECTIVE: The purpose of this study was to quantify the extent of nonadherence and to determine the rate of switching across organ rejection drugs. **METHODS:** Blinded prescription data from 35 national retail pharmacy chains was analyzed for 13,250 patients taking sirolimus, cyclosporine, and tacrolimus. Cumulative drug consumption (total days supply) during the one year follow up period was employed as the measure of adherence. Kaplan Meier estimates of survival (persistence) curves were used to assess the time to discontinuation and to calculate the one-year rate of discontinuation. Baseline patient characteristics, including age, gender, geographic region, median income, index quantity dispensed, population density, co-pay, and index refill and days supply prescribed were analyzed. **RESULTS:** Adherence data across these drugs showed that sirolimus, cyclosporine, and tacrolimus patients on average obtained 5.5 (±4.5), 5.2 (±5.4), and 6.5 (±5.3) fills, and 170.8 (±132.9), 159.2 (±163.96), and 194.8 (±159.6) days supply of medication over 12 months, respectively. At day 60, 41% of sirolimus, 44% of tacrolimus, and 52% of cyclosporine patients discontinued therapy. After 6 months, 68% of tacrolimus and sirolimus and 77% of cyclosporine patients discontinued therapy. The rate of switching to another agent was 6.5% for sirolimus, 1.4% for tacrolimus, and 1.1% for cyclosporine at month 6, and 10.9%, 2.3%, and 1.8% at month 12, respectively. **CONCLUSION:** Even though organ transplant drugs are vital for transplant patients, 68% to 77% of patients discontinue therapy after 6 months. Research has showed that nonadherence to immunosuppressive therapy is the leading cause of organ rejection, organ loss, and death. Efforts to maintain patients on these drugs are needed in the beginning of and throughout treatment to avoid organ rejection.

PHP6

PREDICTORS OF NONCOMPLIANT COST-CUTTING BEHAVIORS AMONG ADULTS IN THE UNITED STATES

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OBJECTIVE: To determine the demographic, insurance, and health status predictors of noncompliant cost-cutting behavior among U.S. adults. **METHODS:** Data were from quarters one and two of the 2007 National Health and Wellness Survey (NHWS), an internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+. Noncompliant cost-cutting behaviors were defined as taking less medication than prescribed, cutting tablets in half, or buying fewer tablets. Logistic regression analysis was used to determine the demographic, insurance, and health status predictors of noncompliant cost-cutting behavior. **RESULTS:** Of the 42,010 NHWS respondents, 12% reported some noncomplaint cost-cutting behavior, more specifically 7% reported taking less medication than prescribed, 6% reported cutting tablets in half, and 2% reported buying fewer tablets. Significant predictors of greater likelihood of noncompliant cost-cutting behavior include being non-white (OR = 1.182, $p < 0.001$), having a college degree (OR = 1.094, $p = 0.009$), having individual or family insurance purchased directly (OR = 1.300, $p < 0.001$), purchasing medications outside the U.S. (OR = 3.862, $p < 0.001$), number of physical comorbid conditions (OR = 1.176, $p < 0.001$), having a psychiatric condition (OR = 1.620, $p < 0.001$), currently smoke (OR = 1.137, $p < 0.001$), and body mass index (OR = 1.006, $p = 0.007$). Significant predictors of lesser likelihood of noncompliant cost-cutting behavior include age (OR = 0.996, $p = 0.001$), having insurance through the Veteran's Administration (OR = 0.514, $p < 0.001$), and having Rx coverage (OR = 0.808, $p < 0.001$). Gender, marital status, annual income greater than $50,000, number of adults in household, and insurance through employer, Medicaid, or Medicare were not significant predictors of non-compliant cost cutting behavior. **CONCLUSION:** There are several significant predictors of noncompliant cost-cutting behavior. Knowing these predictors may help in targeting cost

savings and compliance programs at those who need them the most.

PHP7

THE EFFECTS OF NONCOMPLIANT COST-CUTTING BEHAVIORS ON OUTCOMES AMONG ADULTS IN THE UNITED STATES

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OBJECTIVE: To quantify the effects of noncompliant cost-cutting behavior on health-related quality of life (HRQOL), work productivity, and activity impairment among U.S. adults. **METHODS:** Data were from quarters one and two of the 2007 National Health and Wellness Survey (NHWS), an internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+. Noncompliant cost-cutting behaviors were defined as taking less medication than prescribed, cutting tablets in half, or buying fewer tablets. Outcomes measures include the SF12V2 and the Work Productivity and Activity Impairment (WPAI) questionnaire. Linear regression analysis was used to control for gender, age, race, marital status, education, and comorbid conditions. **RESULTS:** Of the 42,010 NHWS respondents, 7% took less medication than prescribed, 6% cut tablets in half, and 2% bought fewer tablets. Controlling for potential confounders, SF12 physical and mental summary scores are significantly lower for those taking less medication (2.3 and 2.5 points lower, $p < 0.001$), those cutting tablets in half (0.9 and 1.1 points, $p < 0.001$), and those buying fewer tablets (1.5 and 1.6, $p < 0.001$). Controlling for potential confounders, WPAI overall work loss and WPAI activity impairment are significantly lower for those taking less medication (10.3 and 7.2 points lower, $p < 0.001$), those cutting tablets in half (11.2 and 5.3 points, $p < 0.001$), and those buying fewer tablets (15.8 and 8.2, $p < 0.001$). **CONCLUSION:** Noncompliant cost-cutting behavior negatively affects humanistic outcomes. By decreasing this behavior cost savings and compliance programs should have a positive effect on humanistic outcomes.

PHP8

THE EFFECTS OF NONCOMPLIANT COST-CUTTING BEHAVIORS ON INDIRECT COSTS AMONG ADULTS IN THE UNITED STATES

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OBJECTIVE: To quantify the effects of noncompliant cost-cutting behavior on health-related quality of life (HRQOL), work productivity, and activity impairment among adults in Europe. **METHODS:** Data were from the 2007 European National Health and Wellness Survey (NHWS), a self-administered, Internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+ across five European countries: France, Germany, Italy, Spain, and the UK. Three noncompliant cost-cutting behaviors were analyzed: taking less medication than prescribed, cutting tablets in half, and buying fewer tablets. Outcomes measures included the SF12V2 and the Work Productivity and Activity Impairment (WPAI) questionnaire. Linear regression analysis was used to adjust for gender, age, country of residence, marital status, education, and physical and psychiatric comorbid conditions. **RESULTS:** Of the 53,524 NHWS respondents, 3.1% took less medication than prescribed, 2.1% cut tablets in half, and 1.6% bought fewer tablets. Unadjusted results showed a negative association between these behaviors and indirect costs. Adjusting for potential confounders, SF12 physical and mental summary scores were significantly lower for those taking less medication (2.2 and 2.4 points lower, $p < 0.001$), those cutting tablets in half (1.8 and 2.0 points lower, $p < 0.001$), and those buying fewer tablets (1.8 and 2.3 points lower, $p < 0.001$). Adjusting for potential confounders, WPAI overall work loss and WPAI activity impairment were significantly lower for those taking less medication (11.0 and 9.2 points lower, $p < 0.001$), those cutting tablets in half (13.4 and 6.3 points lower, $p < 0.001$), and those buying fewer tablets (10.1 and 7.7 points lower, $p < 0.001$). **CONCLUSION:** Noncompliant cost-cutting behavior negatively affects indirect costs, specifically HRQOL, work productivity, and activity impairment. By decreasing this behavior cost savings and compliance programs should have a positive effect on humanistic outcomes.

PHP9

UNITED STATES PHYSICIANS AND IN-OFFICE DRUG ADMINISTRATION: THE CONCEPT OF "INCIDENT-TO" SERVICES

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OBJECTIVE: The U.S. Centers for Medicare and Medicaid Services (CMS) generally pays for non-institutional-based services and supplies "incident to" a physician's professional service. This study explores the concept of incident-to, the regulations and guidance surrounding its use and presents practical considerations for physicians. **METHODS:** Incident-to guidance provided by CMS was collected, arranged in order of issuance, abstracted and analyzed. A compilation of relevant resources, a glossary and checklist tool were also created as part of the project. **RESULTS:** Federal regulations at 42 CFR 410.26(b) specify criteria for "incident to" services. Medicare Part B pays for services and supplies incident to the service of a physician, including drugs or biologicals that are not usually self-administered. The services and supplies must be furnished in a non-institutional setting to non-institutional patients and be of an integral, though incidental, part of the service of a physician in the course of diagnosis or treatment of an injury or illness. They are also provided without charge or included in the bill of a physician. Such services are typically performed by non-physician staff however require direct personal supervision by the physician. The U.S Office of the Inspector General (OIG) has announced incident-to services as an area of study in their 2008 Work Plan. **CONCLUSION:** The concept of incident-to services is commonly misunderstood and may therefore present a Medicare compliance risk for physicians. It is essential for physicians and their practice decision-makers to understand and apply the CMS regulations surrounding incident-to services in order to appropriately bill and be reimbursed by Medicare for the provision of Part B separately payable drugs in non-institutional settings.

HEALTH CARE USE & POLICY STUDIES— Consumer Role in Health Care

PHP10

CREATION OF A RISK RATING SYSTEM TO COMMUNICATE DRUG SAFETY INFORMATION TO CONSUMERS

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OBJECTIVE: With the withdrawal of Zelnorm, recall of products such as Ranbaxy's generic gabapentin, and the increase in

FDA safety communications related to highly prescribed products including the thiazolidinediones and bisphosphonates in 2007, information on drug safety was present weekly, if not daily, in the newspaper and on television. To assist consumers in understanding their risk of developing serious side effects and put into context the relative risk of their various medications, we have developed a 5-color drug risk rating system. **METHODS:** The iGuard Risk Rating system is a patented process for summarizing serious adverse events contained in each medication's Prescribing Information. Specifically, we focus on: 1) the severity of the reaction (serious disability or death); 2) the likelihood of the reaction (e.g., >1 in 10,000); and 3) proportion of the population affected (e.g., 0–15%). We also adjust for lack of experience with a product on the market: <1,000,000 prescriptions or <2 years post-launch. Our iGuard Risk Ratings, from lowest to highest, are as follows: 1) Green: Low Risk–Suitable for widespread use; 2) Blue: General Risk–Use under normal care of a doctor; 3) Yellow: Guarded–Be on the lookout for safety events; 4) Orange: Elevated Risk–Create a personal risk reduction plan with your doctor; and 5) Red: High Risk–Requires careful consideration of risk versus benefit. **RESULTS:** To date, we have rated 106 medications. Risk Ratings associated with individual medications are available on the project website at www.iguard.org. A total of 80 of 106 medications (75%) were rated Level 2/Blue: General Risk. An additional 20% were rated Level 4/Orange: Elevated Risk. Ratings across molecules within a therapeutic class are very similar. **CONCLUSION:** Consumer feedback on the iGuard Risk Ratings has been very positive, especially in understanding which of their medications they need to be most diligent in monitoring.

PHP11

ETHNIC DISPARITIES IN HOSPITAL DISCHARGES AGAINST MEDICAL ADVICE AMONG CARDIOVASCULAR DISEASE PATIENTS: THE ROLE OF HOSPITAL QUALITY

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OBJECTIVE: Ethnic disparities in hospital discharges against medical advice (AMA) have been examined in previous studies. However, the institutional factors affecting health decision making have received much less attention. This study examines the evidence for a joint impact of ethnicity and hospital quality on the likelihood of a discharge AMA in patients with cardiovascular disease (CVD). **METHODS:** Adult patients hospitalized with a primary admissions diagnosis of CVD from 2000 to 2005 were identified in a state-wide confidential inpatient hospital discharge dataset. The dataset was augmented with information from several sources, including the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). A high quality hospital was defined as a hospital whose performance exceeded the state average on each JCAHO hospital performance measure. A hierarchical generalized linear logistic model of a discharge against medical advice controlling for various individual and contextual factors was estimated using cross-sectional data. **RESULTS:** A total of 2593 of the 328,342 hospitalizations for CVD (0.8%) resulted in a discharge AMA. The patients self-identified as non-caucasian in thirty percent (N = 100,074) of the hospitalizations. Fifteen percent (N = 48,177) of the hospitalizations occurred in high quality hospitals. The adjusted odds of a discharge AMA in a low quality hospital were lower for non-Caucasians (OR = 0.74; p = 0.0005) compared to Caucasians while the adjusted odds of a discharge AMA in a high quality hospital were unchanged between Caucasians and non-Caucasians (OR = 0.95; p = 0.6). Among Caucasians, a discharge AMA was less likely (OR = 0.75; p = 0.01) at a high quality hospital compared to a low quality hospital while, among non-Caucasians, the odds of a discharge AMA were unchanged (OR = 0.96; p = 0.74) across hospital quality groups. **CONCLUSION:** The two unique and complementary findings here are that: 1) institutional quality mediates the relationship between ethnicity and hospital discharges AMA; and 2) the relationship between hospital quality and discharges AMA varies with ethnicity.

PHP12

ASSOCIATION BETWEEN DIRECT-TO-CONSUMER ADVERTISING (DTCA) AND DRUG UTILIZATION IN THE U.S. MEDICAID MARKET FOR SELECTED DRUG CLASSES

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OBJECTIVE: Spending on direct-to-consumer advertising (DTCA) has seen exponential growth since the late 1990s. The purpose of this research was to assess the association between DTCA spending and drug utilization and reimbursement in the U.S. Medicaid market. **METHODS:** National direct-to-consumer advertising expenditures were obtained from Advertising Age for selected brands in three drug classes: HMG Co-A reductase inhibiting agents (statins), anti-ulcer/GERD medications, and antidepressants. The drug utilization and reimbursement (sales) data were extracted from the national Medicaid pharmacy files provided by the Centers for Medicare & Medicaid Services. The annual advertising expenditures, drug utilization, and reimbursement were charted from 2000 to 2005. Correlation analysis was used to assess the association between both contemporaneous and lagged DTCA spending by pharmaceutical companies and drug utilization and reimbursement for each of the three therapeutic classes. **RESULTS:** A wide range of estimated Pearson correlation coefficients were derived, including some negative coefficients. The strongest positive correlations were found for the statins and antidepressants for the year 2003. Only antidepressants had a statistically significant correlation ($r = 0.58$, $p < 0.05$) between DTCA and reimbursement/utilization based on a pooled correlation analysis from 2000 to 2005. **CONCLUSION:** Utilization rates and reimbursement in the Medicaid market for the investigated medications were not consistently statistically impacted by DTCA. While there is evidence of a strong correlation for antidepressants, there is less compelling evidence for statins, and none for the anti-ulcer drugs. Although both utilization and expenditures in Medicaid were growing for all three classes, their growth was due to factors beyond DTCA.

HEALTH CARE USE & POLICY STUDIES— Drug or Devices & Health Policy

PHP13

CONTROLLED SUBSTANCE WASTE IN HOME HOSPICE SETTINGS

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OBJECTIVE: To describe the amount and types of unused controlled substances (CS) at the time of death in home hospice and to describe methods used by hospice nurses to destroy CS after

patients expire. **METHODS:** Retrospective chart review of 105 home hospice patients with a narcotic waste destruction record who expired during a 3-month period in 2007 while receiving care from 4 small hospices (average daily census [ADC] <60) and 1 large (ADC = 160) hospice in the Southeastern Pennsylvania region. Data were collected through review of narcotic waste destruction records as recorded by nurses at the time of patient death. Strength of formulation was recorded sporadically. Hospice nurses were surveyed about CS disposal methods. **RESULTS:** Mean age of the patients was 78, (range 44–103); majority (57%) was diagnosed with cancer, followed by heart failure (24%). Average length of stay in hospice was 42 days (median 21). Almost all patients had unused CS; morphine concentrate (20 mg/ml) was the most common medication (average 31.8 ml./patient). Collectively, over 3 liters (64,680 mg) of morphine were destroyed. Lorazepam was the next most common drug with 990 tablets and 397 ml liquid wasted. Other CS remaining at the time of death included varying strengths of long-acting morphine (251 tablets); OxyContin (90 tablets); and unused transdermal fentanyl (57 patches). Hospice nurses disposed of all unused CS by flushing them down the toilet. **CONCLUSION:** Although not excessive on an individual level, the amount of CS waste in hospice is significant when viewed in the aggregate. When flushed, these medications reach water ways, potentially posing environmental or health hazards. Regulatory changes are required to address disposal of unused CS. Future analyses should examine the cost of CS medication waste in hospice.

PHP14

ESTIMATION OF USAGE OF NEW DRUG AFTER REIMBURSEMENT FOR BUDGET IMPACT ANALYSIS

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OBJECTIVE: The estimation of budget impact is important in listing a new drug, but there are a lot of uncertainties. We analyzed usage of new drug after reimbursement and investigated various factors influencing budget impacts of the new drug to get a guidance for public insurance BIA in Korea. **METHODS:** We used 3 year claims data of 23 new drugs listed in 2004 to analyze usage pattern and market share. We evaluated influencing factors that clinical improvements, treatment cost, disease burden, patient number, market competition, type of company, etc. and conducted multiple regression analysis using these factors. **RESULTS:** The indications of the 23 listing drugs were for cancer, hypercholesterolemia, diabetes, schizophrenia, pneumonia, peptic ulcer, rheumatoid arthritis, hepatitis B, HIV treatment, etc. At third year after new drug listing, average market share incrementally rose to 20% (0.06–78%, range) both in patient number and volume of use. In case of the new drug with clinical improve and higher cost, the average market share amounted to 33% (n = 4). The market share of drugs with no improve and lower costs amounted to 26% (n = 8). When total patient number of new and pre-listed drugs were under 50,000, market share of new drugs amounted to 25%, 35% of total volume and patient number, respectively. But in case of over 250,000 of patients, market share of new drugs were less than 10% in both. New drugs commanded 27%, 4%, 0.08% of market when number of pre-listed competing drugs were <25, 5–25, 25<, respectively. When the company is domestic, new drugs amounted to about 4% of market share and 25% when it is not. **CONCLUSION:** Clinical improvements, disease burden, number of patients, number of pre-listed drug, and company type may affect to market diffusion of new drugs. So we suggest these results be considered in forecasting future usage of new drug and conducting budget impact analysis.

PHP15

EVALUATING THE USE OF PROVISIONAL PATENTS BY THE PHARMACEUTICAL INDUSTRY: THE EXPERIENCE OF THE UNITED STATES

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OBJECTIVE: The U.S. intellectual property regulations allow for claiming the right of priority by an inventor by filing a patent in a foreign country or by filing a U.S. provisional patent. The study evaluated the provisional patent system introduced in 1994 by the Uruguay Round Agreement Act (URAA). **METHODS:** Data on patents listed in the FDA Orange Book (OB) for new chemical entities approved between 1980 and 2007 were derived from the USPTO. Descriptive statistics were calculated for the variables included in the study. Chi-square and t-tests were used to assess differences between groups. **RESULTS:** The OB listed 1452 patents, of which 9.6% claimed priority from a U.S. provisional patent and 39.5% claimed priority from a foreign priority filing. The mean time gained was 328.9 ± 75.2 days from provisional patents and 340.8 ± 60.3 days from foreign rights of priority. The proportion of U.S. companies that obtained a foreign or provisional right of priority increased from 27.4% prior to 1995 to 75.2% after 1995 ($p < 0.001$). This increase was due to the use of provisional patents. A significant increase in the use of provisional patents and a significant decrease in the use of foreign right of priority also occurred in non-US companies, nevertheless, no increase in the combined use of a foreign and provisional right of priority was found for non-US companies. **CONCLUSION:** The foreign companies significantly decreased the use of foreign priority patents while increasing the use of provisional patents. The introduction of provisional patents to the existing foreign priority system resulted in a three-fold increase in the use of these systems by U.S. companies. The 1995 URAA change in the USPTO priority system has significantly influenced the frequency by which U.S. companies seek a foreign or a provisional right of priority.

PHP16

IMPROVING HEALTH TECHNOLOGY APPRAISAL AND DECISION-MAKING: WHAT HAS THE BRITISH PARLIAMENT'S INQUIRY OF NICE TAUGHT US?

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OBJECTIVE: The British Parliament recently held an inquiry into the National Institute for Health and Clinical Excellence (NICE) health technology appraisal (HTA) process. We summarized stakeholder concerns about health economic and decision methodology used for HTAs appraisals and funding decisions, particularly with regard to serious/life-threatening illnesses, and drew comparisons to standards among other nations that use HTA to understand why criticisms might have arisen. **METHODS:** A systematic review was conducted of written evidence submitted to Parliament about the appraisal process and corresponding health economic methods. Stakeholders were limited to manufacturers, professional and trade associations, and patient/disease advocacy organizations (limited to oncology). We excluded evidence from individuals. We extracted themes from this evidence and generated items for a comparison of methods of other countries that conduct appraisals. Only publicly available, English-language qualitative data were considered. **RESULTS:** We identified written evidence from 92

constituents through August 1, 2007, of which evidence from 27 were extracted using our criteria. Stakeholder comments on the HTA process and decision methodology were distilled into 12 categories, ranging from impact of severity/rarity of disease on acceptability of cost-effectiveness thresholds to over-reliance of QALYs in decision-making. Compared to attributes reported for other countries, NICE's criteria and methods for health economic assessment and decision-making varied substantially, such as that of the model perspective, e.g., payer versus societal. **CONCLUSION:** We found that aspects of NICE technology appraisals garner criticism common to many stakeholders. This underscores the need to reconsider how current health economic and decision methodology might be improved. Furthermore, country-level heterogeneity in HTA processes and methods suggests the need to determine why these variations arise, and whether they reflect societal preferences or misunderstandings of appropriate methods.

PHP17

HOW MANDATORY PRICE REDUCTION OF REIMBURSED PHARMACEUTICALS COULD RESULT IN INCREASED PHARMACEUTICAL EXPENDITURE?

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OBJECTIVE: Political objectives may alter economic rationale in health care decision-making. The Hungarian government had promised to reduce the prices and copayment of pharmaceuticals, therefore 15% price cut was mandated to all reimbursed pharmaceuticals from April 2004. Three months later the regulation was abrogated by the Constitution Court. As the government did not want to communicate a price increase, the level of copayment remained the same, while the reimbursement level was increased. It took two years to increase the copayment back to the original level by a 7.5% reimbursement reduction in February 2005, and by a further 7.5% reduction from February 2005 to July 2006. Our objective was to measure the impact of price cut on the public pharmaceutical budget. **METHODS:** An estimated public pharmaceutical spending was calculated based upon projections from the expenditure in previous periods. Only pharmaceuticals with reimbursement in April 2004 were included into the analysis. The estimated expenditure was compared to the real expenditure. Hungarian Forint was converted to US$ by employing the quarterly exchange rate. **RESULTS:** In Q2 2004 the mandated price cut resulted in $39.65 million savings in the pharmaceutical expenditure. In Q3-Q4 2004 the reduced copayment generated $29.98 million increase in the drug budget. Between Q1 2005 and Q2 2006 the impact of reduced copayment was $42.42 million. **CONCLUSION:** The mandated price cut and its subsequent abrogation resulted in $32.75 million increase in the Hungarian public pharmaceutical expediture between April 2004 and June 2006, as the government did not dare to withdraw its promise on cheaper pharmaceuticals. Our estimate is conservative, as the mandated price cut influenced spending not only on pharmaceuticals with reimbursement in April 2004, but via reference pricing also the spending on new pharmaceuticals with initial reimbursement between April 2004 and June 2006.

WITHDRAWN **PHP18**

PHP19

EFFECT OF PRESCRIPTION DRUG COVERAGE ON HEALTH AMONG CHRONICALLY ILL ELDERLY POPULATION

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OBJECTIVE: To estimate the effect of prescription drug insurance on health, as measured by self-reported poor health status, functional disability, and hospitalization among elderly with at least three chronic conditions. **METHODS:** Analyses are based on a nationally representative sample of non-institutionalized elderly (>64 years of age) from the Medicare Current Beneficiary Survey (MCBS) for years 1992–2000. Estimates are obtained using multivariable regression models that control for observed characteristics and unmeasured person-specific effects (i.e., fixed effects). Fixed effects analysis uses within person variation in drug coverage to estimate the effect of gaining or losing coverage on outcome of interest (i.e., health). **RESULTS:** In general, prescription drug insurance was not associated with significant changes in self-reported health, and hospitalization. However, prescription drug coverage decreased functional disability slightly (4% improvement), although this was not statistically significant. **CONCLUSION:** Findings suggest that prescription drug coverage may have some health benefits for chronically ill.

PHP20

PREDICTORS OF ENROLLMENT IN MEDICARE PART D: THE EXPERIENCE OF MEDICARE DRUG DEMONSTRATION PARTICIPANTS WITH RHEUMATOID ARTHRITIS AND MULTIPLE SCLEROSIS

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OBJECTIVE: During the 16 months preceding the start of the Medicare prescription drug program (Part D), 22,359 vulnerable Medicare beneficiaries with rheumatoid arthritis (RA) or multiple sclerosis (MS) participated in the Medicare Replacement Drug Demonstration (MRDD), which provided access to specialty biologic medications. We examine beneficiary characteristics associated with Part D enrollment among this population in early 2006. **METHODS:** Predictors in multivariate logistic regressions included female gender, age, race (white, black, or other), region of the U.S., urban residence, Hierarchical Condition Category score (HCC; a measure of comorbidity), use of the MRDD benefit, subsidy level under the MRDD, self-report of other drug coverage during the MRDD, and death within six months of the start of Part D. **RESULTS:** Among 14,963 MRDD beneficiaries with RA, 12,174 (81%) enrolled in Part D plans during the first half of 2006. Ninety percent (6646) of the 7396 beneficiaries with MS enrolled in a Part D plan—about 50% higher than the rate of enrollment in the general Medicare population. Female gender (OR = 1.5, 1.3–1.6), MRDD benefit use (OR = 2.6, 2.4–2.8), higher HCC score (OR = 1.07, 1.03–1.10), other drug coverage during the MRDD (OR = 1.6, 1.5–1.7), were associated with Part D enrollment. There were regional differences as well. Older age (OR = 0.9, 0.9–0.9) and death within 6 months (OR = 0.3, 0.3–0.4) were associated with not enrolling in Part D. Separate regressions for the RA and MS populations produced similar results. **CONCLUSION:** With the inception of Medicare Part D, most MRDD beneficiaries with RA and MS enrolled in Part D plans. Beneficiaries who had used their MRDD benefit and had worse health status—those who appear to need prescription drug coverage most—were more likely to enroll. Disproportionately high enrollment suggests that

the Medicare prescription drug program provided this vulnerable population with an important new source of drug coverage.

PHP21

CLINICALLY SIGNIFICANT DRUG-DRUG INTERACTION PROFILES IN THE ELDERLY—A CALIFORNIA QUALITY IMPROVEMENT ORGANIZATION (QIO) COLLABORATIVE EXPERIENCE

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OBJECTIVE: Drug-drug interactions (DDI) have been well associated with significant medical, safety, and economic consequences, particularly in older and chronically ill patients. This study examined several aspects of medication safety by quantifying and profiling the prevalence, population exposure, and characteristics of clinically significant DDIs among Medicare Part D utilizing beneficiaries. Lumetra and six California Medicare Advantage prescription drug plans (MAPD) and stand-alone prescription drug plans (PDP) will collaboratively utilize results to design effective quality improvement initiatives to minimize adverse clinical outcomes due to these DDI's. **METHODS:** This study assessed the prevalence and population exposure of DDIs among Medicare and dual eligible (i.e., Medicare +Medi-caid status) beneficiaries enrolled across six of California's Part D MAPD and PDPs. Retrospective, cross sectional pharmacy claims data from January 1, 2006 through December 31, 2006 were analyzed to obtain the frequency of drug interactions that are clinically significant and well-documented in the medical and pharmacy literature. **RESULTS:** The analysis included 368,607 utilizing beneficiaries. The overall prevalence rate of DDI was 5.9%. The number of clinically significant DDI cases was 7962 per 100,000 beneficiaries. Stratified analyses indicated that males and older beneficiaries appear to be at a higher risk of incurring a clinically significant DDI. Risk of a DDI also increased as the number of unique medications and/or number of prescribing physicians increased per enrollee. **CONCLUSION:** The prevalence and characteristics of clinically significant DDIs among California elderly and chronically ill patients were positively associated with certain demographic factors and health care resource utilization profiles. Stratifying high-risk individuals with discrete or multiple DDI's will enable Part D MAPDs and PDPs to perform in-depth case management in targeted individuals. Point-of-service edits and information obtained from retrospective drug claims review can be used in conjunction to customize meaningful intervention strategies.

PHP22

MEDICARE SPENDING GROWTH FOR DIAGNOSTIC IMAGING AND ACCESS TO CARE

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OBJECTIVE: To measure the impact of improvements in access to care on Medicare spending growth for diagnostic imaging (DI) services. **METHODS:** We modeled Medicare DI spending growth as a function of growth in: enrollment; per-service payment; access to care (% using ≥ 1 service); volume (services/user); and intensity (relative value units per service used). We then used Medicare Standard Analytic File 5% sample data from 2002–2005 to decompose DI spending growth into these factors by modality: standard (x-ray and ultrasound); and advanced (computed tomography (CT), magnetic resonance (MR) and nuclear). **RESULTS:** Aggregate DI service spending grew at an annual rate of 15.2% during 2002–2005, and varied substantially by modality (x-ray 10.2%, ultrasound 11.7%, CT 19.6%, MR 18.5%, nuclear 15.0%). Enrollment growth accounted for less than 15% of this increase (range: 7.2% (CT)—13.3% (x-ray)), while the impact of payment increases was far greater and varied widely (range: 7.6% (nuclear)—54.0% (x-ray)). The share of DI spending growth attributable to improvements in access to care was: x-ray (6.5%); ultrasound (19.1%); CT (30.4%); MR (49.0%); and nuclear (30.5%). The contribution of volume growth to overall spending growth ranged from 10.5% for MR to 24.1% for CT. Service intensity growth accounted for less than 10% of spending growth for x-ray, CT and MR; 17.9% and 33.0% of spending growth for ultrasound and nuclear were due to service intensity growth, respectively. **CONCLUSION:** Improved access to care explains approximately 30%–50% of the growth in Medicare spending for advanced diagnostic imaging services.

PHP23

SPECIALTY BIOLOGIC DRUG COVERAGE UNDER MEDICARE PART D: THE EXPERIENCE OF VULNERABLE BENEFICIARIES WITH RHEUMATOID ARTHRITIS (RA) AND MULTIPLE SCLEROSIS (MS)

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OBJECTIVE: In early 2006, 18,820 vulnerable Medicare beneficiaries with RA or MS participating in a biologic drug demonstration program (MRDD) transitioned into Medicare Part D plans. We compared the types of biologic drug coverage offered by Part D plans. **METHODS:** We examined Part D plans' cost structure (e.g. premium, deductible, cost sharing) for the specialty biologic drugs offered during the MRDD: adalimumab, etanercept, anakinra (for RA), interferon beta 1a and 1b, glatiramer acetate, and HP acthar gel (for MS). For MRDD and Part D plans, we compared beneficiaries' average out-of-pocket costs (OOPC). **RESULTS:** Beneficiaries enrolled in 1061 stand-alone (SA) and 705 Medicare Advantage (MA) Part D plans. All SA plans and all but one MA plan covered etanercept, interferon beta 1b, and glatiramer acetate. The proportion covering the other drugs varied between 38–92%. MA plans were more likely to cover anakinra, interferon beta 1a, and HP acthar gel than SA plans ($p < 0.05$). All plans used co-insurance as the preferred form of cost sharing; average co-insurance ranged from 25–31% of the drug price. The majority of plans assumed >75% of the cost sharing for each drug dispensing during the initial coverage period, but only 2% of plans offered coverage during the coverage gap. On average, beneficiaries' OOPC were greater under Part D than the standard benefit-structured MRDD. Patients with a MRDD subsidy were significantly less likely to receive a Part D subsidy ($p < 0.0001$), because assets were considered in addition to income in the granting of subsidies under Part D. **CONCLUSION:** Many Part D plans assume some costs for specialty biologic drugs to treat RA and MS. Beneficiaries still find themselves facing high OOPC due to drug price, plans' preference for co-insurance, and scant coverage during the coverage gap.

PHP24

THE IMPACT OF BENEFIT PLAN DESIGN ON COST AND HEALTH OUTCOMES

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OBJECTIVE: When private payers implement changes to control health benefit costs, the longer term consequences may not be considered. The aim was to identify scientific studies that exam-

ined the impact of changes in private drug plan formulary design on the health of private plan beneficiaries. **METHODS:** A search of the medical literature was conducted using the PubMed search engine. Search terms included combinations of reimbursement, formulary, plan, payer, restriction, cost, and adherence. The 'related articles' feature in PubMed was also used to identify relevant papers. **RESULTS:** While no published studies of Canadian employer-sponsored drug plans were identified, there were 15 North American studies that focused on the effects of changes in drug plan design. This body of research demonstrated three key points. Cost-sharing initiatives resulted in a reduction, or complete cessation, of medication consumption, including drugs deemed "essential", and that decreased adherence to drug therapy can actually lead to the increased use of other more expensive health care resources. On the other hand, higher levels of medication adherence, which increased drug costs, were associated with lower overall health care costs. Employee satisfaction with their employer drug plan decreased when cost-containment measures were implemented and this is a problem for employers since drug plan changes typically involved increasing fees or imposing more restrictions to access. **CONCLUSION:** A short-term focus on controlling drug costs is likely to have negative consequences on the health, productivity and satisfaction of plan members. If changes to drug plans are not properly assessed, there can be undesirable and expensive consequences for plan members and employers. Employers need a longer term framework to guide and support health plan decision-making that avoids sudden or drastic changes to health benefits. Careful consideration of drug plan design and cost-sharing can improve medication adherence, health outcomes, employee satisfaction, and costs.

PHP25

TOWARD HIGH PERFORMANCE 'PHARMACARE' SYSTEMS: A REVIEW OF EXPERIENCES IN SEVEN COUNTRIES

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OBJECTIVES: While pharmaceuticals can significantly improve the health of patients and help to mitigate health-related inequities within a population, their rising prominence within health systems is not without challenges. This paper explores health related aspects of pharmaceutical policy in Australia, Canada, Germany, The Netherlands, New Zealand, the UK and the United States. **METHODS:** Drawing on published goals for national policies, we developed a framework for gauging pharmacare system performance. We review policy structures and investigate system performance using preliminary indicators drawn from the 2007 Commonwealth Fund Survey. Survey responses to questions related to accessibility, affordability, and appropriateness are compared across countries and stratified by age, income and morbidity. **RESULTS:** Shares of populations reporting prescription drug use were lowest in Germany and highest in the US. Pharmaceutical use displayed expected age gradients in all countries and expected income gradients in all but Germany and the US. Cost-related non-adherence was most frequent in the US and Australia, and relatively unlikely among elderly populations. Relatively few patients reported prescribing errors, with no significant differences across countries. Out-of-pocket drug costs were highest in the US and Canada. From 1995 to 2005, pharmaceutical expenditures outpaced health care and GDP in all countries except New Zealand. Expenditure grew most quickly in the US. **CONCLUSION:** Though no country appears uniformly strong in all areas of pharmacare policy, several appear to have done well to manage difficult tensions in the pharmaceutical sector.

PHP26

RESEARCH AND MARKETING COMPLEMENTARITY IN PHARMACEUTICAL FIRMS: EMPIRICAL EVIDENCE

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OBJECTIVE: Snyder and King (2007) developed a theoretical model of firm behavior in which research and marketing activities are complements rather than substitutes. Public policy debate frequently makes the implicit assumption that the two activities are substitutes. In this paper the author uses financial reports of Fortune 200 pharmaceutical firms to examine the evidence for Snyder and King's theoretical model. **METHODS:** We extract research and marketing expenditure totals from the quarterly filings of the eight largest U.S. based pharmaceutical companies. We also create a comparator list of non-pharmaceutical companies matched for size and using pre-specified exclusion criteria. Univariate analysis is used to test whether pharmaceutical companies are systematically different from the comparator companies. Simple regression analysis is used to test whether companies with higher research/revenue ratios have higher or lower marketing/revenue ratios. **RESULTS:** Pharmaceutical firms spend a greater share of revenue on both marketing and R&D than the comparator firms. The share spent on marketing is similar to a subgroup of the comparator firms. The share spent on research is uniquely high. Pharmaceutical firms are also unique in their combination of high marketing and high research spending. Regression analysis shows no significant relationship (positive or negative) between research and marketing expenditure. **CONCLUSION:** Empirical analysis provides limited support to the theory developed in Snyder and King (2007). The absence of significant regression results may be due to the time lag between development and approval for sale.

PHP27

ESTIMATION AND COMPARISON OF ORTHOTIC BRACE COSTS WITH REIMBURSEMENT TARIFFS AND RETAIL PRICES IN BELGIUM

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OBJECTIVE: The RIZIV/INAMI, the Belgian third-party payer, aims to set reimbursement tariffs at a level that reflects costs of orthotic braces. In the absence of publicly disclosed information on the cost structure of braces, estimating production and distribution costs of braces is valuable to reimbursement agencies with a view to setting tariffs. The aim of this study is to calculate the cost of production and distribution of a prefabricated hard neck brace and a prefabricated hard knee brace, and to explore whether Belgian tariffs and actual retail prices correspond with estimated costs of these two braces. **METHODS:** The cost model took into account manufacturing costs, general overhead, research and development, warehousing, profit and distribution margins. Data were gathered from manufacturers, a visit to a production site, desk research, a decomposition of finished products and interviews with stakeholders. The price year was 2007.

RESULTS: The cost model generated an estimated retail price of €55 or €113 for the neck brace depending on assumptions. The estimated retail price for the neck brace was lower than the reimbursement tariff of €194 and the actual retail price of €241. With respect to the knee brace, the estimated retail price of €331 or €523 was inferior to the tariff of €580 and the actual retail price of €948. **CONCLUSION:** Actual retail prices and reimbursement tariffs for two selected neck and knee braces substantially exceeded retail prices based on estimated production and distribution costs. Therefore, there seems to be scope for reducing reimbursement tariffs and containing public expenditure on orthotic braces.

PHP28

THE PROCESS OF UPDATING THE NATIONAL LIST OF HEALTH SERVICES IN ISRAEL: IS IT LEGITIMATE? IS IT FAIR?

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OBJECTIVE: The Israeli National Health Insurance Law stipulates a National List of Health Services (NLHS) which all residents are entitled from their HMOs. This list has been updated annually for almost a decade using a structured review and decision-making process. Although the Israeli explicit priority-setting experience is unique and may be considered groundbreaking, its fairness and legitimacy have not been assessed. To assess the priority-setting process for compliance with the four conditions of accountability for reasonableness outlined by Daniels and Sabin (relevance, publicity, appeals, and enforcement), and with the four steps of the trans-disciplinary model for priority setting in health care (reasonableness, transparency, responsiveness, and accountability). **METHODS:** We used such data as public documents, audit reports, literature review, the mass media, observations from the meetings of the Public Adivosry Committee responsible for recommending new technologies for th NLHS, and interviews with the committee members. **RESULTS:** The Israeili process for updating the NLHS does not fulfill the appeals and enforcement conditions, and only partially follows the publicity and relevance conditions, outlinesd in the accountabilty for reasonableness and transparency framework. Only the reasonableness and transparency steps of the trans-disciplinary model are partially fulfilled, but the priority setting process lacks responsiveness and accountability. **CONCLUSION:** The fairness and legitimacy of the priority-setting mechanism have not been established. The main obstacles for achieving these goals may relate to the large number of technologies assessed each year within a short time frame (500 technologies assessed in 2007), the lack of personnel engaged in health technology assessment and the desire for early adoption of new technologies. Changes in the priority-setting process should be made in order to increase its acceptability among the different stakeholders.

PHP29

STAKEHOLDER PERSPECTIVES ON ECONOMIC EVALUATION: THE CASE OF NICE

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OBJECTIVE: Stakeholder involvement in health technology assessment (HTA) is of growing importance, as their participation in and support of economic evaluation is generally considered to improve the assessment process and subsequent implementation. Consequently, in early 2007, the Health Select Committee of the UK House of Commons initiated a public inquiry into the National Institute of Health and Clinical Excellence (NICE), calling for comments from a variety of stakeholders. This study aimed to examine stakeholder perspectives on several topics, including public confidence in NICE; appropriateness of economic evaluation methods; and, effectiveness of guidance implementation. **METHODS:** All stakeholder submissions (n = 92) were systematically reviewed and key themes were identified across three principal categories: 1) organisation and process; 2) methods; and 3) decision-making and implementation. **RESULTS:** Stakeholders identified a number of overarching issues regarding NICE and economic evaluation, more broadly. Firstly, despite its "arms-length" organisational structure, NICE is perceived to lack independence. Secondly, stakeholders contented that its methods assume an overly narrow perspective, especially regarding the use of RCTs, QALYs, and measures of costs and benefits. Thirdly, commentators asserted that manufacturers, clinical experts, and patients should play a greater role in HTA processes. Fourthly, the time taken to issue guidance was considered an important limitation, especially given evidence that local decision-makers delay the introduction of new treatments pending NICE's decision(s). Other key concerns included inconsistent local implementation of guidance and the overall transparency of NICE operations. **CONCLUSION:** Most stakeholders support the overall role of NICE in the NHS, and acknowledge that the Institute generally undertakes rigorous assessments. Nevertheless, many criticisms were put forth by stakeholders. NICE should continue to capitalise on its strengths, while pioneering solutions to address existing limitations and challenges. However, it is unlikely that any national HTA system will satisfy the needs and expectations of all key parties.

HEALTH CARE USE & POLICY STUDIES—
Disease Management

PHP30

COST-EFFECTIVENESS ANALYSIS AND RETURN ON INVESTMENT OF HIGH COST PATIENTS MANAGEMENT PROGRAM WITHIN A PRIVATE HEALTH CARE PLAN IN BRAZIL

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OBJECTIVE: To evaluate a methodology of managing high cost patients, called Case Management Program (CMP), within a private health plan in southern Brazil and show that such program is cost-effective and the return on investment (ROI) is positive. **METHODS:** Using NAGIS(c) model and software for disease management program, the CMP was implemented in 211 patients (0.9% of the health plan beneficiaries). I compared health plan utilization and costs including CMP costs of one period of time before the program starts with the same period of time that the program was in place. **RESULTS:** After 9 months of CMP, there were 162 patients. I considered outcomes for these 162 patients. For one Real invested, R$4,78 was saved (One 2008 American Dollar is 1,78 Brazilian Real). The average cost per enrollee per month reduced 45.9% (R$463,85 to R$250,89) and 39.4% (R$463,85 to R$280,90) if the program's costs (direct and indirect costs) are included as fixed costs. The number of visits reduced by 11.3% (794 to 704), as well as the labs exams which reduce 35.7% (420 to 270). Nevertheless, the labs exams per visit index reduce by 27.5%, where almost 53% of the visits had at least one exam before starting the program against 38.3% after the same period of time that the program starts. The number of hospitalizations reduced 34.6%, from 483 to 316. Thus, the bed-days saved were 554 days at infirmaries and 62

days at intensive care unit. The incremental cost per bed-day saved was R$419,66. **CONCLUSION:** The NAGIS(c) model of managed high cost patient, called Case Management Program is cost-effective where the incremental cost per bed-day saved is $419,66, and its return of investment is highly positive.

PHP31

DRUG PROXIES FOR IDENTIFYING SPECIFIC DIAGNOSES IN MEDICARE PART D

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OBJECTIVE: The purpose of this analysis was to develop a method for identifying Medicare Part D members with cardiovascular disease using medication proxies. **METHODS:** A binary matrix was created from cardiovascular medication prescription claims for Medicare Part D MAPD and commercial members from the first quarter of 2007. The binary matrix was subjected to factor/principal component analysis. The maximum valued factor loading for each of the generated components were then used to create a member/factor loading matrix. This matrix was used to derive beta coefficients, from logistic regression, to calculate a member's probability of having hypertension, CAD, or CHF. **RESULTS:** One-hundred and twelve factors were produced over 696,471 members prescribed cardiovascular medications. Different probability thresholds were evaluated to determine the sensitivity and specificity for the identification method. The threshold probabilities ran from >0.30 to >0.975. As the threshold probabilities increased, sensitivity/specificity for hypertension, CAD, and CHF ran from 0.99/0.50–0.50/0.99, 0.61/0.91–0.50/0.99, and 0.63/0.96–0.50/0.99, respectively. A similar result was produced using maximum score coefficients resulting from the principal component analysis. **CONCLUSION:** Although this approach to identifying members with medication proxies appears to separate members with and without certain cardiovascular conditions, it tends to exclude members at the cost of minimizing erroneously identified members.

HEALTH CARE USE & POLICY STUDIES—Drug Use

PHP32

WHAT'S DRIVING PRESCRIPTION COPAYMENTS?

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OBJECTIVE: Some contend that prescription copayment increases reflect a disproportional shifting of costs to members while others believe that copayments are simply keeping pace with rising prescription costs. To better understand the drivers of prescription cost sharing, this analysis examines recent trends in member copayments relative to total prescription costs. **METHODS:** The study is a retrospective descriptive analysis of prescription claims data for a sample of commercially-insured members enrolled with Express Scripts between 2002 and 2006. Plan sponsors included in the analysis offered integrated prescription coverage within an employer-based market (no Medicare or Medicaid). For each year, the data represent prescription claim activity for over 18 million members. Total per-prescription costs were calculated as the sum of the discounted ingredient cost, dispensing fee, administrative fees and any applicable tax divided by the number of 30-day equivalent prescriptions. Average member per-prescription cost was calculated as the total member cost divided by the total number of 30-day equivalent prescriptions. Costs were calculated separately for generics, preferred brands and non-preferred brand-name prescriptions. **RESULTS:** From 2002 to 2006 the average total per-prescription cost increased $10.23 or 20.5% while the average member per prescription copayment increased by $1.70 or 14.3%. The proportion of total costs paid by members decreased from 24% in 2002 to 23% in 2006. Per-prescription member costs increased by 10% for generics, 25.7% for preferred brands and 58.6% for non-preferred brands. **CONCLUSION:** These findings suggest that plan sponsors are not shifting a greater proportion of costs to members, nor is member cost share keeping pace with rising prescription costs. Actual per-prescription member cost share increased at a modest rate, influenced by increased generic use which grew from 42% in 2002 to 58% in 2006.

PHP33

HERB/DIETARY SUPPLEMENT AND PRESCRIPTION DRUG USE TRENDS AMONG US ADULTS, 1999–2004

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OBJECTIVE: The aim of this study was to evaluate trends in the use of herbs and dietary supplements (HDS) in relation to prescription drug (Rx) use, as well as their individual use, among US adults from 1999–2004. **METHODS:** Data were abstracted from the 1999–2000 and 2003–2004 cycles of the National Health and Nutrition Examination Survey (NHANES). HDS included herbs, vitamins, minerals, and other supplements. Trends in HDS and/or Rx use were examined based on stratified characteristics (i.e., sociodemographics, insurance coverage, health care visits during the preceding year, chronic conditions). Sampling weights were adjusted to allow for the pooling of data from multiple waves. **RESULTS:** Overall, the proportion of HDS users increased from 51.2% during 1999–2000 to 53.0% during 2003–2004, while that of Rx users increased from 49.9% to 55.6% over the same period. Between 1999 and 2004, the proportion of HDS-only users decreased while the proportion of people who only used Rx increased. The concomitant use of HDS and Rx increased for most subgroups, except for those who had an annual household income less than $14,999 or greater than $65,000, and who had never have health care visits during the preceding year. **CONCLUSION:** Trends suggest that concomitant HDS and Rx use increased over the period of observation in the general US population. Further research is needed to investigate the outcomes of concurrent HDS and Rx use.

PHP34

PRINCIPAL COMPONENTS ANALYSIS OF DRUG UTILIZATION AND EXPENDITURE TRENDS FOR MAJOR THERAPEUTIC CLASSES IN U.S. MEDICAID PROGRAMS

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OBJECTIVE: Drug expenditures have been increasing much faster than spending on other medical services and have become burdensome for state Medicaid programs. This study was to analyze the trends of Medicaid drug utilization and expenditures across all major therapeutic classes and to identify their similarities and differences. **METHODS:** Quarterly Medicaid reimbursed drug prescriptions and dollar amounts for each drug were extracted from the national claims data from the Centers for Medicare & Medicaid Services for 1991 through 2004. Expenditures were aggregated across all drugs in 64 different therapeutic classes, providing 64 different time series of length 56 quarters

each. Principal components analysis (PCA) was then applied to the data to identify major types of expenditure trends across all the different therapeutic classes. **RESULTS:** In total, across all drugs in the 64 therapeutic classes, Medicaid spending increased from $4.6 billion with 231 million prescriptions in 1991 to $22.5 billion with 350 million prescriptions in 2004, representing total Medicaid spending on outpatient drugs during the time period. PCA revealed three principal components that accounted for 90 percent of total variation in Medicaid drug expenditure patterns. The first principal component (PC1), explaining 66 percent of the variation, is an exponential-like upward trend; PC2, explaining 17% of the variation, represents an increasing-then-decreasing expenditure pattern; and PC3, explaining 7% of the variation, represents an up-and-down cyclical expenditure pattern. Therapeutic classes exhibiting high correlation ($r > 0.9$) with PC1 include corticoid steroids, anti-neoplastics, anti-seizure agents, bone density regulators, anti-inflammatory agents, antiretroviral agents, antipsychotics, antidepressants, oral diabetic agents, and gastrointestinal agents. When PCA was applied to drug utilization trends, the same principal components were discovered and accounted for 92% of total variation in drug utilization patterns. **CONCLUSION:** Most drug therapeutic classes exhibited exponential-like upward expenditure trends, clearly contributing to the overall rising expenditure burden for Medicaid.

PHP35

CHARACTERIZING PHARMACY AND MEDICAL CLAIMS FOR A PRIVATE INSURANCE POLYPHARMACY POPULATION

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OBJECTIVE: To describe and characterize a group of private insurance members taking multiple medications over a one-year period. **METHODS:** Persons were selected for this polypharmacy analysis if they had at least five unique maintenance prescriptions in their pharmacy claims records for the period of January-March 2005, based on a customized list of chronic medications. The full set of pharmacy and medical claims for these members were evaluated for a 12-month period, October 2004 to September 2005. Standard descriptive statistics were calculated to characterize the population. Logistic regression models were used to assess the association of pharmacy claims and "safety events" (i.e., emergency room visits (ER) and hospitalizations (H)). **RESULTS:** The final analytic sample, having both pharmacy and medical coverage for the period, consisted of N = 14,890 members ≥19 years of age (66% female), from four U.S. states. There were over 93,000 unique pharmacy claims with a monthly average of 6.3 per member. Males (M) and females (F) had similar averages (M = 6.2; F = 6.3), yet males were more likely to have ER (12.1%M vs. 10.8%F, $p = 0.022$) and H (8.3%M vs. 6.3%F, $p < 0.0001$). Unadjusted logistic regressions estimated the effect of medication claims on ER and H as OR = 1.14, $p < 0.0001$ and OR = 1.18, $p < 0.0001$, respectively. This implies 14% and 18% higher odds of ER or H, respectively, for every unit increase in monthly medications. Adjusting for age and gender does not substantially affect these results. **CONCLUSION:** Evaluating serious medical events in sub-populations taking multiple prescription medications provides important information for health insurers trying to reduce ER and hospitalizations. In a privately insured polypharmacy sub-population, there was a strong association with these safety events and increased average monthly pharmacy claims. Private insurers should consider establishing managed care programs to evaluate and improve the overall safety of their members taking higher numbers of monthly medications.

PHP36

RELATIONSHIP OF DOCTOR SHOPPING AND POLYPHARMACY: A NATIONWIDE STUDY IN TAIWAN

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OBJECTIVE: The National Health Insurance (NHI) system in Taiwan is characterized by 1) free choice of physicians and health care facilities without formal referral; 2) generous drug benefits; and 3) low co-payments. The NHI beneficiaries thus exhibit features of frequent attendances, frequent changes of physicians, and a higher number of drug items in a prescription. It is interesting to know how likely a doctor shopper is to be a patient of polypharmacy. **METHODS:** The data sources came from the historical claims datasets of 200,000-person cohort in 2005, offered by the National Health Insurance Research Database in Taiwan. The analysis was limited to the ambulatory records with conditions of chronic diseases, represented by visits with more than seven days of drug supply. For those people with at least one visit for chronic diseases, the degree of correlation between the total number of consulted facilities and the total number of distinct prescribed drug items in all visits for chronic diseases in 2005 would be determined. **RESULTS:** Of the study cohort 56,956 people (30,070 females and 26,886 males; mean age 49.9 ± 19.9 [SD] years) had at least one visit for chronic diseases in 2005. On average, one of these people had paid 6.8 ± 7.0 (max. 98) visits, consulted 1.5 ± 0.9 (max. 32) facilities, and received 7.3 ± 7.3 (max. 93) distinct drug items for chronic diseases in a year. The total number of consulted facilities for chronic diseases in a year was strongly correlated with the total number of distinct prescribed drug items in all visits for chronic diseases in a year (Spearman's rho 0.548, $p < 0.001$ [2-tailed]). **CONCLUSION:** More visits for chronic diseases at different facilities were related to more drugs prescribed. Besides the patients' reasons, the causes inherent in the health care system deserve investigations.

PHP37

THE EPIDEMIOLOGY AND OUTCOMES OF PATIENTS BY SERUM DIGOXIN LEVELS DURING HOSPITALIZATION

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OBJECTIVE: Dosing and therapeutic range of digoxin has recently changed based on results from clinical trials. We examined the epidemiology, mortality and length of stay (LOS) of patients with serum digoxin level results during hospitalization. **METHODS:** We retrospectively analyzed 4765 cases with serum digoxin levels from 2 institutions that electronically provided laboratory data from 2004–2006. Cases were stratified into the groups based on maximum serum digoxin level; <1.0, 1.0–2.0, 2.1–2.4, and >2.4. The actual to predicted hospital mortality and length of stay was compared across each strata with predicted mortality and LOS determined by previously described admission based clinical models. **RESULTS:** Approximately 3 in 5 cases (57.8%) had a serum digoxin level higher than the recommended range of <1.0. The crude mortality for cases with digoxin levels <1.0 was 4.1% and 9.1% for those with digoxin levels ≥ 1.0. After adjustment for severity of illness on admission cases with a digoxin level ≥ 1.0 had a significantly higher actual to predicted mortality ratio (1.3 [CI = 1.1–1.4]) than cases <1.0 (0.8 [0.7–1.0]). While crude LOS was higher for serum digoxin

levels ≥ 1.0 (7.2 ± 7.7 days vs. 5.5 ± 5.6 days) after risk adjustment the actual to predicted LOS ratio was not significantly different from 1. **CONCLUSION:** The majority of cases have serum digoxin levels that are above the currently recommended range and cases with serum digoxin levels ≥ 1.0 have a higher mortality. Cases with serum digoxin levels ≥ 1.0 did not have higher risk-adjusted LOS. Digoxin dosing during hospitalization requires careful monitoring and has the potential of improving safety and related outcomes.

PHP38

A QUALITATIVE REVIEW OF OFF-LABEL USES OF INTRAVENOUS IMMUNGLOBULIN

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OBJECTIVE: The various off-label uses of intravenous immune globulin (IVIG), used for the treatment of immunodeficiency disorders, far exceeds its labeled indications. This study represents an effort to identify these uses. **METHODS:** Clinical studies concerning the off-label uses of IVIG preparations were identified by searching the PUBMED (MEDLINE+) database from January 1, 1998 to January 1, 2006. The search was limited to clinical trials, meta-analyses, randomized controlled trials, and case reports in English. **RESULTS:** A review of 138 clinical trial abstracts identified 10 trials examining 2 labeled uses (635 patients) and 128 trials examining 61 different off-label uses (6781 patients). The top off-label indications included multiple sclerosis, graft versus host disease in transplant patients, prevention of antiphospholipid syndrome in miscarriage, and Guillan-Barre syndrome. The studies appear to support many of the acceptable off-label uses cited by various guideline groups. A total of 276 case reports were identified, with 268 reports representing 156 different off-label uses (362 patients). Patient outcomes from published abstracts were positive for 267 patients (74%). Seven meta-analyses were identified, evaluating recurrent miscarriage, in vitro fertilization failure, infection in preterm infants, multiple sclerosis, immune thrombocytopenic purpura, and pemphigoid. With the exception of recurrent miscarriage and infection in preterm infants, the off-label use of IVIG for these indications was found to have positive outcomes. **CONCLUSION:** Over 150 off-label uses were identified from reviewing clinical trials and case reports. An examination of IVIG guidelines by specialty society, payer, and other review organizations shows that the biomedical evidence supporting off-label uses is being interpreted in different ways. Health care institutions are strongly urged to approve and closely monitor specific uses of IVIG to reserve dwindling supplies for the "best evidence" uses. Clinicians should be aware of the limits of knowledge in many off-label uses and exercise restraint in prescribing for unproven indications.

PHP39

THE EPIDEMIOLOGY AND OUTCOMES OF PATIENTS TREATED WITH HEPARIN DURING HOSPITALIZATION

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OBJECTIVE: Current national patient safety goals call to "Reduce the likelihood of patient harm associated with the use of anticoagulation therapy". We examined the epidemiology, length of stay and occurrence of bleeding in non-surgical patients treated with heparin infusions during hospitalization. **METHODS:** We retrospectively analyzed 668 non-surgical cases that were treated with heparin for at least 24 hours during hospitalization from 2 institutions that electronically provided laboratory and pharmacy data from 2005–2006. Cases were categorized into the following groups based on serum APTT results; subtherapeutic (<51), therapeutic (51–75), above therapeutic (76–99) and supratherapeutic (≥100). The number of cases meeting each APPT category was compared at approximately 6 and 24 hours post heparin treatment. The actual to predicted hospital length of stay was compared for each APTT category with predicted LOS determined using previously described admission based clinical models. Bleeding was assessed by the presence of diagnostic codes. **RESULTS:** Those with APTT measured, the percent of cases at 6 and 24 hours were; 20.7 vs. 20.3 for subtherapeutic, 23.4 vs. 31.6 for therapeutic, 16.2 vs. 19.0 for above therapeutic, and 30.4 vs. 18.6 for supratherapeutic. There was a 1.8 day excess LOS in the subtherapeutic group at 24 hours ($p < 0.05$). Unadjusted bleeding rates were 21.6% for subtherapeutic, 17.5% in therapeutic, 13.4% in above therapeutic and 12.1% in supratherapeutic cases at 24 hours. **CONCLUSION:** One in 5 cases treated with heparin had a subtherapeutic APTT at 24 hours and these cases had a significantly longer LOS. Clinicians responsible for assuring anticoagulation safety should incorporate monitoring strategies for subtherapeutic APTT results as diligently as those for supratherapeutic results.

HEALTH CARE USE & POLICY STUDIES— Equity and Access

PHP40

ANALYZING INEQUITY IN HEALTH CARE UTILIZATION BY THE US POPULATION

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OBJECTIVE: To evaluate equity concerns in routine and preventive health care utilization. **METHODS:** Data from the MEPS's Household Component (2004), a nationally representative survey of the U.S. civilian noninstitutionalized population, was used. Equity was defined on the principle of equal treatment for equal need. Need variables controlled in the model were perceived health status, presence of illness, comorbidities, activities and instrumental activities of daily living limitations. Non-need variables assessed for presence of horizontal equity were age, gender, race, ethnicity, income, and education. Need variables were studied to confirm presence of vertical equity, which was defined as different levels of need variables consuming appropriate different levels of health care. Equity in routine health care utilization namely-expenditures on Emergency room (ER), Inpatient hospitalization (IPH), Outpatient care (OPT), Office-based care (OFB), Dental care (DENTAL), and Prescription drugs (RX) were analyzed by GLM with log-link and Gamma/Poisson families. Binary measures of dental check-up, cholesterol check-up, blood-pressure check-up, and flu-shots, as indicators of preventive health care utilization, were analyzed by logistic and skewed-logistic models. **RESULTS:** Horizontal inequity was observed by age, gender, and income in all routine care variables except ER. Inequity by education was observed in OFB, DENTAL, and RX. Race related inequity was observed in OFB, IPH, DENTAL, and RX. Inequity by ethnicity was observed in utilization of all routine care variables. Necessary condition for vertical equity was not satisfied only in ER and DENTAL utilization. Horizontal inequity was observed in all four preventive care variables by age, gender, ethnicity, income, and education. Horizontal inequity by race was observed in cholesterol check-up, blood pressure check-up, and receipt of flu shots. Evidence of vertical equity was not observed in preventive care utilization. **CONCLUSION:** Horizontal inequity in age, gender, race, ethnic-

ity, income, education and the lack of vertical equity in preventive care may be an indication of sub-optimal resource allocation in the US population.

PHP41

PATIENT RACE AND MEDICATION CHOICE FOR HYPERCHOLESTEROLEMIA, HYPERTENSION, AND DIABETES

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OBJECTIVE: Prior research reports black patients have lower medication use for hypercholesterolemia, hypertension, and diabetes. We consider whether these differences reflect physicians' prescribing decisions. **METHODS:** Data from an ongoing web-based survey of 2,200 randomly-selected primary care physicians in 4 states were used to assess the role of patient race in prescription decisions. Physicians viewed 3 clinical vignettes (hypercholesterolemia, hypertension, diabetes) consisting of a patient photo and text, provided medication recommendations, and estimated treatment compliance using a 10-point Likert scale (1—definitely not comply, 10—definitely comply). Patient race (black, white) was randomly assigned at the respondent level; other factors were held constant. We compared medication recommendations and compliance estimates by patient race for each vignette using Fisher chi-square analysis and t-tests. **RESULTS:** Data from 229 respondents (1942 eligible, 11.8% response rate) were available at time of submission; 118 respondents were randomized to black patients, 111 to white patients. Black and white patients were equally likely to receive a prescription in the hypercholesterolemia (99.2% black vs. 100.0% white, $P = 1.00$), diabetes (99.2% black vs. 99.2% white, $P = 1.00$) and hypertension (99.2% black vs. 100.0% white, $P = 1.00$) vignettes. Hypertension treatment recommendations differed by race; black patients were less likely to be prescribed an ACE inhibitor (43.0% vs. 71.3%) and more likely to be prescribed a calcium channel blocker (19.3% vs. 2.8%, overall $P < 0.001$). Mean levels of estimated compliance were similar by race in the hypercholesterolemia (black 7.2 vs. white 7.3, $P = 0.56$) and diabetes (black 7.6 vs. white 7.7, $P = 0.44$) vignettes, but trended lower for the black patient in the hypertension vignette (7.4 vs. white 7.7, $P = 0.06$). **CONCLUSION:** These preliminary data indicate patient race may influence physicians' choice of drug class and estimates of compliance in patients with hypertension, but has no measurable effect on the decision to initiate treatment for hypertension, hypercholesterolemia or diabetes.

PHP42

PHYSICIANS' VIEWS REGARDING PRESCRIPTION DRUG ACCESS UNDER MEDICARE PART D

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OBJECTIVE: To assess primary care physicians' attitudes regarding the impact of Medicare Part D on beneficiaries' access to prescription drugs. **METHODS:** We used data from an ongoing web-based survey of 2,200 randomly-selected primary care physicians in Florida, Massachusetts, North Carolina, and Texas to analyze respondents' views of Part D. Physicians were contacted by mailed invitation and offered a cash honorarium for participation. **RESULTS:** There were 229 survey respondents (1,942 eligible, 11.8% response rate) at the time of abstract submission. When asked "Overall, what is your impression of Part D?" 46% (105/229) of physicians responded "somewhat favorable" or "very favorable," while 36% (93/229) responded "somewhat unfavorable" or "very unfavorable." Most respondents (63%, 140/221) felt Part D formularies were insufficient for their patients' needs, but a majority (51%, 111/216) believed patients' access to prescription drugs had improved under Part D. Physicians reported patients with no prior prescription drug coverage had better access to drugs under Part D (83%, 190/229), while patients with prior prescription drug coverage experienced worse access (49%, 113/229). Physicians varied in their views regarding the impact of Part D on access to drugs for minority patients; 19% (44/229) reported access was worse, 44% (101/229) reported access was unchanged, 37% (84/229) reported accessed improved. Most physicians reported requesting prior authorization for Part D patients in the prior 30 days (86%, 196/229), and changing a prescription in the past 30 days because their preferred medication was not covered by a Part D formulary (93%, 214/229). **CONCLUSION:** These preliminary data indicate physicians have mixed opinions about Medicare Part D. Although many physicians believe Part D has improved access to prescription drug coverage, especially for those without prior coverage, current Part D formularies were considered insufficient and frequently required physicians to request prior authorization or prescribe a non-preferred medication.

PHP43

PHYSICIANS' VIEWS REGARDING THE IMPACT OF MEDICARE PART D DRUG COVERAGE FOR DUAL-ELIGIBLE PATIENTS

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OBJECTIVE: Drug coverage for dual-eligible patients switched from Medicaid to Medicare Part D in January, 2006. We assessed primary care physicians' current beliefs regarding the impact of the switch on dual-eligible patients and physicians, and examined possible differences based on the restrictiveness of states' Medicaid drug coverage. **METHODS:** In an ongoing web-based survey of 2,200 randomly-selected primary care physicians in Florida, Massachusetts, North Carolina, and Texas, respondents were asked how aspects of drug access changed under Part D relative to pre-Part D Medicaid coverage. Physicians were contacted by mail and offered a cash honorarium for participation. Chi-square tests compared responses between physicians in states with less-restrictive Medicaid drug coverage (NC) and states with more-restrictive Medicaid coverage (FL, MA, TX). **RESULTS:** There were 229 survey respondents (1,942 eligible, 11.8% response rate) at the time of abstract submission. Findings are reported as percentages of respondents indicating a feature was worse/unchanged/better under Part D relative to Medicaid. Most respondents reported dual-eligible patients' access to drugs (54/22/24%) and satisfaction (61/23/16%) were worse in Part D, but patient compliance (29/61/10%) was unchanged. Most physicians also reported their ability to prescribe preferred medications (60/29/11%) and administrative burden of writing prescriptions (56/30/15%) were worse in Part D. Findings differed by the restrictiveness of states' Medicaid drug coverage. Respondents from NC were more likely to report Part D was worse than Medicaid for: dual-eligible patients' access to medications (72/20/9% vs. 43/23/35%, $P < 0.001$), satisfaction (77/17/6% vs. 50/27/23%, $P < 0.001$), and compliance (40/55/5% vs. 21/65/14%, $P = 0.008$); and physicians' prescribing preferred drugs (80/20/0% vs. 47/35/18%, $P < 0.001$) and administrative burden (80/17/2% vs. 38/38/23%, $P < 0.001$). **CONCLUSION:** These preliminary data indicate physicians believe Medicare Part D has adversely affected dual-eligible patients previously covered under Medicaid. The transition to Part D coverage for dual-

eligible patients is viewed less negatively in states with more-restrictive Medicaid coverage.

HEALTH CARE USE & POLICY STUDIES—
Formulary Development

PHP44

SOURCES OF MEDICAL INFORMATION AND DEGREE OF TRUST PLACED IN THEM BY RUSSIAN DOCTORS

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OBJECTIVE: To analyse the degree of trust placed in sources of medical information by practising doctors-therapists. **METHODS:** We questioned 144 doctors or therapists from various cities in Central Russia. Doctors completed a questionnaire containing demographic data, information sources and how much trust they placed in these sources. **RESULTS:** Mean age of respondents was 43.4 [SD 9.8] years with 60% women and 40% men. Most (92%) noted that their basic sources of specialised information were various medical magazines. In daily work, 84% use various directories and consult with colleagues. Doctors use books and other monographs in 55% of cases and 49.3% receive information from medical representatives of companies. Just over a quarter (29% and 26%) receive information from advanced training courses and from weekly hospital meetings. Only 1.7% of doctors use specialized medical Internet sites. The most important criteria for quality information were availability and reliability of data. The most trustworthy information, in the opinion of practising doctors, was from medical magazines (78%) and information from courses to upgrade qualifications (60%). **CONCLUSION:** Our data reflect the need to implement measures to improve the quality of medical information.

PHP45

COMMON DRUG REVIEW (CDR) RECOMMENDATIONS: DOES COST-EFFECTIVENESS MATTER?

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OBJECTIVE: CDR is the Canadian central review agency whose advisory body, the Canadian Expert Drug Advisory Committee (CEDAC), makes recommendations for drug reimbursement decisions by public payers. CEDAC is explicitly charged to consider cost-effectiveness in its mandate. A review was conducted of all Reasons for Recommendation to determine if and how cost-effectiveness information was used. **METHODS:** Reasons for Recommendation were identified from the CDR website, from inception (September 2003) to the end of October 2007. Reasons were reviewed by both authors. Each drug indication was categorized as follows: cost-effectiveness was mentioned in the Reasons, incremental cost-effectiveness ratios (ICERs) were considered attractive, and the listing recommendation. ICERs were designated as attractive or not based on either direct comments in the Reasons or indirectly through the restrictiveness of the recommended criteria. Descriptive statistics were performed. **RESULTS:** There were recommendations for 78 unique drug submissions. Economic evidence was not mentioned in 55% of recommendations (N = 44). Costeffectiveness was mentioned in the remaining 45% of recommendations (N = 34). The ICER was considered attractive for 15% of drugs (N = 5), with an ICER range from dominant (N = 3) to $71K/life year gained. These five drugs had positive listing recommendations. Drugs that were economically unattractive but achieved positive recommendations had an ICER range (where stated) from $50K–$80K/QALY. Economically unattractive drugs with negative recommendations had an ICER range from $18K to $189K/QALY. **CONCLUSION:** Cost-effectiveness was often not mentioned in CEDAC recommendations. There appeared to be an acceptability threshold of $50K/QALY with a grey zone extending up to $80K/QALY. However, many drugs were not recommended which had ICERs below these thresholds. Overall, economic information had a limited role for informing Canadian drug reimbursement recommendations.

HEALTH CARE USE & POLICY STUDIES—
Health Care Payment and Management Policies

PHP46

IMPACT OF A DRUG POLICY ON AVAILABILITY AND DRUG COST CONTAINMENT IN A TERTIARY CARE HOSPITAL: 10 YEARS OF EXPERIENCE

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OBJECTIVE: To study the impact of a model adopted to improve availability and accessibility to essential drugs and impact on hospital budget in a super specialty tertiary care hospital. **METHODS:** The interventions consisted of selection of limited list of essential medicines (EML) and procurement through centralized pooled procurement system in 1996–1997, followed by setting up of Drugs & Therapeutic Committee (DTC) to review drug expenditure and prescribing pattern in 1998. Analysis of the annual hospital budget, expenditure on drugs, availability of key drugs, stock-outs, and ABC analysis was done before (1994–1996) and after intervention (1997–2004). **RESULTS:** Rise in average drug expenditure from 3.63% to 5.16% only was observed after intervention despite 5-fold rise in patient attendance. Previous trend of ever rising annual drug expenditure was reversed immediately after interventions in 1997 as drug expenditure reduced by 47%, accompanied by increased availability (94.6%) of key drugs. Despite high expenditure on key drugs (75.89%) mean availability was 67.48% but after intervention with the same expenditure (77.68%) it increased to 95.28%. Percent drugs out-of-stock decreased from 27.57% to 19.57% & were of minor duration with no stock-out of vital drugs. ABC analysis before intervention showed only 3.33 drugs of the category A consumed 74% budget which increased to 9.63 drugs consuming 79.53% of the annual drug budget. Analysis of top 10 drugs consumed showed reversal of previous trend of non-essential among top 10 drugs from 1998 onwards where only vital drugs represented top 10 drugs. **CONCLUSION:** Effective containment of overall expenditure on drugs accompanied by increased availability of essential drugs is possible by some managerial interventions-selection of essential drugs, centralized pooled procurement and functioning DTC. These interventions serve to optimize the value of limited government funds and thereby empower and support government in making basic medicines available to all.

PHP47

ASSESSMENT OF NATIONAL MEDICARE PART D ESTIMATED ANNUAL COSTS FOR 2007 AND 2008 USING A PATIENT COHORT

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OBJECTIVE: This study used a sample cohort of Medicare-eligible patients to determine the yearly and regional variation in estimated annual costs (EAC) of all stand-alone Medicare Part D

(MPD) plans. **METHODS:** Fifty patients were randomly selected from a database of 18,000 Medicare-eligible patients provided by a pharmacy benefits management company. Each patient's medication history from January–June 2007 was used to generate their medication profile. Each profile was entered into the Medicare website and the EAC were calculated. For each patient the lowest, mean, and highest EAC were obtained for both 2007 and 2008 in each of the 34 MPD regions. EAC from 2007 were inflation-adjusted and compared to 2008 costs. Pair-wise comparisons were performed to analyze unadjusted and inflation-adjusted 2007 versus 2008 EAC differences within each region. **RESULTS:** In some regions, significant increases were observed in the comparisons of 2007 EAC or inflation-adjusted 2007 EAC versus 2008 EAC. For example, in California all 2008 EAC values (lowest, mean, and highest) significantly increased from 2007 (both unadjusted and inflation-adjusted). This differed from other regions where there was no change or a decrease in EAC was observed. For example, in Alaska the lowest EAC were not statistically different between 2008 and 2007 (both unadjusted and inflationadjusted). Mean EAC showed a significant decrease only when 2007 EAC were inflation adjusted, while highest 2007 EAC values (both unadjusted and inflation-adjusted) were significantly greater than the highest 2008 EAC. **CONCLUSION:** The privatization of MPD plans was intended to decrease drug acquisition costs and theoretically these savings would decrease drug costs for Medicare-eligible patients. However, based on the variable trends between MPD regions, and in some instances the increase in EAC from 2007 to 2008, drug costs incurred by patients do not appear to be decreasing between 2007 and 2008.

PHP48

THE STATE OF HEALTH ECONOMICS AND PHARMACOECONOMICS EVALUATION RESEARCH IN ZIMBABWE

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OBJECTIVE: The study objectives were to describe the characteristics and quality of health economics (including pharmacoeconomics) evaluation research studies related to Zimbabwe. **METHODS:** A literature review was conducted to identify health economic evaluation articles. Health economics evaluation, PUBMED, MEDLINE, HealthSTAR, EconLit, and Psychinfo databases and sociological and dissertation abstracts were used to search economic analyses. Only original applied economic evaluations addressing a health-related topic related to Zimbabwe and published in peer reviewed journals in the English language were included. Two reviewers independently evaluated and scored each article in the final sample. **RESULTS:** The 25 identified articles, published between 1987 and 2005, appeared in 13 different journals (based mostly outside of Zimbabwe). On average, each article was written by three authors, who had mostly medical/clinical training. The number of articles peaked between 1993 and 1997. Based on a 1 to 10 scale, with 10 indicating the highest quality, the mean quality score for all studies was 5.36 (SD = 1.57) and about one-third of the articles were of poor quality (score < 4). The quality of articles was statistically significantly related ($p < 0.10$) to the country of journal (non-Zimbabwe = higher), type of publication (non-medical = higher), number of authors (more authors = higher), years of publication (more recent = higher), and primary health intervention (services higher than pharmaceutical interventions). The quality of the articles was not significantly related to the country of current residence of the primary authors, sample size, primary training of the first author, main objective of the study, and type of data (primary vs secondary). **CONCLUSION:** The results of the study indicated that the use of health economics (including pharmacoeconomics) evaluation research in Zimbabwe is limited and about one-third of published articles were of poor quality. More and better quality health economics research in Zimbabwe is warranted.

PHP49

FRAMEWORK AND METHODOLOGY TO IDENTIFY AND ASSESS PHARMACIST-SENSITIVE OUTCOMES IN COLLABORATIVE MEDICATION MANAGEMENT

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OBJECTIVE: To develop a theoretical framework and process to define and identify pharmacist-sensitive outcomes for chronic diseases and propose how these can be operationalized within practice, policy, and research. **METHODS:** A collaborative medication management framework was developed to provide a platform for identifying outcomes sensitive to pharmacists' contribution to patient's care. Potential indicators for specific pharmacist's roles identified were: supporting medication-prescribing practice; medication-taking practice; and medication-related information transfer. Clinical indicators of potential impact on patient's outcomes were noted. The framework was used to structure gathering, selecting, and processing of literature-based information. We searched IPA, Medline, and Embase (inception-2006) to identify research describing the impact of pharmacists' patient-care interventions. Two independent reviewers identified articles, then extracted data; results were compared and settled through consensus. Articles were grouped by disease. Outcomes/indicators were categorized as definitely sensitive, probably sensitive, probably not sensitive, or definitely not pharmacist-sensitive. Data extracted included intervention type, patient numbers, demographics, study characteristics, instruments used, data compared, and outcomes. Where sufficient, data were combined in a random-effects meta-analysis. Study quality was assessed using Downs-Black scale. **RESULTS:** The framework and the methodology developed are effective in synthesizing and interpreting literature data to identify pharmacist-sensitive outcomes. Average study quality was 62% ± 11% ("fair"). Significant impacts were found on reducing glycosylated hemoglobin (0.62% ± 0.29%; $N = 2247$; $k = 16$; $P = 0.03$) and systolic blood pressure (6.9±3.5 mmHg; $N = 2246$; $k = 13$; $P = 0.047$). Non-sensitive were diastolic blood pressure (3.6 ± 1.9 mmHg; $N = 2246$; $k = 13$; $P = 0.06$), quality of life (1/8 significant) and compliance (5/13 significant). **CONCLUSION:** Pharmacist-sensitive outcomes identified to date are for diabetes and hypertension (in progress are asthma-COPD, congestive heart failure, mental illnesses and arthritis). More research studies are required to verify the significance of findings. Pharmacist-sensitive outcomes is an underdeveloped concept. Current studies primarily assess clinical outcomes and few measure indicators that are more proximal to a pharmacist intervention.

PHP50

A TYPOLOGY OF AFRICAN AMERICAN COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) USE AND ITS CORRELATES FROM THE ANDERSEN HEALTH CARE UTILIZATION MODEL

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OBJECTIVE: 1) To identify clusters of African-American (AA) CAM users based on their past 12 month usage of 17 CAM

modalities, and 2) to examine associations between clusters and key aspects of the Andersen health care utilization model. **METHODS:** Using the 2002 National Health Interview Survey (NHIS), the sample included 2949 AA adults who reported using at least 1 of 17 CAM modalities in the past 12 months. A cluster analysis was performed and a multivariate binary logistic regression tested which Andersen model variables (Predisposing, Enabling, Need) and disease conditions added unique explanation of the conditional probability of being in a particular cluster. **RESULTS:** Five clusters were identified: Spiritual—prayer only (64%); Mind/Body/Spirit—primarily prayer, herbal, and relaxation (7%); Mind Focus—primarily relaxation and prayer (10%); Spiritual/Biological—primarily prayer and herbal use (14%); and Mind/Body alternatives—relaxation, yoga/tai chi/vitamins (5%). Overall, prayer, relaxation, and herbal use were the strongest influences on cluster makeup. The logistic regression results showed that compared to other clusters, the Spiritual cluster was less educated and less physically active. Additional predictors that were statistically significant for some clusters were: age; region of country; not having a usual source of medical care; retirement status; experiencing anxiety/depression; living with others; gender; currently smoking; experiencing limits in daily activities; suffering from insomnia, joint pain, high cholesterol, and diabetes; marital status; income; and over-the-counter drug use. **CONCLUSION:** The majority of AAs who use CAM can be grouped together based predominantly on prayer, relaxation, and herbal use. While predictors of usage vary by cluster, education and physical activity were important for all. Cluster analysis highlights differences within one racial group and these differences can be used by clinicians to engage AA CAM users and better understand how to treat their conditions.

PHP51

COMPARISONS OF RELATIVE RISKS OF SERIOUS COMORBIDITIES AMONG EMPLOYEES WITH AND WITHOUT INSOMNIA, GERD, HEPATITIS C, MULTIPLE SCLEROSIS, AND CHRONIC CONSTIPATION

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OBJECTIVE: To compare the relative risks of 12 serious co-existing health conditions among employees with insomnia, gastroesophageal reflux disease (GERD), hepatitis C (HCV), multiple sclerosis (MS), or chronic constipation (CC). **METHODS:** A 2001–2007 US employee database was used to identify subjects with insomnia, GERD, HCV, MS, or CC. For each condition, controls were matched on demographics, job-information, and geography. For each employee, 12-month post-index date medical claims were assigned to 261 Agency for Healthcare Research and Quality (AHRQ) condition categories using ICD-9 codes. Prevalence of these conditions was compared between the five pairs of matched disease/non-disease cohorts. **RESULTS:** Numbers of employees with disease and matched employees without disease were: Insomnia 17,230/17,230; GERD 11,653/116,530; HCV 1,329/26,580; MS 765/15,300; CC 1,215/29,160. Of the 261 AHRQ categories, insomnia employees had significantly higher prevalence than controls in 201 and significantly lower prevalence in two categories. Numbers of categories with higher/lower prevalence in the GERD, HCV, MS, and CC populations compared to their respective controls were 197/7, 126/0, 96/0, and 148/0, respectively. Relative risks of coronary atherosclerosis among employees with insomnia, GERD, HCV, MS, or CC (relative to employees without these diseases) were 1.8*, 2.2*, 1.3*, 1.7*, and 1.6*, respectively. Similarly, respective relative risks were calculated for essential hypertension (1.5*, 1.6*, 1.2*, 1.1, 1.3*), hyperlipidemia (1.6*, 1.8*, 0.9, 1.2*, 1.7*), acute cerebrovascular disease (3.4*, 2.3*, 0.9, 7.8*, 2.5*), diabetes without complications (1.4*, 1.4*, 1.5*, 0.9, 1.2), diabetes with complications (1.3*, 1.3*, 1.9*, 0.9, 1.5*), chronic obstructive pulmonary disease (2.0*, 2.0*, 1.7*, 1.4, 1.4*), asthma (2.1*, 2.5*, 1.3, 1.1, 1.6*), rheumatoid arthritis (2.0*, 2.1*, 2.5*, 1.8, 2.9*), osteoarthritis (2.2*, 2.1*, 1.6*, 1.3, 1.8*), osteoporosis (1.7*, 1.7*, 1.4, 2.6*, 2.3*), and neoplasms (1.4*, 1.8*, 1.5*, 1.4*, 2.0*) (*$P < 0.05$). **CONCLUSION:** Employees with insomnia, GERD, HCV, MS, or CC have many more serious co-morbidities than employees without these diseases.

PHP52

CHANGES IN PHARMACIST-PROVIDED MEDICATION THERAPY MANAGEMENT SERVICES: ANALYSIS OF ONE INNOVATIVE COMPANY'S MTM SERVICE CLAIMS OVER TIME

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OBJECTIVE: To characterize changes in medication therapy management (MTM) interventions across time, including identification of trends associated with the provision of pharmacist-provided MTM services and evaluation of potential cost savings from avoidance in health care utilization resulting from pharmacist-provided MTM services. **METHODS:** Pharmacist generated claims from a multi-state MTM company were analyzed across a seven-year time period. Data extracted from each claim included patient demographic information (e.g., age and gender), specific information about the medication triggering the intervention (e.g., therapeutic class and therapy type), and specific information about the service provided (e.g., reason for service, professional service provided, result of service, and estimated cost avoidance (ECA) associated with the MTM intervention). In addition, pharmacy payment information was extracted, so that along with ECA, an estimated return on investment for each claim could be calculated. **RESULTS:** A selected subsample containing over 75,000 MTM claims submitted by pharmacists in 47 states from years 2000 through 2006 were analyzed. The reason for pharmacist-provided MTM intervention moved away from new/changed drug therapy to cost efficacy management, while actions shifted from patient education/follow up to provider consultations ($P < 0.01$). Services also shifted towards claims involving chronic type medications and away from acute type medications ($P < 0.01$), resulting in significant changes in the therapeutic classes and older patients being served ($P < 0.01$). These trends resulted in higher pharmacy reimbursements, greater cost avoidance, and larger average returns on investment per claim across time ($P < 0.01$). **CONCLUSION:** MTM interventions over a seven year period evolved from the provision of traditional patient education involving acute medications towards consultation-type services for chronic medications. These shifts suggest the provision of MTM services will be increasingly vital as the population ages. Further, these trends suggest that pharmacists will be provided with increasing opportunities to provide MTM services and receive higher reimbursements for performing these services.

PHP53

TRENDS IN COMMUNITY BASED ADVERSE DRUG EVENTS IN THE UNITED STATES: 1996–2005

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OBJECTIVE: Despite 1999 Institute of Medicine report, which brought implications of adverse drug events (ADEs) in the US health care system in focus, the information on community based ADEs in the United States is still lacking. In this retrospective study we evaluate trends in occurrence, costs, and mortality due to community based ADE from 1996–2005. **METHODS:** Discharge level data from community hospitals across the United States included in National Inpatient Sample (NIS) data from the Healthcare Cost and Utilization Project (HCUP) was used. Records with principal diagnosis of ADEs were extracted using 378 different ICD-9 CM and external cause of injury (E-codes) codes assigned for diagnosis of ADEs. ADEs due to adverse effects of appropriately administered drugs and drug poisoning were included. Hospitalizations due to illicit drug use, intentional harm, or self-intended events of overdosing or drug poisoning were excluded from the analysis. **RESULTS:** There was an estimated increase of 16.7%, between 1999 and 2005, in the occurrence of ADEs as the primary diagnosis. Primary diagnosis of ADE was predominantly observed among whites compared to non-whites. Average age of people hospitalized with diagnosis of ADE increased from 36 years in 1996 to 40 years in 2005. Average duration of hospitalization between 2000 and 2005 was found to increase steadily. Average total charge towards hospitalization and care due to ADEs increased from $6070.20 to $14,223.37 over the 10 years study period. Among those with a primary diagnosis of ADE, there was an increase in mortality during inpatient stay, from 0.82% in 1996 to 0.99% in 2005. **CONCLUSION:** Our study suggests a steady increase in community based hospitalizations due to ADEs since 1996 indicating a direct impact on health care costs and utilization of health care resources.

PHP54

PREVALENCE OF CONDITIONS IN THE US EMPLOYER-INSURED POPULATION

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OBJECTIVE: This study presents a methodology to estimate prevalence rates for specific diagnosed conditions among the ~170 million Americans covered by employer-sponsored insurance (ESI). Individuals with ESI represent over 58% of the United States population, a large group with fewer cost barriers to care. **METHODS:** Estimates were made from the 2006 MarketScan databases, which include all health care claims for approximately 17 million employees, dependents, and retirees with ESI. The Sample Select Prevalence tool identified patients diagnosed with asthma, osteoporosis, allergic rhinitis (AR), essential hypertension, rheumatoid arthritis (RA), type II diabetes, congestive heart failure (CHF), or hypercholesterolemia (using relevant ICD-9-CM diagnosis codes), and calculated prevalence rates. Weights were developed based on the Medical Expenditure Panel Survey (MEPS), a probability sample that estimates the number of Americans by health insurance type. The ratio of MEPS population estimate to MarketScan population within certain strata of demographic characteristics provided the projection weights. Prevalence rates were calculated for the total population and by age, gender, geographic region, and health plan type. **RESULTS:** Based on the 2006 MarketScan databases, annual rates per 100,000 were as follows: 12,101.63 (hypertension), 5,102.10 (type II diabetes), 4,648.86 (AR), 4,257.15 (hypercholesterolemia), 3,015.54 (asthma), 947.14 (osteoporosis), 713.7 (CHF), 532.97 (RA). These rates varied by age, gender, and geography. Annual expenditures per patient in the convenience sample ranged from $5,920 (AR) to $36,615 (CHF). **CONCLUSION:** Reliable estimates of prevalence and costs for diagnosed health conditions are valuable to policy makers, providers, and payers. This study demonstrates a reliable projection methodology for estimating annual prevalence, treatment rates, and costs associated with a diagnosed disease or condition based on a large convenience sample of health care claims data.

PHP55

DEVELOPING A PRACTICE –BASED RESEARCH NETWORK (PBRN) TO EVALUATE MULTI-CENTER PHARMACIST-CONDUCTED MEDICATION THERAPY MANAGEMENT PROGRAMS (MTMPS) USING THE ECHO MODEL

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OBJECTIVES: MTMPs positively impact individual chronic diseases, but little is available on their impact on multiple chronic conditions using the Economic, Clinical, and Humanistic (ECHO) model. Merging community pharmacy practice and academic research to form a PBRN is a unique and innovative approach to assessing community-based patient outcomes. Authors will present a PBRN model developed and sustained for demonstrating MTMPs reduce costs and utilization, while improving humanistic and clinical outcomes. **METHODS:** Initiation to develop the multi-center PBRN began in 2005 with the goal to combine practice and research agendas for successful data mining and sustaining an ongoing practice-research environment. This led to a newly formed coalition of independent pharmacies followed by solicitation by several employer groups for providing MTMPs to their employees. An academically affiliated Outcomes Research Laboratory was assigned the research role. Currently, the PBRN has two completed and two new projects. Studies designed for the PBRN have used a prospective, pre-post longitudinal design for employees receiving MTMPs at one of the five coalition pharmacies. Program algorithms using evidence-based guidelines determine visit patterns. Adults with diabetes, hypertension, hyperlipidemia, or a combination of these diseases are enrolled through various incentive and marketing strategies. Outcomes data are obtained using claims, clinical laboratory tests, and patient self-reports. Measures are staggered at three month intervals and include: (1) costs and number of physician, ER, and hospital visits; length of stay, type of admission, and absenteeism; (2) HbA1c, self-monitoring of blood glucose, blood pressure, and total lipid panel; (3) patient satisfaction, quality of life (SF-36), and disease state knowledge (4) social history (5) HEDIS process measures. **CONCLUSION:** There is a paucity of PBRNs and lack of knowledge to develop and sustain one. Given the need to continually showcase outcomes achieved by pharmacist-based MTMPs, the presentation will focus on establishing and sustaining a PBRN.

PHP56

COMPARATIVE ANALYSIS OF THE ACCESS TO PHARMACEUTICALS IN SELECTED EAST EUROPEAN COUNTRIES

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OBJECTIVE: The purpose of this work is to evaluate the access to pharmaceuticals and system in three European neighboring

countries (Slovenia, Bulgaria and Serbia) by the selected indicators. **METHODS:** Retrospective study for the period 2003–2006 year. Source of data was publicly available and the indicators refer to population, market value, value per inhabitant, the number of pharmacies and the number of pharmacists. **RESULTS:** Slovenia has a pharmaceutical market accounting for €407 millions and 5.9 pharmacists per 10,000 inhabitants in 2003 (1,996,773 inhabitants). The number of pharmacists slowly increases to 6.9 and 7.0 per 10,000 inhabitants till 2005, but pharmacies remain almost constant at around 270 and the majority of them (about 71%) are publicly owned. The Bulgarian drug market accounts approximately for €300 millions at manufacturing price in 2006 and number of pharmacists is increasing from 7.1 to 7.7 per 10,000 inhabitants in 2004 and 2005. All of the Bulgarian community pharmacies are private and are permanently increasing from 4210 into 4631 till 2006. The Serbian pharmaceutical market has been estimated at €308 million but number of pharmacists is the lowest ones accounting for 2.5, 2.6, and 2.5 per 10,000 inhabitants, in 2003, 2004, and 2005, respectively. In Serbia majority of pharmacies (77%) are private ones but there is also a strong governmental sector of 568 pharmacies dispensing the reimbursement medicines. The market value per inhabitant is €42 in Bulgaria, €41 in Serbia and 157 EUR in Slovenia. **CONCLUSION:** The results suggest that in all three countries simultaneously with the development of the market, is also changing the pharmaceutical system by increasing the number of facilities and pharmacist. It could mean that access to medicines is improving but it is still lower in value terms per inhabitant in comparison with the economically developed countries.

PHP57

FACTOR ANALYSIS OF PHARMACISTS' PERCEIVED BARRIERS TO PROVISION OF MEDICATION THERAPY MANAGEMENT SERVICES (MTMS) IN WEST VIRGINIA

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OBJECTIVE: To determine barriers to provision of MTMS perceived by pharmacists and factors associated with the likelihood of working in a pharmacy that provides MTMS. **METHODS:** Surveys with cover letters were mailed to community pharmacists (907) licensed in West Virginia using a stratified random sample. It was constructed and finalized following a review by experts and pilot tested in a convenience sample of pharmacists. Principle Components Analysis with Varimax rotation was performed to determine the factors that describe perceived barriers to provision of MTMS. **RESULTS:** A three-factor model was extracted from the responses, which explained 53.3% of the total variance. The three factors included: abilities of the pharmacist (confidence, education, and patients' willingness); pharmacy facilities (counseling area, time, and customer loyalty); and a third factor including physician acceptance and staff support. The discriminant function developed for the sample correctly classified 73.8% of the cases, and included comfort level in provision of services, whether they currently offer MTMS, abilities of the pharmacist, and perceived value of services to patients. These variables were all positively correlated with pharmacists' likelihood of working in a pharmacy that provides MTMS. **CONCLUSION:** Pharmacists who have a high comfort level with provision of MTMS, are currently providing MTMS, and perceive a great value of MTMS to patients are more likely to join pharmacies that want to participate in MTMS. This highlights the importance of advanced practice experiences to build confidence, and the role of targeted recruitment to promote MTMS in community pharmacies.

PHP58

ECONOMIC-BASED OUTCOMES ASSESSMENT OF PHARMACEUTICAL CARE IN A UNIVERSITY HOSPITAL MEDICAL INTENSIVE CARE UNIT IN TAIWAN

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OBJECTIVE: While there is raising awareness of pharmacists' contribution in a critical care team, little is known about its economic, clinical and humanistic outcomes. The aim of this study is to assess the economic-based impacts of pharmacists' intervention in a medical intensive care unit (MICU) in a medical center in Taiwan. **METHODS:** It was hypothesized that a clinical pharmacist's provision of pharmaceutical care in an MICU from October to December in 2005 (i.e., intervention group) would result in a reduction of patients' average drug expenditures and their length of stay (LOS) as compared to those patients' without pharmacists' intervention in the same unit in the same time period in year 2004 (i.e., historical control group). Independent t test was performed to investigate difference of drug expenditures and LOS. **RESULTS:** There is no statistically significant difference of average drug expenditures and LOS between two groups other than having comparable patient characteristics (e.g., ages, genders, bed occupancy rates, APACH II scores of admission to and discharging from the MICU), and their professional caregivers' characteristics (i.e., seniority of attending physicians and nurses). However, with pharmacist's provision of pharmaceutical care in MICU, there was an average of $27 per patient daily savings of drug expenses and a reduction of 0.67 day of LOS in MICU, which may reduce the cost by $205 per patient per admission. **CONCLUSION:** While pharmacists' involvement have been improving the quality of medical services and patients' medication use, our study further explores pharmacists' contribution in a medical critical care team. Health policy makers and administrators in hospitals should not underestimate the importance of pharmacists' roles in evaluating medical economic benefits.

PHP59

DRUG THERAPY PROBLEMS: DOES PHARMACIST'S INTERVENTION SAVE COST?

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OBJECTIVE: To conduct a cost-benefit assessment of an intensive drug therapy problems (DTP) intervention program from a societal perspective. **METHODS:** A stochastic Cost-Benefit model was constructed with data collected from a clinical pharmacist in a Nigerian federal medical centre. The number of patients, frequency of occurrence of identified DTP, accepted (and rejected) interventions plus their cost implication to society were used to estimate potential cost savings. Pharmacist's time was obtained by observation. Equipment cost for the program was estimated from local vendors while pharmacists' wages were obtained from pay slips. Inflation data from literature and a fixed discount rate of 5% was applied where necessary. The model in 1000 iterations repeated ten times used the data to estimate projected Net Benefits, Pharmacy Costs, Net Present Value(NPV) and Cost Benefit Ratio(CBR) from year 2008–2013. A sensitivity analysis was conducted to see how input data affects CBR. **RESULTS:** Unnecessary drug therapy has the highest potential cost savings. The projected amount lost from the absence of an intensive DTP intervention increased significantly from NGN5.9million in year 2008 to NGN22.5million in 2013 ($p < 0.001$) while total financial loss due to physician rejected

interventions was NGN17.7million in the same period. The simulated range of cost savings per DTP patient encounter was NGN207.83-NGN587.27. Probability of NPV ≤ 0 or CBR ≤ 1 was about 11%.The total NPV in the analysis time frame was NGN33.2million (range = NGN1.7million to NGN11.2million) with an Internal Rate of Return range of 102%–203% (CBR = 2.02:1 to 3.03:1). Sensitivity analysis showed that CBR was consistently above 1 except when rejected interventions already at 43.6% were increased beyond an additional 40%. **CONCLUSION:** Pharmacist's intensive interventions to prevent DTP have positive financial benefits from the perspective of society. A possibility exists that promotion of pharmacist-physician cooperation will reduce the rate of rejected interventions such that more cost savings may accrue to society.

PHP60

DEVELOPMENT OF A DRUG INVENTORY MANAGEMENT MODEL FOR THE STATE HOUSE MEDICAL CENTRE, ABUJA, NIGERIA

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OBJECTIVE: In a bid to overhaul the near chaotic drug management situation in most health care facilities in Nigeria, we set out to develop an inventory management system in a medium-sized health facility that will serve as a model for other health care organizations. **METHODS:** We separately utilized the ABC (cost) and VEN (criticality) analytical approaches to analyze the two hundred and seventy four (274) entries in the drug formulary being currently used in the State House Medical Centre, Abuja. We also performed a matrix analysis of both data to assess variation, harmony and overlap of the two analytical tools. **RESULTS:** In the ABC method, 39 drug entries that represent 76.08% of the annual drug expenditure (ADE) of the hospital in the 2005 fiscal year were high cost drugs; 57 items representing 16.04% of the ADE were medium cost drugs, while 178 drug items that make up 7.88% of the ADE were low cost drugs. In the VEN model, 60 entries (21.90%) were vital drug items, 112 (40.87%) essential drug items, and 102 (37.23%) nonessential drug items. A matrix analysis of both models when coupled together resulted in two broad classifications-Priorities I and II of drugs in the hospital formulary. **CONCLUSION:** The two analytical models when separately applied revealed overlapping classification, which complicates the decision-making process for drug inventory management. Creating a matrix of cost and criticality by coupling together the two analytical models gives two broad inventory classifications that simplifies the decision-making process and potentially improves the overall drug inventory management system of the health facility. This study revealed that prioritization of drug inventory on the basis of both cost and criticality can result in effective drug inventory management system and may serve as a useful model for other health care facilities in the country.

PHP61

PAY-FOR-PERFORMANCE PROGRAMME FOR BRAZILIAN PRIVATE HEALTH PLAN: HOW TO IMPLEMENT AND MEASURE

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OBJECTIVE: To introduce methodology of pay-for-performance program (FFS+P4P) within a private health care plan in southern Brazil where fee-for-service is the main reimbursement system. The objective of FFS+P4P are: increase visits value without compromising relationship between direct health care cost and revenue; to reduce labs exams; to reduce visits average cost; to improve patient satisfaction; to seek doctor's and provider's accountability; and to improve health plan information system. **METHODS:** The FFS+P4P implemented consists in comparing doctors' indicators (i.e. utilization, effectiveness, costs, health care and patientxs satisfaction) with a benchmark and, depending upon their performance, increase their fee in 0%, 10% or 20%. All 138 doctors of this health plan were elected to participate. To monitoring the outcomes of this program I compared patient satisfaction and health plan utilization, costs and effectiveness of one year before (i.e. 2006) to one year after (i.e. 2007) starts FFS+P4P Program. **RESULTS:** Doctor's visits fee increased 16.3% (R$ 25.00 to R$ 29.15). Patient's satisfaction increased as well, by 13.6%, from 8.37 to 9.51. The diagnosis image exams requested by visit reduced just 1.1%, labs exams increased by 3% (1.32 to 1.36) and the average costs generated by one visit increased 7.8%% (R$ 132.80 to R$ 143.18). In hospitalization by visits reduced 1.4% (4.5% to 4.4%) and average length of stay increased 3.6% (from 2.59 to 2.69 days). Number of mammography requested for women aged more than 40 years old who visited gynecologist increased 1.5% (76.6% in 2006 against 77.9% in 2007) and number of PSA requested for men aged more than 40 years old who visited urologist increased 5.3% (94.5% in 2006 and 99.5% in 2007). **CONCLUSION:** Pay-for-performance program shows that it is possible to increase doctor's fee without compromising health care costs and patient satisfaction, as well as improving decision maker information and relationship with doctors' network.

PHP62

HOW EVIDENCE-BASED AND TIMELY ARE MEDICARE COVERAGE DECISIONS FOR NEW TECHNOLOGIES: AN EMPIRICAL ANALYSIS, 1999–2007

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OBJECTIVE: In the past decade, the U.S. Medicare program has attempted to make its national coverage decisions (NCDs) for new technologies more transparent, evidence-based, and timely. We examined all NCDs from 1999 through 2007 (n = 115) to analyze whether decisions were consistent with the evidence and what factors predict review times. **METHODS:** We reviewed NCDs based on publicly-available decision memoranda posted on the Medicare website. We reviewed each NCD on roughly 30 variables, including the quality of clinical evidence available for each technology (i.e., according to sample size, controls, and randomization) and the mean duration of review times. (Medicare does not use cost or cost-effectiveness as a criterion for coverage.) **RESULTS:** Medicare's 115 NCDs since 1999 have pertained mostly to medical devices (45%), medical/surgical procedures (40%), and pharmaceuticals (9%). The Centers for Medicare and Medicaid Services (CMS) most frequently covered a technology "with conditions" (58%) followed by "no change to existing national coverage" (20%) and "rejected coverage completely" (11%). Only 15% of technologies were supported by what CMS considered "good" quality evidence; in contrast, 41% had "fair" and 36% "poor" evidence. Technologies with good evidence were much more likely to be covered than were technologies with fair or poor evidence (RR = 1.80, p = 0.0008). NCD reviews averaged 8.7 months (range, 0.5 to 39.2 months). CMS requested input on 16% of NCDs from the Medicare Coverage Advisory Committee (MEDCAC), and on 29% from formal technology assessments (TAs) by evidence-based practice centers. MEDCAC involvement added 5.3 months to review times on average (p = 0.0002), and TA involvement added 3.7 months (p < 0.0001). **CONCLUSION:** Medicare national cover-

age decisions are generally consistent with the evidence base. The quality of evidence available to CMS for the vast majority of technologies has been fair or poor. Involvement of external advisory bodies is relatively infrequent and tends to prolong review times.

PHP63

SEGMENTED REGRESSION ANALYSIS OF INTERRUPTED TIME SERIES PRESCRIPTION GROSS MARGIN TRENDS FOR INDEPENDENT PHARMACIES BEFORE AND AFTER MEDICARE PART D

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OBJECTIVE: To evaluate longitudinal effects of Medicare Part D implementation on dual eligible prescription gross margins (GM) for independent pharmacies and to estimate GMs for these claims if Medicare Part D had not been implemented. **METHODS:** Dual eligible prescription claims from January 2005 to September 2006 from 344 independent pharmacies in Texas were collected. After eliminating claims from the designated lag period (January–March 2006), the dataset included 1,066,918 claims for 26,697 dual eligible patients. Claims were divided into monthly intervals allowing for an interrupted time series design. Segmented regression analysis was used to estimate the effect of Medicare Part D implementation on prescription GMs immediately and over time. The segmented regression model corrected for autocorrelation and allowed for the calculation of counterfactual GM values (as if the Part D program had not been implemented). **RESULTS:** The introduction of Medicare Part D was associated with a significant change in GM per dual eligible claim, which fell almost $4.00 between December 2005 and April 2006 ($p < 0.001$). GM per claim did not significantly change between April and September 2006. Ingredient costs after program implementation dropped significantly by $5.62 ($p < 0.001$) and continued to fall in the second and third quarters of 2006 ($p < 0.004$). Between December 2005 and April 2006, revenue per claim fell by $9.50 ($p < 0.001$) and also continued to decrease through September 2006 ($p < 0.004$). The average GM per dual eligible claim for the second and third quarters of 2006 was estimated to be 62.0% below what it would have been had Medicare Part D not been implemented ($2.43/claim with policy, $6.37/claim without policy). **CONCLUSION:** Since the majority of independent pharmacies' total revenue is from prescription drugs, the decrease in GM for dual eligible claims is a probable contributor to the financial hardship currently facing many independent pharmacies across the USA.

PHP64

THE EFFECT OF THE PERFORMANCE VOLUME LIMIT (PVL) ON THE DRG FINANCING OF THE HUNGARIAN HOSPITALS

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OBJECTIVE: Hungary was the first country in Europe fully implementing a DRG (Diagnosis Related Groups) like financing method for the whole hospital care as early as 1993. In 2004 in addition to the DRG like financing technique, the so-called performance volume limit (PVL) was introduced forming an artificial financial cap for the activity based financing of the Hungarian hospitals. The aim of our paper is to analyze the effect of the performance volume limit (PVL) financing method on the acute hospital care. **METHODS:** Data were derived from the nationwide administrative dataset of the National Health Insurance Fund Administration (OEP) covering the period 2003–2006. We analyzed the trends in DRG cost-weights, cases and hospital days. Than we calculated the average annual reimbursement rate of DRG cost-weight with and without the application of PVL degression according to hospital type. **RESULTS:** Our results showed that between 2003–2006. the annual number of DRG cost-weights did not change, the trend of annual number of cases slightly increased, while the total number of hospital days decreased. As a result of the PVL system, we found the lowest reimbursement rate of DRG cost-weights at the national medical institutes (l HUF 127.600) and university medical schools (l HUF 128.500), while the highest was at the city hospitals of Budapest (l HUF 132.600 Ft) and county hospitals (l HUF 132.000). **CONCLUSION:** We can conclude that the implementation of performance volume limit as a fiscal tool partly fulfilled the expectations towards the reduction of activity of hospital care. However, the effect of performance volume limit was different on the different types of hospitals, and had a serious disadvantageous effect on the university medical schools and national medical institutes. The hospitals of Budapest were the main winners of this new regulation.

PHP65

THE ROLE OF THE ACADEMY OF MANAGED CARE PHARMACY (AMCP) FORMAT IN MANAGED CARE FORMULARY AND COVERAGE DECISIONMAKING

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OBJECTIVE: To evaluate the use of the AMCP format as a tool to evaluate drugs for formulary and coverage decisions. **METHODS:** Thirty-four United States-based managed care executives were invited to complete a nine-question electronic survey. **RESULTS:** Twenty-two responses were received, including pharmacy ($n = 15$) and medical ($n = 7$) directors from 6 national, 10 regional and 6 local plans representing approximately 40 million covered lives (range: 45,000 to 12.4 million). For drugs covered under the pharmacy benefit, 3 (14%) respondents require; 6 (27%) recommend or prefer; 9 (41%) use, but do not recommend or prefer; and 4 (18%) do not use the AMCP format to support formulary or coverage decisions. For drugs covered under the medical benefit, 2 (9%) respondents require; 5 (23%) recommend or prefer; 8 (36%) use, but do not recommend or prefer; and 7 (32%) do not use the AMCP format. On average, respondents receive approximately one AMCP format submission per month. Among plans that require, recommend/prefer or use the AMCP format, the section of the dossier describing supporting clinical and economic information (Section 2.0) was considered most useful; the modeling report (Section 3.0) least useful. Plans reported that about half of AMCP submissions are accompanied by an economic model or modeling report. Fifty-six percent of plans reported using the budget impact model results and 33% reported using the cost-effectiveness model results during their review. **CONCLUSION:** For drugs covered under the pharmacy and medical benefits, a large majority of managed care plans currently require, recommend/prefer or use the AMCP format to inform formulary and coverage decisions. Additional research with larger sample sizes is warranted to substantiate findings and further explore managed care information needs during formulary review.

PHP66

EVALUATION OF INDIRECT COMPARISONS USED FOR REIMBURSEMENT DECISIONS: LESSONS FROM THE COMMON DRUG REVIEW

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OBJECTIVE: To review listing recommendations made by the Canadian Expert Drug Advisory Committee as part of the Common Drug Review (CDR) process to gain an understanding of how indirect comparisons between active treatments are evaluated as part of reimbursement decisions. **METHODS:** Recommendations published on CDR's website from the point of inception to November 2007 were reviewed by two independent reviewers. The inclusion criterion for this evaluation was that the reasons for the recommendation must report that no active comparators were used in controlled-trials despite the fact the comparator was available in Canada or that a meta-analysis was used in place of a head-to-head trial. The recommendations of therapies deemed to have used an indirect analysis were then compared with reviews made of the same treatments by three other Health Technology Assessment Agencies (HTAAs), the National Institute for Health and Clinical Excellence in the UK, the Scottish Medicines Consortium, the Institute for Quality and Efficiency in Health Care in Germany. **RESULTS:** Of 90 recommendations reviewed, 6 were included for full review. Of the six, five included original indirect comparisons and one was based on a resubmission. Of the five included therapies, two utilized a pooled or meta-analysis and three recommendations reviewed placebo or non-controlled trials. The recommendations of the six reviews were as follows: one general listing, three restricted listings and two do not list recommendations. The reasons for recommendations included the results of the indirect comparisons and, also, an interpretation of the clinical meaningfulness of the technology and, in some cases, the resultant cost-effectiveness. Reviews, where available, of these technologies by other HTAAs resulted in similar reimbursement recommendations/decisions. **CONCLUSION:** The results of this evaluation suggest the use of indirect analyses is accepted by the CDR, but is generally not the sole basis for a listing recommendation.

PHP67

THRESHOLD VALUE FOR A QALY—CORRELATION WITH DISEASE SEVERITY AND DECISION UNCERTAINTY

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OBJECTIVE: The assignment of the Pharmaceutical Benefits Board (LFN) is to decide which pharmaceuticals should be included in the Swedish national benefits scheme. Societal cost-effectiveness and a "need and solidarity principle" are key decision parameters. No explicit value or threshold exists. The primary purpose is to investigate what the LFN has been willing to pay for a QALY and relate this to other decision parameters, in particular the perceived severity of disease. The secondary purpose is to investigate the extent to which uncertainty in the cost effectiveness estimate affects the LFN's willingness to pay. **METHODS:** All applications for reimbursement for new products from October 2002 to October 2007 were included. The total number of applications was 205 over the 5-year period. About half of the applications for reimbursement contained a health economic analysis and 40% of these presented a cost-effectiveness estimate using QALYs. The published decision as well as the memorandum for each product was examined looking for information on the cost per QALY, severity of disease (low, medium or severe) as well as a measure of the uncertainty as judged by the LFN. Decisions were classified as full reimbursement, limited reimbursement or rejection. **RESULTS:** There is a correlation between disease severity and willingness to pay for a QALY. On average, the cost/QALY is €35,000. For more severe conditions the LFN has accepted costs per QALY in the area of €100,000. **CONCLUSION:** The LFN has still, after five years not established a threshold value for the QALY. Due to a low number of rejections it is not possible to determine a threshold. A high degree of uncertainty in the cost-effectiveness estimate does not seem to reduce the willingness to pay for a QALY. Instead it is highly correlated with restrictions in the reimbursement status or with follow up data being requested.

PHP68

CHARACTERISTICS OF RISK-SHARING SCHEMES IN EUROPE

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OBJECTIVE: The characteristics of attractive conditional reimbursement settlements such as risk-sharing agreements (RSA) to manufacturers and health care payers have previously been discussed (Sculpher et al. 2007). Mutual trust between the two parties is a pre-requisite. Manufacturers should prefer: minimal pre and post launch burden; clarity in the link between reimbursement, access, sales and retrospective/future revenue; clarity on timing of decisions; clarity in agreements on data sharing. Payers aim to maximise net health benefit and should prefer RSAs in which proposed research agendas are expected to most improve knowledge of clinical effectiveness and economic value. **METHODS:** We reviewed the qualities of RSAs in several European countries for which sufficient detail had been published. The qualities compared were: financial burden; relationship between reimbursement decision, access, sales and revenue; validity of treatment effectiveness metric; clarity of decision timing; and data-sharing agreement type. **RESULTS:** Four RSA schemes were considered. The beta interferons in multiple sclerosis and proposed Velcade (bortezomib) in multiple myeloma schemes in England and Wales were compared with the conditional reimbursement scheme operated by The Netherlands Health Care Insurance Board and the prospective price fixing regulations operated by the Economic Committee of Health Products (CEP) in France. Relationships between reimbursement, access, sales and revenues were clearest in the Velcade scheme. The effectiveness metric used in the beta-interferons scheme was unconventional, but reflective of quality of life improvements. The 3-year reassessment timeframe of The Netherlands scheme provided greatest decision timing clarity. The financial burden to manufacturers and payers of the RSAs was difficult to assess. Data-sharing agreements varied. **CONCLUSION:** The nature of risk-sharing schemes in Europe is developing and highly variable. Risk-sharing is clearly an area of policy development where innovative proposals by manufacturers that address the concerns of payers can lead to earlier, wider market access.

HEALTH CARE USE & POLICY STUDIES— Prescribing Behavior

PHP69

THE PRESCRIBING OF CHINESE HERBAL PRODUCTS IN TAIWAN: A CROSS-SECTIONAL ANALYSIS OF THE NATIONAL HEALTH INSURANCE REIMBURSEMENT DATABASE

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OBJECTIVES: The consumption of Chinese herbal products (CHPs) is increasing exponentially. However, the scientific evidence is lacking and there is an urgent requirement for detailed pharmacoepidemiological information on CHP usage. This study was to investigate CHP prescription patterns in Taiwan. **METHODS:** We carried out a cross-sectional analysis on a cohort of 200,000 patients, based on 2004 data from the National Health Insurance (NHI) reimbursement database. Data mining techniques were applied to explore CHP co-prescription patterns. **RESULTS:** A total of 46,938 patients had been prescribed CHPs on at least one occasion in 2004. Patients using CHPs were generally female and middle-aged, made more outpatient visits, had fewer hospitalizations and consumed more medical resources than non-users of CHPs. A total of 1,073,030 CHPs were contained within 220,123 prescriptions, for which acute nasopharyngitis was the most common indication. Yan hu suo and Jia Wei Xiao Yao San were the most frequently prescribed single herb (SH) and herbal formula (HF), respectively. The results of the data mining showed that the best predictions were provided by co-prescriptions of "Mo yao and Ru xiang", "Ye jiao teng and Suan Zao Ren Tan" and "Dang Gui Nian Tong Tang and Shu Jing Huo Xue Tang" in the groups of SH-SH, SH-HF and HF-HF, respectively. **CONCLUSIONS:** This study provides national-level CHP prescription profiles and utilization rates, and documents, for the first time, HF-HF prescription combinations in Chinese medicine practices in Taiwan. We conclude that more studies are needed to validate the safety and effectiveness of CHP prescriptions.

PHP70

PHYSICIANS' KNOWLEDGE OF LABELED DRUG INDICATIONS AND ATTITUDES REGARDING OFF-LABEL USE: RESULTS OF A NATIONAL SURVEY OF GENERAL INTERNISTS AND PSYCHIATRISTS

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OBJECTIVE: Off-label prescription use can be a valuable source of innovation and is often supported by considerable evidence. However, many uses are not supported by evidence and unregulated off-label use may expose patients to serious harm. We sought to examine physicians' knowledge, attitudes, and experiences regarding off-label use. **METHODS:** Ongoing nationally representative random-sample mail survey of general internists and psychiatrists. Knowledge of approved indications was assessed using a list of 15 specific drug-indication pairs for each specialty that varied in their clinical applications and levels of supporting evidence. **RESULTS:** There were 166 respondents at the time of abstract submission (14% preliminary response rate); 67% were psychiatrists and 33% internists. Of the drug-indication pairs examined among general internists, use of the drug for the specified off-label indication varied from 24% (venlafaxine for adjustment disorder) to 87% (lisinopril for diabetic proteinuria) (mean 59%). Of these instances, physicians accurately identified the off-label status in less than half of the cases, ranging from 22% correct identification that escitalopram was off-label for panic disorder to 71% comfirmation that trazadone was off-label for insomnia (mean 36%). Results were substantively similar among psychiatrists; there was common use of specific drugs for off-label indications, despite poor to moderate knowledge of the labeling status of the use. Overall, the most important factors associated with off-label were practice guidelines or references (26%), successful off-label use in other patients (24%), and the absence of a labeled alternative (14%). **CONCLUSION:** These preliminary findings suggest that practicing internists and psychiatrists may not have precise knowledge of the FDA approved indications of the drugs they prescribe. Given how commonly off-label use occurs, further work is needed to better delineate and communicate the levels of evidence that should be incorporated in clinical decision-making to guide optimal prescribing.

HEALTH CARE USE & POLICY STUDIES—Education

PHP71

PHARMACY STUDENTS' ABILITY TO RECOGNIZE DRUG-DRUG INTERACTIONS (DDIS)

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OBJECTIVE: Drug interactions have been associated with increased incidence of adverse events, hospitalizations, and death. Our objective was to determine the degree of knowledge of clinically significant DDIs by third- and fourth-year pharmacy students. **METHODS:** Two independent questionnaires designed to measure knowledge of DDIs were utilized in this analysis. Both questionnaires asked students to categorize the potential severity of various DDI pairs. The first questionnaire was disseminated to fourth year Class of 2005 pharmacy students (n = 68) at one school of pharmacy and consisted of 22 DDI pairs. A second questionnaire was distributed to third-year Class of 2007 pharmacy students at two schools of pharmacy (School A, n = 70; School B, n = 120) and it contained ten DDI pairs for students to categorize. A year later, the second questionnaire was re-administered to Class of 2007 students at School A (n = 75). **RESULTS:** Forty-seven (69%) fourth year pharmacy students completed the first questionnaire. Respondents correctly categorized an average (SD) of 42% (12%) of the DDI pairs. Sixty-six (94%) and 115 (96%) of third year pharmacy students from School A and School B, respectively, completed the questionnaire. The average (SD) number of drug interaction questions answered correctly by third year students was 56% (±18%) at School A and 59% (±16%) at School B, $p = 0.22$. Forty-three (57%) fourth year students from the Class of 2007 completed the questionnaire and the average percentage of correct responses was 59% (±17%), $p = 0.36$ for third year versus fourth year Class of 2007 students from School A. **CONCLUSION:** This study suggests that pharmacy student knowledge of DDIs is poor. Modifications in pharmacy school curriculum may be necessary to increase students' ability to correctly identify drug interactions.

HEALTH CARE USE & POLICY STUDIES— Pharmacogenomics

PHP72

GENETIC TESTING FOR WARFARIN INITIATION: A COST-EFFECTIVENESS ANALYSIS BASED ON CURRENT EVIDENCE

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OBJECTIVE: The FDA has recently included information about warfarin pharmacogenomics on the label because the influence of the CYP2C9 and VKORC1 genes on dose. The purpose of this study was to evaluate the potential cost-effectiveness of warfarin pharmacogenomic testing based on a recent clinical trial. **METHODS:** A Markov model was developed to evaluate the clinical and economic outcomes of adding genetic testing to anticoagulation clinic standard of care for a hypothetical cohort of long-term anticoagulation patients. The effect of pharmacogenomic testing on time within therapeutic range and on health care utilization were based on the COUMAGEN randomized trial. The change in risk of bleeds and thromboembolic events were modeled on University of Washington Anticoagulation Clinic data and medical literature. Costs and utilities were literature-based. The cost of pharmacogenomic testing was estimated based on currently available pharmacogenomic tests ($250). A lifetime horizon and payer perspective was utilized with a one-year scenario analysis. Probabilistic and one-way sensitivity analyses were performed to explore the range of plausible results. **RESULTS:** The improvement in QALYs with testing was small, 0.0033, with an increase in total cost of $101. The base-case incremental effectiveness ratio (ICER) was $31,000/QALY, but the results ranged from testing dominating to standard of care dominating. The ICER was $50,000/QALY in 63% of simulations. In the first year, thromboembolic events were increased by 0.03% and bleeds were decreased by 0.17%. Varying the cost of genotyping between $100 and $550 resulted in cost saving of $44 and $123,000/QALY, respectively. **CONCLUSION:** Additional studies are needed to optimize the effectiveness of pharmacogenomic testing for warfarin and derive more precise estimates of treatment effect. Genotyping patients for CYP2C9 and VKORC1 is likely to increase costs, but has the potential to be cost-effective depending on the effectiveness of dose changes and the cost of the test.

PHP73

CONSUMPTION PATTERNS AND ECONOMIC BURDEN OF DRUGS IN FORTALEZA, BRAZIL

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OBJECTIVE: Increasing drug expenditures are a major concern in health care systems worldwide. Additionally, in developing countries such as Brazil, guaranteeing expanded drug access within a constrained public health care budget is a pivotal challenge. Our objective was to characterize and quantify drug consumption and its economic burden in the primary care setting in the city of Fortaleza, Brazil. **METHODS:** The drug acquisition database from the Municipality of Fortaleza, Brazil was surveyed. The database comprehends daily drug acquisitions funded by the Brazilian Public Health System, which provides free formulary-listed drugs to the public-managed primary health care service of Fortaleza, a 2.3 million people city. A complete dataset of the year 2006 was used in the analysis. Drugs were categorized according to the Anatomical Therapeutic Chemical Classification (ATC, WHO) coding and their consumption was reported as Defined Daily Dose (DDD) per 1000 inhabitants/day. Individual drug acquisition costs were calculated and summed to project the economic burden of drugs in 2006. **RESULTS:** The estimated economic burden of drugs in the publicly-administered primary health care in Fortaleza for the year 2006 was R$10 million (approximately US$5.5 million). Drugs comprised only 1.53% of total health care expenditures. The therapeutical class with highest expenditure was antibiotics (26.2% of total drug expenditures; mainly represented by beta-lactamics/penicillins), followed by antihypertensives (15.3%; mainly represented by renin-angiotensin drugs). Most consumed drugs and strengths were captopril 25mg (22.7 DDDs/1000 inhabitants/day), followed by hydrochlorotiazide 50mg (16.1) and acetil salicilic acid 0.1mg (8.7). Drugs with highest cost/DDD were penicillin benzathine 600,000U (R$8.00), followed by norethisterone 0.35mg (DDD low preparation 0.65mg; R$4.77) and penicillin benzathine 1,200,000U (R$4.42). **CONCLUSION:** Drugs used to treat most prevalent cardiovascular chronic diseases were the most consumed in Fortaleza. However, higher expenditures lie within drugs for treating infections. Research should study specific determinants of drug consumption and expenditures in public-health care system in Fortaleza, Brazil.

PHP74

THE CADTH GUIDELINES FOR THE ECONOMIC EVALUATION OF HEALTH TECHNOLOGIES: DO CURRENT CANADIAN ECONOMIC EVALUATIONS PASS THE TEST?

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OBJECTIVE: A new set of economic evaluation guidelines for health technologies has recently been published by the Canadian Agency for Drugs and Technologies in Health (CADTH) to replace the old 1997 set of guidelines. The purpose of this research is to: 1) describe economic evaluations conducted from a Canadian perspective and published from 2001 to 2006; 2) assess compliance with the 1997 CADTH guidelines; 3) highlight the key differences between the 1997 and 2006 CADTH guidelines; and 4) assess compliance with the 2006 CADTH guidelines. **METHODS:** A systematic literature review was conducted to collect all health technology economic evaluations conducted from a Canadian perspective published between 2001 and 2006. To investigate whether these studies complied with the 1997 and 2006 CADTH guidelines, each study was assessed against the main eleven recommendations. Comparisons were made to examine significant changes and assess issues that were uncertain in the 1997 edition but clarified in the 2006 edition. **RESULTS:** The literature search identified 1743 unique titles and abstracts. Of these 153 were included in the study. Of the 11 major recommendations by the 1997 guidelines, compliance (over 50% of studies) was found for sensitivity analysis, describing the target population and time horizon and including Canadian resource utilization data. There were three major differences between the 1997 and 2006 guidelines: 1) evaluation type; 2) perspective; and 3) indirect costing methodology. In addition, five issues were clarified in the 2006 edition. Assessment of the studies against the 2006 guidelines again showed minimal compliance. **CONCLUSION:** Based on these 153 economic studies there is minimal compliance with the 1997 and 2006 CADTH economic evaluation guidelines. This could be a result of limited publication space in journals or that it is not mandatory to follow the guidelines.

HEALTH CARE USE & POLICY STUDIES— Post Marketing Studies

PHP75

SATISFACTION WITH MEDICATION: PRELIMINARY RESULTS FROM A NOVEL PATIENT REGISTRY TRACKING SATISFACTION WITH DIFFERENT CHRONIC MEDICATIONS

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OBJECTIVE: Patients are increasingly getting involved in making their treatment decisions, however, options for obtaining satisfaction information from other patients on their medications is limited primarily to on-line blogs. Using a validated PRO instrument to capture and disseminate feedback in a structured, unbiased way could be a valuable service to patients. The Treatment Satisfaction Questionnaire for Medication Version I (TSQM) is a 14-item reliable and valid instrument to assess patients' satisfaction with medication, providing scores on four scales—side effects, effectiveness, convenience and global satisfaction. This study discusses preliminary results on satisfaction with ten different chronic medications from a novel patient registry. **METHODS:** The registry recruited patients from multiple sources including physicians, pharmacies, and online referrals. Patients were asked to report ongoing medications on the project website (www.iGuard.org). A sample of patients were contacted to complete the TSQM. The current analysis captures data from patients on any of the following ten chronic medications—acetylsalicylic acid, atorvastatin, simvastatin, lisinopril, metoprolol, metformin, levothyroxine, salbutamol, fluticasone/salmeterol or sertraline (n = 495). Analyses were conducted to explore differences in patients' satisfaction across medications. **RESULTS:** The mean age (SD) of the patients was 54.1 (14.2) years: 62.7% were females, 91.6% Caucasian and 3.7% black. The TSQM domains had good internal consistency with Cronbach's alpha for all domains exceeding 0.85. The number of respondents was more than 30 for all but one medication. The mean TSQM scores ranged from 67.3 (metoprolol) to 76.1 (atorvastatin) on effectiveness, from 77.3 (metoprolol) to 95.3 (acetylsalicylic acid) on side effects, from 77.3 (salbutamol) to 87.7 (simvastatin) on convenience and from 60.9 (metoprolol) to 78.0 (levothyroxine) on global satisfaction. Differences were observed in TSQM domain scores between medications used for treating the same medical condition. **CONCLUSION:** Comparative data on patients' satisfaction with medications can provide useful information to patients when starting a new medication or comparing their own experience.

HEALTH CARE USE & POLICY STUDIES— Quality of Care

PHP76

ALBERTA'S HEALTH SYSTEM PERFORMANCE: A BALANCED SCORECARD STUDY

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OBJECTIVE: The aim of this study is to evaluate Alberta's health system performance using a balanced scorecard approach. **METHODS:** Comparable indicators of health outcome, quality of care and health service accessibility available on the websites of Canadian Institute of Health Information and Alberta Health and Wellness were analyzed. In total, 36 indicators of Alberta were relatively compared to the corresponding average and best numbers of Canada. **RESULTS:** Alberta's health system generally performed slightly better than the country's average (103%) but significantly lower than the country's best (79%). Among the comparable indicators, 15 were under the country's average and only 3 were equal to the best, indicating that there is a long way ahead for Alberta's Health System to become the best in terms of comprehensive performance in Canada. The study also identified the worst five indicators of Alberta in comparison with the country's average. They were infant mortality, potential years of life lost due to unintentional injuries, potential years of life lost due to suicides, mortality for prostate cancers, and mortality for all strokes. A further analysis on these 5 indicators across 9 regions of residence in Alberta showed that regions with the highest number (rate) of infant mortality was Capital (East Central), mortality for transport accidents was Calgary (Peach Country), mortality for falls was Capital (Palliser), mortality for suicides as well as for strokes was Capital (Aspen), and mortality for prostate cancers was Calgary (Northern Lights). **CONCLUSION:** We suggest that this information should be considered when setting priority for planning of the province's health system.

PHP77

EVALUATION OF THE IMPACT OF PATIENT SAFETY ACTIVITIES ON THE NUMBER OF VOLUNTARY INCIDENT REPORTS AT TEACHING HOSPITALS IN JAPAN

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OBJECTIVE: To assess the effectiveness of hospital-wide patient safety activities in order to improve incident reporting systems. **METHODS:** A questionnaire was administered to all 1039 teaching hospitals in Japan. The number of incident reports was measured by type of profession and the volume of human resources used for patient safety activities during the 6 months in 2006 was inquired. To control the barriers of incident reporting among health care staff and hospital characteristics, we also collected institutional data regarding system design of incident reporting in each hospital, hospital ownership, and hospital size. We measured the amount of patient safety activities for the following domains: meetings and conferences, internal audits, and staff education. The activity volumes were then divided into two categories: above and below the median. Poisson regression with overdispersion was used to perform multivariate analyses of the incident reports. **RESULTS:** We received 418 replies (40.2%) out of the 1039 institutions. We excluded hospitals with missing data, resulting in final respective samples sizes of 234 and 233 for the number of incident reported by doctor and nurse, respectively. The use of online reporting appeared to increase the number of incident reports by doctors (21.2%, $P < 0.05$), while reducing time required to report the incident (24.3%, $P < 0.05$). Moreover, in hospitals that implemented more staff education for doctors, reporting significantly increased by over 30% ($P < 0.01$). In contrast, nurses were encouraged only by online reporting. Staff education for nurses was not significant factor, though the point estimates tended towards an increased number of incident reports. **CONCLUSION:** In accordance with "theory-based" findings in past literature, our findings have shown that patient safety program for staff education might increase the number of incident reports, even if we controlled factors regarding system design of incident reporting, by the analysis of the "empirical" data of a nation-wide multi-centre study.

PHP78

STABILITY OF PHYSICIAN PERFORMANCE ON PAY-FOR-PERFORMANCE PROCESS MEASURES OVER TIME: EFFECT OF PATIENT DENOMINATOR THRESHOLDS

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OBJECTIVE: The purpose of this study was to determine stability of physician performance rates on process metrics by patient volume threshold level and by alternative algorithms of deriving a global physician performance score. **METHODS:** Preferred provider organization (PPO) health plan claims data between April 2003 and March 2005 were analyzed. Six alternative algorithms of calculating a global metric rate from several process metrics were compared. Stability was also assessed across the different patient thresholds within each algorithm, where patient volume thresholds of 0, 5, 10, 15 and 20 were applied for each process measure. Trend test was used to compare longitudinal stability across patient volume thresholds and across global score algorithms. **RESULTS:** A total of 2036 generalist and specialist physicians were included. The sample size of eligible physicians decreased with increasing minimum patient volume thresholds. The greatest drop occurred when the threshold was increased from 0 to 5 patients (17–21% decrease, varying by year). The average indicator denominator size ranged from 95 patients (S.D. ± 160) in 2003 to 172 patients (S.D. ± 337) in 2005. Physician performance rates were least stable when no minimum patient volume threshold was required for analysis. No significant differences in score stability over time were observed between the different patient volume thresholds of 5 patients or above. **CONCLUSION:** A minimum patient volume threshold of 5 patients is likely necessary to preserve stability of physician performance rates over time. Increasing the level of threshold beyond 5 patients, however, did not seem to significantly increase longitudinal stability of performance rates.

PHP79

PHYSICIAN QUALITY MEASUREMENT IN THE HEALTH PLAN PPO SETTING: THE IMPORTANCE OF SCORING ALGORITHMS

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OBJECTIVE: Various methodologies for measuring quality have been developed within pay-for-performance programs. This study sought to examine whether the relative ranking of physicians with regard to their quality performance is affected significantly by alternative scoring algorithms. **METHODS:** Administrative claims data from a preferred provider organization plan for 2004–2005 were used to measure physician performance on a set of 54 previously validated quality indicators. Three physician composite scoring approaches (binary, quartile, sum) were compared. In the binary method, each indicator was scored based on a comparison to the median. In the quartile method, the score for each indicator was based on the quartile of the physician's performance. In the sum method, the score is a ratio of all numerator cases over all denominator cases summed across all indicators. Wilcoxon rank-sum test, Spearman rank-correlation coefficient, and kappa statistic were used to evaluate differences between the alternative methodologies. **RESULTS:** A total of 2744 physicians were included, representing a total of 41 specialties. Physician scores were not highly correlated and achieved only a moderate level of agreement when using the different composite scoring algorithms. The "sum" strategy tended to result in the highest physician scores compared to the other scoring methods. **CONCLUSION:** The type of scoring algorithm considerably affects physician quality performance scores measured by clinically appropriate quality of care metrics. Using binary or quartile composite scoring methods can lead to a significant loss of information compared to the sum method.

HEALTH CARE USE & POLICY STUDIES—Regulation of Health Care Sector

PHP80

ANALYSIS OF FDA WARNING LETTERS AND NOTICES TO MANUFACTURERS OF PHARMACEUTICALS CONCERNING HEALTH OUTCOMES-RELATED PROMOTIONAL CLAIMS VIOLATIONS

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OBJECTIVE: To conduct a formal content analysis of FDA warning letters to manufacturers of pharmaceuticals concerning misleading health outcomes claims. **METHODS:** Two judges formally trained in content analysis procedures critically evaluated warning letters issued by the FDA from 2000 to 2006. An abstraction form was developed to capture information such as company name, product information, type of violation, target audience, and media type. Misleading health outcomes claims were classified into several categories including economic violations, quality of life (QoL) violations, misleading outcomes claims, misleading patient adherence claims, and misleading claims of preference by physicians or patients. The researchers derived a count of all letters and notices and calculated frequency statistics, as appropriate. Disagreements among judges were adjudicated by a third researcher. Inter-rater reliabilities among the judges were determined through kappa statistics. **RESULTS:** A total of 249 FDA letters to manufacturers were reviewed: 53 (21.3%) warning letters and 196 (78.7%) notices of violations. Misleading outcomes claims accounted for 33 (4%) of the total 809 violations. Misleading health outcomes claims included misleading pharmacoeconomic or cost advantage claim (n = 8, 0.9%), misleading claim of improved QoL (n = 11, 1.4%), misleading outcomes claims (n = 4, 0.5%), misleading patient adherence claims (n = 3, 0.4%) and misleading claims of preference by physicians or patients (n = 7, 0.9%). Target audience for these violations included health care providers (n = 11, 33%) and patients (n = 10, 30%). Inter-rater reliabilities among the 2 judges were exceptional, ranging from 0.86 to 1.00. **CONCLUSION:** Given that a large portion of drug selection decisions are made on the basis of outcomes data, it is not surprising that the FDA has begun monitoring outcomes research claims to ensure dissemination of accurate and reliable information. The small number of health outcomes violations could be attributed to Section 114 of the 1997 FDA Modernization Act that allows pharmaceutical companies to directly communicate such data to formulary decision-makers.

PHP81

PROGRESSIVE LICENSING AND VALUE FOR MONEY: USE OF RESPONDER ANALYSIS IN ECONOMIC EVALUATION

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OBJECTIVE: In responder-based reimbursement scenarios, patients who have demonstrated benefit after a test period are

reimbursed for continued use of a therapy. Benefit is evaluated based on a priori criteria regarding what constitutes a clinically important improvement. Payers incur costs for the patients who meet established responder criteria for a given therapy. **METHODS:** An economic evaluation of Sativex(r) vs. standard analgesic care in adults with Multiple Sclerosis and neuropathic pain is used to illustrate the application of a responder-based reimbursement scenario (N = 66). Sativex(r) response was defined as a reduction in pain score (2-points on BS-11) on the 10th day of treatment based on clinician opinion. Base case and responder-based incremental cost-utility ratios (ICUR) were determined. Efficacy and safety data were based on a phase III pivotal trial. Costs (CND$ 2006) were based on provincial sources. Direct medical resources were taken from a burden of illness study. **RESULTS:** In the base case, the incremental cost was $5339 and incremental QALY was 0.13. The ICUR was $70,103/QALY. In the responder-based economic analysis, 55.9% of Sativex(r) patients were defined as responders, incremental costs was $9352 and incremental QALY was 0.21, resulting in an ICUR of $44,917/QALY. **CONCLUSION:** Progressive licensing, in the form of conditional approvals, allows for earlier market access to pharmaceutical products. Based on the conditional nature of these approvals, the evidence for a new therapy may not be definitive. However, their potential benefit, by filling a void for previously unmet medical need, is significant. As payers are interested in maximizing value for money, they may not feel compelled to fund a conditionally-licensed product, when the data supporting its value is considered uncertain. To increase the confidence in the value for money proposition, responder-based reimbursement scenarios may be an option.

PHP82

RECENT TRENDS IN THE INCLUSION OF PATIENT-REPORTED OUTCOME (PRO) DATA IN APPROVED DRUGS LABELING BY FDA AND EMEA

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OBJECTIVE: The PROLabels database (www.mapi-prolabels.org) was developed to provide easy access to patient-reported outcomes (PROs) included in approved labeling of products in Europe and the USA. Two years after its launch, the coverage of FDA labels has been extended to give a more comprehensive image of the current use of PROs in clinical studies. **METHODS:** In 2006, the database opened with drugs approved in Europe through the centralized procedure established by the EMEA in January 1995 and with New Molecular Entities (NME) approved in the USA since January 1998. The extension project focused on other chemical types approved by FDA (e.g. New dosage form, New combination, etc.) and on NME approved before 1998. Once a PRO claim was identified in a label, the drug was added in PROLabels and the following information was retrieved: the PRO claim, description of clinical studies supporting the claim, description of PRO endpoints and measures used, pharmacological action of products and information source. **RESULTS:** New figures resulting from this major extension of PROLabels will be presented. These new figures will include the number of drug products present in the database with the FDA/EMEA distribution, the most represented therapeutic areas (currently nervous system diseases: 32.0%, immune system diseases: 24.0%, musculoskeletal diseases: 18.0%, genitourinary system diseases: 14.8%, and respiratory system diseases: 13.2%), and the most frequently measured PROs (currently Signs and Symptoms followed by Health-Related Quality of Life (HRQL)). Finally, any change in the rate of PRO data found overall in FDA approvals will be checked. **CONCLUSION:** This extension of the FDA coverage of the PROLabels database allows a clearer picture of the use of PROs to assess patients' treatment benefit to be drawn. In addition, it facilitates the examination of the discrepancies between the US and European regulatory agencies.

CANCER—Clinical Outcomes Studies

PCN1

DIAGNOSIS OF HER2 PROTEIN OVEREXPRESSION IN PATIENTS WITH BREAST CANCER IN BRAZIL

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OBJECTIVE: Protein HER2 identifies a more aggressive subtype of breast cancer. For this type of tumor, currently there are specific treatments (trastuzumab and lapatinib), which, if used in early phase of the disease can render a higher chance of cure and survival to the patients (the HERA study showed that the use of Herceptin after a standard chemotherapy in adjuvant tumors has reduced by 46% the risk of a tumor to return). The study objective is to assess the performance of the diagnostic tests of this protein for Brazilian patients with breast cancer. **METHODS:** A diary study with 220 Brazilian clinical oncologists was used; in the end of the study, a total of 3994 patients with breast cancer were followed up. **RESULTS:** Fifty-eight percent of the patients found were in the public market, and 42% were from the private market. We also have that 64% of the patients have early tumors (adjuvant or neoadjuvant), and 36% have metastatic tumors. The HER2 test is performed in 80% of the patients in the private market, with only 36% of the patients of the public market being tested. The test performance rate has little correlation with the disease phase (P value = 0.81); however, there is some correlation of the performance of this test with the patient's age (P value = 0.3). Physicians from several Brazilian states have different behavior while performing this exam (P value = 6^162). **CONCLUSION:** We verified that few patients of the public market (36%) perform this test comparing with the private market (80%). We also verified great differences in the performance of it in the different regions of the country. An increased performance rate of this exam would increase the chances of survival and cure for the patients, since it allows the use of specific treatments for positive HER2 tumors.

PCN2

SYSTEMATIC REVIEW OF PALONOSETRON IN CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING

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OBJECTIVE: The purpose of this study is to systematically review the evidence of palonosetron in chemotherapy-induced nausea and vomiting (CINV) and to understand its place in therapy. **METHODS:** The English-language literature in OVID and Cochrane databases were searched using the following terms: palonosetron, antiemetics, CINV, and delayed. Of the 168 abstracts identified, 3 pivotal trials were deemed relevant by 2 independent reviewers. Guidelines from the American Society of Clinical Oncology, National Comprehensive Cancer Network (NCCN), and Multinational Association of Supportive Care in Cancer and the Food and Drug Administration (FDA) reviewers' comments on palonosetron were also obtained. **RESULTS:** The trials, all non-inferiority studies, compared palonosetron 0.25mg to single-dose intravenous ondansetron or dolasetron.

Two studies involved moderately emetogenic regimens. Palonosetron 0.25mg was associated with a significantly higher complete response (CR) rate in the delayed phase compared to ondansetron (74.1% vs. 55.1%, p = 0.001) and dolasetron (54.0% vs. 38.7%, p = 0.004). The CR rate with palonosetron 0.25mg in the acute phase was significantly higher than ondansetron (81.0% vs. 68.6%, p = 0.009), but only numerically better than dolasetron (63.0% vs. 52.9%, p = 0.049). In the trial with highly emetogenic agents, CR rates were comparable between palonosetron 0.25 mg and ondansetron in both the acute (59.2% vs. 57.0%, p = 0.701) and delayed (45.3% vs. 38.9%, p = 0.180) phases. The FDA considered the CINV claims relative to placebo due to lack of approval of comparators for delayed CINV. Because of its long half-life, NCCN guidelines indicated that single-dose palonosetron could be considered at the start of a multi-day chemotherapy regimen instead of multiple daily doses of other 5-HT3-RAs; however, none of the guidelines designated a preferred 5-HT3-RA. **CONCLUSION:** 5-HT3-RAs can be considered clinically interchangeable. While palonosetron may provide convenience by avoiding the need for repeat daily dosing, this needs to be balanced against its additional cost given the advent of generic 5-HT3-RAs.

PCN3

EFFECTIVENESS OF BORTEZOMIB IN MULTIPLE MYELOMA: PRELIMINARY RESULTS FROM AN INTERNATIONAL ELECTRONIC OBSERVATIONAL STUDY

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OBJECTIVE: Multiple myeloma (MM) is a plasma-cell malignancy with approximately three years median survival. Patients usually relapse or become refractory to existing treatments. Bortezomib(VELCADE) is indicated for the treatment of MM in patients who have received at least one prior therapy. The electronic VELCADE Observational Study (eVOBS) is a multicenter naturalistic study designed to evaluate the clinical and outcomes benefits of bortezomib in actual clinical practice. **METHODS:** This is a multi-center study with sites in Belgium, France, Greece, Russia, Spain, Sweden, and Turkey. The study enrollment period is between October 2006 and December 2008 with a 3-year follow-up. Adults are eligible for study if they are scheduled to initiate bortezomib within the approved indication. All bortezomib dosages and concomitant treatments are permitted, except investigational therapies. Data treatment response, and safety are collected prospectively. **RESULTS:** The current analysis reports data collected on patients initiated with bortezomib between October 2006 and July 2007. A total of 86 pts with at least four months of data are included in this analysis. Demographic and clinical characteristics of the initial participants were similar to those of the participants in the prospective controlled phase 3 APEX trial. Adverse events (AEs) were reported in 61 (71%) pts, including Grade ≥3 AEs in 38% and Grade ≥4 AEs in 9%. AEs were treatment-related in 45% of patients and treatment-limiting in 9%. Presently, 72 of 86 pts have been evaluated for response, of whom 5 (7%) achieved complete response, 9 (13%) achieved near complete response, and 30 (42%) achieved partial response. Updated data will be presented at the meeting. **CONCLUSION:** In this preliminary analysis of data from a prospective, observational study, response rates and safety data demonstrate that bortezomib-containing regimens are effective and well-tolerated in the treatment of MM in actual clinical practice and the results are in line with previously published studies.

PCN4

DATA ANALYSIS WITH GENERALIZED LINEAR MODELS ON LUNG CANCER DATA

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OBJECTIVES: The Nationwide Inpatient Sample is part of the Healthcare Cost and Utilization Project, and is the only national hospital database with charge information on all patients, regardless of payer, including persons covered by Medicare, Medicaid, private insurance, and the uninsured. It is the purpose of this study to examine the relationship between patient outcomes and conditions of the patients undergoing different treatments for lung cancer. **METHODS:** There are fifteen possible patient diagnoses in the dataset. SAS Enterprise Guide was used to obtain Lung Cancer data from NIS by using the CATX and the RXMATCH statements in SAS. We bring all fifteen diagnoses into one column as a string of codes, using the CATX function. Total charges are used to examine the relationship between diagnoses and procedures. The generalized linear regression model was used to fit the data. **RESULTS:** After filtering down to lung cancer using the strings of diagnoses, there were 5457 records in the data set. By the plot method, we selected variables related to Total charges. We found that the Total charges were highly related to Age in years at admission, Diagnosis Related Group, Length of stay and Died during hospitalization. By the basic criterion, deviance residuals and Pearson chi-square residuals, the specified model fits the data reasonably well. From the Type 1 and Type 3 analysis, all the estimates for the intercept, Los, Age, DRG, and Died were 10.1805, 0.1181, 0.003, –0.0008, and –1.024, respectively. All of them were statistically significant. Co-morbid diagnoses that increased total charges include coronaries, multiple significant traumas, and cardiac implant. **CONCLUSIONS:** Our analysis revealed that there was a specified relationship between these variables. With increasing of length of stay, age in years at admission, small codes of diagnosis related group and surviving during hospitalization, the total charges increase, which is reasonable.

PCN5

META-ANALYSIS ON THE MORBIDITY AND MORTALITY OF CLODRONATE, PAMIDRONATE AND ZOLEDRONATE IN PATIENTS WITH BONE METASTASES

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OBJECTIVE: Complications from skeletal-related events (SREs) constitute a challenge to the care of patients with bone metastasis originated from any type of malignancy. Our objective was to determine the reduction in morbidity (SREs) and mortality (overall) of clodronate, pamidronate, and zoledronic acid in patients diagnosed with bone metastasis. **METHODS:** Medline and Embase (from inception to October 2007) were searched in order to retrieve randomized clinical trials evaluating targeted bisphosphonates in cancer patients with bone metastasis. Patients with a definite (i.e., biopsy-proven) diagnosis of metastatic bone disease were included in the analysis. We extracted and combined data from studies describing the number of patients reporting 12-month SREs and mortality data. Two independent reviewers identified articles, then extracted data; results

were compared and settled through consensus. A random-effects meta-analytic model was applied in all calculations. Jadad's scale assessed study quality of reporting. **RESULTS:** A total of 50 potential studies were identified. Thirty-five were excluded and 15 were evaluated. Quality of reporting of included studies was on average 59 ± 24%. All three drugs showed beneficial effects in preventing all SREs over placebo in cancer patients with bone metastasis. Zoledronate was the pharmacological strategy reporting the lowest relative risk (RR = 0.67; CI95% = 0.55, 0.81; N = 695), followed by pamidronate (RR = 0.79; CI95% = 0.71, 0.88, N = 1951), and clodronate (RR = 0.87; CI95% = 0.75, 1.00; N = 681). However, no clear advantage of one drug over the others was observed since confidence intervals overlapped substantially. All targeted bisphosphonates showed no benefits over placebo in reducing the number of deaths in a 12-month period ($p > 0.05$). **CONCLUSION:** Clodronate, pamidronate, and zoledronate are able to reduce the morbidity of patients with bone metastasis in regards to SREs but not overall mortality.

PCN6

ESTIMATION OF THE EPIDEMIOLOGICAL EFFECT OF TRASTUZUMAB OVER 10 YEARS IN 5 EUROPEAN COUNTRIES

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OBJECTIVE: To assess the potential value of trastuzumab (T) to society, we initially assessed the long-term impact of T treatment in early breast cancer (EBC) on the annual number of patients developing metastatic BC (MBC) from 2005–2015 in five European countries. **METHODS:** Annual EBC incidence for 2003–2015 was projected by applying stage-specific proportions for stages I-III, according to regional registry data, to published female BC incidence rates from 1990–2002. Age-specific rates for 2002 were then applied to United Nations 2003–2015 population projections. The annual number of patients with HER2-positive MBC includes de novo MBC incidence plus patients with BC recurrence. The baseline 10-year recurrence rate for standard treatment was estimated as 37%, based on 4-year follow-up in the control arm of a combined trial analysis in patients with HER2-positive BC and the long-term timing of recurrence in all patients with BC. To model recurrence in T-treated EBC patients, the hazard ratio at median 1-year follow-up in the HERA trial (0.49; 95% confidence interval [CI]: 0.38, 0.63) was applied, resulting in an estimated 10-year recurrence rate of 18.1% (95% CI: 14.0, 23.3). **RESULTS:** In 2004, prior to T approval for EBC, the pool of de novo and relapsed MBC patients was estimated at 16,156. Between 2005 and 2015, the model predicts that T treatment will result in an annual decline of 2.5% (95% CI: 1.7, 3.2). The total number of patients prevented from developing metastases over 10 years is projected to be 27,727 (95% CI: 20,116, 33,709). **CONCLUSION:** T is expected to prevent nearly 28,000 women from developing MBC over a 10-year period in five countries alone and should considerably reduce the health resource burden of MBC treatment.

PCN7

ANALYSIS OF MASTECTOMY IN BREAST CANCER TREATMENT

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OBJECTIVE: Surgery is main treatment used in most early breast cancer cases; surgery is the primary treatment for breast cancer to remove as many as cancer cells as possible. There are two types of surgeries: mastectomy and lumpectomy. Studies have shown that mastectomy is the most performed in comparison to lumpectomy. With our data, out of 1485 cases of breast cancer, 146 were primarily treated by mastectomy while only 26 were treated with lumpectomy. We analyzed, in detail, the information on mastectomy as a treatment option for breast cancer to compare the use of different types of mastectomy and to study the cost of the most frequent types. **METHODS:** We used the 2004 data from the National Inpatient Sample (NIS). We first filtered the data with respect to the main types of mastectomy: radical mastectomy, modified radical mastectomy, simple (total) mastectomy, and the subcutaneous mastectomy. Second, we analyzed them with summary statistics using SAS, and then finally, we looked at the cost of the most frequent by plotting the actual costs and the future trend. We used SAS Text Miner to compress patient diagnoses, and compare them to the types of treatment. **RESULTS:** The modified radical mastectomy is the most frequently used in treating breast cancer with 81.5% of the total mastectomies. Then, we have the simple (total) mastectomy with 13.7%. Finally, we have the subcutaneous mastectomy (2.7%) and the radical mastectomy (2.1%). The cost of the modified radical mastectomy has a constant trend of around $20,000. **CONCLUSION:** The modified radical mastectomy is the most performed so far in the treatment of breast cancer by mastectomy. SAS can be used to study health care cases.

PCN8

IMPROVED SURVIVAL OF PATIENTS WITH GLIOBLASTOMA MULTIFORME BY TEMOZOLOMIDE AS ADJUVANT THERAPY: A RETROSPECTIVE COHORT STUDY

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OBJECTIVE: Glioblastoma multiforme (GBM) accounts for 35% of primary brain tumor in Taiwan. The objective of this study is to determine if patients with GBM survived longer after adjuvant therapy by temozolomide. **METHODS:** We collected all inpatients of GBM verified with pathology in Chang Gung Memorial Hospital from January 2001 to March 2006. Patients aged more than 80 at diagnosis were excluded. Outcome was followed until December 31, 2006. Survival analysis was performed by Kaplan-Meier estimation method and Cox regression model and explores the effect related to various prognostic factors including adjuvant therapy of temozolomide. **RESULTS:** There were 66 temozolomide users and 133 non-users during the study period. They were no statistical significant differences on gender, age at diagnosis and year of diagnosis between these two groups. Analysis showed 50% survival for users and non-users were 18.7 and 9.9 months, respectively (Log-rank test, $p < 0.0001$). The hazard ratio was 2.58 (95% confidence interval, 1.60–4.16) for the aged 60–80 compared with patients aged 20–40, and that of temozolomide treatment was 0.47 (.34–.66). Stratified analysis showed that there was no significant difference in survival between patients with concomitant radiotherapy. **CONCLUSION:** The adjuvant therapy with temozolomide seemed to improve survival, but randomized trial is still needed to test this hypothesis.

PCN9

VALIDITY OF PROPORTIONAL HAZARDS (PH) WEIBULL MODELS FOR ANALYZING PROGRESSION FREE SURVIVAL (PFS) AND OVERALL SURVIVAL (OS) IN PATIENTS WITH TRASTUZUMAB (TZ)-REFRACTORY ERBB2+ (HER2+) METASTATIC BREAST CANCER (MBC) RECEIVING LAPATINIB PLUS CAPECITABINE (L+C) VERSUS CAPECITABINE ONLY (C-ONLY)

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OBJECTIVES: Lapatinib is an oral small molecule dual targeted therapy that binds intracellularly to the ATP binding site of the EGFR and ErbB2 (HER2) receptors. In the EGF100151 trial, L+C improved time to progression (TTP) and progression free survival (PFS) vs C-only in women with ErbB2+ MBC who had received prior therapy including TZ. Following achievement of the primary endpoint, enrollment was halted, preventing demonstration of a significant difference in OS. **METHODS:** To inform ongoing analyses of the cost-effectiveness of L+C vs. C-only, Weibull survival functions for PFS and OS were fitted to observed failure time data from EGF100151 using Accelerated Failure Time (AFT) regression. Survival function parameters were estimated using a single regression equation for each outcome with treatment groups entered as an independent variable. Hazard Ratios (HRs) for progression and death with L+C were assumed to be proportionate to HRs for C-only. Expected PFS, OS, and post-progression survival (PPS) were calculated for each group. The validity of the Weibull model and PH assumption were assessed using graphical and analytical methods. **RESULTS:** Expected PFS, PPS and OS for L+C were 36.89, 43.78, and 80.67 weeks, respectively. Corresponding values for C-only were 22.49, 45.03, 67.47 weeks, respectively. Graphical tests of transformed survival functions supported use of Weibull distribution. Correlation tests between the ranked failure times and Schoenfeld residuals, supremum test for proportional hazards assumption, and comparisons of HRs for L+C vs. C-only by quarter post-randomization, provided no strong evidence of non-proportionality. **CONCLUSION:** Proportional hazards Weibull survival models are valid for modeling survival time data in patients with trastuzumab-refractory ErbB2-overexpressing MBC receiving L+C versus C-only, and suggest that lapatinib provides substantial benefit in terms of PFS and OS in patients with ErbB2+ MBC.

PCN10

CANCER RISK BETWEEN ATORVASTATIN AND SIMVASTATIN IN THE LOUISIANA MEDICAID PATIENTS

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OBJECTIVE: To compare the risk of cancer between Atorvastatin and Simvastatin users. **METHODS:** Retrospective cohort study was conducted in Louisiana Medicaid program from January 1, 1998 through June 30, 2005. Inclusion criteria were recipients continuously eligible with no more than two months gap, a paid claim for statin, and at least 40 years of age. Patients with diagnosis or drug claim for cancer in the washout period were excluded. Washout period was defined as a period between index date minus 12 months and index date plus 18 months. Statin (Atorvastatin or Simvastatin) users were patients with 300 or more days of supply of statin within 18 month period from the index date. Patients were then followed for at least six months or until end of study period. A propensity score-based matching method was used to match both the groups (1:1 match). Users of Atorvastatin were compared with the users of Simvastatin as to their risk of cancer. **RESULTS:** Each group had 1050 recipients after matching for comparison. Compared with Atorvastatin users, Simvastatin users experienced similar cancer risk (OR 1.20, 95% C.I. = 0.78–1.82). **CONCLUSION:** The data from present study provides evidence that there is no significant difference in risk of cancer between Atorvastatin and Simvastatin users.

CANCER—Cost Studies

PCN11

A BUDGET IMPACT ANALYSIS OF IXABEPILONE IN TREATING METASTATIC CANCER PATIENTS

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OBJECTIVE: To evaluate the budget impact to a health plan after introducing Ixabepilone as a treatment option for metastatic breast cancer patients who have previously failed Anthracycline and Taxane based regimens. **METHODS:** The analysis was conducted from a U.S. payer's perspective over a three-year time horizon. The model specifically considered 2 segments of MBC patients for which Ixabepilone is indicated: 1) patients pretreated with Anthracycline and Taxane (AT_p); and 2) patients pretreated with Anthracycline, Taxane, and Capecitabine (ATC_p). After combining epidemiological data (SEERs, NCI), market uptake assumptions from market research forecasting, and current drug treatment costs (based on WAC price and average number of treatment cycles a patient received), the model estimated the incremental budget impact after adopting Ixabepilone as a treatment option. The model assumed that during the first year, 9.41% of AT_p patients receive Ixabepilone and Capecitabine combination therapy; and 62.7% of ATC_p patients are treated with Ixabepilone monotherapy. A plausible range of parameter values were considered in the sensitivity analysis. **RESULTS:** In a hypothetical health plan with approximately 0.06% of members estimated to be diagnosed with MBC, it was assumed that 37% were AT_p and 5% were ATC_p patients. In the year after introduction of Ixabepilone, the overall incremental cost per member per month (PMPM) was estimated to be approximately $0.03. For the AT_p patient segment, the incremental PMPM cost was estimated to be $0.03. However, for the ATC_p population, the model estimated a savings of $0.002 in PMPM. The incremental cost per treated MBC member per year is estimated at $545.29 for Year 1, and $640.76 and $668.01 for Years 2 and 3, respectively. **CONCLUSION:** In patients with MBC who have few viable treatment options after failing AT or ATC treatments, the budgetary impact of adding Ixabepilone to a health plan was estimated to be minimal.

PCN12

USE OF HEALTH RESOURCES IN LUNG CANCER PATIENTS: A BRAZILIAN ANALYSIS IN THE PRIVATE PAYER PERSPECTIVE

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OBJECTIVE: To evaluate the HRU in a supplementary medicine environment in Brazil comparing intravenous (IV) treatments used in clinical practice. The health resources utilization (HRU)

in lung cancer treatment is variable according to several items: the country where the treatment is performed, hospitalization, administration and drug costs. **METHODS:** A total of 344 Lung cancer patients were selected within the records of a private hospital in Brazil. Of those, 69 patients that received pemetrexed or docetaxel as second line chemo. The chemotherapy protocols considered were: Pemetrexed 500mg/m^2 every 3 weeks, Docetaxel 75mg/m^2 every three weeks, Docetaxel 35mg/m^2 weekly (3 times per cycle) and Docetaxel 40mg/m^2 weekly (3 times per cycle). HRU frequency (hospitalization, clinical visits, complementary examinations, medication, transfusions) related to lung cancer treatment was reviewed retrospectively from clinical records. The costs were calculated in dolars (US$) following the original records for each cycle. The values for neutropenia were also calculated. **RESULTS:** Pemetrexed 500mg/m^2 every three weeks was used by 20.5% of the patients; Docetaxel 75 mg/m^2 every three weeks by 17.1%; Docetaxel 35mg/m^2 weekly (3 times per cycle) by 8.1% and Docetaxel 40mg/m^2 weekly (3 times per cycle) by 1.1%.The cost of each cycle was U$6897.00 for Pemetrexed 500mg/m^2; US$3041.00 for Docetaxel 75mg/m^2; US$5919.00 for Docetaxel 35mg/m^2 and US$6669.00 for Docetaxel 40mg/m^2. The costs of neutropenia and febrile neutropenia episodes were respectively US$1310.00 and US$6000.00. **CONCLUSION:** Besides the cost of the drug is a mean point in health resources utilization we have to consider other variables to have a clear picture of each chemotherapy scheme costs and were the resources have been used. Since the chance of toxicity is different for every kind of treatment, all the inputs to reach the total cost of treatment are necessary.

PCN13

BUDGET IMPACT ANALYSIS OF SORAFENIB IN THE TREATMENT OF HEPATOCELLULAR CARCINOMA IN CANADA

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OBJECTIVE: To determine the financial impact of sorafenib in the treatment of hepatocellular carcinoma (HCC), the most common form of liver cancer, from a Canadian provincial drug plan perspective for 2008–2010. **METHODS:** A prevalence-based approach was used to estimate the number of HCC patients in Canada. Liver cancer prevalence from 2008–2010 was estimated using the GLOBOCAN 2002 database, supplemented with actual and projected Canadian liver cancer incidence figures from 2003–2010, and survival rates for each stage of HCC. Liver cancer figures were condensed to HCC figures as ~90% of liver cancers are HCC. HCC figures were then segmented using the Barcelona Clinic Liver Cancer staging system and diagnosis rates provided the clinical community. Age and geographic distribution patterns, market share assumptions and provincial drug plan coverage factors were then applied to the HCC figures to determine the number of HCC patients eligible for treatment with sorafenib and coverage from the province. Drug costs including wholesale and pharmacy mark ups were multiplied with the median treatment duration and patient number to determine the financial impact of sorafenib. **RESULTS:** The prevalence of liver cancer in Canada in 2008 has been estimated to be 1284 increasing to 1324 by 2009 and 1366 by 2010. Of these an estimated 206 HCC patients will be treated with sorafenib in 2008, increasing to 321 in 2009 and 438 in 2010. The number of HCC patients treated with sorafenib that are eligible to receive coverage through their provincial drug plan are 154, 240 and 328 in 2008, 2009 and 2010 respectively. The financial impact of sorafenib to the provincial drug plans is $3.7 million in 2008, $7.1 million in 2009 and $9.7 million in 2010. **CONCLUSION:** The financial impact of sorafenib to the provincial drug plans will range from $3.7 million to $9.7 million from 2008–2010.

PCN14

A SYSTEMATIC REVIEW OF ECONOMIC ANALYSES OF HER2 TESTING & TRASTUZUMAB THERAPY

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OBJECTIVE: We sought to systematically review economic analyses (EAs) of HER2 testing and trastuzumab therapy in all stages of breast cancer (BC) with specific attention to the methodological quality, quantification of uncertainty and incorporation of diagnostic test characteristics. **METHODS:** EAs of trastuzumab in BC or HER2 diagnosis with either immunohistochemistry or fluorescence in situ hybridisation techniques were considered. Biosis, Cochrane, CRD, EconLit, Embase, HEED, Medline and PubMed databases were searched. The reference lists of each retrieved article, relevant reviews, and abstracts of the San Antonio Breast Cancer Symposium were hand-searched. Citations were reviewed in duplicate and relevant articles were qualitatively rated per Drummond. **RESULTS:** Twenty studies, conference abstracts and health technology assessments were selected for full review from among 641 citations as of December 2007 (reviewer agreement kappa = 0.85). Studies examined trastuzumab in metastatic (7/20) or adjuvant (10/20) settings or had a testing focus (4/20). HER2 diagnosis strategy and trastuzumab treatment were evaluated jointly in only one study. Few decision models were calibrated against epidemiological data (3/20). Probabilistic sensitivity analysis was infrequently used to characterise uncertainty (3/20) and decision uncertainty in the form of cost-effectiveness acceptability curves was presented in a single study. The overall reported quality of EAs was comparatively poor. **CONCLUSION:** Testing and treatment were rarely examined in tandem, despite a 2004 EA addressing this very issue in metastatic disease. Given the controversy around trastuzumab funding in many jurisdictions, the need for adequate attention to testing and uncertainty analysis is not met in the literature.

PCN15

MODELING THE COST IMPACT OF POSSIBLE CROSS-PROTECTION DIFFERENCES OF TWO CERVICAL CANCER VACCINES IN CANADA USING MULTIPLE PROBABILISTIC SENSITIVITY ANALYSIS

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OBJECTIVE: Two vaccines against cervical cancer are now available. One reduces the burden of genital warts; with the other the model estimates it may have better cross-protection against oncogenic non-vaccine HPV-types. We aimed to understand the extent to which cross-protection could have an equivalent cost impact and the likelihood this would occur. **METHODS:** A population model was developed in Excel(r) to evaluate the expected annual health care cost of protecting cervical diseases with vaccines against specific HPV-types. The type-specific vaccine effect was assessed on the number of abnormal pap smears, pre-cancer lesions, genital warts and cervical cancer cases prevented. Vaccine effect was calculated by multiplying the proportion of HPV-types per lesion, as reported in the literature, by a range of vaccine efficacy values. A health care perspective was selected, with unit costs (2006 CDN$) for each intervention obtained from official tariff data. No discounting was applied as

results are reported over a one-year period after reaching steady-state level of vaccination. Multiple probabilistic sensitivity analysis was performed to estimate the distribution of the cost difference between the two vaccines by running 5000 iterations with @Risk(r) software in Excel(r) (normal distributions for vaccine efficacy, uniform distributions for HPV typing and costs). **RESULTS:** Multiple probabilistic sensitivity analysis showed an average annual cost difference of $9.3M (CDN) (95% CI: –$10M, +$43M) in favor of cross-protection over genital warts protection. Cross-protection provided additional cost saving with an 86.3% probability. An efficacy for additional cross protection of around 12% would achieve cost neutrality. The difference in cost was most sensitive to vaccine efficacy of cross-protection, the proportion of non-vaccine oncogenic HPV-types in CIN1, and the unit cost of treating CIN1. **CONCLUSION:** A vaccine with additional cross-protection of at least 12% is likely to offset the costs associated with the protection against genital warts in the Canadian health care system.

PCN16

COST DIVERSITY OF DRG BASED COLORECTAL CANCER THERAPIES IN HUNGARY

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OBJECTIVE: In Hungary, costs of anti-cancer treatments are covered by hospitals' budget, and funds for therapy expenditures provided from the National Health Fund Administration, based on DRG accounts. The goal was to investigate the real cost of treatments, and assess a comparison of DRG based remittance and expenditures of therapies. **METHODS:** Cost analysis of CRC chemotherapy-protocols has been conducted from the perspective of Oncology Departments. Regimens of 5-fluorouracil+/–leukovorin, irinotecan, cetuximab, bevacizumab and oxaliplatin have been investigated, focusing on cost of medication, hospitalisation and total expenditure of protocols. **RESULTS:** Real expenditures of protocols were assessed. The range of drug related costs were USD$18.20–3085.80 as expenditures of hospitals. Total expenditures of chemotherapy-regimens have been assessed and compared to allocation of remittances from the National Health Fund Administration. The value of remittances have been found between USD$405.70 and USD$2875.20, depending on protocols. The gap analysis of drug expenditures and remittances has resulted in a wide range of USD$–347 to USD$1611. The ratio of drug related expenditures and total remittance of hospitals showed diversity from 5% to 107%. **CONCLUSION:** The analysis showed that fixed DRG values had not represented real expenditures of chemotherapies of CRC treatment. Remittances should have been validated regularly. Neither priority, nor incentive elements, have been found in protocols containing molecules with superior efficacy or improved safety. In general, Oncology Departments are motivated to use protocols, containing generic compounds with low expenditures and to achieve significant savings in hospitals' budget.

WITHDRAWN **PCN17**

WITHDRAWN **PCN18**

PCN19

A COST-EFFECTIVENESS ANALYSIS OF LAPATINIB AT A TERTIARY CANCER CENTER

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OBJECTIVE: As new agents become available for the treatment of diseases, there exists a need to evaluate the cost-effectiveness of the agents. This study calculates the cost-per life-year saved and the budget impact of lapatinib, a new dual tyrosine inhibitor as part of the formulary evaluation process at a major tertiary cancer center. **METHODS:** A decision analytical model was developed to estimate the incremental cost-effectiveness of lapatinib for advanced breast cancer. The model estimates the incremental cost-effectiveness of two strategies: combination therapy of lapatinib with capecitabine compared to capecitabine alone. The outcome of interest was time to disease progression, based on randomized clinical trials (RCTs). Direct medical costs from the institutional perspective were utilized and were calculated for a one year time period. One-way and two-way sensitivity analysis on the rate of disease progression for monotherapy and combination therapy was conducted. In addition, a budget impact model was also calculated for the institution. **RESULTS:** Based on outcome estimates from RCTs and the application of the institutional costs, the cost-per-life-year saved for lapatinib for treatment of advanced breast cancer was $108,300. One-way sensitivity analysis of the combination response (0–50%) indicated that lapatinib's cost-effectiveness ratios ranged from $100,000 to $119,000 per life-year saved. Two-way sensitivity analysis indicated that the majority of the time monotherapy was more cost-effective. The lapatinib combination was only considered cost-effective, if the response rate of the monotherapy never exceeded 14.6%. The budget impact model, which incorporated both on-label and off-label usage of lapatinib, estimated that the institution will utilize about 10 million dollars worth of drugs annually, based on acquisition costs. **CONCLUSION:** Lapatinib appears to have similar cost-effectiveness in comparison with other targeted oncology agents. Post evaluation economic analysis will be conducted to determine how closely the economic model predicted the utilization of lipatinib at the institution.

PCN20

COST ANALYSIS OF IMMUNOGLOBULIN PROPHYLAXIS IN CHRONIC LYMPHOCYTIC LEUKEMIA

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OBJECTIVE: Patients with chronic lymphocytic leukemia (CLL) are often treated with prophylactic intravenous immunoglobulin (IVIG) to reduce risk of infection, although increased survival has not been demonstrated with use. The objective of this study was to estimate direct medical costs of IVIG versus no prophylaxis over 12 months. **METHODS:** Costs were estimated from the government (Medicare) perspective when available, or calculated from the literature in 2007 US dollars. Assuming a regimen of 400mg/kg every four weeks for one year, 12 administrations for a 70kg patient was calculated using a reimbursement of $30 per 500mgs. Estimated resources costs were $24 per preparation and $144 per administration. Infections were considered minor, moderate, or severe and both costs and probabilities of infection were extracted from previous studies. Risk of any infection with IVIG use was 36% and with no prophylaxis, 56%. Reported infections per year among patients with 1+ infection was 1.4 with IVIG use and 2.25 infections with no prophylaxis. **RESULTS:** Under the described model, the total cost per year of prophylactic IVIG = $24,512 per patient. The weighted average cost per infection was $1688. The average weighted infection cost (AWIC) of minor infections = $12; moderate, AWIC = $96; and severe, AWIC = $2256. In comparison, total cost with no prophylaxis was $4500 per patient year. The weighted average cost of one infection with no prophylaxis = $2000. The AWIC of minor

infections in untreated patients = $31; moderate, AWIC = $287; and severe, AWIC = $4182. **CONCLUSION:** These data show IVIG prophylaxis cost $24,512 per patient year, compared to $4500 with no prophylaxis, or about a 445% increase in cost. The cost-effectiveness of IVIG in CLL has not been established, and availability of IVIG is limited. Further studies on other alternatives, such as prophylactic antibiotic therapy, and impact on quality of life are needed.

PCN21

SYSTEMATIC REVIEW OF COST-EFFECTIVENESS-ANALYSIS STUDIES OF TRASTUZUMAB (HERCEPTIN™) IN TREATMENT OF HER2-POSITIVE BREAST CANCER

Le QA

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OBJECTIVE: There have been numerous studies on cost-effectiveness of trastuzumab in both treatments of adjuvant and metastatic breast cancer (BC). Nevertheless, the results reported were varied depending upon the assumptions and/or perspectives of the studies. We performed a systematic review of cost-effectiveness-analysis (CEA) studies of trastuzumab in treatment of HER2-postive breast cancer. **METHODS:** Literature search from 1996 to December 2007 on databases including PubMed, Ovid MEDLINE, and HealthSTAR was performed to retrieve CEA studies of trastuzumab, using MESH terms and keywords such as "trastuzumab," "costs and cost analysis," "economics," "breast neoplasm," "cost effectiveness," "cost utility," and "breast cancer." Additionally, abstracts on CEA studies were also obtained from American Society of Clinical Oncology (ASCO) and ISPOR annual meetings. Only CEA studies reported incremental cost-effectiveness ratio (ICER) or cost-utility ratio (ICUR) as cost per quality-adjusted life years were included in this review. **RESULTS:** Thirty five studies (20 published articles and 15 abstracts) were identified, of which 18 studies (14 adjuvant, 3 metastatic BC studies, and 1 study of product life-cycle of trastuzumab) representing societal health care perspectives from 12 countries were satisfied the criteria. The mean (median) ICERs of trastuzumab are $24,069/QALY ($23,766/QALY) [ranged from $4,767 to $58,414/QALY] and $88,373/QALY ($80,000/QALY) [ranged from $60,120 to $125,000/QALY] for HER2-postive adjuvant and metastatic breast cancer treatments, respectively. Majority of sensitivity analyses showed the main cost driver was the acquisition cost of trastuzumab. In addition, over the product life-cycle of trastuzumab, the overall ICER is $34,400/QALY (Garrison et al., 2006). **CONCLUSION:** This review suggests that the average costs per QALY of trastuzumab in both treatments of adjuvant and metastatic HER2-positive breast cancer are consistent and below the suggested cost effectiveness threshold of $100,000/QALY.

PCN22

IS CAPECITABINE A COST-EFFECTIVE ADJUVANT TREATMENT OF STAGE III COLON CANCER IN ONTARIO?

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OBJECTIVE: To explore the cost-effectiveness of capecitabine as adjuvant treatment for Stage III colon cancer. Phase III clinical trials show that capecitabine improves disease-free survival. However, these trials involved younger patients than reflected clinically and overall survival was not significantly better than with usual care. We conducted a modeling study comparing the cost-effectiveness of capecitabine and standard care (Fluorouracil/Leucovorin (5FU/LV)) in a public-payer context (Canada), using an older cohort, and with overall survival as the main outcome. **METHODS:** A Markov model was developed to determine the cost-effectiveness of capecitabine compared with 5FU/LV. The base case was a 70-year-old man after total mesorectal resection excision of Stage III colon cancer. A five year time horizon was used. Health states included treatment phase, remission, recurrence, disease progression, and death; throughout the model (except during the active treatment states) patients could die from other risk-related causes. Ontario health economic data were used for costs. Probabilities were obtained from the published literature, and sensitivity analyses were conducted. **RESULTS:** The base case costs for capecitabine and 5FU/LV were $12,999 and $12,191, respectively. Overall survival was 4.132 and 4.069 years, respectively. The incremental cost-effectiveness ratio of capecitabine was $12,821 per life year gained. However, the incremental cost-effectiveness ratio of capecitabine was greater than $50,000/life year when the annual probability of relapse was greater than 0.96 or when drug costs were assumed to be greater than $1410 per cycle (both values within the plausible range). **CONCLUSION:** Capecitabine produced modestly improved survival over 5FU/LV (0.063 extra years) with a favourable cost-effectiveness ratio. However, because the model was sensitive to variations in relapse rate and drug costs, the relative attractiveness of capecitabine over 5FU/LV is not certain. In addition, utilities and indirect costs were not considered in the model. Because capecitabine is administered orally, this could be an important factor warranting further research.

PCN23

COST-EFFECTIVENESS ANALYSIS OF LAPATINIB PLUS CAPECITABINE VERSUS CAPECITABINE ALONE IN THE SECOND LINE TREATMENT FOR BREAST CANCER TREATMENT

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OBJECTIVE: Compare two therapy regimens, Lapatinib plus Capecitabine to Capecitabine alone, for advanced or Metastatic HER2-positive breast cancer patients who were pretreated with regimens that included an anthracycline, a taxane, and trastuzumab. **METHODS:** A Markov model, written in Microsoft Excel(r), is used to simulate progression of breast cancer in a hypothetical cohort of breast cancer patients in a societal perspective. The model consists of three health states: Clinical Benefits (Response or Stable Disease), Progressive Disease, and Death. Transitions between health states were assumed to occur once a month. Life expectancy, costs and QALYs are discounted monthly by 0.0025% (3% annually). All costs are adjusted to 2007 dollars. **RESULTS:** Lapatinib plus Capecitabine increases discounted life expectancy and quality-adjusted life expectancy by 0.43 years and 0.54 years, respectively, when compared to Capecitabine alone. This result yields an incremental cost-effectiveness ratio (ICER) of USD$135,701.69 per QALY (upper 95% CI USD$230,864.99 per QALY), which may be cost effective, based on the threshold of USD$150,000/QALY. If the value of Lapatinib price increases at least 13.4%, the combination therapy is no longer cost-effective. The same outcome is observed if we increase the transition probability from the Clinical Benefits state to the Progressive Disease state in the combination therapy by 12.5% or if we decrease it by 19.3% in monotherapy. Additionally, by using the 5th percentile of the utility for Clinical Benefits and the 95th percentile of the utility for Progressive Disease, the ICER is US$D281,091.34/QALY and USD$201,232.58/QALY, respectively. **CONCLUSION:** Based on a threshold of USD$150,000/QALYs, the treatment with Lapatinib plus Capecitabine is cost-effective in the base case for

metastatic breast cancer patients. Although the mean of ICER is USD$135,701.69, the upper limit 95% CI suggests that Lapatinib plus Capecitabine may be cost-ineffective. In addition, for reasonable changes in key parameters, the combination therapy becomes cost-ineffective.

PCN24

ECONOMIC EVALUATION OF SORAFENIB VERSUS BEST SUPPORTIVE CARE IN ADVANCED RENAL CELL CARCINOMA: AN UPDATED COST-EFFECTIVENESS ANALYSIS

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OBJECTIVE: An earlier economic evaluation showed that sorafenib was cost-effective compared to best supportive care (BSC) in advanced renal cell carcinoma (RCC) (ASCO 2006). Recently latest overall survival data from the Phase III TARGET study was presented (ASCO 2007). The objective of this study was to update the earlier economic model with the latest clinical data to evaluate the cost-effectiveness of sorafenib+BSC versus BSC alone in advanced RCC from a United States payer perspective. **METHODS:** A Markov model was developed to project lifetime survival and costs associated with sorafenib+BSC and BSC alone. The model tracked patients with advanced RCC through three states—PFS, progression, and death. Transition probabilities varied for each three-month period and were obtained from the TARGET data. Treatment effectiveness was measured in life-years gained. Resource utilization included drug, administration, physician visits, monitoring, and adverse events. Costs and survival benefits were discounted annually at 3%. Univariate and probabilistic sensitivity analyses were conducted. **RESULTS:** Lifetime per patient costs were $92,222 and $36,634 for sorafenib+BSC and BSC alone, respectively. The incremental survival benefit with sorafenib+BSC was 0.88 life years. The incremental cost-effectiveness ratio (ICER) of sorafenib+BSC versus BSC alone was $63,219 per LYG. Results were sensitive to variation in sorafenib and BSC survival after progression as well as sorafenib cost. There was a 95% probability that sorafenib would be cost-effective vs. BSC alone, using a threshold of $95,000 or less. **CONCLUSION:** Updating the model with the most recent clinical trial data still resulted in an incremental cost-effectiveness ratio within the established threshold that society is willing to pay for cancer care (i.e. $50,000–$100,000 per LY). Thus, consistent with earlier findings, sorafenib+BSC appears to be cost-effective in the management of advanced RCC.

PCN25

CONSIDERATIONS FOR MODELING THE COST-EFFECTIVENESS OF PREVENTATIVE PROSTATE CANCER TREATMENTS

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Current cost-effectiveness models of prostate cancer prevention treatments examine the cost-effectiveness of preventative treatments from the perspective of patient populations specific to the treatment's clinical trial. However, factors such as age, race, family history, and prostate-specific antigen (PSA) levels are major predictors of patient risk for developing prostate cancer. **OBJECTIVE:** To create a model that examines potential clinical and economic benefits of preventative treatments in various patient populations as defined by prominent risk factors that can be used to identify populations who might most benefit from preventative treatments. **METHODS:** Similar to previously published cost-effectiveness models for preventative prostate cancer treatments, we developed a Markov model considering health states such as cancer-free, low-grade prostate cancer, high-grade prostate cancer, and death. We also consider the impact of avoiding benign prostate hyperplasia (BPH) and decreased quality of life due to treatment-related adverse events such as erectile dysfunction. Unlike previous models, our model incorporates prostate cancer nomograms developed from an analysis of a clinical database of at-risk men to estimate the probability of high and low-grade prostate cancer and recurrence. Nomograms consider age, race, family history, free-to-total PSA levels, PSA levels, and DRE results. The model can also consider incidence of prostate cancer by age and race as seen in SEER and high-grade prostatic intraepithelial neoplasia, family history, PSA levels, previous biopsy results, and BPH and DRE results as obtained from an analysis of the European Study of Screening for Prostate Cancer database. **RESULTS:** The model generates cost-effectiveness ratios identifying conditions where preventative treatment is most cost effective versus no preventative treatment. Ratios also identify specific patient populations where preventative treatment has an advantage. **CONCLUSIONS:** The model can incorporate patient risk factor diversity to generate cost-effectiveness ratios specific to different epidemiological populations; thus, better targeting populations who might benefit most from preventative treatments.

PCN26

COST-EFFECTIVENESS MODELING OF COLORECTAL CANCER 10 YEARS SCREENING USING COMPUTED TOMOGRAPHIC COLONOGRAPHY VERSUS COLONOSCOPY AND FECAL OCCULT BLOOD TESTS

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OBJECTIVE: To assess the cost, effectiveness and cost-effectiveness of three colorectal cancer (CRC) screening strategies. **METHODS:** Simulation modeling was used to assess three colorectal screening strategies of a virtual population over 50 years old: computed tomographic colonography (CTC), colonoscopy and Fecal occult blood tests (FOBT). The model used a simulation decision framework over a ten-years period. CTC is repeated after 10 years if negative, and after three or five years if positive with advanced or non-advanced adenoma respectively. Colonoscopy is repeated after ten years if negative and after three years or five years if positive with advanced or non advanced adenoma respectively. FOBT is repeated every two years. Positive CTC and FOBT are systematically confirmed by colonoscopy. The model computes the total cost and the incidence of CRC after ten years of each screening strategy. **RESULTS:** Considering a population adherence of 50%: colonoscopy being the only screening strategy over 10 years is the most costly screening strategy, €885 per individual, with 0.54% of remaining CRC. CTC as only screening strategy over 10 years costs €543 per individual with 0.18% of remaining CRC. FOBT as only screening strategy over 10 years costs €459 per individual with 0.18% of remaining CRC. Mean cost-effectiveness ratios expressed as cost-per-CRC-avoided are 544 with CTC, 890 with colonoscopy and €460 with FOBT. **CONCLUSION:** This simulation modeling approach allows to take into account data variability and to test various screening strategies. Further simulations have been performed to study the impact of various screening program

adherence various. This original approach could be useful to perform budget impact studies before implementing large public health screening programs.

PCN27

COST-EFFECTIVENESS ANALYSIS OF SCREENING SUBJECTS WITH DIFFERENT LEVELS OF RISK FOR HEPATOCELLULAR CARCINOMA IN TAIWAN

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OBJECTIVE: The American Association for the Study of Liver Diseases 2005 practice guidelines recommended that various groups at different levels of risk to hepatocellular carcinoma (HCC) undergo surveillance. This study aimed to assess which high risk group had the lowest incremental cost-effectiveness ratio (ICER) for the HCC screening program from the insurer's perspective. **METHODS:** The high risk subjects were identified from the communities with high prevalence of hepatitis viral infection and classified into three groups at different levels of risk to HCC at the time of enrollment. The repeated ultrasound screenings at an interval of three, six, and twelve months were applied to cirrhosis group, early cirrhosis group, and no cirrhosis group, respectively. The Markov-based decision model was constructed to simulate progression of HCC and to estimate the ICER for each group over a time horizon of 50 years or the subjects' remaining life expectancy. Validity of the model outcomes was examined against the health statistics. **RESULTS:** The incremental ICER for the cirrhosis group, early cirrhosis group, and no cirrhosis group were $1375, $816, and $861, respectively. Among the three groups, the early cirrhosis group had the highest incremental effect (3.41 years per person) and the cirrhosis group had the largest incremental cost ($4247 per person). It is noteworthy that when compared to the other two groups, the cirrhosis group showed the lowest incremental effect (2.03 year) and the highest incremental cost ($4247). **CONCLUSION:** Screening the no cirrhosis group for HCC at a 12-month interval had the lowest incremental cost-effectiveness ratio.

PCN28

COST-EFFECTIVENESS ANALYSIS OF RITUXIMAB-CHOP VS. CHOP ON NON-HODGKIN LYMPHOMA PATIENTS IN THE MEXICAN CONTEXT

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OBJECTIVE: This study is intended to evaluate the costs derived from the treatment of aggressive and indolent Non-Hodgkin Lymphoma (NHL), in patients treated with R-CHOP vs. CHOP in order to provide solid pharmacoeconomic arguments for decision-makers in regards to a cost-effective therapy for patients with NHL and hence have a more efficient allocation of resources. **METHODS:** A cost-effectiveness analysis model was developed based on the efficacy reports of the international literature in regards to treatment of NHL estimating the probabilities of no remission or disease relapse and the costs of treatment failure and those derived from salvage therapies used. This was calculated in a time horizon of 3 years with a 5% discount rate, based on public health care institutions perspective. **RESULTS:** The results of the model using a cohort of 200 hypothetic NHL patients, 100: aggressive-NHL and 100: indolent-NHL, in which 50% received treatment with R-CHOP and the other half with CHOP showed that the use of Rituximab in addition to the CHOP therapy in the case of patients with Aggressive NHL represents savings per patient in compete remission of USD$138,530.33. In the case of patients with Indolent NHL the savings were USD$1,366,417.78. Both savings represents the possibility to obtain 10 more patients in complete remission (3 and 7 respectively). **CONCLUSION:** The use of Rituximab in addition to CHOP as first line therapy for NHL is not only a cost-effective intervention when compared to CHOP therapy in the Mexican context, but, according to the results, it is also a cost-saving intervention with an average saving of USD$821,739.23.

PCN29

SCREENING, PREVENTION, AND TREATMENT OF CERVICAL CANCER—A GLOBAL AND REGIONAL GENERALIZED COST-EFFECTIVENESS ANALYSIS

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OBJECTIVE: The paper calculates regional generalized cost-effectiveness estimates of screening, prevention, treatment and combined interventions for cervical cancer. **METHODS:** Standardised WHO-CHOICE methodology was used. A cervical cancer model was employed to provide estimates of screening, vaccination and treatment effectiveness. Intervention effectiveness was determined via a population state-transition model (PopMod) that simulates the evolution of a sub-regional population accounting for births, deaths and disease epidemiology. Economic costs of procedures and treatment were estimated, including programme overhead and training costs. **RESULTS:** In regions characterised by high income, low mortality and high existing treatment coverage, the addition of any screening programme to the current high treatment levels is very cost effective. However, based on projections of the future price per dose (representing the economic costs of the vaccination excluding monopolistic rents and vaccine development cost) vaccination is the most cost-effective intervention. In regions characterized by low income, low mortality and existing treatment coverage around 50%, expanding treatment with or without combining it with screening appears to be cost effective or very cost-effective. Abandoning treatment in favour of screening in a no-treatment scenario would not be cost effective. Vaccination is usually the most cost-effective intervention, however in some regions one-off PAP or VIA screening at age 40 are more cost-effective than other interventions though less effective overall. In regions characterised by low income, high mortality and low treatment levels, expanding treatment with or without adding screening would be very cost-effective. One-off PAP or VIA screening at age 40 are more cost-effective than other interventions though less effective overall. **CONCLUSION:** From a cost-effectiveness perspective, consideration should be given to implementing vaccination (depending on cost per dose) and screening programmes on a worldwide basis to reduce the burden of disease from cervical cancer. Treatment should also be increased where coverage is low.

PCN30

COSTS RELATED TO ADVERSE EVENTS IN CHRONIC MYELOID LEUKEMIA PATIENTS TREATED WITH TYROSINE KINASE INHIBITORS IN CANADA

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OBJECTIVE: Treatment options for the relatively small group of patients resistant or intolerant to imatinib, a recommended first-line therapy for chronic myeloid leukemia (CML), include nilotinib or dasatinib. Current data indicates that nilotinib and

dasatinib have different side effect profiles. The aim of this study was to investigate costs of adverse events (AEs) in patients receiving recommended doses of nilotinib or dasatinib for treatment of chronic and accelerated CML. **METHODS:** Incidence rates of grade 3/4 AEs in CML patients treated with nilotinib or dasatinib were obtained from clinical trial data. Direct medical costs for non-hematological AEs and for grade 4 anemia and thrombocytopenia, and febrile neutropenia were obtained from Ontario Case Costing Initiative (OCCI) inpatient databases and were specific to oncology patients. Costs for grade 3 anemia, thrombocytopenia, and non-febrile neutropenia were assumed to be outpatient costs and were based on literature and expert validation of treatment pathway and resource utilization in the Canadian context. Multivariate sensitivity analyses were conducted on costs of AEs and for an alternative dasatinib dosing (100 mg). **RESULTS:** Cost of treatment-related AEs for CML patients was highest for dasatinib. Total costs for AEs associated with the accelerated phase were higher than those associated with the chronic phase: $19,902 versus $7,653 for dasatinib and $8,645 versus $3,790 for nilotinib, respectively. Ranking observed among treatments for base case costs of AEs was maintained for both high and low cost estimates, and for 100 mg dasatinib dosing, indicating that the model was robust to variation in these parameters. **CONCLUSION:** For patients resistant or intolerant to imatinib, costs of dasatinib-related AEs were approximately twice the costs of nilotinib-related AEs in both chronic and accelerated phases, highlighting the importance of considering the cost of AEs in economic evaluation of tyrosine kinase inhibitors. Further research is needed to evaluate the impact of AEs on health care expenditures.

PCN31

A PROBABILISTIC DECISION MODEL TO GUIDE OPTIMAL HEALTH POLICY DECISIONS FOR LUNG CANCER SCREENING

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OBJECTIVES: We developed a probabilistic decision model of cost-effectiveness for lung cancer (LC) screening with helical computed tomography (hCT) compared with chest x-ray (CXR) and no screening (NS) given uncertain efficacy and risks of screening in practice. **METHODS:** Markov model comparing NS to CXR and hCT screening in 60-year old current smokers screened annually until age 75 as base case using published literature, Surveillance Epidemiology and End Results database, and Mayo Clinic data. In the base case, we assumed stage shifts observed with screening translate into survival benefits. Sensitivity analyses evaluated cohort ages for starting and stopping screening, screening compliance, smoking status, positive nodule management and treatment costs. An expected value of perfect information analysis (EVPI) was estimated to determine the value of further research to reduce current uncertainty. **RESULTS:** In the base case, CXR cost $51,245/QALY vs. NS and hCT was dominated by CXR. The probability that CXR is cost-effective was 94.3% at a maximum acceptable ratio of $100,000/QALY (4.8% and 0.9% for NS and hCT, respectively). EVPI analysis suggested that at a maximum ICER of $100,000/QALY, further research would potentially be worth $55 million for the US population over ten years. When it was assumed that hCT screening did not result in any false positives necessitating invasive surgery, hCT cost $119,571/QALY vs. CXR. CXR cost $137,652 vs. NS for former smokers and was dominated by NS for never smokers; hCT was dominated in both these analyses. Results were sensitive to age at annual screening initiation and termination. **CONCLUSIONS:** Assuming stage shifts observed with LC screening translate into survival benefits, hCT was, as expected, most efficacious, but also had the highest false positive rate. The associated detrimental cost and quality of life effects resulted in hCT being dominated by CXR (less efficacious but more specific).

PCN32

COST-EFFECTIVENESS ANALYSIS OF AN HPV-16/18 PROPHYLACTIC CERVICAL CANCER VACCINE IN A SETTING OF EXISTING SCREENING IN PORTUGAL—RESULTS FROM A MATHEMATICAL MODEL

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OBJECTIVE: To examine the cost-effectiveness of introducing an HPV-16/18 prophylactic cervical cancer (CC) vaccine in a setting of existing screening in Portugal. **METHODS:** A Markov cohort simulation model was used with an annual cycle length and which mimics the natural history of HPV infection to CC. The analysis was undertaken from the health care system perspective. Direct medical costs were estimated and discounted at a rate of 3%. Effect measures were: CC cases and deaths avoided, life years saved and QALYs, discounted at a rate of 3%. The incremental cost-effectiveness was estimated by comparison of the options to be implemented with the current strategy. The analytic horizon was lifetime where subjects enter the model at 10 years old and are followed for 95 cycles until death. One-way sensitivity analysis was conducted on the key variables. **RESULTS:** Our results predicted that an HPV-16/18 vaccine targeting 12-year-old girls would be cost-effective and could reduce lifetime CC cases and mortality by 92% compared with current screening. Vaccination was predicted to substantially reduce the number of oncogenic HPV infections and Cervical Intraepithelial Neoplasia cases (CIN1-3 cases). The additional cost of generating one QALY by implementing a vaccination strategy, where all 12-year-old girls are vaccinated with a vaccine showing 96.7% efficacy against HPV-16/18, was €13,810. The results were sensitive to alternative assumptions about the discount rate and age at which vaccination begins. The base-case strategy was robust to modifications in vaccination coverage and fairly robust to changes in both percentages of oncogenic HPV and of opportunistic screening rates. **CONCLUSION:** The analysis suggested that prophylactic cervical cancer vaccination could have a substantial public health benefit. A vaccine directed specifically at reducing the incidence of oncogenic HPV types 16 and 18, during the peak ages of infection, could be expected to be economically attractive.

PCN33

COST UTILITY ANALYSIS OF VACCINATION AGAINST HPV IN ISRAEL

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OBJECTIVE: Determine appropriate scenarios for screening compliance for vervical cancer in Israel. **METHODS:** Generalised cost-effectiveness estimates of screening (PAP, HPV-DNA, VIA at various frequencies) and/or HPV vaccination interventions for cervical cancer in Israel were calculated using WHO-CHOICE standardised methodology, utilising a state transition population model (POPMOD) simulating Israeli population

demographics. **RESULTS:** What single intervention should we currently use? HPV vaccine (three doses, costing $120 per dose at age 12) is not cost-effective as its cost per Quality-Adjusted-Life-Year (QALY) is more than three times the magnitude of the GNP per head. Adoption of a thrice a lifetime PAP screening strategy dominates (ie: costs less and adds more QALYs) the current strategy, which opportunistically gives PAP screens to 12.2% of females annually. However, because of the inevitable future fall in the HPV vaccine price, it is not recommended to abandon the current opportunistic PAP smear strategy for a more systematic thrice a lifetime strategy. When should the HPV vaccination be adopted? Assuming non-waning efficacy, HPV vaccinations become cost effective when cost falls below $97 per dose, become very cost-effective (ie: cost per QALY < per capita GNP) when cost falls below $50 per dose and become cost-saving (ie: gains in decreased treatment costs exceed increased screening, program and training costs) when cost per dose falls below the $27.20 threshold. After HPV vaccination is adopted, should we still have screening programs? Expansion of the PAP program to a penta-annual PAP program would provide the most additional QALYs within cost-effectiveness constraints. **CONCLUSION:** PAP compliancy should be increased to 20.0% per annum, both before and after the vaccination is introduced. An HPV vaccination program should be adopted when the vaccine price drops to a level that it becomes affordable to the Ministry of Health or falls below $20.44 per dose, providing a cost-saving incentive to the health insurance funds.

PCN34

COST-EFFECTIVENESS OF GEFITINIB FOR FIRST-LINE TREATMENT OF ADVANCED NON-SMALL CELL LUNG CANCER: A MARKOV MODEL-BASED ANALYSIS

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OBJECTIVE: Gefitinib, an epidermal growth factor receptor (*EGFR*) tyrosine kinase inhibitor, is a new treatment option for non-small cell lung cancer (NSCLC). Some studies have found better clinical outcomes for gefitinib treatment in women, never-smokers, certain mutation in the tumor *EGFR* gene, and patients with adenocarcinoma and in East Asian ethnicity. However, gefitinib is currently regarded as a salvage treatment rather than a first-line option. The objective of this study was to assess the cost-effectiveness of gefitinib for first-line treatment of the inoperable, chemo-naïve NSCLC patients in Taiwan. **METHODS:** We developed a Markov model of the cost, quality of life, survival, and incremental cost-effectiveness of the alternative option with gefitinib for first-line treatment, as compared with current practice of platinum-based chemotherapy regiments. Variables of clinical effectiveness were determined from corresponding trials. The economic analysis adopted the health care payer's perspective, and only direct medical costs were taken into account. **RESULTS:** Use of gefitinib for first-line treatment had a better mean survival than platinum-based chemotherapies (13.1 versus 11.6 months) while increasing lifetime cost. Given the base-case assumptions, we found that gefitinib increased life expectancy by 1.49 months, or 0.80 quality-adjusted months, at an estimated cost of $4,140 per treated patient, for an incremental cost-effectiveness ratio (ICER) of $62,100 per quality-adjusted life-year (QALY). The ICER would decrease to $48,600 per QALY gained when such analysis was applied to a subgroup of patients with molecular marker of *EGFR* exon 19 deletion or L858R mutations while they had a significantly longer mean survival of 20.8 months. Sensitivity analyses showed that this ICER remained below $100,000 per QALY for all model variables. **CONCLUSION:** Use of gefitinib for first-line treatment has a cost-effectiveness ratio below $50,000 per QALY gained in advanced NSCLC patients with preferred clinical characteristics in which a significant extension of overall survival has been demonstrated.

PCN35

COST-EFFECTIVENESS ANALYSIS OF DASATINIB FOR THE TREATMENT OF IMATINIB RESISTANT OR INTOLERANT CML PATIENTS IN BRAZIL

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OBJECTIVE: Currently imatinib resistant or intolerant CML patients have minimally effective therapies available. Dasatinib binds to the protein Bcr-Abl; it binds also to active and inactive forms of protein, while imatinib binds only to the inactive forms. Therefore, mutations that affect the active form can lead to resistance to imatinib. A Markov model was built to evaluate the long-term cost-effectiveness of dasatinib in the treatment of adult CML patients, after resistance or intolerance to imatinib. **METHODS:** The model consists of an initial within-trial period in which best response rates observed from the clinical trials are used. Response was defined as best response of complete hematologic response (CHR), minor cytogenetic response (CyR), minimal CyR, partial CyR, and complete CyR. The model simulates patients moving between health states using progression probabilities derived from the literature and BMS clinical trials. The time horizon was the lifetime of patients in the cohort, allowing evaluation of life expectancy and lifetime costs. Brazilian costs and health resource estimates were applied to the treatment of the different phases of CML. **RESULTS:** For CML patients in CP dasatinib provided 0.66 QALYs per patient and the ICER was R$80,000 with an additional life expectancy of 0.98 years. In the case of AP dasatinib provided an additional life expectancy of 3.48 years with a ICER of R$91,000. And in the BP dasatinib provided an additional life expectancy of 1.91 years with a ICER of R$123,000. **CONCLUSION:** The CE analysis showed that dasatinib is more cost-effective in the resistant or intolerant patients than imatinib in the three phases of CML with increased life expectancy with quality. Though there is an incremental cost associated to the treatment with dasatinib, the cost is related to longer life expectancy and therefore expenditure of more resources.

PCN36

COST-MINIMIZATION ANALYSIS OF CAPECITABINE FOR ADVANCED GASTRIC CANCER IN TAIWAN

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OBJECTIVE: Gastric cancer is the fifth most prevalent cancer and the fifth cause of cancer-related mortality in Taiwan. The objective of this study was to access the cost-effectiveness of capecitabine plus cisplatin (XP) vs. intravenous 5-fluorouracil plus cisplatin (FP) for the treatment of advanced and metastatic gastric cancer (AGC) in Taiwan, from a payer's (Bureau of National Health Insurance [BNHI]) perspective. **METHODS:** A cost-minimization analysis (CMA) was conducted by applying

clinical outcomes and medical resource utilization (MRU) derived from the phase III ML17032 study. Direct medical costs associated with trial-based MRU were based on Taiwan's National Health Insurance fee schedule for 2007. Costs associated with intravenous chemotherapy administration and adverse event (AE) management were estimated by an expert panel survey conducted among 12 oncologists. One-way sensitivity analyses were performed on key model parameters by varying the input values by ±20%. **RESULTS:** A trend toward superior progression-free survival was observed in the XP arm (median 5.6 months for XP vs. 5.0 for FP). Patients in the XP arm received 5.2 cycles of therapy vs. 4.6 cycles of FP. Compared to FP, administration of XP required fewer consults per patient (5.2 for XP vs. 22.8 for FP). Chemotherapy drug cost was higher (USD$1712) in the XP arm; however, these cost increments were offset by differences of chemotherapy administration costs (USD$4376) between two arms. AE profiles were similar and the cost associated with grade 3/4 AE management were slightly lower (USD $30) in the XP arm. Overall, XP was associated with a cost saving of USD$2691(NTD$87,351). XP remained cost-saving under one-way sensitivity analyses. **CONCLUSION:** From the Taiwan BNHI perspective, this CMA demonstrates that replacing FP by XP for the treatment of AGC would not only save direct medical costs but also improve health outcomes in Taiwan.

PCN37

PRELIMINARY COST-CONSEQUENCE ANALYSIS OF EPIRUBICIN/CISPLATIN/5FU (ECF) COMPARED TO EPIRUBICIN/CISPLATIN/CAPECITABINE (ECX) IN PATIENTS WITH ADVANCED OESOPHAGOGASTRIC CANCER

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OBJECTIVE: To undertake a cost-consequence analysis of direct medical costs in the treatment of advanced oesophagogastric cancer based on the REAL 2 randomized clinical trial, which demonstrated non-inferiority when oral capecitabine was substituted for infusional 5FU as part of the standard regimen, ECF. **METHODS:** Direct medical costs (2007 CDN$) from the perspective of the Canadian public health system were applied to resources (e.g., study treatment, toxicity management) obtained from REAL 2 trial data available in the public domain. Complete drug delivery was assumed. Mean overall costs per patient were estimated over six cycles, corresponding to treatment duration. **RESULTS:** The mean total cost per patient treated with ECF was $9065 and $9268 for ECX. The major driver of cost in the ECX arm is chemotherapy drug, $5472 for capecitabine versus $2400 for infusional 5FU (6 cycles). This is offset by the cost of chemotherapy administration, $1551 for ECF compared to $671 for ECX, and central venous access costs, $1230 for ECF. Additional line complication and hospitalization data were not available and therefore not included in these estimates. Limited data on toxicity management, (e.g. febrile neutropenia, anemia, thromboembolism), are available, and cost estimates are $2955 for ECF and $2433 for ECX-treated patients. **CONCLUSION:** ECX has similar efficacy to ECF in the REAL 2 trial, but has potential advantages in terms of patient preference and convenience of an oral therapy. In addition, oral therapy decreases hospital resource consumption. While drug costs for ECX are greater, costs for chemotherapy administration and line-related costs are substantially less, and underestimated in this analysis. Substituting capecitabine for infusional 5FU in the ECF regimen is an attractive and affordable alternative for patients with advanced oesophagogastic cancer.

PCN38

THE IMPACT OF BREAST CANCER CARE DEVELOPMENT ON MEDICAL AND ECONOMICAL OUTCOMES IN A TOTAL SOCIETAL COST CONTEXT

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OBJECTIVE: In Finland, the overall costs of breast cancer management have increased, primarily during the last years by the launch of expensive pharmaceutical therapies (trastuzumab in 2000). Economical reasons may therefore play a part in the prescribing of new drugs. We analyzed with comprehensive time series of all expenditures the effectiveness of pharmaceutical developments and other interventions from 1987 to 2005. **METHODS:** Finnish registry based data from 1987 to 2005 was combined to evaluate all costs related to the care of breast cancer. These included comprehensive health care costs, sick-leave compensations, disability pensions, and loss of productivity; all converted to 2004 euros. Several scenarios were thereafter constructed to identify the important changes in care processes and cost drivers during this period. **RESULTS:** During the observation period, the number of patients with breast cancer (5-year survival prevalence) increased by 100% up to 17,000 patients and the overall expenditure of care more than doubled from €70 to €160 million. The health care costs increased by 150% and the cumulative costs per patient increased from €4500 to €5500. The cost of medications has escalated with an overall increase of 660%, mostly during 2000's. However, during this period, the effectiveness of the treatment has increased as breast cancer related deaths, in-hospital days and loss of productivity due to premature deaths have decreased significantly. Altogether, our scenarios showed that new medications have had a beneficial financial impact of 16–35 million € for the society during the study period. **CONCLUSION:** Comprehensive assessment of large patient cohorts and long term economical outcomes is a useful method for evaluation of outcomes in chronic diseases. Identification of different cost drivers is needed as the cost of new interventions is increasing and their benefits should ideally be assessed in relation to their broader societal influence.

PCN39

DIFFERENCES IN COLORECTAL CANCER TREATMENT COSTS BY TREATMENT PHASE, CANCER SITE, AND STAGE AT DIAGNOSIS: EVIDENCE FROM LINKED SEER-MEDICARE DATA

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OBJECTIVE: This study provides updated, in-depth estimates of colorectal cancer (CRC) treatment costs. **METHODS:** This retrospective cohort study included patients aged ≥65 years, who were recently diagnosed with colon (CC) or rectal (RC) cancer in a SEER registry between 1996 and 2002 (n = 60,916) and 1:1 matched (by age, sex, geographic region) non-cancer comparison patients from a 5% Medicare sample. We assigned costs to phases as follows: 1) initial: costs in the period up to one year after diagnosis among patients with ≥13 months survival; 2) continuing: costs in the years between the initial and terminal years among patients with ≥36 months survival; and 3) terminal: costs in the final year of life. Terminal costs were assigned first (all costs considered terminal for patients who lived <13 months). Costs reflect all provider payments for cancer patients in excess of those for matched comparison patients (2006 US

Dollars). **RESULTS:** Cancer-related CRC costs averaged $32,303 in the initial phase, $3,548 per year in the continuing phase, and $14,323 in the terminal phase. Initial-phase costs were similar by site (CC: $32,528; RC: $31,701; $P = 0.015$), while continuing-phase costs were roughly 1/3 higher for RC versus CC ($4,266 vs. $3,287; $P < 0.001$). Terminal-phase costs were $14,197 for CC and $14,654 for RC ($P = 0.424$). Initial-phase CC costs were $17,278 and $40,501 for Stages 0 and 4, respectively ($P < 0.001$), compared to $14,060 and $37,235 for Stage 0 and 4 RC ($P < 0.001$). Continuing costs ranged from $2,499–$17,861 and $2,822–$17,741 for Stage 0–4 CC and RC patients, respectively; terminal costs ranged from $7,814–$27,742 for Stages 0–4 CC and $6,376–$20,047 for Stages 0–4 RC patients. **CONCLUSION:** Excess costs associated with CRC are striking and vary considerably by treatment phase, cancer site, and stage at diagnosis. Interventions aimed at earlier diagnosis and prevention have the potential to reduce cancer-related health care costs.

PCN40

CONTROLLING FOR POTENTIAL CENSORING BIAS ON DEPENDENT VARIABLES

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OBJECTIVE: To determine how independent variables (e.g., gender, comorbidities, etc) predict total medical cost of lung cancer in the two years following dignosis after we account for the bias introduced by censoring. **METHODS:** Since health care costs and utilization may be subject to right censoring and therefore are not always observable, the standard regression models cannot be used to assess the effects of confounders. Inverse Probability Weighted estimation is ideally suited to estimation from non-random samples which might arise due to censoring or by the censoring strategy used. IPW produces consistent estimator with a covariance matrix that can be calculated by most commercial statistics software. We applied a test to see if possible censoring bias exists. We also calculated the deviation from the consistent value if standard ordinary least square method was used. **RESULTS:** A total of 201 patients with incident of cases of lung were recruited from Michigan community hospitals and their oncology units. We obtained Medicare claim files for the two years following diagnosis. 28.8 percent of the cases were censored, therefore their annual costs were not observed. The total cost of all care is $60,429 for the two years following a lung-cancer diagnosis and $55,877 for incomplete cases. Inverse probability weighted results significantly diverged from standard regression model. There exist a selection bias ($p = 0.000$) therefore IPW estimation yielded consistent results. **CONCLUSION:** This paper applies the inverse probability weighted estimation to an inception cohort of patients newly diagnosed with lung cancer. Our findings suggest that standard regression models yields inconsistent estimator due to censoring bias. IPW least square estimation method removes that bias.

PCN41

THE LIFETIME COST OF CERVICAL CANCER IN TAIWAN

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OBJECTIVE: Cervical cancer is the top female cancer in terms of incidence rate in Taiwan. Since July 1, 1995, the NHI program has provided annual cervical smear tests for all women over the age of 30. Besides, the vaccine for preventing cervical cancer has been marketed in Taiwan in 2006. The purpose of this paper was to estimate the lifetime (20 years) direct medical cost of cervical cancer patients for future economic evaluation. **METHODS:** The estimation of the lifetime cost based on insurer perspective and incidence approach sourced from 1994–2002 cancer registry statistics of patients with cervical cancer and the claim data from Taipei Veterans General Hospital (TPE-VGH). Totally, we have 2525 patients. Propensity score method was applied to match the comparison group using the population claimed data from The National Health Research Institutes (NHRI). The probabilities of survival, dying of cancer or dying of other causes were estimated through Cancer Registry statistics. We divided the whole disease process into initial, continuing and terminal three phases. The cost of cancer is the sum of the average cost of each phase. Lifetime costs of cancers were estimated from the costs calculated above incorporate survival rates of the cancers. **RESULTS:** The results showed only 61 patients survived less than one year and each patient spent US$13,358 during that period. For those survived more than one year, terminal phase resulted in the highest costs which was US$23,078. For those survived more than one year, the initial phase cost for each patient was US$4157 and the monthly cost for continuing phase was US$113. The expected lifetime cost (20 years) of average cervical cancer patient was US$30,238. **CONCLUSION:** Our study provided critical information for the economic evaluation of Pap smears screening and the vaccination program for human papilloma virus.

PCN42

THE ECONOMIC BURDEN OF CHRONIC LYMPHOCYTIC LEUKEMIA IN THE UNITED STATES

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OBJECTIVE: Currently, two out of every 100,000 people develop Chronic Lymphocytic Leukemia (CLL) annually. Over 90% of cases are found in people who are older than 50 years of age. As the United States population ages over the next two decades significantly more patients with CLL are likely to be diagnosed resulting in increased spending on CLL. **METHODS:** Prevalence estimates of CLL in various age cohorts from Surveillance Epidemiology and EndResults (SEER) data combined with population demographics from the United States Census Bureau are used to project the direct costs associated with CLL over the next two decades. Sensitivity analysis is conducted around all estimates to assess key model parameters. **RESULTS:** In 2006, the average direct cost of treatment was estimated at $304 million this is estimated to increase to 333 million by 2010 and over 413 million in 2020; an increase of 27% in the numbers of individuals in need of treatment. These conservative cost estimates are based on changing demographic distributions and do not include increases in the costs of health care delivery, treatments or indirect costs. The total costs of CLL are expected to reach over 1.5 billion USD by the year 2020. **CONCLUSION:** This work reviews the literature on the economic costs associated with CLL and based on expected demographic changes to the United States population, identifies an area of increasing concern to health care policy makers and providers of clinical services to oncology patients.

PCN43

THE ASSOCIATION OF TUMOR HISTOLOGY WITH FIRST-LINE TREATMENT AND LIFETIME MEDICAL-CARE COSTS AMONG ELDERLY STAGE IIIB/IV NON-SMALL CELL LUNG CANCER (NSCLC) PATIENTS TREATED WITH COMMONLY USED DOUBLET THERAPIES AMONG

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OBJECTIVE: Evidence concerning the relationship between medical-care costs and tumor histology among advanced-staged NSCLC patients is lacking. The purpose of this analysis was to identify costs associated with first-line chemotherapy treatment and total lifetime medical-care costs by tumor histology among elderly Stage IIIB/IV NSCLC patients treated with commonly used doublet chemotherapy regimens. **METHODS:** Study patients included those aged 65 years and older who were diagnosed with Stage IIIB/IV NSCLC in a SEER cancer registry between 1997 and 2002 and who received first-line treatment with a commonly used doublet regimen. Study patients were followed in the SEER-Medicare database to evaluate costs while on first-line chemotherapy treatment as well as lifetime medical-care costs by histology for commonly used doublets. Pairwise comparisons of costs estimated using non-parametric bootstrap methodology were generated for treatment comparisons. Estimated differences in mean costs, adjusted for sex, race age, urban/rural, geographic region, stage, Charlson comorbidity index and tumor histology are presented. **RESULTS:** Total lifetime medical-care costs for elderly IIIB/IV patients with squamous cell carcinoma were $51,360, while costs for those with non-squamous cell carcinoma were $50,905. Costs per month were $6364 and $6870 respectively, and were dominated by hospital and physician utilization. Among commonly used doublets, the estimated difference in adjusted mean total costs for Cisplatin/Carboplatin (P) and a Taxane (T) were significantly higher when compared to P and Gemcitabine (G) (difference $4816 [$1554–$8101]). Similar findings were observed for costs while on first-line therapy, (difference $5686 [3738-$7630] respectively). **CONCLUSION:** While lifetime medical-care costs and costs while on first-line chemotherapy among treated Stage IIIB/IV NSCLC patients are substantial, the cost differential between squamous cell and non-squamous cell carcinoma is small. Controlling for tumor histology and other factors, patients treated with a combined platinum and taxane regimen experience the highest costs.

PCN44

INCIDENCE AND COSTS OF TREATMENT-RELATED COMPLICATIONS AMONG PATIENTS WITH ADVANCED SQUAMOUS CELL CARCINOMA OF THE HEAD AND NECK

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OBJECTIVE: Platinum-based chemotherapies have been associated with debilitating treatment-related complications among patients with advanced squamous cell carcinoma of the head and neck (ASCCHN). This study evaluated the incidence and costs of such complications among ASCCHN patients undergoing radiotherapy alone versus platinum-based chemoradiotherapy. **METHODS:** Using 2000–2006 data from the PharMetrics Patient-centric Database, this retrospective cohort study measured clinical practices, incidence rates, and costs of treatment-related complications including oral complications, dehydration, infection/fever, fatigue, malnutrition, nausea, neutropenia and anemia among ASCCHN patients undergoing radiotherapy alone or platinum-based chemoradiotherapy. Patients were identified if they had a SCCHN claim between June 30, 2000 and December 31, 2005 and an indication of a secondary malignant neoplasm (both based on ICD-9-CM diagnosis codes). Patients were assigned to a treatment-based cohort–radiotherapy only or platinum-based chemo-radiotherapy, and were followed for six months. **RESULTS:** We identified 131 ASCCHN patients treated with radiotherapy alone and 90 patients treated with chemoradiotherapy, including 62 with cisplatin plus radiotherapy, 30 with carboplatin plus radiotherapy, and two with cisplatin and carboplatin plus radiotherapy. Patients undergoing chemo-radiotherapy were slightly younger than radiotherapy patients (mean ages: 54.1 and 56.1 years, respectively), were more likely to be male, and were less healthy, as evidenced by higher Charlson co-morbidity scores. We found significantly ($P < 0.001$) higher rates of treatment-related complications among patients receiving chemo-radiotherapy (87%) compared with patients receiving only radiotherapy (51%). Mean per-patient costs associated with treatment-related complications were $10,632 higher among chemo-radiotherapy patients compared to radiotherapy patients ($P = 0.002$). These costs comprised 18% of total costs during follow-up for chemo-radiotherapy patients and 9% of costs for radiotherapy patients. The most expensive complications were dehydration/electrolyte imbalance and oral complications. **CONCLUSION:** Our findings suggest that the excess incidence and costs of treatment-related complications associated with chemo-radiotherapy in ASCCHN are substantial. The emergence of safer treatments may alleviate this cost burden.

PCN45

RESOURCE UTILIZATION AND COST ESTIMATION OF ADVERSE EVENTS OF NON-SMALL CELL LUNG CANCER TREATMENT IN MEXICAN PATIENTS. RESULTS OF A DELPHI PANEL

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OBJECTIVE: To estimate mean costs per event of the most common adverse events (AEs) due to treatment of non-small cell lung cancer (NSCLC) in Mexican patients based on treatment patterns (TP) and resource utilization. **METHODS:** Specialists were invited to participate in a Modified Delphi Panel to acknowledge real TP of AEs for patients undergoing NSCLC treatment such as neutropenia (NP), anemia (AN), thrombocytopenia (TC), febrile neutropenia (FN), dyspnea (DS), hypersensitivity (HS), rash (RA), nausea (NS), vomiting (VO), diarrhea (DR), stomatitis (ST), peripheral neuromotor alterations (PNA), anorexia (AX) and interstitial lung disease (ILD). Questionnaire was designed based on experts' opinion and answered by specialists, using a nine level Likert scale in order to obtain consensus for the proposed scenarios. Scenarios included drugs use, percentage of hospitalized patients, hospitalization days and visit to emergency room, and laboratory/cabinet exams. Afterwards, an analysis and controlled feedback with a moderated debate stage took place until consensus achievement (≥7 approval-median) for each questionnaire item. Economic analysis was done under the public sector perspective. Unitary costs were obtained from the Mexican Institute of Social Security (Diario

Oficial de la Federación, 23-04-07). Results are expressed as AE or its treatment cost in US dollars. **RESULTS:** Eight oncologists participated in the Panel. Consensus was achieved for all items after the questionnaire's second filling round. Second line treatment for NSCLC cost estimate was $5377.46 (includes four chemotherapy cycles with docetaxel, administration costs and premedication costs). Estimated cost for AEs per event was: RA $112.13, AN $140.50, NS $194.56, VO $243.08, DR $243.64, HS $251.56, NP $495.27, TC $948.00, PNA $1167.02, DS $1807.86, AX $1939.88, ST $2055.82, FN $2527.39, and ILD $5189.02. **CONCLUSION:** ILD was the most expensive AE due to NSCLC treatment, while the most costly were those incurring in emergency room visits and/or patient hospitalization.

PCN46

COMPARISON OF SURGICAL TREATMENT COSTS OF NONMELANOMA SKIN CANCER PATIENTS IN A UNIVERSITY-AFFILIATED PRACTICE

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OBJECTIVE: Non-melanoma skin cancer incidence is increasing yet no specific guidelines for treatment selection exist. Reports vary on surgical treatment efficacy, and treatment choice may be based in-part on costs, despite little comparative cost information. We compared 2007 treatment costs of the three most common nonmelanoma skin cancer treatments: tumor destruction by ED&C, excision, and histologically-guided serial excision (Mohs surgery). **METHODS:** We studied 936 consecutive nonmelanoma skin cancers diagnosed in 1999–2000 in a university-affiliated dermatology practice. Clinical and utilization data were obtained from patient surveys and medical records. We determined cost of treatments, repairs, pathology, and biopsies based on size, lesion location, number of Mohs stages, medications, and physician visits, using CPT codes and Medicare fees. We controlled for procedure risk-selection factors in our sample. **RESULTS:** A total of 27.2% of lesions were treated with ED&C, 29.2% with excision, and 43.6% with Mohs surgery. The weighted average costs per lesion for initial treatment for ED&C, excision, and Mohs were $221, $529, and $1287, respectively. When wound repairs, pathology, drug costs and follow-up physician visits were included, costs rose to $646, $1531, and $2805. When controlling for risk selection using Mohs sample for baseline risk, initial costs changed little ($232, $578, $1287). However, when adding all costs to the controlled sample, the totals rose to $1750, $2096, and $2805, and differences across treatments diminished. The uncontrolled costs of Mohs procedure itself (46%) accounts for a greater percentage of total costs compared with the other two procedures (35%, 34%), and more than subsequent repair costs (31%, 20% 2%). **CONCLUSION:** Mohs surgery was the most costly procedure, however cost differences across treatments diminished when controlling for treatment selection factors. This is the first cost study which compares surgical treatment costs using the new (2007) Medicare/CPT costing rules allowing higher payments for increased complexity of lesion location.

PCN47

IMPACT OF HIV INFECTION ON INVASIVE CERVICAL CANCER INCIDENCE AND TREATMENT COSTS IN SOUTH AFRICAN WOMEN

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OBJECTIVE: To assess the impact of the human immunodeficiency virus (HIV) on the pathogenesis of human papillomavirus (HPV) infection, precancerous lesions, invasive cervical cancer, and total treatment costs in South African women. Invasive cervical cancer is the second most common cancer among South African women. The high prevalence of HIV in South Africa (18%) is likely a contributing factor to the high rates of cervical cancer, as immunocompromised patients are at higher risk of HPV infection and associated precancerous lesions. **METHODS:** We developed a lifetime Markov simulation model of the natural history of cervical neoplasia and HIV infection. The model was used to predict the impact of HIV and acquired immunodeficiency syndrome (AIDS)-related mortality on the course of cervical disease in a hypothetical cohort of 100,000 South African women. Clinical data were based on published South African literature, high-quality clinical studies, and expert opinion. Risk of progression of HIV/AIDS was based on CD4 cell counts and viral load levels. Primary outcome measures included lifetime risk of cervical intraepithelial neoplasia and cervical cancer, years of life saved, quality-adjusted life years saved (QALYs), and total lifetime costs. **RESULTS:** Lifetime risk of cervical cancer ranged from 2.3% among HIV-negative women to 3.3% in HIV-positive women. In a cohort of 100,000 women, the high rate of HIV infection in South Africa led to an additional 5200 HPV infections, 490 cervical cancers, and 175 cervical cancer deaths. HIV infection decreased average life expectancy among South African women by 3.31 years or 3.28 QALYs and increased costs by approximately Rand 21,400 per woman. **CONCLUSION:** HIV infection contributes to higher rates of invasive cervical cancer and increases costs. Given the high prevalence of HIV infection in South Africa, more frequent cervical cancer screening for HIV-positive women may be warranted.

PCN48

LONGITUDINAL COMPARISON ACROSS TREATMENTS, RISK AND AGE OF WORK LOSS COSTS IN PROSTATE CANCER PATIENTS: 10 YEAR PATTERNS

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OBJECTIVE: The few workloss studies of prostate cancer patients are short-term and single-treatment focused. We compare long-term patterns of workloss and costs of 5414 newly diagnosed patients over 10 years stratified by treatment type, age and risk group. **METHODS:** Workloss patterns for prostate cancer were identified using CaPSURE, a national disease registry that includes clinical data and patient-reported outcome questionnaires, including demographics, co-morbidity, risk, and work patterns at 31 academic and community urology practices. Both change in work status (decreased if changed from full to part-time or disability, increased if changed back to full time, or no change) and hours lost were assessed at six-month intervals over ten years. National hourly wages were used to determine workloss costs by age, disease risk, and treatment type. **RESULTS:** Patients reported average weekly work reductions of 15.7 hours

in the first 6 month period resulting in $6310 in lost wages. This loss decreased in the 2nd 6 month period as 6.2% reported increasing work status, 88% stayed the same, and 5.2% reported additional decreases, which continued into the first half of year 2. Work loss then increased to 7% until 6 years post treatment when it slowly decreased. Hours of work loss and gain over 10 years resulted in a weighted cumulative average wage loss of $146,500. Those at moderate risk lost more wages than high or low risk patients. Most wages were lost by those receiving androgen deprivation therapy medications alone ($190,000), while those receiving cryotherapy had the lowest wage loss ($99,500). Radical prostatectomy treatment alone resulted in $142,100 lost wages over 10 years. **CONCLUSION:** The wages lost after treatment for prostate cancer are high. This is the first long-term look at prostate cancer workloss. Although most wage loss occurs in the first six months, substantial loss continues over the next ten years.

PCN49

THE COST OF TREATING SKELETAL-RELATED EVENTS IN PATIENTS WITH BONE METASTASES SECONDARY TO BREAST, LUNG, OR PROSTATE CANCER

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OBJECTIVE: Metastatic bone disease (MBD) and subsequent skeletal-related events (SREs) are common complications secondary to solid tumors. We conducted a retrospective analysis of US health insurance claims to examine the cost of SREs among patients with MBD secondary to breast, lung, or prostate cancer. **METHODS:** Data were obtained from i3's Lab Rx Database from May 1, 2000 to March 31, 2005. Patients were included if they had at least two ICD-9 diagnoses of breast, lung, or prostate cancer; at least two diagnoses of MBD; and at least one SRE on or after the initial MBD diagnosis. SREs were defined as a pathological fracture, spinal cord compression, surgery to the bone, or radiation to the bone and were identified using ICD-9 and CPT-4 codes. Patients had to be continuously insured for at least six months prior to their first SRE (index date) and one month after their index date. Descriptive statistics were calculated and the annual cost of SREs was estimated using Kaplan-Meier curves to adjust for censoring. **RESULTS:** In the study period, 3584 patients were diagnosed with breast, lung, or prostate cancer and MBD, and 1840 (51%) experienced at least one incident SRE. Regardless of tumor type, patients were most frequently found to have radiation therapy (86%–89%) followed by pathological fracture (23%–29%), bone surgery (12%–16%), and spinal cord compression (7%–9%). The adjusted mean costs associated with SREs in the one year after the index SRE ranged from $12,469 to $17,408, with the highest costs associated with radiation therapy ($5930 to $7152), pathological fracture ($3179 to $6624), and bone surgery ($2218 to $2536). **CONCLUSION:** This analysis of patients with cancer-related MBD revealed that the incidence of SREs is high and their annual economic impact is substantial regardless of tumor type.

PCN50

THE COST OF TREATING SKELETAL-RELATED EVENTS IN PATIENTS WITH MULTIPLE MYELOMA

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OBJECTIVE: Multiple myeloma (MM) is characterized by the accumulation of monoclonal plasma cells and osteolytic bone destruction and is complicated by skeletal-related events (SREs) which are associated with significant morbidity. We conducted a retrospective analysis of US health insurance claims to examine the cost of SREs among patients with MM and at least one SRE. **METHODS:** Data were obtained from i3's Lab Rx Database from May 1, 2000 to May 31, 2005. Patients were included if they had at least 2 ICD-9 diagnoses of MM (ICD-9 203.0x); and at least 1 SRE on or after the initial MM diagnosis. SREs were defined as a pathological fracture, spinal cord compression, surgery to the bone, or radiation to the bone and were identified using ICD-9 and CPT-4 codes. Patients had be continuously insured for at least six months prior to their first SRE (index date) and one month after their index date. Descriptive statistics were calculated and annual cost of SREs was estimated using Kaplan-Meier curves to adjust for censoring. **RESULTS:** In the study period, 876 patients were diagnosed with MM, and 429 (49%) experienced at least 1 incident SRE. The mean time from MM diagnosis to index SRE was 259 days. Pathological fracture (60%) and radiation therapy (59%) were the most frequently experienced SREs followed by surgery to the bone (23%). Among these patients, 61% had 1 type of SRE, 27% had 2 types of SREs and 12% had 3 or more. The mean charges associated with SREs in the 1 year post SRE was $20,285, with the highest charges associated with pathological fracture ($11,370), followed by bone surgery ($4,020), and radiation therapy ($2,966). **CONCLUSION:** This analysis of patients with MM revealed that the incidence of SREs is high and their annual economic impact is substantial.

PCN51

DIRECT ECONOMIC BURDEN OF HIGH RISK AND METASTATIC MELANOMA: EVIDENCE FROM THE SEER-MEDICARE LINKED DATABASE

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OBJECTIVE: Document total medical resource utilization and associated costs to the Medicare system for elderly patients with high risk (stages IIB/C, IIIA/B, IIIC) or metastatic (stage IV) malignant melanoma. **METHODS:** Data was taken from the Surveillance, Epidemiology, and End Results (SEER)-Medicare linked database combining clinical information on incident cancer cases in the US between 1991 and 2002 with longitudinal (1991–2005) Medicare claims. Subjects aged ≥65 years with ≥1 stage IIB or higher melanoma diagnosis were selected. Index dates was defined as the date of the first observed stage IIB or higher diagnosis. Utilization and costs were descriptively analyzed for each patient from their index date until death, interruption of benefits coverage (≥6 months), or end of the database (December 31, 2005). **RESULTS:** A total of 6470 subjects met all inclusion criteria. Stage distribution was: IIB/C (38%); IIIA/B (46%); IIIC (1%); IV (15%). Median follow-up was 56, 39, 16, and 6 months for each stage, respectively. On average, patients with stage IV disease incurred 3.1 hospital days per month, compared to 0.5, 0.6, and 1.1 days per month for subjects with stage IIB/C, IIIA/B, and IIIC melanoma, respectively (all $P < 0.001$). Mean inpatient costs for stage IV disease were $3337 per patient per month, versus $589, $880, and $1465 for stages IIB/C, IIIA/B, and IIIC, respectively (all $P < 0.001$). Total health care costs, excluding prescription drugs, were $8190 per patient per month for stage IV disease, compared to $1703, $2536, $4880 for stages IIB/C, IIIA/B, and IIIC, respectively (all $P < 0.001$). **CONCLUSION:** This study provides stage-specific estimates of resource utilization and costs in high risk and metastatic melanoma using real-world administrative data. Findings

suggest that the cost burden of advanced melanoma to the Medicare system is high. Efforts to address the large unmet treatment need in patients with advanced melanoma may result in cost savings for Medicare.

PCN52

DIRECT MEDICAL COST OF BREAST CANCER BY STAGE OF CLINICAL DISEASE. A MEXICAN COHORT

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OBJECTIVE: To estimate direct medical costs of breast cancer (BC) by stage of clinical disease in the Ginecology Hospital of West Medical Center, Instituto Mexicano del Seguro Social (IMSS), Guadalajara (GH). **METHODS:** Clinical data and resource utilization were obtained individually from medical records of patients who were breast cancer diagnosed and received attention at GH between March 2005 and February 2007. This data was retrospectively collected with the following inclusion criteria: 1) histopathologic-study confirmed BC, 2) recently diagnosed BC, and 3) absence of any other form of cancer. Only direct medical costs were considered (from the GH perspective) using a bottom up approach (medications, chemotherapy, radiotherapy, hospitalization, laboratory tests and surgery). Unitary costs were obtained from GH's Management. cost are expressed in USD and adjusted to December 2006. A discount rate of 3% was used. Tests were applied in order to define the censoring mechanism (according to Glick) to define the adequate cost analysis method. To compare costs among stage was use ANOVA. Mean Cost estimation (TMC) determinants were obtained using a generalized linear Model (GLM). **RESULTS:** A total of 160 patients were included, 40 in each stage (I, II, III, IV), mean age 50 years (±11), with a therapy duration of 29 months (±11). 82% of patients showed ductal-infiltranting histologic type carcinoma. TMC per patient during the follow-up period was ($20,612.00). Chemotherapy was the most costly resource ($7526.10) followed by the visit to the specialist and emergency room ($3581.88) and hospitalization costs ($3096.45). GLMxs statistically-significant TMC determinants were stage II, III and IV ($p < 0.00$), disease progression ($p < 0.00$) death ($p < 0.00$) and age ($p < 0.046$). **CONCLUSION:** The direct cost in medical attention increases with stage, progression of disease or patient death, stage IV, less age, longer duration of treatment and disease progression, effectively predicted major costs.

PCN53

THE BURDEN OF MANAGING PLEURAL EFFUSIONS IN CML PATIENTS POST-IMATINIB FAILURE: A LITERATURE-BASED ECONOMIC ANALYSIS

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OBJECTIVE: To develop an economic analysis of the management of pleural effusions in CML patients receiving dasatinib. **METHODS:** A cost of treatment analysis was developed using resource utilization data published for 48 patients with dasatinib-related pleural effusions at a large cancer center. Costs were derived from median reimbursements for relevant CPT codes for outpatient services and medical literature for inpatient services. The base case analysis assumed 100% incurred two additional physician visits, two chest x-rays, and a course of diuretics; 37.5% ECHO; 30% steroids; 24% recurrent effusions; 19% multiple thoracentesis procedures; 4% chest tube; 4% Denver shunt; and 2% pericardial window. Sensitivity analyses were conducted for types of procedures used. All costs were adjusted to 2007 US dollars. **RESULTS:** Of pleural effusions reported, 58% involved ≤ 25% of one lung volume and were managed medically costing $750 per episode, including physician visits, ECHO, chest X-rays and medications. The other 42% of pleural effusions were more significant, involving 26%–>75% of one lung volume, with half of those patients requiring invasive procedures. The cost of invasive procedures for inpatient management of pleural effusions was $10,616 for chest tube, $15,170 with pleural catheter, and $15,344 for pericardial window. The cost of invasive outpatient management ranged from $713 for ultrasound thoracentesis to $4598 for pleural catheter. The average cost of treating a pleural effusion adverse event (including all severity levels) ranged from $2062 to >$3000 depending on whether thoracentesis or placement of pleural catheter was utilized. Important drivers included recurrent effusions. **CONCLUSION:** This economic analysis based on actually observed treatment patterns suggests that the management of pleural effusions in CML patients receiving dasatinib is costly and requires intensive resource utilization. Effective tyrosine kinase inhibitors with lower rates of pleural effusions may represent clinically and economically valuable alternatives for imatinib-resistant or -intolerant CML patients.

PCN54

A COST-UTILITY ANALYSIS OF PRIMARY PROPHYLAXIS VERSUS SECONDARY PROPHYLAXIS WITH COLONY-STIMULATING FACTOR IN ELDERLY PATIENTS WITH DIFFUSE AGGRESSIVE LYMPHOMA RECEIVING CURATIVE-INTENT CHEMOTHERAPY USING ONTARIO HEALTH ECONOMIC DATA

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OBJECTIVE: The 2006 American Society of Clinical Oncology guideline recommends primary prophylaxis (PP) with colony-stimulating factor (CSF) for elderly patients with diffuse aggressive lymphoma receiving chemotherapy, based on the assumption of equal survival and studies showing that CSF saved costs by reducing hospitalization from febrile neutropenia (FN). These analyses examined only one cycle of chemotherapy, and did not consider the costs of CSF in subsequent cycles, the strategy of secondary prophylaxis (SP) or patients' preferences. This study examined the cost-effectiveness of PP with SP. **METHODS:** We conducted a cost-utility analysis to compare PP with CSF to SP with CSF for diffuse aggressive lymphoma. We used a Markov cohort model with a time horizon of 8 cycles of chemotherapy (i.e. 24 weeks), using a payer's perspective (Ontario Ministry of Health). Ontario's 2006 health economic data was used. The cost of hospitalization for FN was obtained from Ontario Case Costing Initiative. Data for efficacies of CSF, probabilities and utilities were obtained from published literature. Monte Carlo simulation was conducted. **RESULTS:** The ICER of PP to SP was $739,999/QALY. One-way sensitivity analyses (willingness-to-pay threshold =$100,000) showed that if PP were to be cost-effective, the cost of hospitalization for FN had to be >$31,138 (2.5 times > base case), the cost of CSF per cycle <$96 (base case = $1960), the risk of 1st cycle FN >48% (base case = 24%), or the relative risk reduction of FN with CSF >97% (base case = 41%). Our result was robust to all variables. Second order

probabilistic sensitivity analysis revealed a 10% probability of PP being cost-effective over SP at a willingness-to-pay threshold of $100,000. **CONCLUSION:** PP is not cost-effective when compared with SP under most assumptions. The costs of CSF and hospitalization in all cycles should be accounted for in economic evaluations of CSF.

PCN55

A COST-UTILITY ANALYSIS OF FULVESTRANT IN TREATING RECURRENT METASTATIC BREAST CANCER

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OBJECTIVE: The objective of the study is to evaluate cost-effectiveness of two sequential treatments; with Fulvetsrant sequence and without Fulvestrant sequence in the treatment of postmenopausal women with hormone receptor-positive local advanced or recurrent metastatic breast cancer in Korea. **METHODS:** We developed a Markov model which allows assessments of the two sequential treatments to simulate the course of patients following each treatment pathway, estimating health outcomes through a long-term observation. The model was constructed with data from the literature and expert opinions. Markov health states was consisted of stable/responding, progressive, and death. The Markov cycle length is 28 days for each treatment and the cohort size is 1000 patients for each cohort. This study was analyzed from a societal perspective. All cost and outcomes were discounted at 5% and currency rate was applied to U.S. dollars. One-way sensitivity analysis and probabilistic sensitivity analysis were conducted. **RESULTS:** The base case results that Cohort A (with Fulvestrant) had 1.037 QALY and Cohort B (without Fulvestrant) did 0.822 QALY at year 10. The expected costs results Cohort A spent $2704 more per patient; Cohort A $16,265 and Cohort B $13,562, respectively. The resulting ICER Per QALY was $9513 for cohort A to obtain a quality adjusted life year with respect to Cohort B in the 10-year model. The results of one-way sensitivity analysis showed stable; however; that of probability sensitivity analysis resulted from $15,796 to $16,863 with a range of QALY per person at 0.6964~0.8704 within 95% CI. **CONCLUSION:** Ten–year model of Cohort A in the treatment of postmenopausal women with hormone receptor-positive local advanced or recurrent metastatic breast cancer showed better clinical outcomes than Cohort B.

PCN56

NAB-PACLITAXEL OR DOCETAXEL; AS ALTERNATIVES TO CONVENTIONAL PACLITAXEL FOR THE TREATMENT OF METASTATIC BREAST CANCER (MBC): A COST UTILITY ANALYSIS IN FIVE EUROPEAN COUNTRIES

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OBJECTIVE: In patients with MBC, a common practice in Europe is to offer first line docetaxel or paclitaxel. However, one important drawback in their use is the potential for dose-limiting toxicity. An albumin-bound formulation (nab) of paclitaxel (Abraxane) was recently developed to overcome these safety drawbacks and to provide additional efficacy. To provide health economic data, a cost utility analysis comparing nab-paclitaxel to docetaxel, both as alternatives to paclitaxel was conducted for the United Kingdom (UK), France, Germany, Italy and Spain. **METHODS:** The clinical data were obtained from a meta analysis of randomized trials. Health care resource use for the delivery of chemotherapy and the management of grade III/IV toxicity was collected from a survey of European medical oncologists and from the literature. Using the Time Trade-off technique, utilities were obtained from 70 female oncology nurses in the UK and France. **RESULTS:** Nab-paclitaxel had the most favourable safety profile with the lowest incidence of grade III/IV neutropenia, febrile neutropenia, anemia, emesis and stomatitis. This translated to lower overall costs for managing the grade III/IV toxicity relative to both docetaxel and paclitaxel (e.g. in France; €286 vs. €966 vs. €422). Using the median number of cycles administered and the cost of toxicity in each country, the overall cost for nab-paclitaxel was higher than conventional paclitaxel, but comparable to docetaxel. Overall, 47 of 70 (67.1%) respondents selected nab-paclitaxel as their preferred choice. As an alternative to paclitaxel, the incremental cost per QALY gained was lower for nab-paclitaxel than docetaxel in three of the five countries evaluated. **CONCLUSION:** Given its more favorable safety profile, improved efficacy and comparable overall cost, nab-paclitaxel can be considered a preferred option over docetaxel in MBC. As an alternative to paclitaxel, each of the European health care bodies must decide if the cost per QALY gained for that country represents good value.

PCN57

COST-UTILITY ANALYSIS OF ADJUVANT GOSERELIN AND ADJUVANT CHEMOTHERAPY IN PATIENTS WITH PREMENOPAUSAL BREAST CANCER

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OBJECTIVE: To compare the cost and utility of adjuvant Goserelin and adjuvant chemotherapy for premenopausal breast cancer patients in Taiwan. **METHODS:** A total of 564 premenopausal breast cancer patients were newly diagnosed since 1993. Their medical history and vital status were routinely reviewed and recorded. From July 2007 to December 2007, 105 patients with stage Ia-IIIa disease who received Goserelin for at least one year or received at least 6 cycles of chemotherapy as adjuvant therapy were interviewed to obtain the utility value by standard gambling (SG) and visual scale (VS) methods. The chemotherapy included four regimens: CMF (cyclophosphamide, methotrexate, 5-fluorouracil), TE (docetaxel, epirubicin), TEC (docetaxel, epirubicin, cyclophosphamide), and CEF (cyclophosphamide, epirubicin, 5-fluorouracil). The cost of this study was defined as the total medical cost (surgery, drugs, and all services provided costs) of standard practices from a payer perspective. The standard practices of Goserelin and chemotherapy were subcutaneous injection of 3.6 mg Goserelin every four weeks for two years and six cycles of CMF, TE, TEC, or CEF, respectively. Survival analysis was conducted by Kaplan-Meier method and weighted by utility measurements. **RESULTS:** Survival at 11 years derived from registry data for patients received Goserelin was better than patients received chemotherapy (100% vs. 75%). Combining the survival data with utility score from questionnaires, the utility-weighted life-years were higher in Goserelin group compared to chemotherapy group by SG and VS 8.81 vs. 6.83, 8.78 vs. 7.14, respectively. The cost of Goserelin was lower than that of chemotherapy and ranged from NT$29,825 to 50,234 (US$918–1,545) when applying standard body surface of 1.5 m^2 and 1.8 m^2 about the calculation of chemotherapy doses. **CONCLUSION:** Our data suggest the Goserelin had better survival, higher utility-weighted life-years, but less cost than chemotherapy in the adjuvant treatment of premenopausal patients with stage Ia-IIIa breast cancer in Taiwan.

PCN58

A COST UTILITY ANALYSIS OF ERLOTINIB IN PATIENTS WITH PREVIOUSLY TREATED ADVANCED NON-SMALL-CELL LUNG CANCER (NSCLC)

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OBJECTIVE: Erlotinib, a novel targeted anticancer therapy, improves survival and quality of life (QoL) in patients with advanced NSCLC after chemotherapy failure. The incremental cost effectiveness ratio (ICER) of erlotinib based on a randomized placebo-controlled trial, (NCIC CTG BR.21) is $95,869 (2007 CDN), per life-year gained (LYG). Here we perform a cost utility analysis (CUA) of erlotinib in patients with advanced NSCLC, and explore novel methodology to utilize QoL data collected using the EORTC QLQC30 tool. **METHODS:** Previously published resource utilization and QoL data from patients recruited as part of the NCIC CTG BR.21 clinical trial were used. Utility weights were derived from the prospective collection of the EQ5D in a separate cohort of advanced NSCLC patients receiving erlotinib or supportive care alone. QoL was also prospectively collected using the EORTC QLQC30. Correlation between utility (EQ5D) and QoL in the cohort is being explored, and will be applied to published QoL data from the NCIC CTG BR.21 trial data. **RESULTS:** Prospective data from the EQ5D and EORTC QLQC30 were obtained from 64 patients with NSCLC, 31 receiving erlotinib and 33 supportive care. The mean utility derived for those treated with erlotinib was 0.772, and for those not receiving erlotinib was 0.754. The mean incremental cost of erlotinib over supportive care was previously derived as $12,303, mean survival 0.13 years, and quality-adjusted survival improvement with erlotinib treatment in advanced NSCLC based on published data from the NCIC CTG BR.21 trial was estimated at 0.11 QALY, with an ICER estimated at approximately $110,321 per QALY **CONCLUSION:** The cost utility of erlotinib in patients with advanced NSCLC is estimated at $110,321 per QALY (CDN$ 2007); a parallel investigation to evaluate methodology to utilize EORTC QLQ30 QoL data is underway.

PCN59

TIME COSTS AND OUT-OF-POCKET COSTS OF PROSTATE CANCER SURVIVORS IN ONTARIO, CANADA

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OBJECTIVE: To estimate out-of-pocket costs (OPC) and time costs (TC) for prostate cancer (PC) care in PC survivors. **METHODS:** Surviving PC patients residing in Ontario, and diagnosed in 1993–4, 1997–8, or 2001–2, were selected from the Ontario Cancer Registry (n = 1961). A self-report questionnaire was completed, which asked about health care and lost time associated with PC in eight key areas: 1) health care professional visits, and accompanying person; 2) medication use; 3) equipment purchased; 4) community service use; 5) employment time lost; 6) problems with household chores; 7) leisure time lost; and 8) health care insurance. Time was valued according to the average hourly wage in 2006 in Canada. **RESULTS:** 670 patients returned completed questionnaires. The mean annual OPC and TC of PC care was $1093/patient. Mean annual OPC were estimated to be $349/patient. Patients incurred an average of $319 annually for health professional visits and diagnostic tests. Sixty-nine percent (n = 462) of patients visited at least one health care professional; 43% visited an urologist, 18% visited a family physician, and 15% visited a radiation oncologist. Individuals who visited a radiation oncologist incurred the greatest mean annual TC ($289), followed by patients who visited an urologist ($223) and family physician ($151). Only 26% of patients were employed for pay; 5 patients reported difficulty working. Mean annual productivity loss was estimated at $225 per patient. **CONCLUSION:** TC associated with work loss does not represent a major economic burden among PC patients because a minority are working, and impact among those who work is modest. OPC, in a country with universal health insurance, is similar in magnitude to the annual attributable direct medical costs among stable PC outpatients ($349 vs. $303). Data from this study will be used, along with outcome data gathered from the same patients, to develop a Canadian PC policy model.

PCN60

EFFECT OF DEMOGRAPHIC FACTORS AND SOCIAL ECONOMIC VARIABLES ON HEALTH CARE RESOURCE UTILIZATION AND EXPENDITURE FOR BREAST CANCER PATIENTS USING MEPS 2004

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OBJECTIVE: To examine the influences of demographic and socioeconomic factors on the health care resource utilization and expenditure for breast cancer patients in MEPS 2004. **METHODS:** A retrospective secondary database study was conducted using the 2004 Medical Expenditure Panel Survey (MEPS). Patients with breast cancer ≥ 18 years (ICD-9-CM = 174, 175, V10.3, 233 and CCC code = 024) were included in the analysis. Poisson regression and Generalized Linear-Gamma model were employed to examine how demographics and socioeconomics variables predicted the difference in total health care resource utilization and total expenditure. In order to generalize the results to the whole U.S. population, sample weight from MEPS was utilized. **RESULTS:** A total of 121 female patients were included in the study. Approximately 52.9% of them were over 65 years old; 85.1% were Caucasian women; 52.9% were married; 27.3% had Bachelor's degree or above; 76.0% were urban; 62.0% were unemployed; 67.8% had high family income; 97.5% had insurance. Caucasian women in the age group 50–64, who were living in the rural area and had lower family income, utilized more health care resources. Employment and family size were not found to significantly influence health care resource utilization. **CONCLUSION:** This study provides insight into factors related to health care resource utilization and expenditure. Demographic and socioeconomic factors did influence health care resource and expenditure differently. This study may help policy makers in optimal decision-making based on the factors included in the study. Future studies can look into other factors such as treatment regimen, stage of the disease to explain differences in health care resource utilization and expenditure patterns.

CANCER—Patient-Reported Outcomes

PCN61

EARLY DISCONTINUATION OF ADJUVANT ENDOCRINE TREATMENT OF BREAST CANCER

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OBJECTIVE: To estimate the rate of early discontinuation of oral adjuvant endocrine therapy by women with early-stage breast cancer in a commercially insured population. **METHODS:** The study sample consists of all women from a commercially

insured population who underwent mastectomy for breast cancer then filled a first prescription for an oral adjuvant hormonal agent (OAHA, defined as tamoxifen or an aromatase inhibitor) within one year after surgery, and had continuous eligibility for pharmacy benefits from six months prior to surgery. Patients were excluded if they had claims coded for distant metastasis or chemotherapy agents specific for advanced cancer. Days covered by OAHA are deduced from dispensed dates and days supplied. Time to nonpersistence (defined as 180 days without OAHA coverage) is estimated using a Kaplan-Meier analysis and the relation assessed between time to nonpersistence and age and history of cytotoxic adjuvant chemotherapy or radiation therapy preceding endocrine therapy. **RESULTS:** A total fo 3654 women (age mean 59.8, SD 12.4) were identified who satisfied study criteria, underwent mastectomy between July1998 and December 2006, and had pharmacy benefits eligibility extending through 2007 or at least 180 days after deduced exhaustion of last OAHA supply. A total of 33.2% had claims consistent with cytotoxic adjuvant chemotherapy and 65% had claims for radiation therapy. Including as right-censored patients still receiving therapy at study end (n = 1516) and those lost to follow-up (n = 969), the cumulative nonpersistence rate is estimated as 24% at three years. Nonpersistence rates were higher for the youngest and oldest patients, and lower for patients with a preceding history of cytotoxic chemotherapy or radiation therapy. **CONCLUSION:** It is important to increase understanding of the determinants of persistence with cancer therapies administered orally for long time periods.

PCN62

LEUPROLIDE ACETATE PERSISTENCE VARIES BY AGE IN PATIENTS WITH PROSTATE CANCER

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OBJECTIVE: The prevalence of prostate cancer increases with age. Leuprolide acetate is an efficacious therapy in patients with prostate cancer. Therapy persistence is essential for desirable clinical outcomes. **METHODS:** A retrospective analysis was conducted using the Medstat MarketScan database on a commercially and Medicare aged insured population from 2001–2005. The MarketScan database collects medical claims, pharmacy claims, cost, and demographics data. Subjects new to leuprolide acetate (identified by J-Code of J9217) in 2002 and no codes in 2001 were followed for 3 years. Compliance was calculated using the medication possession ratio (MPR = total days supply obtained/days on therapy). Persistence was characterized by the number of fills and the days on therapy (start plus estimated discontinuation date). Subjects were stratified into age-range groups, by those >18 and <51 yr, those >81 yr, and 10-year age ranges in between (51–60, 61–70, 71–80). Survival rate was calculated using Kaplan–Meier survival curves. **RESULTS:** A total of 1541 men with prostate cancer receiving leuprolide acetate were included in the study. The average MPR for all ages was 0.70 (Standard Deviation [SD] = 0.15) and did not change significantly by age. Average months persistence was 15.9 months (SD = 11.8, N = 1541) and generally increased with age from 10.6 months (SD = 12.4, N = 59) for those 18–50 years; 14.8 months (SD = 13.5, N = 188) for those 51–60 years; 12.5 months (SD = 11.2, n = 302) for those 61–70 years; 16.7 months (SD = 11.4, N = 718) for those 71–80 years; and 19.8 months (SD = 10.4, N = 274) for those over 80 years. More than one-third of patients discontinued by six months of therapy. **CONCLUSION:** Leuprolide acetate therapy persistence increased with age. Persistency improvement efforts in younger patients and during the first six months of therapy may result in better outcomes.

PCN63

RACIAL DIFFERENCES IN MEDICATION ADHERENCE TO ADJUVANT HORMONAL THERAPY IN MEDICAID ENROLLED WOMEN WITH PRIMARY BREAST CANCER: A COMPARISON USING TWO ESTIMATION METHODOLOGIES

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OBJECTIVE: To examine differences in medication adherence to adjuvant hormonal therapy between white and black patients with breast cancer using different statistical techniques. The data source: Linked North Carolina Medicaid claims-Tumor Registry data (years 1999–2005). **METHODS:** The study design was a retrospective cohort study of Medicaid enrollees with breast cancer newly starting adjuvant hormonal therapy (tamoxifen or aromatase inhibitor) between years January 2000 to December 2004. Medication adherence [measured as Medication Possession Ratio (MPR)] was assessed using patients' prescription refill records. The Medicaid claims and CCR data were merged using a probabilistic match algorithm. From the linked data, information on patients with ICD-9 codes for primary breast cancer was extracted. **RESULTS:** Black patients had a 7% and 9% lower adherence rate as compared to white patients in the propensity score and regression method respectively. Stratification based on 80% cut-off point for the MPR showed that black patients were 21% less likely to be in the high adherence group. **CONCLUSION:** Results from the propensity score and regression analysis may agree so closely in this study because there was good overlap in the distribution of background characteristics for the white and black women with primary breast cancer enrolled in Medicaid.

PCN64

CLINICAL AND DEMOGRAPHIC PREDICTORS OF QUALITY OF LIFE IN PROSTATE CANCER SURVIVORS

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OBJECTIVE: To determine predictors of quality of life (QoL) in community-dwelling prostate cancer (PC) survivors. **METHODS:** We derived a population-based sample of PC patients diagnosed in 1993–4, 1997–8 and 2001–2, residing in 3 geographically diverse areas of Ontario, from the Ontario Cancer Registry (n = 2749, survivors = 1961). Consenting survivors (n = 851) were mailed questionnaires, including the Health Utilities Index (HUI 2/3), Patient-Oriented Prostate Utility Scale [PORPUS-P (psychometric) and PORPUS-Ui (utility)], Functional Assessment of Cancer Therapy-Prostate (FACT-P), Prostate Cancer Index (PCI), and a consent form for chart review. We constructed univariate and multivariate regression models to determine the effects of patient-, disease-, system-, and symptom-related variables on QoL. **RESULTS:** A total of 670 patients returned completed questionnaires and 620 charts were reviewed (others lost, destroyed; 597 entered for these analyses). Mean (SD) PORPUS-P score was 71.78 (14.00), mean PORPUS-Ui was 0.86 (0.11), mean HUI3 was 0.78 (0.24), and mean FACT-P was 127.26 (18.40). In univariate analyses with patient-related

variables (age, marital status, education, employment, income, comorbidity), older age, widowhood, lower education, retirement, and comorbidity (Charlson > 2), were associated with lower QoL (all $p < 0.05$). In multivariate analyses, all patient-related variables explained 18–21% of the variance in scores. With the addition of disease-related variables (treatment with radical prostatectomy, radiation, or hormones; metastases, Gleason score at diagnosis), the model explained 21–25% of the variance. Patients currently on hormone treatment had lower PORPUS-Ui and HUI3 scores than patients treated with hormones in the past or never ($p < 0.05$). System-related variables (year and county of diagnosis) contributed little to the explained variance (1–3%). Symptom-related variables (PCI urinary, sexual, bowel function) were the strongest predictors of QOL (explaining 47–70% of the variance). **CONCLUSION:** Symptoms related to PC and its treatment have large effects on the QoL of PC survivors. Although many variables are associated with QoL, only prostate symptoms and comorbidity have independent effects.

PCN65

HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH STAGE III OR IV FOLLICULAR LYMPHOMA RECEIVING 90Y-IBRITUMOMAB TIUXETAN FOLLOWING FIRST-LINE CHEMOTHERAPY

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OBJECTIVE: A multicenter phase III trial showed patients with stage III or IV follicular lymphoma who achieved a partial or complete remission after first-line treatment receiving 90Y-ibritumomab tiuxetan had significantly longer PFS time as compared to similar patients receiving no treatment. The objective of this study was to determine the impact of 90Y-ibritumomab tiuxetan on health-related quality of life. **METHODS:** Health-related quality of life was assessed using EORTC QLQ-C30 version 2 and EuroQoL-5D (EQ-5D) questionnaires. These questionnaires were administered at screening, week 14 and every 6 months thereafter and finally at end of follow-up. Descriptive statistics were used to compare scores across treatment groups. The change in scores from baseline was also assessed by gender, age and first-line treatment. Mixed effects model was used to assess the factors that were associated with final scores of Visual Analogue Scale (VAS) of EQ-5D. **RESULTS:** No notable treatment differences were observed in the scores of EORTC QLQ-C30 (all domains) scores across timepoints or changes from baseline. This result was true for all sub-groups. The mean scores for EQ-5D at screening and final visit were 0.83 and 0.84 for 90Y-ibritumomab tiuxetan and 0.84 and 0.83 for control arm. The mean VAS scores at screening and final visit were 77.52 and 77.64 for 90Y-ibritumomab tiuxetan and 76.57 and 78.51 for control arm. An analysis of factors associated with final VAS scores showed that baseline VAS scores affected final VAS scores ($p < 0.0001$). **CONCLUSION:** There appears to be no difference in quality of life for patients on 90Y-ibritumomab tiuxetan as compared to those in control arm as measured by EORTC QLQ C-30 and EQ-5D questionnaires. 90Y-ibritumomab tiuxetan prolongs PFS without impacting the health-related quality of life of patients.

WITHDRAWN **PCN66**

WITHDRAWN **PCN67**

PCN68

HOUSEHOLD INCOME AS A PREDICTOR OF PSYCHOLOGICAL WELL-BEING AMONG LONG-TERM COLORECTAL CANCER SURVIVORS

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OBJECTIVE: To quantify the impact of disease and its treatment on patient-reported well-being, it is important to consider the patient's economic circumstances. This study explored the relationship between annual household income and health-related psychological well-being among insured, long-term (>five years) colorectal cancer (CRC) survivors with and without permanent intestinal stomas. **METHODS:** This is a secondary analysis of data collected as part of an NCI-funded study of health-related quality of life (HRQOL) among CRC survivors, in which 681 respondents (52% response rate) completed a survey instrument that included the modified City of Hope Quality of Life (mCOH-QOL)–Ostomy questionnaire, SF-36 v2, and socio-demographic items. Of these, 588 subjects provided income data and were included in this analysis. The mCOH-QOL–Ostomy is based on a four-dimension model of HRQOL (physical, psychological, social, and spiritual well-being). For this analysis, the dependent variable was the psychological well-being (PWB) score. Hierarchical linear regression was used to explore the unique contribution of income to the total variance of PWB over and above the model that included the following independent variables: self-reported physical health (SF-36v2 PCS), co-morbidity (Charlson-Deyo), age, sex, race/ethnicity, education, partnered status, and presence of an ostomy. **RESULTS:** After accounting for the proportion of variance in PWB explained by the other independent variables, the additional variance explained by income was significant (R^2 increased from 0.228 to 0.250; $p = 0.006$). When compared to those in the highest household income category (>$100,000), subjects in the lowest income category (<$5000) had a clinically meaningful 0.82 point lower PWB score on the 11-point scale. Significant positive predictors of PWB were PCS score, age, and absence of an ostomy. **CONCLUSION:** Although the study design does not allow causal inference, these results demonstrate a significant relationship between income and PWB that merits further consideration when attempting to interpret patient-reported outcomes, particularly HRQOL.

PCN69

QUALITY OF LIFE IMPACT OF HOT FLUSHES IN MEN RECEIVING TREATMENT FOR PROSTATE CANCER

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OBJECTIVE: To provide qualitative data on the men's experience, impact and relative importance of hot flushes as a result of prostate cancer therapies, with an emphasis on gonadotropin-releasing hormone (GnRH) agonists. **METHODS:** A qualitative study applying a non-probabilistic purposive sampling strategy. Participants were over 50 years old with histologically confirmed adenocarcinoma of the prostate, had recently initiated (≤6

months ago) and were receiving GnRH with or without anti-androgen, and had recent experience of hot flushes as a result of their therapy. A content and thematic analysis was conducted to identify themes and categories that centred on particular phrases, incidents and types of behaviour. **RESULTS:** Participants (n = 12) aged 58–82, diagnosed on average for 5 years, receiving GnRH agonists (100.0% Lupron, 40.0% Casodex, 20.0% Zometa) were interviewed. The first hot flush usually occurred within 2 weeks of GnRH treatment. Participants experienced widely differing hot flush event frequency and severity; from 8–10 events in 24 hours to one in 2–3 weeks. Events lasted 2 minutes to one hour, and occurred at different times. Analyses identified that hot flushes were most commonly described in terms of 'sweating', 'burning up', and 'perspiring'. Those who had more severe flushes also described 'dizziness', 'weakness', and 'nausea'. Participants found their hot flush experience generally distressing e.g. felt scared, anxious, annoyed, confused, irritated, worried. Hot flushes impacted men's lives e.g. sleep problems, needing to stop activities, resting, taking a cold shower. However, most considered the hot flush experience in the context of their overall condition, some reported getting used to the experience over time and adopting varies coping strategies. **CONCLUSION:** Hot flush descriptions reflect those previously reported in the literature, provide additional depth to the experience from the patient's perspective and will inform the development of health states for utility assessment.

PCN70

THE IMPACT OF HODGKIN'S LYMPHOMA ON HEALTH RELATED QUALITY OF LIFE

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OBJECTIVE: Hodgkin's lymphoma (HL) significantly impacts the health related Quality of Life (HRQoL) of patients. Treated patients often report increased stress, fatigue, nausea, sexual dysfunction, decreased social and emotional function, and vocational limitations; however few studies have assessed these domains. This review summarizes the impact of HL on hrQoL and recommends which HRQoL constructs should be assessed in the clinic and in clinical trials. **METHODS:** A systematic review of the literature was conducted in order to better understand the impact of HL and its treatments on HRQoL. The identified articles were reviewed for references to HRQoL and specific tools to assess these constructs. The major impacts of the disease and treatment effects are compared across tools assessing these domains. **RESULTS:** Some 30 published studies assessing hrQoL in patients with HL were identified. In these 30 articles over 20 instruments were used to assess HRQoL. The most common cancer-specific instruments employed were the EORTC QLQ-30 and various fatigue scales. No HL specific instrument was identified as being widely used. Tables summarizing the domains covered by each instrument are provided. The EORTC and FACT-Lym appear to provide the best coverage of relevant HRQoL domains, however, using more than one instrument is necessary to capture all relevant domains. **CONCLUSION:** Although HL significantly impacts HRQoL very few studies have collected this data in a comprehensive manner. This work reviews the literature on the HRQoL in patients with HL and provides insights regarding the key set of HRQoL constructs that should be assessed in the clinic and in clinical trials to best characterize the impact of HL and treatment. Although the FACT-Lym provides good coverage of HRQoL domains in HL, additional validation work is needed to ensure the reliability and validity of the tool in this population.

PCN71

SOCIETAL PREFERENCES (UTILITIES) FOR ADVANCED MELANOMA HEALTH STATES IN THE UNITED KINGDOM (UK) AND AUSTRALIA

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OBJECTIVE: To estimate general public preference-based utilities for standardized health states that include common responses and toxicities observed during treatment of advanced melanoma. **METHODS:** A cross-sectional study was used to elicit standard gamble utilities for melanoma in the UK and Australia. Health states included partial response (PR), stable disease (SD) and progressive disease (PD). Common grade I/II toxicities (occurring in >10% of patients) were abstracted from the literature for dacarbazine, temozolomide, interleukin-2, fotemustine, and interferon alpha2b. These may also apply for ipilumumab, a developmental immunotherapy. Health state descriptions were based on WHO response definitions, Common Toxicity Criteria for Adverse events v3, and feedback from five clinical experts and three quality-of-life researchers. **RESULTS:** Utilities were elicited from 110 participants in the UK (n = 64) and Australia (n = 56). Mean utilities estimated (for UK vs. Australian respondents) were as follows: PR (0.85 vs. 0.89); SD (0.77 vs. 0.80); PD (0.59 vs. 0.44); and best supportive care (0.59 vs. 0.44). Utility decrements associated with the toxicities were: hair loss (–0.03); skin reaction (–0.03 vs. –0.08); diarrhea (–0.06 vs. 0.12); toxicity, but indication that treatment may be working (–0.06 vs. –0.08); nausea/vomiting (–0.07 vs. –0.13); flu-like syndrome (–0.09 vs. –0.13); stomatitis (–0.10 vs. –0.15); 1-day out/inpatient care for grade 3/4 toxicity (–0.11 vs. –0.15); symptomatic melanoma (–0.11 vs. –0.22); and hospitalization for grade 3/4 toxicity (–0.13 vs. –0.22). **CONCLUSION:** The development process for these standardized health states for advanced melanoma can serve as a model for developing disease-specific health states that incorporate both intended treatment responses and adverse events. PR and SD are preferred, and symptomatic melanoma and hospitalization for toxicity yield the highest disutilities. The method of decrementing utility values by subtracting toxicity utility weights holds promise for assigning utilities to serious diseases treated with toxic therapies.

PCN72

DISABILITY AND HEALTH-RELATED QUALITY OF LIFE IN LONG-TERM SURVIVORS OF CANCER IN CHILDHOOD IN BRAZIL: AN ASSESSMENT OF THE CONSTRUCT VALIDITY OF THE HEALTH UTILITIES INDEX (HUI3)

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OBJECTIVE: There is limited experience with patient-reported health status and health-related quality of life (HRQL) in survivors of cancer in childhood in low-income countries. The purpose of this study was to collect these measurements in Brazil, test hypotheses about differences among diagnostic groups, and compare the results with those from other countries in an overall assessment of the construct validity of the HUI3. **METHODS:** Survivors were eligible if: diagnosed with cancer in childhood; attending the long-term follow-up clinic for one treatment center; at least 8 years off therapy; cancer free, literate; and at least 13 years of age. Health status measurements were collected in

the clinic using a Brazilian Portuguese Health Utilities Index self-report questionnaire. Responses were converted to attribute levels, and utility scores for morbidity in individual health attributes and for overall HRQL, using standard HUI Decision Tables and Utility Functions. Standard t-tests and 1-way ANOVA were used to analyze HUI3 utility scores within and across diagnoses and between countries. HUI3 overall HRQL scores were categorized to mild / moderate / severe disability (1.00 = No disability, 0.89–0.99 = Mild, 0.70–0.88 = Moderate, <0.70 = Severe disability). **RESULTS:** A total of 138 consecutive survivors participated in the survey. More than 71% reported some disability (mild-moderate-severe). More than one-third reported some cognitive disability and/or pain while approximately one-quarter reported problems with vision, speech or emotion. As hypothesized, retinoblastoma survivors had significant visual morbidity ($p = 0.048$). Survivors of germ cell tumors had significant pain morbidity ($p = 0.003$) and lowest mean HRQL utility score (0.49) among the diagnostic groups. HRQL means of survivors were similar ($p > 0.05$) among countries (Brazil, Canada, Central America, Uruguay) within diagnostic groups of acute lymphoblastic leukemia and hodgkin's disease. **CONCLUSION:** The results show that the Brazilian survivors experience a wide range of disabilities and impaired HRQL similar to those reported in other countries and affirm the construct validity of the HUI3.

PCN73

COMPARISON OF SURVIVAL QUALITY FROM TWO TREATMENT STRATEGIES FOR ACUTE LYMPHOBLASTIC LEUKEMIA (ALL) IN CHILDHOOD: DANA-FARBER CANCER INSTITUTE (DFCI) AND BERLIN-FRANKFURT-MONSTER (BFM)

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OBJECTIVE: To determine the difference in survival quality of patients treated according to two major treatment strategies for ALL in childhood, for use in a cost-utility study. **METHODS:** Children diagnosed with ALL between 1985 and 2003, and treated in one of five centers according to a DFCI or BFM-based protocol, were eligible if they were alive at least two years post-therapy. Parents of eligible survivors, in a cross-sectional survey, were asked to complete a Health Utilities Index (HUI) 15-item self-complete questionnaire with a 'past 1-week' recall period. HUI3 health-related quality of life (HRQL) and single-attribute scores were determined for each patient according to standard algorithms. Chi-square was used to test for differences in confounding factors between study groups: gender, and age at diagnosis (in quintiles). Differences in mean HRQL and single-attribute scores between DFCI and BFM groups were tested using one-way ANOVA. Statistical significance was set at $p < 0.05$. **RESULTS:** 612 parent assessments were available for analysis: 463 for DFCI survivors and 188 for BFM survivors. No significant differences between DFCI and BFM survivors were detected for proportion of males and females ($p > 0.079$), and age at diagnosis ($p > 0.243$). There were no significant differences detected between DFCI and BFM survivors in mean single-attribute or HRQL scores ($p > 0.176$). The mean HRQL score was 0.90 (SD = 0.166) for DFCI survivors, 0.92 (SD = 0.140) for BFM survivors, and 0.91 (SD = 0.159) for the pooled set of survivors. **CONCLUSION:** Clinical research has reported previously that there is no significant difference in mortality rates between DFCI and BFM treatment strategies. These HRQL results indicate that survivors of these treatment strategies also do not experience a difference in quality of survival. Future work for the cost-utility study will focus on the incremental HRQL of patients during phases of active therapy and the costing of hospital-based health care services.

PCN74

WILL KNOWLEDGE OF GENETIC RISK FOR CANCER INFLUENCE QUALITY OF LIFE AND SCREENING BEHAVIOR? FINDINGS FROM A POPULATION-BASED STUDY

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OBJECTIVE: Determine the impact of testing for high prevalence, low penetrance gene variants associated with colorectal cancer (polymorphisms, haplotypes) on a person's quality of life (QOL), health habits, and cancer screening intentions. **METHODS:** First-degree relatives of colorectal cancer patients and a matched group of persons without a family history of colorectal cancer from the Colorectal Cancer Familial Registry—a population-based registry in Washington State—were invited in 2006–7 to participate in a web-based survey of testing for gene variants associated with colorectal cancer risk. Participants were asked how such tests might influence their QOL, health habits, and intent to obtain colorectal cancer screening. **RESULTS:** A total of 310 relatives and 170 persons without a family colorectal cancer history completed the questionnaire. For the positive genetic test scenario, 69% of respondents stated they would be "somewhat worried"; 18% said they would be "very worried." QOL measured by the standard gamble for the carrier state was modestly lower than current health; the difference was significant only for relatives (no relatives with colorectal cancer 0.89 vs. 0.88, $p = 0.11$; relatives with colorectal cancer 0.90 vs. 0.88, $p = 0.02$). The difference in QOL was not significant after adjustment for sociodemographic and health factors. In the positive gene test scenario, 30% of respondents stated they would change their diet substantially, 25% would increase exercise, and 43% would start colorectal cancer screening. Relatives of colorectal cancer patients did not differ significantly from those without a family history in their reported intent to change these behaviors. **CONCLUSION:** Testing for high prevalence gene variants associated with colorectal cancer risk may increase cancer worry while only modestly influencing overall QOL. Testing could improve cancer preventive health habits and colorectal cancer screening adherence. The findings suggest that testing might reduce colorectal cancer incidence, particularly among those at higher risk for colorectal cancer.

PCN75

BURDEN OF IMMUNE THROMBOCYTOPENIC PURPURA ON HEALTH-RELATED QUALITY OF LIFE

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OBJECTIVE: Adult chronic immune thrombocytopenic purpura (ITP) is characterized by autoimmune-mediated platelet destruction and suboptimal platelet production. Signs and symptoms can range from bruising to gastrointestinal and intracranial bleeding. The disease may therefore impact one's health-related quality of life (HRQoL). We quantified the burden of ITP on

patient-reported HRQoL. **METHODS:** We compared baseline Short Form (SF)-36 scores for individuals with ITP who enrolled in one of two double-blind, randomized clinical trials for the treatment of ITP [one group was refractory to splenectomy (n = 58) and the other had no splenectomy (n = 60)] to general populations in Canada (n = 9408) and the US (n = 2474). We also compared ITP-specific HRQoL burden using the ITP-Patient Assessment Questionnaire (PAQ) across platelet count categories ($<10 \times 10^9$/L vs. 10 to 49×10^9/L). ANOVA tests were used to compare age and sex-adjusted means across samples. **RESULTS:** The mean age of the ITP patients was 53.3 ± 16.2 years, and the majority (64%) was female. SF-36 scores of ITP patients were significantly ($p < 0.0001$) worse than those from the Canadian and US general population for each scale and summary score. The largest differences were found for physical functioning (67.2 vs. 85.8 and 80.8); role functioning-physical (42.3 vs. 82.1 and 77.0); general health (49.4 vs. 77.0 and 69.9); vitality (40.4 vs. 65.8 and 60.0), and role functioning-emotional (60.5 vs. 84.0 and 80.1). In addition to statistical significance, these differences were clinically meaningful. ITP patients with lower platelet counts also had worse SF-36 and ITP-PAQ scores, particularly for symptoms (50.8 vs. 67.8; $p < 0.001$); fear (65.0 vs. 78.9; $p < 0.05$), and social activity scales (59.6 vs. 75.5; $p < 0.05$) of the ITP-PAQ. **CONCLUSION:** ITP was found to impact both physical and psychological aspects of HRQoL.

PCN76

IMPACT OF SILDENAFIL ON MARITAL AND SEXUAL ADJUSTMENT IN PATIENTS AND THEIR PARTNERS AFTER RADIOTHERAPY AND SHORT-TERM ANDROGEN SUPPRESSION FOR PROSTATE CANCER: ANALYSIS OF RTOG 0215

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OBJECTIVE: Radiation Therapy Oncology Group (RTOG) study 0215 was a placebo-controlled, double-blind, cross-over trial of sildenafil given after radiotherapy and neoadjuvant/concurrent short-term androgen suppression. Sildenafil improved erectile function amongst participants. We now report on the study goal to investigate the effect of sildenafil on marital and sexual adjustment for participants and their partners. **METHODS:** RTOG 0215 closed before meeting its desired accrual goal with enrollment of 111 eligible patients (72 married). Twenty-four patients (mean age: 72.6 ± 6.8 y) and their married partners (mean marriage duration: 37.2 ± 16.3 y) completed the self-report assessments of erectile function and of marital and sexual adjustment using the validated measures of the Locke's Marital Adjustment Test (LMAT) and the Sexual Adjustment Questionnaire (SAQ). Statistical differences in and correlations between the change in LMAT and SAQ scores were tested for significance from placebo to sildenafil. **RESULTS:** There was no significant change in LMAT scores for either patients ($p = 0.37$) or partners ($p = 0.35$). The change in patient SAQ score was statistically significant, but not clinically meaningful ($D = 2.58$, $p = 0.02$), while partners reported a smaller change in SAQ score ($D = 1.47$, $p = 0.47$). The correlations between patient and partner LMAT change scores ($\rho = 0.40$, $p = 0.09$) and SAQ change scores ($\rho = 0.15$, $p = 0.48$) were non-significant. Patient LMAT and SAQ change scores ($\rho = 0.38$, $p = 0.08$) were not significantly correlated. However, the partner LMAT and SAQ change scores ($\rho = 0.45$, $p = 0.04$) were significantly correlated. **CONCLUSION:** Erectile dysfunction (ED) affects, and is affected by, the patient, their partner and the relationship. ED treatment appears to significantly influence female partner sexual adjustment and marital adjustment. These results are tentative and should be considered as an exploratory basis for a larger clinical trial. The small sample size may have precluded detection of important other endpoints, which should not be excluded from future investigations.

PCN77

A SYSTEMATIC REVIEW OF BREAST CANCER UTILITY WEIGHTS

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OBJECTIVE: To systematically identify utility weights for health states in breast cancer. **METHODS:** Searches were performed of electronic databases (PubMed, EMBASE and the Cochrane Library, including DARE, NHS EED and HTA databases) and internet resources for the period 1990 to date. Sources potentially containing relevant information were retrieved and reviewed. **RESULTS:** Fifty-nine studies were identified as potentially containing utility weights for breast cancer health states. These were assessed for methodological compliance with the NICE reference case, leading to the exclusion of 50 non-compliant studies. Within the remaining nine studies there was wide variability between both alternative NICE compliant estimates for similar health states, and the health states defined. In some cases estimates for poor health states (for example metastatic disease) were higher than those for good health states (for example remission). For some health states (notably terminal disease) there are no estimates available based on NICE recommendations. **CONCLUSION:** A review of utility weights for breast cancer health states has revealed high levels of uncertainty within the identified estimates. Despite the quantity of information available there is no universally accepted set of health states covering the whole of the disease pathway for breast cancer, which has lead to the development of numerous utility estimates for numerous health states. The review also highlighted that the majority of studies undertaken (85% of potential studies identified) do not conform to the methodological standards stipulated in the NICE reference case. This is predominantly due to the elicitation method used. For some health states there are no estimates available based on these recommendations. It is a difficult task to identify a coherent set of health state utilities covering the entire disease pathway in breast cancer using previously published data and which conform to NICE standards.

PCN78

DERIVATION OF UTILITY VALUES FROM EORTC QLQC30 IN LUNG CANCER

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OBJECTIVE: Cancer clinical trials frequently incorporate quality of life (QL) measures, but rarely patient utility and resource utilization. Cost utility evaluations of novel cancer therapies remain challenging. Here we explore the correlation between QL data from the EORTC QLQ-C30 with the EQ5D, for which

published utility values exist. **METHODS:** Consecutive outpatients with non-small cell lung cancer (NSCLC) attending a major Canadian cancer centre completed the EORTC QLQ-C30 and EQ5D on a single visit. Different patient disease states included: 1) relapse-free post-resection, including on preventive chemotherapy; 2) in relapse, including on palliative chemotherapy or targeted therapy (erlotinib); and 3) on chemoradiation for locally advanced NSCLC. Exploratory correlation of EORTC QLQ-C30 and EQ-5D scores is ongoing. **RESULTS:** A total of 172 patients participated. The median age of the sample was 65, (range 32–85 years); 47% were male. Half had advanced NSCLC (51%), 41% were relapse-free post-resection, and 8% had locally advanced NSCLC. Nearly half of relapse-free patients received preventive chemotherapy. Twenty-seven percent of advanced NSCLC patients were receiving palliative chemotherapy, 35% targeted therapy with erlotinib, and the rest were not on active treatment. Utility values (based on the EQ5D) were not significantly different among groups, including by disease status (relapse-free versus in relapse), and current treatment (chemotherapy, erlotinib or observation). Mean utilities were similar for relapse-free patients despite treatment, 0.76, and minor differences were seen among those in relapse, (on chemotherapy, mean utility 0.69; on erlotinib 0.77, on supportive care, 0.75). Exploratory correlation of EORTC QLQ-C30 and EQ5D values will be presented. **CONCLUSIONS:** QL values in the derivation of patient utility for different health states in clinical trials may further the ability to estimate cost utility of novel therapies in cancer clinical trials.

PCN79

METHODS FOR ASSESSING QUALITY OF LIFE IN CANCER PATIENTS EXPERIENCING COMPLICATIONS: OSTEONECROSIS OF THE JAW PILOT STUDY

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OBJECTIVES: Intravenous bisphosphonate use in cancer patients is associated with exposed and necrotic jaw bone, called Osteonecrosis of the Jaw (ONJ). The overall aim of this pilot study was to develop a survey that captured the oral health-specific and the global health related quality of life (HRQoL) impact of ONJ, to test the feasibility of survey instruments and to assess subject distress. **METHODS:** A 30 minute phone survey was created with multi-disciplinary collaboration. Four standardized ONJ health states were developed and subjects' preferences (utility) for each state were obtained using the Visual Analogue Scale (VAS), the EQ5D and time-tradeoff (TTO) questions. A Visual Basic Interface was constructed to guide the interviewer through TTO questions designed for the survey. The subject's life before and after ONJ was evaluated with the Oral Health Impact Profile (OHIP). Emotional discomfort during and after survey was evaluated on a five point Likert scale. Subjects were randomly identified from a cohort of 80 cancer patients with ONJ. **RESULTS:** The pilot study included five patients (response rate = 100%). Utility decreased with increasing ONJ stage for all HRQoL instruments: 0.76, 0.97, 0.86 (Cancer and No ONJ), 0.72, 0.88, 0.83 (Cancer and Stage 1 ONJ), 0.43, 0.52, 0.63 (Cancer and Stage 2 ONJ) and 0.34, 0.39, 0.56 (Cancer and Stage 3 ONJ) for VAS, EQ5D and TTO respectively. With a baseline mean of 1.6, the OHIP score increased to 7.2 after ONJ (0–28 scale). Two subjects ranked 2 ("a little") for the level of emotional discomfort during the survey, but none were upset afterwards. **CONCLUSIONS:** Based on preliminary results, the study design was feasible and both oral health-specific and global HRQoL instruments were sensitive to QoL changes associated with ONJ. All HRQoL instrument performance showed appropriate rank ordering and consistent relationship by ONJ stage. There was minimal subject distress.

PCN80

COMPARISON OF STANDARD GAMBLE UTILITIES AND VISUAL ANALOG SCALE VALUES IN AN OVARIAN CANCER PATIENT AND ONCOLOGIST STUDY OF CANCER TREATMENT PREFERENCES

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OBJECTIVE: To compare the valuation of ovarian cancer health states as assessed by the visual analog scale (VAS) and the standard gamble (SG). **METHODS:** Ovarian cancer patients and oncologists were enrolled in this study. Participants were asked to score six hypothetical treatment scenarios using the VAS and SG. Values were compared using the intraclass correlation coefficient (ICC) and t-test. **RESULTS:** Fifty-one patients and 34 oncologists were enrolled to this study. Participants were asked to rank order health states in a one-time interview using the VAS, followed by assessment of the health states, in random order, using the SG. This resulted in 244 and 199 SG-VAS data pairs for analysis from patients and oncologists, respectively. The ICC among patients was 0.003 (95% CI: –0.122 to 0.129; F-test, $p = 0.479$). A significant difference was observed between VAS and SG scores for patients receiving chemotherapy (mean difference, –0.114, $p < 0.0001$), but not for patients under surveillance (mean difference 0.06, $p = 0.13$). The SG produced higher valuation than the VAS among patients receiving chemotherapy, but the VAS produced higher values than the SG among patients under surveillance. For oncologists, the ICC was 0.323 (95% CI: 0.192 to 0.442; F test $p < 0.0001$), with the SG 0.09 higher than VAS values ($p < 0.0001$). Each patient group valued the health states in the mean range of 0.46–0.61 on the VAS; however, SG utilities ranged from 0.53–0.61 for patients receiving chemotherapy and from 0.30–0.37 for patients under surveillance. The range of mean values by oncologists was 0.27–0.66 and 0.30–0.70 for the VAS and SG, respectively. **CONCLUSION:** There appear to be different utility values obtained using the SG and VAS among patients undergoing treatment, patients under surveillance, and oncologists. This comparison suggests the importance of considering differences between these groups and method used when conducting utility valuation research in ovarian cancer.

PCN81

INJECTABLE CHEMOTHERAPY VS CAPECITABINE: PREFERENCE IN BRAZILIAN PATIENTS

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OBJECTIVE: Patients with breast and colorectal cancer can use oral and injectable chemotherapy treatments. The objective of this study is to assess the satisfaction in patients using capecitabine (oral chemotherapy) in comparison with their previous experiences with injectable chemotherapies. Also, we aimed to compare the preference of patients on this oral drug to the injectable chemotherapy treatments. **METHODS:** Quantitative study performed with 150 oncology patients with breast and colorectal cancer (from all Brazilian regions) who use capecitabine as a treatment. A structured questionnaire with 10 answers assessing six attributes was used. **RESULTS:** The average age of

the patients is 61 years, with these patients presenting cancer for an average of 4 years. Eighty-nine percent of the patients use capecitabine as monotherapy, and the rest use it combined with injectable treatments. Comparing capecitabine with injectable regimens, 89% of the studied subjects prefer the oral treatment. Capecitabine is best evaluated than the injectable treatments in the attributes: practicability, freedom, quality of life, efficacy and side effects. Treatments were assessed in a similar way about the item cost. Approximately third quarters consider capecitabine as efficient; such rate is slightly higher than the observed for injectable chemotherapy: 75% vs. 58%. **CONCLUSION:** Capecitabine is largely approved by its users, with 89% of them preferring it in comparison with the injectable treatments. The oral chemotherapy has as positive differences, in the perception of its users, practicability and freedom.

PCN82

PATIENT-REPORTED OUTCOMES IN ELDERLY VS. YOUNG PATIENTS WITH ADVANCED RENAL CELL CARCINOMA TREATED WITH SORAFENIB VS. PLACEBO

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OBJECTIVE: Elderly patients are underrepresented in oncology trials and may be at higher risk of toxicity with less than optimal quality of life compared with younger patients. The Phase III TARGET clinical trial showed that sorafenib significantly prolonged progression-free survival (PFS) compared with placebo ($P < 0.000001$) in patients with advanced renal cell carcinoma (RCC). This retrospective analysis of sorafenib in advanced RCC patients from the pivotal TARGET trial compared patient reported outcomes (PRO) in young and elderly patients. **METHODS:** This subgroup analysis examined the PRO in elderly (>=70 years of age) and young patients (<70 years of age) for sorafenib and placebo. PRO was assessed at baseline and day 1 of each cycle using Functional Assessment of Cancer Therapy-General (FACT-G) and FACT-Kidney Cancer Symptom Index (FKSI). Descriptive statistics compared the proportion of patients with a clinically meaningful change (4 point change) in total scores of FKSI and Physical Well Being (PWB) from baseline. Time to health status deterioration (4 point drop in total FKSI scores or PWB scores of FACT-G) was assessed using Cox-proportional Hazards model. **RESULTS:** A greater proportion of patients in the sorafenib-treated group had improved or stable symptom response and physical functioning in later cycles of treatment, irrespective of age. Sorafenib delayed median time to health status deterioration (as measured by FKSI questionnaire) compared to placebo in elderly patients (121 days vs. 85 days) The median time to health status deterioration as measured by PWB domain of FACT-G was also longer for sorafenib compared to placebo among elderly patients (126 vs. 84 days). A similar trend was observed in younger patients. **CONCLUSION:** When compared with placebo, elderly patients with advanced RCC receiving sorafenib had PROs similar to those of young patients receiving the same treatment, with both groups maintaining their quality of life longer on sorafenib.

CANCER—Health Care Use & Policy Studies

PCN83

KNOWLEDGE OF THE BRAZILIAN POPULATION ABOUT COLORECTAL CANCER

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OBJECTIVE: According to INCA (National Cancer Institute of Brazil) estimates, colorectal cancer is the fifth most common type of cancer in the population; otherwise, it is the thirrd leading type of tumor to cause death. The objective of this research is to assess the knowledge of the Brazilian population about colorectal cancer, its risks and diagnosis. **METHODS:** Quantitative study performed through personal and individual interviews. A representative sample of the study population ($N = 600$) was used. People over 30 years old were interviewed. A 10-item structured questionnaire was used. **RESULTS:** The study showed that 70% of the population consider themselves as informed about cancer. When asked about which would be the 3 most common types of cancer, the main answers given were: 66% breast, 46% cervix, 42% prostate, 16% skin, and 15% lung. The colorectal cancer was not mentioned by any subject in this question. Fifty-seven percent of the population had never heard about colorectal cancer. Among the 43% who had already heard about this type of tumor, 76% didn't know what were the symptoms and prevention measures for this disease. Only 18% of the subjects over 50 years old have already undergone diagnostic tests for colorectal cancer. **CONCLUSION:** Colorectal cancer is known for only 43% of the Brazilian population, which does not identify it as one of the main tumors causing death in the country. In addition, 76% of the subjects who have already heard about this type of cancer do not know the diagnostic and prevention methods for this tumor. Only 18% of the population over 50 years old has already undergone diagnostic tests for this type of cancer. These results show that information campaigns about cancer could render a better knowledge of the disease, which could result, in the future, in early diagnosis, enabling a higher chance of cure for patients.

PCN84

CLINICAL AND ECONOMIC OUTCOMES FOR CANCER CHEMOTHERAPY PATIENTS WHEN INITIATED ON ERYTHROPOIESIS-STIMULATING AGENTS (ESA) AT BASELINE (BL) HEMOGLOBIN (HB) <10 G/DL

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OBJECTIVE: Certain recent policy changes have mandated ESA initiation at Hb < 10 g/dL. Real world clinical and economic outcomes data associated with this change have not been reported for the two FDA-approved ESAs for this population [epoetin alfa (EPO) and darbepoetin alfa (DARB)]. **METHODS:** Data drawn between 12/03–11/07 from 55 U.S. oncology clinics from the Dosing and Outcomes Study of Erythropoietic Stimulating Therapies (D.O.S.E.) registry were assessed. Patients were included if they were initiated on ESAs with a BL Hb < 10 g/dL, age ≥18 years, and received ≥2 doses of either EPO or DARB. Outcomes assessed included transfusion utilization, Hb at Weeks 4, 8, 12 and 16 after ESA initiation, and cumulative ESA doses with associated cost (based on 11/2007 wholesale acquisition cost). **RESULTS:** A total of 384 patients (168 EPO, 216 DARB) were identified. BL character-

istics were similar between treatment groups with regard to age, weight, cancer type and Hb. The proportion of patients transfused was similar between groups (~30%). Mean Hb values were consistently higher in the EPO group compared to the DARB group at Weeks 4, 8, 12, and 16. A repeated measures model showed a significant Hb increase from BL at each timepoint assessed in both groups as well as a significant difference between the two groups. Mean cumulative administered dose was 342,959 Units for EPO and 1239 mcg for DARB with overall ESA drug cost significantly lower in the EPO group compared to the DARB group (EPO $4503, DARB $5669 $p < 0.001$). **CONCLUSION:** In patients with Hb < 10 g/dL prior to ESA initiation, mean Hb levels were higher in the EPO group than the DARB group throughout the study, with ESA drug costs 21% lower in the EPO group than the DARB group. Such findings inform decision-makers on ESA-associated outcomes based on initiation as imposed in certain coverage policies.

PCN85

EFFECT OF AGE AND PLACE OF RESIDENCE ON COLORECTAL CANCER TREATMENTS IN NEBRASKA CANCER REGISTRY FROM 1998 TO 2003

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OBJECTIVE: The National Cancer Institute indicates surgery, chemotherapy, and/or radiation treatments in colorectal cancer (CRC). Data on the effect of age and place of residence on accessing CRC treatments in the Midwest region of United States is limited. Therefore, using Nebraska Cancer Registry we tested the hypothesis that CRC patients' residence-county and age would be associated with receipt of surgery, radiation, and chemotherapy treatments. **METHODS:** In a retrospective study, we examined treatments of 6813 CRC patients identified by incident ICD-O CM codes between January 1998, and December 2003 from the Nebraska Cancer Registry data. In multivariate logistic regression analyses, we studied the association of age and the year 2003 Urban Influence Code based residence-county with each of the three CRC treatments. **RESULTS:** After adjusting for patient's demographics, insurance payer, county-specific provider-to-population ratio, and stage and anatomical site, CRC patients living in small urban counties were more likely to receive chemotherapy than were those living in rural counties (adjusted Odds-Ratio, OR, 1.53; 95% confidence-interval, CI: 1.25–1.88, $p < 0.001$). However, there were no significant rural-urban differences in receiving any CRC treatment. Compared with 19-to-64-year-olds, patients aged 75 years and older with local CRC stage were less likely to receive surgery (OR, 0.22; 95% CI: 0.07–0.76, $p < 0.001$), patients aged 75 years and older were less likely to receive radiation (OR, 0.36; 95% CI: 0.24–0.55, $p < 0.0001$), and patients aged 75 years and older were less likely to receive chemotherapy (OR, 0.21; 95% CI: 0.16–0.27, $p < 0.0001$). **CONCLUSION:** Nebraska CRC patients living in rural counties were less likely to receive chemotherapy than were those living in small urban counties. Elderly CRC patients were less likely to receive surgery, radiation, and chemotherapy treatments. Despite limitations of registry data, these findings warrant the attention of decision-makers to age and geographic access issues in planning future delivery of CRC treatments.

PCN86

DRUG UTILIZATION AND COST CONSIDERATIONS OF ERYTHROPOIESIS-STIMULATING AGENTS (ESAS) IN PATIENTS WITH MYELODYSPLASTIC SYNDROMES (MDS)

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OBJECTIVE: To assess current real-world utilization of ESAs in patients with MDS, recent epoetin alfa (EPO) and darbepoetin alfa (DARB) dosing patterns and ESA treatment costs were examined. **METHODS:** A retrospective analysis was conducted using medical claims from approximately 45 health plans nationwide during the period of Janaury 2004–June 2007. Patients included in the study were ≥18 years old, had ≥1 claim for MDS (ICD-9 code: 238.7) prior to initiating ESA therapy, and were newly initiated on EPO or DARB with ≥2 doses of either drug during the treatment period. Patients with cancer before initiating ESA treatment for MDS were excluded. The study period terminated with the last ESA treatment dose, end of data availability, initial AML diagnosis, or initial stem cell transplant, whichever occurred first. Mean cumulative ESA dose was used to calculate ESA cost (based on October 2007 WAC) and dose ratio (Units EPO : mcg DARB). **RESULTS:** The study population consisted of 275 patients who received EPO and 155 patients who received DARB. Mean age and gender distribution was similar between the two groups. Mean treatment duration was also similar for both groups (EPO: 75 days; DARB: 71 days; $p = 0.638$). The mean cumulative ESA dose administered was 374,415 Units for EPO and 1475 mcg for the DARB group, corresponding to a dose ratio of 254:1 (Units EPO: mcg DARB). Based on these doses, ESA cost was $2139 (31%) less for EPO than for DARB (EPO: $4688; DARB: $6827; $p = 0.010$). **CONCLUSION:** These real-life clinical practice findings in the MDS population show significantly lower drug cost in the EPO group compared to the DARB group and a dose ratio of 254:1 (Units EPO : mcg DARB) between the two agents.

PCN87

USE OF PHARMACOECONOMIC MESSAGES IN ONCOLOGY PROMOTIONAL MATERIALS

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OBJECTIVE: To evaluate the presence of pharmacoeconomic messages in the US, France, Germany, Italy, Spain, and UK for ten representative oncology products (Alimta, Avastin, Gemzar, Herceptin, Neulasta, Novantrone, Sutent, Tarceva, Taxotere, and Velcade). **METHODS:** This qualitative assessment covered the following data sources: 1) Government websites (Canadian Agency for Drugs and Technologies in Health, National Institute for Health and Clinical Excellence, Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen, La Haute Autorité de santé, and Cochrane Reviews); 2) company sponsored product websites; 3) FDA and EMEA products labels; and 4) promotional materials (detail aid brochures, direct mail, and professional journal/newsletter ads). These data sources were searched for relevant pharmacoeconomic messaging including statements regarding cost, QoL, utility, patient preference, etc. **RESULTS:** While health technology assessments have a clear impact on market access, specific examples of pharmacoeconomic data in promotional messaging was limited. Pharmacoeconomic messages, with particular focus on QoL, were more prominent in promotional materials of oncology

products in Europe as compared to the US. **CONCLUSION:** While European regulatory bodies have long-embraced QoL/PROs (along with efficacy and safety) as key endpoints for approval, the FDA is starting to acknowledge pharmacoeconomics in their evaluations. Further research is warranted to determine if there is a correlation between pharmacoeconomic messaging and product uptake, with prescription or unit sales analysis combined with large scale physician surveys on influences of prescribing patterns.

PCN88

FACTORS ASSOCIATED WITH THE PRESCRIPTION OF ADJUVANT HORMONAL THERAPIES AMONG MEDICAID ENROLLEES WITH BREAST CANCER

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OBJECTIVE: The purpose of this study was to examine various patient and provider characteristics associated with being prescribed an aromatase inhibitors (AI) v. tamoxifen only therapy among a cohort of North Carolina (NC) Medicaid enrollees diagnosed with breast cancer. **METHODS:** Data was gathered using the Linked NC Central Cancer Registry-Medicaid Claims database which links NC cancer registry claims with Medicaid data. A logistic regression model was built to determine the odds of an individual ever receiving an AI during the study period. **RESULTS:** A total of 600 patients were included, of which 451 (75.2%) and 149 (24.8%) received tamoxifen only and AI (alone or in combination) therapy, respectively. Results showed that patients who lived in urban areas (compared to rural), were postmenopausal (based on age ≥55), had regional- or distant-staged cancer (opposed to local or unknown), had been hospitalized in the year prior to treatment index, and had breast conserving surgery (BCS) (rather than mastectomy) had 1.97 [1.29, 3.00], 2.26 [1.80, 2.83], 2.74 [1.79, 4.20], 1.87 [1.20, 2.92], 0.64 [0.41, 1.00] times the odds, respectively, of ever receiving an AI compared to tamoxifen only. Additionally, for every one-year increase in the time a patient started hormonal therapy, the odds of receiving AI therapy (compared to tamoxifen only) increased 2.26 [1.80, 2.83] fold. **CONCLUSION:** The differences in antiestrogenic treatment type based on whether the patient visited a hospital in the year prior to the study and in whether the patient lived in urban or rural area may represent disparities in access to advances in care. Furthermore, it may be the case that women who undergo mastectomy or who have locally staged cancer are not being treated aggressively enough with novel antiestrogenic therapies.

PCN89

DRUG UTILIZATION PATTERNS AND COSTS FOR ERYTHROPOIESIS-STIMULATING AGENTS (ESAS) IN A MANAGED CARE CANCER POPULATION RECEIVING CHEMOTHERAPY

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OBJECTIVE: To assess current utilization patterns and costs for epoetin alfa (EPO) and darbepoetin alfa (DARB), two ESAs, in managed care cancer patients receiving chemotherapy. **METHODS:** Medical claims from the Ingenix Impact National Managed Care Database between January 2006 and June 2007 were analyzed. Patients included were ≥18 years old, had ≥1 claim for cancer within 90 days prior to treatment initiation, were newly initiated on EPO or DARB with ≥2 doses of either drug, and received chemotherapy during ESA treatment. Mean cumulative ESA dose was used to calculate ESA cost (based on October 2007 wholesale acquisition cost [WAC]) and dose ratio. **RESULTS:** A total of 2322 EPO and 4353 DARB formed the study population. EPO patients were older (57.7 vs. 55.7 years; $p < 0.0001$) and a lower proportion were women (65% vs. 69%; $p = 0.0002$), compared to DARB patients. Mean ESA treatment duration was slightly longer in the EPO group (59 vs. 55 days; $p = 0.0001$). The mean cumulative dose (SD) was 312,723 (255,432) Units for EPO and 1174 (833) mcg for DARB, resulting in a dose ratio of 266:1 (Units EPO : mcg DARB). Based on these doses, WAC-based ESA cost was 28% less for EPO than for DARB (EPO $3915; DARB $5434; $p < 0.0001$). A sensitivity analysis using January 2008 average sales price +6% also indicated lower cost for EPO (EPO $2803; DARB $3396; $p < .0001$). This finding was also maintained after adjusting for age, gender, treatment duration, payer type, type of malignancies, cancer treatments, and severity indicators, (adjusted cost difference: $1788, $p < 0.0001$). **CONCLUSION:** This observational study of 6675 cancer patients reported a dose ratio of 266:1 which resulted in a 28% lower drug cost in the EPO group compared to the DARB group. These findings provide greater understanding of current real-world ESA utilization in the managed care setting.

PCN90

EFFECT OF THE HUNGARIAN ORGANIZED NATIONWIDE CERVICAL CANCER SCREENING PROGRAMME ON THE COVERAGE OF WOMEN UNDER THE AGE OF 25 YEARS

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OBJECTIVE: Organized nationwide screening programme for cervical cancer was introduced in Hungary in 2003. The aim of this study is to analyze the three year screening rate (coverage) of the organized cervical cancer screening programme in women aged less than 25 years. Although women under 25 years are out of the scope of the organized screening programme, but opportunistic screening may be applied. **METHODS:** The data derive from the financial database of the National Health Insurance Fund Administration (OEP) of Hungary covering the period of 2000–2002 (without organized screening) and 2003–2005 (with organized screening). We calculated the three-year screening rate for 2003–2005 according to the age-group of women less than 25 years (15–19 and 20–24). Screening is defined with cytological examination of Papanicolau smear and includes all smears taken either within or outside of the organized programme. **RESULTS:** The three-year screening rate of women aged 25–64 years was 52.65 % in 2003–2005. The coverage of women under 25 years was the following in 2003–2005: 15–19 years: 31.94 %; 20–24 years: 61.20 %. Comparing this values to the coverage of 2000–2002 (without organized screening) we found a decreasing tendency in these two age-groups: 15–19 years: –0.06 percent point decrease (non-significant), 20–24 years: –6.28 percent point decrease ($p < 0.01$). **CONCLUSION:** We found that coverage of women aged 20–24 being out of the scope of the organized cervical cancer screening programme is higher (61.2 %) than the average of target age group of 25–64 years (52.65). Despite of this finding, the coverage of women 15–19 and 20–24

showed a decreasing tendency following the introduction of organized screening programme.

PCN91

A PREVALENCE-BASED ECONOMIC ANALYSIS OF THE GROWTH IN CANCER TREATMENT SPENDING IN THE UNITED STATES

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OBJECTIVE: The cost of illness due to cancer is substantial in terms of both human suffering and economic resources. The growth in cancer treatment spending in the United States is due in large part to increases in survival and cancer prevalence. The objective of this study is to analyze the growth in spending on direct medical costs for cancer treatment using a prevalence-based cost-of-illness approach. Direct costs include personal health care expenditures for hospital and nursing home care, physician and other professional services, drugs, and home care. **METHODS:** Estimates for cancer prevalence counts in the year 2004 were derived by applying U.S. Census population data to National Cancer Institute Surveillance Epidemiology and End Results (SEER 9) and historical Connecticut Limited Duration Prevalence proportions. Cancer treatment cost estimates were based on Centers for Medicare & Medicaid Services projections for total 2005 health expenditures by type of direct costs, and the National Center for Health Statistic's methodology for calculating direct costs for major diagnostic groups. Cancer treatment spending and national health care expenditure values were adjusted to year 2005 dollars using the Consumer Price Index—All Urban Consumers. **RESULTS:** From 1985 to 2004, inflation adjusted per-capita national health care expenditures increased 70%, while inflation adjusted cancer treatment spending per prevalent case increased 16%. In 2004, cancer spending per prevalent case ($6862) was on par with per-capita total health care spending ($6492). **CONCLUSION:** Per-capita health care spending has increased significantly over the past two decades in comparison to cancer spending per prevalent case. Prevalence-based costing acknowledges that the direct costs of cancer care in any given year are attributable to new and previously diagnosed cancer patients. Our analysis underscores the importance of evaluating spending on cancer care in the context of overall health care spending, cancer survival rates, and disease prevalence.

PCN92

THE WAR ON CANCER: AN ECONOMIC EVALUATION OF RECENT GAINS IN CANCER SURVIVAL

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OBJECTIVE: Cancer continues to be a leading cause of death, but the last few decades have seen many changes in the diagnosis and treatment of the disease. In this study, we estimate the economic value of gains in cancer survival over the last 20 years, separate these gains into the portions due to improvements in treatment and detection, and determine the extent to which the economic value of gains in cancer survival have been divided between patients and firms. **METHODS:** Using methodology developed by Philipson and Jena (2005), we estimated the economic value of gains in cancer survival between 1990 and 2000. We then used estimates from the literature to calculate expenditures on cancer treatment, thereby allowing us to determine how the social value of gains in cancer treatment has been divided between patients and firms. **RESULTS:** The value of survival gains for all cancers combined was worth roughly $28,000–$30,000 per cancer patient, and most (78–88%) of this gain has been driven by improvements in treatment. For all cancers combined, improvements in cancer survival between 1990 and 2000 had a social value of roughly $1.6–$1.9 trillion, and health care providers were able to appropriate 6–19% of this total, with the rest accruing to patients. **CONCLUSION:** The social value of recent gains in cancer survival is very large. Most of this gain has been driven by improvements in cancer treatment, and has been appropriated by patients, not health care providers.

PCN93

THREE SCIENTIFIC PARADIGMS IN HEALTH TECHNOLOGY ASSESSMENT: EXPERIENCES OF THE COMMITTEE TO EVALUATE DRUGS IN ONTARIO, CANADA

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OBJECTIVE: To describe how decision making in the Cancer Subcommittee of the Ontario Committee to Evaluate Drugs (responsible for deciding which novel and costly cancer drugs will be funded in Ontario) is evolving along three scientific paradigms. **METHODS:** We describe how these paradigms shape both criteria and process of decision making. We also systematically reviewed meeting transcripts to analyze decisions made in 2006. **RESULTS:** Evidence Based Medicine (I) is part of decision making through rigorous evidence reviews and the implicit rule that drugs must pass the threshold of effectiveness to be funded. Although drugs must pass one evidence threshold to be licenced in Canada, higher standards are required for reimbursement (e.g. phase III controlled trial data, peer reviewed publication). Health economic criteria (II) are assuming greater weight in decision making, as the review process is standardized, committee members become more economically literate, and a cancer pharmacoeconomics unit is established. The process of decision making (versus decision criteria) is evolving using the ethical foundations of Accountability for Reasonableness (III), important tenets of which are transparency, accountability, and stakeholder involvement in the decision process. Review of the 2006 decisions showed that 16 of 37 drugs were funded (43%). Among negative funding decisions 86% were characterized by inadequate evidence (main reason in 43%), 71% were characterized by cost effectiveness concerns (main reason in 15%), and 5% by ethical concerns (main reason in 5%). Forty-eight percent of decisions were multifactorial. **CONCLUSION:** Each paradigm used to make cancer drug funding decisions comes from a distinct intellectual tradition. Most decisions in 2006 were based on more than one paradigm. We believe that optimal decision making for cancer drugs involves integrating concepts from all traditions, involving both distinct decision criteria and decision processes. Integration requires judicious tradeoffs between both efficiency and equity, and evidence quality and efficiency/equity.

PCN94

PREDICTORS OF TREATMENT CHOICE IN HIGH RISK AND METASTATIC MELANOMA: EVIDENCE FROM LINKED ELECTRONIC MEDICAL RECORDS AND ADMINISTRATIVE CLAIMS DATA

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OBJECTIVE: Evaluate predictors of four major therapeutic choices (surgery, radiation, chemotherapy, immunotherapy) in

high-risk (stage IIB/C, III) and metastatic (stage IV) melanoma. **METHODS:** Data were acquired from Convergence CT, a company that links longitudinal electronic medical records and claims data from large physician practices, clinics, ambulatory centers, and hospitals in the US. Subjects with ≥1 diagnosis of malignant melanoma (ICD-9 172.xx, 173.xx, V10.82) from July 1, 2003 November 30, 2006 and pathology-confirmed disease stage of IIB/C, III, or IV were selected. Additional stage IV patients were identified based on evidence of a subsequent ICD-9 code (197.xx, 198.xx) for secondary metastases. Post-diagnosis prevalence of the key treatments was analyzed descriptively. Logistic regression was used to assess predictors of therapeutic choice. **RESULTS:** A total of 268 subjects were identified. Stage distribution was: IIB/C (18%); III (21%); IV (61%). 58% were ≥65 years of age and 62% were male. Surgery was the predominant treatment in stage IIB/C and III (received by >80% of subjects), but was seen in only 38% of stage IV patients. Across all stages, radiation, chemotherapy, and immunotherapy were less common (23%, 27%, and 10%, respectively). Being elderly [odds ratio = 2.19; 95% CI = (1.10–4.35)] and having stage IV disease [7.31 (2.38–22.39)] was associated with a significantly increased likelihood of receiving no active treatment. Older age (65+), higher co-comorbidity burden, and having stage IV disease were associated with a decreased probability of surgery [0.55 (0.30–0.99), 0.92 (0.86–0.99), 0.08 (0.03–0.22), respectively]. Receiving radiation was reduced by older age, but increased by having stage IV disease [2.38 (0.91–6.22)]. Significant predictors of chemotherapy were stage IV disease [2.65 (1.01–6.93)] and higher co-morbidity burden [1.08 (1.01–1.17)]. Finally, increasing age substantially reduced the likelihood of receiving immunotherapy [0.24 (0.10–0.60)]. **CONCLUSION:** Factors influencing practice patterns and treatment choice in a population with high risk or metastatic melanoma. Across therapeutic choices, age and disease stage were the significant predictors.

PCN95

CHANGE IN THE USE OF BREAST CONSERVING SURGERY BEFORE AND AFTER GUIDELINE PUBLICATION IN JAPAN

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OBJECTIVE: Using 12 years of administrative data, we assessed the trends in the use of breast conserving surgery (BCS) before and after the release of clinical guidelines on BCS in Japan (published in 1999 and updated in 2005.) **METHODS:** We used a database from the Quality Improvement/Indicator Project that involved 40 teaching hospitals in Japan. Data on all discharged cases were collected from these hospitals from 1995. We then selected female operable breast cancer patients who were admitted to five of these hospitals from January 1996 through September 2007 (n = 1971). A multiple regression analysis was performed to examine whether the proportion of the use of BCS after publication of guidelines was higher than that before publication, after adjusted for the effects of patient's age, comorbidity status (Charlson Comorbidity Index), hospital, and time period of admission. The Hosmer-Lemeshow test was conducted to assess the goodness-of-fit of the model. **RESULTS:** The proportion of BCS use increased from 16.1% in 1996 to 62.2% in 2007. Multiple logistic regression analysis revealed that patients who were <50 years old ($P < 0.001$) and had no comorbidity ($P < 0.001$) were significantly more likely to receive BCS. The proportion of BCS use has been substantially higher since 2001, two years after the BCS guidelines were published in Japan. Significant practice variations of BCS use were also confirmed among hospitals. **CONCLUSION:** This study confirmed the lag time between guideline publication and change in practice of BCS use. We further need to examine the potential barriers to guideline adoption related to physicians' knowledge and attitudes as well as external barriers including patient-, guideline-, and environment-related factors, to explain the reasons of change in the use of BCS over ten years.

PCN96

REAL WORLD TREATMENT PATTERNS IN HIGH RISK OR METASTATIC MELANOMA: EVIDENCE FROM THE SEER-MEDICARE LINKED DATABASE

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OBJECTIVE: To document real-world treatment patterns in elderly patients with high-risk (stage IIB/C, IIIA/B, IIIC) or metastatic (stage IV) melanoma. **METHODS:** Data was taken from the Surveillance, Epidemiology, and End Results (SEER)-Medicare linked database combining clinical information on incident cancer cases in the US between 1991 and 2002 with longitudinal (1991–2005) Medicare claims. Subjects ≥65 years with ≥1 stage IIB or higher melanoma diagnosis and ≥6 months of subsequent benefits coverage were selected. We documented utilization patterns of four major therapies (surgery, radiation, chemotherapy, immunotherapy) following the diagnosis. **RESULTS:** A total of 6470 subjects met all criteria. Stage distribution was: IIB/C (38%); IIIA/B (46%); IIIC (1%); IV (15%). Median follow-up was 56, 39, 16, and 6 months, respectively. Surgery (primarily tumor excision) was the predominant 1st line treatment, received by >85% of subjects with stage IIB/C, IIIA/B, or IIIC melanoma and 60% of stage IV cases, but was a rare 2nd line approach. Radiation was 1st line treatment in only 2%, 5%, and 13% of stage IIB/C, IIIA/B, and IIIC cases, respectively, but was more common as a 2nd line approach in these subjects (15%, 24%, and 41%, respectively). Radiation was equally prevalent (~30% of cases) as 1st or 2nd line treatment in stage IV. Chemotherapy was uncommon as 1st line treatment (<4% of all cases), but prevalent as 2nd line therapy (by respective stage, 14%, 20%, 41%, and 22% of cases). Immunotherapy was rare, except as 2nd line treatment in stage IIIC (26% of cases). **CONCLUSION:** Beyond surgery as a 1st line approach, relatively few patients received other types of treatment as either 1st or 2nd line therapy. These findings demonstrate an unmet need in high risk and metastatic melanoma. Additional analyses of administrative data characterizing real-world treatment patterns in melanoma are needed to help inform the direction of future clinical trials.

GASTROINTESTINAL DISORDERS— Clinical Outcomes Studies

PGI1

HETEROGENEITY ACROSS RANDOMIZED CONTROLLED TRIALS OF PROTON-PUMP INHIBITORS IN NIGHTTIME GERD: A SYSTEMATIC REVIEW

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OBJECTIVE: Numerous randomized controlled trials (RCTs) have evaluated efficacy of proton-pump inhibitors (PPIs) in controlling nighttime symptoms of gastroesophageal reflux disease (GERD). Quantitative synthesis of the effect of PPIs on nighttime symptoms is lacking, thus the validity of performing a meta-analysis was assessed. **METHODS:** MEDLINE and EMBASE

databases from 1990–June 2007 were systematically searched for RCTs evaluating the efficacy of PPIs on nighttime symptoms in adults with GERD. Methodological and clinical homogeneity across studies was explored. Methodological diversity or differences in study quality evaluated by Jadad score (ranging from 1 = low to 5 = high) and clinical diversity in nighttime criteria used for patient enrollment, nighttime outcomes measured, and the nighttime definition used were explored. **RESULTS:** Thirty-two RCTs compared the efficacy of PPI with placebo only (n = 7), H2-receptor antagonist only (n = 12), another PPI only (n = 11) or both placebo and H2-receptor antagonist (n = 2) in controlling nighttime GERD. The majority of studies (n = 28) were of high methodological quality (Jadad score of at least 3 points). Source of data collection was patient daily diaries across all studies. Criteria for enrolling nighttime GERD patients (frequency and/or severity of nighttime symptoms) lacked consistency. Nighttime heartburn measures varied from percentage of patients without heartburn (n = 18), percentage of heartburn-free nights (n = 15), heartburn severity score (n = 11) or time to heartburn relief (n = 6). Most studies assessed efficacy at eight weeks or less; only three studies measured the long-term efficacy of PPI. However, very few nighttime heartburn measures assessed the same timeframe. The time window for the nighttime symptom assessment was reported in only three studies and was not based on specific hours but on sleep/posture (retiring/lying down to sleep). **CONCLUSION:** RCTs of PPI therapy in nighttime GERD are of high methodological quality. However, presence of clinical heterogeneity across trials in enrollment criteria, outcomes, and timeframes minimizes the possibility of performing meta-analysis.

PGI2

HOSPITALIZATIONS FOR GASTROINTESTINAL EVENTS AMONG USERS OF COX 2 INHIBITORS COMPARED WITH TRADITIONAL NON-STEROIDAL ANTI-INFLAMMATORY DRUGS WITH PROTON-PUMP INHIBITORS

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OBJECTIVE: To compare the rate of hospitalizations for serious upper and lower GI events in patients with increased GI risk taking a Traditional NSAID (tNSAID)+Proton Pump Inhibitor (PPI) or a COX-2 selective inhibitor (Coxib), chronic and acute. **METHODS:** From the PHARMO Record Linkage System, including among others linked drug-dispensing and hospital records of approximately three million individuals in The Netherlands, we selected new users of Coxibs or tNSAIDs between January 1, 2000 and December 31, 2004. Eligible patients had ≥1 year history before the 1st NSAID dispensing and ≥1 year follow-up which ended at first hospitalization for serious GI event (the outcome), the last dispensing, or the end of the study period. Chronic users were defined as patients who used any NSAIDs for ≥60 days during the first year of follow-up (n = 58770); other NSAID users were acute users (n = 538.420). Multivariate analysis by Poisson regression adjusted for sex, age, duration of follow-up, tNSAID and coxib dose, adherence to NSAIDs or PPIs, gastroprotection, anticoagulants, acetaminophen, corticosteroids, and cardiovascular disease. **RESULTS:** The cohort included 52,953 new tNSAIDs+PPI users and 80,756 new Coxib users, with main characteristics: mean (±SD) age 58.1 ± 15.5 vs. 56.7 ± 17.5; female 55.3% vs. 62.2%; mean duration of treatment (days): 137 ± 217 vs. 138 ± 179, respectively. Among acute users, adjusted hazard ratios (95% Confidence Interval) of hospitalizations were 0.21 (0.14–0.32) for upper and 0.26 (0.16–0.42) for lower GI events, for Coxib versus tNSAIDs+PPI users. Among chronic users, adjusted hazard ratios were 0.35 (0.22–0.55) for upper GI and 0.43 (0.25–0.75) for lower GI events, for Coxib versus tNSAIDs+PPI users. **CONCLUSION:** Acute and chronic Coxib users had a statistically significantly lower rate of hospitalizations for upper and lower GI events compared to tNSAIDS+PPI users. Future research is needed to explain these findings, possibly due to prescribing for non-preventive reasons.

GASTROINTESTINAL DISORDERS—Cost Studies

PGI3

COST OF PATIENT CARE IN PATIENTS WITH ULCERATIVE COLITIS IN BRAZIL: PUBLIC HEALTH PERSPECTIVE

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OBJECTIVE: Ulcerative colitis (UC) is a chronic condition that afflicts young adults in their economically productive years. Because of its long duration, UC causes high use of health services and high lifetime costs for medical care. The aim of this study was to measure the annual costs of patients with UC from the Brazilian public heath perspective and to identify potentially relevant determinants of costs. **METHODS:** Thirty-one gastroenterologists from southeast Brazil prospectively evaluated all their UC patients during two months. They used a structured questionnaire specifically developed to evaluate resource use by patients with ulcerative colitis. Costs of medical services (diagnostics and treatment) were considered as well as costs of medication. Resource use was valued using government reimbursement for hospital services and government tender prices drugs. **RESULTS:** A total of 175 patients were evaluated. The mean annual cost of one CD patient was R$1945.06, including medication, physician, laboratory, diagnostic, hospitalization and surgery costs. Medication, hospitalization, surgery and diagnostic procedures accounted respectively for 95%, 3%, 1%, and 1% of the total annual costs. Mesalazine was the most used drug to initiate UC's treatment (58%). There was no statistical difference between the costs of the patients treated with mesalazine and sulfasalazine. Due to differences in the mean dosage of theses drugs, mesalazine daily cost is lower than sulfasalazine. **CONCLUSION:** This is the first time that UC treatment costs have been demonstrated from the Brazilian public health perspective. Although mesalazine is deemed to be more expensive than sulfasalazine and considering that there was no statistical difference in total costs among patients taking mesalazine and sulfasalazine, and that medications represent more than 90% of total UC treatment annual costs in the public Brazilian health care system, the use of mesalazine may represent a reduction factor in the financial resource expenditure for the treatment of UC.

PGI4

A BRAZILIAN CROSS SECTIONAL STUDY TO EVALUATE HOSPITALIZATION AMONG MODERATE AND SEVERE CROHN'S DISEASE PATIENTS

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OBJECTIVE: Infliximab improves patient quality of life and is effective to control Crohn's disease refractory to the standard treatment. It lacks real world Brazilian data demonstrating that this improvement in quality of life and disease control is related to decrease of resource use mainly due to hospitalization reduction in moderate and severe Crohn disease patients receiving

infliximab. **METHODS:** Thirty one gastroenterologists from southeast Brazil prospectively evaluated all their Crohn's disease patients during two months. They used a structured questionnaire specifically developed to evaluate resource use by patients with Crohn's disease. **RESULTS:** A total of 118 patients with moderate and severe disease were evaluated during 2 months. The patients average age was 30 years and the mean body weight was 62 kg. Fourteen patients were using infliximab. The comparison among infliximab patients and standard care patients showed that 60.6% of the standard care patients needed hospitalization and only 21.4% of the infliximab patients needed hospitalization ($p = 0.005$). The main reason for hospitalization among the standard care patients was due to anal fistula, and among the infliximab patients, was due to anemia/hemorrhage. **CONCLUSION:** The use of infliximab in the management of moderate and severe Crohn's disease can be contributive to reduction of the need of hospitalization among these patients.

PGI5

COST-EFFECTIVENESS OF NATALIZUMAB IN CROHN'S DISEASE PATIENTS WHO HAVE FAILED ANTI-TNF ALPHA THERAPY

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OBJECTIVE: To compare the cost-effectiveness (CE) of natalizumab (NAT) to FDA-approved tumor-necrosis factor alpha inhibitors (anti-TNFα) in Crohn's disease (CD). **METHODS:** Decision analysis was used to model treatment for patients with moderate-to-severe CD (Crohn's Disease Activity Index scores ≥220 and <450). Patients are assumed to have failed treatment with corticosteroids, immunomodulators, and anti-TNFα therapy. The model includes an induction phase followed by a two year maintenance phase comparing NAT 300 mg, infliximab (INF) 5 mg/kg or 10 mg/kg, and adalimumab (ADA) 40 mg every other week or weekly. At the end of induction and each of the four six-month maintenance cycles, patients enter one of three efficacy states (remission, response, nonresponse) that are estimated from phase III clinical studies and NAT clinical data. Total costs associated with each comparator agent are composed of pharmacy and medical costs derived from published price lists and analyses of CD claims from a database assembled by Health Benchmarks International. Drug costs for INF and ADA were weighted by dose based upon the distribution observed in published phase IV studies. **RESULTS:** Over the two year maintenance period, NAT patients on average were estimated to be in remission for 0.41 years versus 0.22 and 0.26 for those receiving INF and ADA, respectively. Average total costs over induction and maintenance were predicted to be $62,377 (NAT), $55,195 (INF), and $56,654 (ADA). NAT was associated with 13% and 10% increases in total cost compared to INF and ADA, but resulted in 86% and 57% increases in remission duration over the comparators, respectively. The CE ratio for NAT relative to ADA and INF remained insensitive to increases in NAT-related costs (up to $36,000) or decreases in NAT efficacy (up to –25%). **CONCLUSION:** This model, based on estimates from the available published literature, projected NAT to be the most cost-effective treatment alternative for patients who had failed prior anti-TNFα therapy.

PGI6

COST-EFFECTIVENESS RECOMBINANT FACTOR VIIA USE IN ORTHOTOPIC LIVER TRANSPLANT

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OBJECTIVE: Recombinant factor VIIa, an expensive coagulation factor, was previously utilized pre-operatively at UC San Diego Medical Center (UCSDMC) to reduce blood loss during Orthotopic Liver Transplant (OLT). Recent large randomized, controlled clinical trials have demonstrated a lack of efficacy and a potential risk of thromboembolic complications. As a result, use of recombinant factor VIIa for bleeding prophylaxis in OLT was discouraged due to compromised cost-effectiveness. This change in practice warranted validation through pharmacoeconomic outcomes research. **METHODS:** A single-center, retrospective review was performed to determine if the change in UCSDMC OLT guidelines resulted in negative outcomes. The primary outcome measure was the volume of blood products required during OLT. Secondary outcomes included total cost of care, operating room time, LOS, and thromboembolic events. **RESULTS:** 119 liver transplant recipients were included in the analysis. There was no significant difference in the primary outcome of blood product requirement. Patients receiving factor VIIa failed to demonstrate any statistically significant reduction in need for PRBC 13.8 vs 13.4 units ($p = 0.9$), FFP 11.3 vs 15.6 ($p = 0.2$), or PLT 4 vs 6.6 ($p = 0.08$) when compared to controls. The secondary outcome measurements also failed to reach statistical significance, including LOS 23 vs 15 days ($p = 0.17$), blood costs ($p = 0.92$), surgical costs ($p = 0.69$), and total cost of care ($p = 0.15$). Two patients developed hepatic artery thrombosis in the treatment group compared to one patient in the control group. As measured by the Scientific Registry of Transplant Recipients (SRTR), no significant changes in liver transplant patient or graft survival were noted. An 83% reduction average recombinant factor VIIa use during OLT has been demonstrated, resulting in annual savings of $170 K. **CONCLUSION:** Recombinant factor VIIa use for reduction of blood product requirements in OLT has not been demonstrated to be cost-effective and may be associated with a risk of thromboembolic events.

PGI7

COST EFFECTIVENESS ANALYSIS OF HELICOBACTER PYLORI SCREENING IN PREVENTION OF GASTRIC CANCER IN CHINESE

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OBJECTIVE: Associated with no screening, H. pylori serology screening, and the ^{13}C-Urea breath test (UBT) for gastric cancer in Chinese. **METHODS:** A Markov model simulation was carried out in Singaporean Chinese at age of 40 years ($n = 478,500$) from the perspective of public health care providers. The main outcome measures were costs, number of gastric cancer cases prevented, life years saved, quality-adjusted life-years (QALYs) gained from the screening age to death, and incremental cost-effectiveness ratios (ICERs), which were compared among the three strategies. The uncertainty surrounding ICERs was addressed by scenario analyses and probabilistic sensitivity analysis using Monte Carlo simulation. **RESULTS:** The ICER of serology screening versus no screening was $25,881 per QALY gained (95% confidence interval (95% CI): $5700 to $120,000). The ICER of UBT versus no screening was $53,602 per QALY gained (95% CI: $16,000 to $230,000). ICER of UBT versus serology screening was $470,000 per QALY gained, for which almost all random samples of the ICERs distributed above

$50,000 per QALY. **CONCLUSION:** It cannot be confidently concluded that either H. pylori screening was a cost-effective strategy compared to no screening in all Chinese at age of 40 years. Nevertheless, serology screening has demonstrated much more potentiality to be a cost-effective strategy, especially in the population with higher gastric cancer prevalence.

WITHDRAWN **PGI8**

PGI9

DEVELOPMENT OF A CLAIMS-BASED MARKOV MODEL FOR CROHN'S DISEASE

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OBJECTIVE: To develop a claims-based Markov model for Crohn's disease (CD) based on the American College of Gastroenterology (ACG) criteria. **METHODS:** A Markov model was developed using disease states as defined by ACG CD practice guidelines. The study sample consisted of unique individuals ≥18 years old from the Medstat Marketscan databases (Medicare and Commercial) with ≥3 years of continuous enrollment from 2000–2005, and with an ICD-9 diagnosis code of 555.xx. Patients were classified as severe-fulminant, moderate-severe, mild-moderate, or remission based on the ACG criteria. Patient exposure was divided into six month intervals, starting on first day of exposure. For each interval, disease state was defined according to the most severe disease activity. Transition probabilities between disease states were calculated based on movement from one six month period to the next. Costs of disease states were calculated using mean per member per month (PMPM) medical claim costs, and the model was run separately for males and females due to differences in life expectancy, assuming 30 years old at start. Quality-adjusted life year (QALY) estimates were obtained from the literature. **RESULTS:** There were 23,419 unique individuals, with 198,497 eligible 6-month intervals. The distribution of disease states were: remission (99,584; 50.2%), mild-moderate (24,788; 12.5%), moderate-severe (56,686; 28.6%), severe-fulminant (17,439; 8.8%). Model results for both males and females showed that, as disease severity increased, cost per QALY also increased. Cost per QALY for mild-moderate disease in males was $4,310 whereas for severe-fulminant disease, it was $68,538. Results were similar for females ($4,311 vs. $68,643). **CONCLUSION:** Results of this model indicate that cost of CD increases as disease severity increases. In addition, although less time is spent in the severe disease state, the cost per QALY was high, suggesting that therapies that can keep patients in other disease states may prove to be beneficial.

PGI10

DOES THE DOSING FREQUENCY OF PROTON PUMP INHIBITORS (PPIS) AFFECT SUBSEQUENT RESOURCE UTILIZATION AND COSTS AMONG PATIENTS DIAGNOSED WITH GASTROESOPHAGEAL REFLUX DISEASE (GERD)?

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OBJECTIVE: To assess utilization and costs of health care services for patients diagnosed with gastroesophageal reflux disease (GERD) that were dispensed once (QD) vs. twice (BID) daily PPIs. **METHODS:** Employing Thomson's MarketScan Database, GERD patients 18+ years of age with 1+ PPI dispensed, but had no esophagitis or Barrett's esophagus diagnosed during 2003–2004 were selected. The date of the first observed PPI was considered as the index date. Frequency of PPI dosing (QD vs. BID) was assessed from pharmacy claims. Differences in total and GERD-related costs by cohort for the 12-month period following the index date were assessed using multivariate regression, adjusting for demographic and clinical characteristics (age, gender, region, Charlson comorbidity score [CCS], pre-index diagnosis of esophageal stricture or hemorrhage [ESH], and pre-index use of PPIs). **RESULTS:** A total of 219,365 GERD patients on QD PPI therapy and 23,011 patients on BID PPI therapy were identified. The cohorts were similar in age, but the QD cohort had a larger proportion of males (41% vs. 37%, $p < 0.01$). Mean CCS was higher in the BID cohort (1.2 vs. 1.0, $p < 0.01$). A higher proportion of BID patients had pre-index ESH diagnosed (4% vs.3%, $p < 0.01$) and PPI's dispensed (58% vs. 47%, $p < 0.01$). In the 12-month follow up period, the mean number of office visits was higher among BID patients (14.5 vs. 12.4, $p < 0.01$). Total health care payments were about $2900 higher for BID patients ($11,102 vs. $8,169, $p < 0.01$), 55% of which were payments for services. GERD-related costs were about $750 higher for BID patients ($1941 vs. $1187, $p < 0.01$). On an adjusted basis, total and GERD-related payments were approximately $1500 and $450 higher among the BID cohort. **CONCLUSION:** Findings indicate that patients diagnosed with GERD who receive BID PPI therapy incur more and GERD-related health care resource utilization and plan payments relative to those on QD therapy.

PGI11

DIRECT COST SIMILARITIES BY POINT OF SERVICE FOR PERSONS WITH CONSTIPATION OR IRRITABLE BOWEL SYNDROME PLUS CONSTIPATION IN THE SIX MONTHS BEFORE AND AFTER DIAGNOSIS: AN EMPLOYER PERSPECTIVE

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OBJECTIVE: Both constipation (C) and irritable bowel syndrome plus C (IBS+C) are known to be very costly. However, it is unknown whether the costs of C are driven by the same factors that drive the costs of IBS+C. We aimed to assess the cost of illness (COI) for C without and with IBS (IBS+C) by point of service. **METHODS:** A retrospective analysis was conducted using multiple US-based employers' health claims data from 2001–2005. Data included medical, pharmacy, payroll, and demographics. ICD-9 Codes were used to include employees in the C cohort: 564.0 (Constipation), 564.00 (Unspecified), 564.01 (Slow Transit), and 564.09 (Other). Employees with C and an ICD-9 for IBS (564.1x) at any time were included in the IBS+C cohort. Propensity-scores based on demographics, job-related variables, region, existence of medical claims, and Charlson Comorbidity Index Score were used to match five C to each IBS+C cohort employee. For both cohorts, the index date was the date of the first claim for the condition. Per member per month (PMPM) costs (adjusted to 2006 US$) were compared for each category based on claims from: doctor's office, inpatient hospital, outpatient hospital/clinic, emergency department (ED), laboratory, other locations, and pharmacy. Costs were compared between groups before diagnosis, after diagnosis, and change (before–after). **RESULTS:** Data were available for 203 persons with IBS+C and 1015 propensity-score-matched C subjects.

Between group comparisons (before, after, and change) were all non-significant except for Rx drugs ($19 higher for IBS+C, $P < 0.05$) and other ($8 higher for C, $P < 0.05$) in the after period as well as the change for Rx drugs ($16 higher for IBS+C, $P < 0.05$). Within groups, costs for Rx Drugs significantly increased in both cohorts and outpatient and ED significantly increased for the C cohort. **CONCLUSION:** Patients with constipation and IBS+C incur similar costs throughout the health care system.

PGI12

HEALTH CARE COSTS RELATED TO THE TREATMENT OF CROHN'S DISEASE

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OBJECTIVE: To estimate differences in health care costs between Crohn's disease (CD) patients and controls and to examine differences in CD costs by prescription therapy. **METHODS:** Administrative claims data from geographically diverse private US health plans with service dates between January 1, 2002 and December 31, 2005 were utilized. CD patients (ICD-9-CM code 555.x) were identified and matched to controls in a 1:5 ratio on age, gender, health plan, and duration of enrollment. Two part models (logistic regression for likelihood to incur any costs and log-transformed regression for costs) were used to estimate costs (amounts paid by health plans for medical services and pharmaceuticals), controlling for socio-demographic characteristics and medical co-morbidities. CD patients were grouped by drug regimen as follows: steroids, immunosuppressants, infliximab, any combination of the three drug classes, and no regimen or regimens not including the three studied drug classes. Average per patient per day medical and pharmaceutical cost was estimated for each group and projected annually. **RESULTS:** A total of 9,302 CD patients and 46,510 matched controls were identified. The mean age in each group was 46.9 and 55.8% were females. Annual total predicted costs per patient were over 3 times higher in the CD group ($11,569) than the control group ($3,564, $p < 0.01$). Medical and pharmacy costs were the lowest in the group receiving no regimen/regimens not including studied classes. Medical costs were at least 50% higher in patients receiving combination therapy that included steroids than those receiving combinations not including steroids. **CONCLUSION:** CD patients incur significantly greater costs than matched controls. CD patients on no regimen/regimens not studied incur few costs suggesting that they may be experiencing remission or mild symptoms. Steroids are associated with significantly higher medical costs, which may be suggestive of uncontrolled symptoms or flares requiring medical resources.

PGI13

DIRECT ECONOMIC BURDEN OF CHRONIC HEPATITIS C VIRUS IN A LARGE MANAGED CARE POPULATION

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OBJECTIVE: Hepatitis C virus (HCV) is one of the most common blood-borne infections in the US. The cost burden of HCV to third party payers has not been widely investigated using administrative data. We analyzed retrospective insurance claims to estimate total, all-cause resource utilization and costs among managed care enrollees with chronic HCV compared to similar subjects without HCV. **METHODS:** A large US claims database was analyzed from January 1, 2002 through December 31, 2006. Inclusion criteria were: ≥1 diagnosis of chronic HCV (ICD-9 070.44, 070.54, 070.70, or 070.71); no evidence of hepatitis B; ≥12 months of continuous plan enrollment post-diagnosis. Per patient use and costs of all medical services and prescription drugs utilized over a 12-month period post-diagnosis were evaluated. Outcomes were also assessed in controls without HCV matched (1:1) on age, gender, and length of plan enrollment. **RESULTS:** A total of 20,662 patients met all inclusion criteria. Mean age was 49 years and 61% were male. Total costs were $20,830 per HCV patient, compared to $4673 per control ($P < 0.0001$). Hospitalization was seen in 24% of HCV patients compared to 7% of controls ($P < 0.0001$), with mean inpatient costs of $5765 and $1031 per patient, respectively ($P < 0.0001$). Patients with HCV had significantly higher ($P < 0.0001$) prescription costs compared to controls ($6178 vs. $1097), as well as increased use and costs of other medical services, including office visits (23 vs. 11 visits; $2112 vs. $1036), other ancillary services ($4800 vs. $1301), emergency care (32% vs. 14% with ≥1 admission; $387 vs. $114), and laboratory tests ($741 vs. $110). **CONCLUSION:** Costs incurred by payers for patients with HCV are more than four times the costs attributable to individuals without HCV. Pharmacy and inpatient services are drivers of these costs. Health plans should be aware of heightened costs for enrollees with HCV when considering formulary access for treatments.

PGI14

COST-EFFECTIVENESS OF PROTON PUMP INHIBITORS FOR PATIENTS WITH GASTROESOPHAGEAL REFLUX DISEASE: SHOULD EMERGING SAFETY CONCERNS AFFECT THERAPEUTIC DECISION-MAKING?

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OBJECTIVE: Studies have shown that continuous and on-demand use of proton pump inhibitors (PPI) are more efficacious and cost-effective strategies than continuous histamine-2 receptor antagonist (H2RA) use for maintenance therapy of gastroesophageal reflux disease (GERD). Recent research has raised questions about potential safety concerns of hip fractures and acute myocardial infarction (AMI) associated with long-term PPI use. This study integrates treatment efficacy with emerging safety data to compare the cost-effectiveness from the payer perspective of continuous PPI use, on-demand PPI use, and continuous H2RA use for maintenance therapy for GERD. **METHODS:** A Markov model was designed to simulate, over five years, the clinical and economic outcomes of GERD patients asymptomatic after initial acute treatment on maintenance therapy with PPIs or H2RA. The transition probabilities, costs, and utilities were derived from the peer-reviewed literature. Sensitivity analysis was conducted to examine the robustness of the model and to determine the thresholds at which safety issues may alter therapeutic decisions. **RESULTS:** In the base-case efficacy model, intermittent PPI treatment was the least costly and least effective strategy, whereas the step-down PPI strategy was most costly and most effective, with an incremental cost-effectiveness ratio (ICER) of $24,636 per quality-adjusted life-year (QALY), relative to the intermittent PPI strategy. The maintenance H2RA strategy was dominated throughout the sensitivity analysis. The results were consistent when hip fracture events were introduced into the model, with the step-down PPI strategy ICER increasing to $29,113/QALY. Threshold analysis for AMI showed the hypothesized relative risk (RR) would need to be 11.9 before maintenance H2RA therapy would be considered a cost-effective

alternative. **CONCLUSION:** Under all circumstances, strategies using PPIs are optimal for managing patients with GERD. Emerging concerns around hip fracture and AMI do not significantly affect the relative cost-effectiveness performance of alternative treatment strategies.

PGI15

ECONOMIC EVALUATION OF PROTON PUMP INHIBITORS, RELATIVE TO ALTERNATIVE GASTROINTESTINAL PROPHYLAXIS AGENTS, FOR PREVENTION OF GI COMPLICATIONS IN ELDERLY PATIENTS TAKING NON-SELECTIVE NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSNSAIDS)

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OBJECTIVE: To determine the cost-utility of PPIs, compared to alternative gastrointestinal prophylaxis, in the prevention of GI complications among elderly patients (age ≥ 65) taking nsNSAIDs. **METHODS:** A cost-utility analysis, from a third-party payer perspective, was conducted using a decision analytical model over a one year time horizon. We compared: nsNSAID alone, nsNSAID + PPI (omeprazole, 20 mg od), nsNSAID + ranitidine (150 mg bid), nsNSAID + ranitidine (300 mg bid), misoprostol (200 ug bid), and misoprostol (200 ug qid). Clinical inputs (including ulcer risk, bleeding complications, dyspepsia symptoms), costs, and utilities were derived from recently published studies. Probabilistic and deterministic sensitivity analyses were performed to test the robustness of the results. **RESULTS:** In elderly patients' aged ≥65 y, the incremental cost-utility ratio (ICUR) of PPIs, relative to nsNSAID alone, was $320,743 per Quality-adjusted life year (QALY) gained. Other treatment alternatives (ranitidine and misoprostol) were dominated. The ICUR of PPI, relative to nsNSAID alone, was $207,604 per QALY gained in patients aged >75 y. In patients taking concomitant low-dose aspirin, ICURs for PPI therapy were $190,943 and $117,944 per QALY gained in patients' aged ≥65 y and aged ≥75 y, respectively. In patients' aged ≥65 y with a history of a complicated or uncomplicated ulcer, ICURs of $25,662 and $45,688 were observed, respectively. **CONCLUSION:** Routine prescription of PPIs in all elderly patients (age ≥65 y) taking nsNSAIDs may not be warranted in a health care system with finite resources, as ICURs exceeded commonly cited thresholds in the range $50,000–$100,000 per QALY gained. However, co-prescribing PPIs among all elderly patients (age ≥65 y) taking nsNSAIDs and with a history of a complicated or uncomplicated ulcer may be considered good value for money, as ICURs are less than $50,000 per QALY gained.

GASTROINTESTINAL DISORDERS—
Patient-Reported Outcomes

PGI16

DISPARITIES IN MEDICATION UTILIZATION AND COMPLIANCE FOR GASTRO-ESOPHAGEAL REFLUX DISEASE: A POPULATION-BASED STUDY

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OBJECTIVE: Examine medication utilization for gastro-esophageal reflux disease (GERD) in a community-based setting. Assess disparities in types of medications used and frequency of use related to severity of symptoms, race, education, employment, and income. **METHODS:** A questionnaire based upon previous work (Srinivansin, J Clin Gastro) was developed to assess self-reported GERD prevalence and medication utilization and was translated into Chinese and Spanish. We worked with community and faith-based leaders to identify events for data collection. GERD prevalence and medication usage in four ethnic groups (White, Black, Asian, Hispanic) were compared, controlling for age, gender and other demographic variables. Descriptive and multivariate analyses were done using SAS 9.1. **RESULTS:** Of the 34.6% (307/1172) of respondents reporting at least weekly heartburn, 60.6% took over-the-counter medication, 56.4% took prescription (Rx) medication and 12.7% took no medications. Whites had a significantly higher rate of OTC utilization at 68.8%, followed by Hispanics, Blacks, and Asians at 61.1%, 60.2%, and 35.5%, respectively (P = 0.0127). Whites were the lowest utilizers of Rx medications compared to the other ethnicities. For those taking prescription Proton Pump Inhibitors (PPIs), (N = 131) 51.7% took them 5 to 7 times per week. Participants with at least weekly and daily heartburn were more likely to take PPIs 5–7 times per week (P = .0098 and P = 0.0056, respectively). Subjects with a diagnosis of GERD by a physician were more likely to take their prescription PPIs 5 to 7 times per week compared to those claiming no diagnosis, 60% v. 37.3%, respectively (P = 0.0111). **CONCLUSION:** We found significant variation in the use of OTC and RX medications for GERD by ethnicity. Only half of patients taking prescription PPIs took them 5–7 times per week. Future research should focus on improving communication of GERD diagnosis to patients and recommended use of prescription PPIs in the absence of a diagnosis for GERD.

PGI17

ADHERENCE TO INFLIXIMAB MAINTENANCE THERAPY AND ITS IMPACT ON HOSPITALIZATION OF PATIENTS WITH CROHN'S DISEASE

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OBJECTIVE: Several biologics, especially TNF antagonists, have been established as effective therapy for Crohn's disease (CD). Adherence to biologic therapy is thought to be important for optimal outcomes. This analysis retrospectively quantified the impact of non-adherence to infliximab maintenance therapy on medical service use by CD patients. **METHODS:** CD patients on infliximab maintenance therapy were identified from the Integrated Healthcare Information Services claims database (covering approximately 35 million managed care lives from January 1, 1999 to June 30, 2006) if they had ≥4 infliximab infusions (with intervals ≤12 weeks between the first four infusions) in the first year following infliximab initiation. Non-adherence was defined as total number of infliximab infusions <7 in the first year (the expected number is ≥8 if patients follow the labeled schedule). One-year medical service utilization and costs (excluding infliximab drug/administration costs) were analyzed. Descriptive statistics and multivariate regressions adjusted for confounders were performed. **RESULTS:** A total of 647 CD patients were identified. The 1-year non-adherence rate was 35.9%. Descriptive statistics demonstrated that non-adherent patients were more frequently hospitalized, and incurred greater 1-year costs for hospitalization and total medical services (p = 0.05 for all comparisons). Adjusted multivariate regression analyses demonstrated that, compared with adherent patients, non-adherent patients had greater risks of hospitalization (odds ratios were 2.3 for CD-related; 2.5 for all-cause, both p < 0.001); and

incurred greater costs for hospitalization (additional $7767 for CD-related, $9417 for all-cause; both $p = 0.001$), outpatient visits (additional $1025 for CD-related, $p < 0.001$; $1307 for all-cause, $p = 0.003$), and total medical services (additional $5236 for CD-related and $6953 for all-cause, both $p < 0.001$). **CONCLUSION:** More than one-third of the CD patients on infliximab maintenance therapy in the cohort were non-adherent to therapy within 1 year. Non-adherence was associated with greater medical service utilization and costs.

PGI18

LINGUISTIC VALIDATION OF THE INFLAMMATORY BOWEL DISEASE QUESTIONNAIRE (IBDQ) IN 35 LANGUAGES

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OBJECTIVE: The Inflammatory Bowel Disease Questionnaire (IBDQ) is a valid, reliable, and sensitive measure to assess patients' subjective health status and quality of life (QOL). Prior to its use in an international clinical trial of active Ulcerative Colitis, the 32-item IBDQ underwent linguistic validation in 35 languages or cultures, including 8 Indian languages. **METHODS:** For languages with no prior translation, the Canadian English original was translated by specialists in each target country following a standardized methodology: 1) two independent forward translations were done by professional translators, native speakers of the target language and fluent in English; 2) comparison with the original and reconciliation of translations by the target country specialist were made; 3) backward translation was performed by a native English speaker; 4) comparison of source and backtranslations were reviewed with the IBDQ developer; 5) comprehension testing of 5 patients with moderately to severely active Ulcerative Colitis was performed. Pre-existing translations were integrated into the process as appropriate. **RESULTS:** Linguistic and conceptual challenges emerged in translating the 7-point Likert scale response choices (RC). Literal translation of the original 7-point RCs was not suitable in all languages. Anchors were chosen to be comparable to the original; the five middle response choices were logical and equidistant from one another. Some wording adaptation was needed for most countries to reflect local idiomatic expressions; particularly, "bowel movements" required more precise translation in most languages. **CONCLUSION:** The 35 language versions of the IBDQ were established using a rigorous process to ensure conceptual harmonization that would permit international comparisons and data pooling. The IBDQ may now be used confidently in these countries to evaluate the impact of inflammatory bowel disease on patients' daily lives.

PGI19

DEVELOPMENT OF AN HIV-RELATED, DIARRHEA IMPACT, PATIENT REPORTED OUTCOME (PRO) QUESTIONNAIRE

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OBJECTIVE: Diarrhea without infectious etiology (episodic, chronic) is reported in excess of 20% of HIV/AIDS patients receiving standard of care HAART therapy. Diarrhea of any severity and/or frequency negatively affects health-related quality of life (HRQoL) for these individuals. No instrument specific to the impact of HIV/AIDS-related diarrhea currently exists. To measure a HRQoL benefit from a new oral antidiarrheal in clinical testing, a new PRO instrument is being developed. **METHODS:** Comprehensive review of the HRQoL literature of diarrhea in the general and HIV/AIDS populations was conducted and experts in HIV and GI medicine were interviewed. Focus groups of HIV+ individuals experiencing diarrhea were undertaken. The psychometric properties of the draft questionnaire items were evaluated from data collected via the Internet in 320 respondents. Also collected within the cross-sectional, development study were respondent demographics, bowel movement history, SF-12, and Work Productivity & Activity Impairment (WPAI) questionnaire. Following item reduction, content validity was evaluated by cognitive debriefing. **RESULTS:** Literature review, expert feedback, and focus groups informed the conceptual model and construction of 41 draft questions regarding HRQoL related to chronic diarrhea among HIV+ individuals. Item reduction was achieved by exploratory and confirmatory factor analyses and confirmed a one-factor best fit model. A generalized, partial credit IRT analysis facilitated further item reduction. Differential item functioning analyses confirmed no significant differences in item performance among subgroups tested. Convergent and discriminate validity were supported by correlations with SF-12 scales, WPAI and self-reported symptom frequency and severity scores (correlation coefficients 0.58 to 0.71), and analysis of variance among clinically defined diarrhea severity ($F = 32$, $p < 0.0001$, ç2 0.17). **CONCLUSION:** A newly developed survey assessing the impact of chronic diarrhea on HIV+ patients has demonstrated acceptable psychometric properties. The survey will be validated in a double-blind, placebo-controlled diarrhea treatment study.

PGI20

PARTIAL RESPONDERS TO PPI TREATMENT; HOW DO THEY DIFFER FROM OTHER GERD PATIENTS IN TERMS OF HEALTH-RELATED QUALITY OF LIFE AND HEALTH CARE RESOURCE UTILISATION?—A DATABASE ANALYSIS

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OBJECTIVE: To describe gastroesophageal reflux disease (GERD) patients who are partial responders to treatment of proton pump inhibitors (PPI) in terms of their health care utilization, quality of life and work productivity. **METHODS:** The analysis is based on the National Health and Wellness Survey (NHWS) conducted by the Consumer Health Sciences (CHS) in USA 2006. Partial responders are defined as diagnosed GERD patients with remaining at least moderate symptoms 4 times/week or more after two months PPI-treatment ($n = 1433$). This group is compared to 1) GERD patients with only mild symptoms or moderate to severe symptoms less than 4 times/week after a short course of PPI treatment ($n = 281$), and 2) all individuals, excluding partial responders, who self-reported GERD, ($n = 19{,}817$). **RESULTS:** Partial responders use PPI on average 24.5 days/month which is 7.4 days more than patients responding well and 1.2 days more than all GERD patients. The SF-8 physical summary score is 38.6 for partial responders, which is 5.3 points less than for patients responding well and 7.4 points less than for all GERD patients. The mental summary score for partial responders is 41.9 which is 4.3 and 4.6 points less for patients responding well and all GERD patients, respectively. Partial responders lost 10.9 hours per week due to reduced productivity at work, which is 2.4 hours more than for patients responding well and 3.8 hours more than for all GERD patients. Partial responders consume resources and impose total productivity losses equivalent to $2603 per month, which is $724 more than for patients responding well and $1162 more than for

all GERD patients. **CONCLUSION:** Partial responders to PPI treatment are more costly and score lower on physical and mental dimensions of HRQoL than patients responding well to PPI treatment and GERD patients in general.

PGI21

A COMPARISON OF TEST-RETEST RELIABILITY OF SELF-REPORTED SF-36, WHOQOL, AND EQ-5D QUESTIONNAIRES BASED ON DIFFERENT ADMINISTRATION APPROACHES

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OBJECTIVES: This study aims to examine whether the test-retest reliability of SF-36, WHOQOL-BREF, and EQ-5D questionnaires will be changed by different administration approaches by which patients with chronic liver disease self-report their quality of life. **METHODS:** Patients with chronic liver disease were recruited from the outpatient department of a medical centre in Taiwan. Their self-reported questionnaires were collected by two approaches. The first approach patients received was an interview and questionnaire in hospital. They returned the retest questionnaire by mail two weeks later. In the second approach, patients were instructed to fill out both test and retest questionnaires at home and send back by two separate mails. The time gap was also two weeks. After scoring questionnaires, a paired-t test was conducted to compare test-retest reliability for three questionnaires. The mean score difference between two approaches was examined by independent t test. An analyses of mean score differences of different domains were performed by multiple linear regressions. **RESULTS:** Of 69 patients recruited for the first approach; 52 persons completed both questionnaires (75%), while the response rate of the second approach was 84% (127 of 151). The results indicate that there is no statistically significant difference in the test-retest reliability of SF-36, WHOQOL-BREF, and EQ-5D questionnaires. There was also no significant difference in the test-retest results between two approaches, except in the dimension 'pain/discomfort' mean difference (0.3 ± 1.2 and -0.1 ± 1.1, $p = 0.03$) by EQ-5D. Similar results ($p = 0.04$) were also found by multiple linear regression, after controlling age, sex, and education. This reflects that greater pain/discomfort was more likely to present in the first approach as compared to that in the second one. **CONCLUSIONS:** Alternative administration approaches did affect the results of test-retest questionnaires, which idicated that the Hawthorne Effect occurred in the interview in hospital.

PGI22

VALIDATION OF A NOCTURNAL GASTROESOPHAGEAL REFLUX DISEASE (GERD) SYMPTOM SEVERITY AND IMPACT INSTRUMENT

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OBJECTIVE: Current GERD assessment questionnaires for adults are limited in their ability to capture nocturnal symptoms. The objective of this study was to develop and validate an instrument to assess severity and impact of nocturnal GERD symptoms. **METHODS:** Two focus groups and 16 cognitive debriefing interviews were conducted among patients with GERD to identify key issues and concerns related to nocturnal GERD symptoms. The resulting 29-item draft instrument was included in a study of 196 patients diagnosed with GERD at 12 clinics in the United States to evaluate the psychometric properties. Assessments were conducted at baseline and at 4 weeks. Construct validity was evaluated using the Patient Assessment of Upper Gastrointestinal Disorders Symptoms Questionnaire (PAGI-SYM), Patient Assessment of Upper Gastrointestinal Disorders-Quality of Life (PAGI-QOL), number of nights with symptoms, disability days, and clinician and patient assessment of GERD severity. Exploratory factor analyses and item response theory analyses were conducted to finalize items and subscales. **RESULTS:** Mean age of participants was 45 years; 76% were female and 68% were Caucasian. Patient-rated severity at baseline was mild or moderate for 69% of participants, with 48% reporting GERD-related symptoms 2–3 nights within the past week. The final questionnaire includes 20 items and consists of 3 subscales: nocturnal symptoms; morning impact; and concern regarding nocturnal GERD. The subscales demonstrated internal consistency reliability (Cronbach's alpha 0.92–0.95). The subscale scores were statistically significantly correlated with subscales of the PAGI-SYM and PAGI-QOL (0.41–0.81; all $p < 0.0001$), number of nights with GERD symptoms (0.45–0.54; all $p < 0.0001$), disability days (0.19–0.43; all $p < 0.05$), and clinician and patient-reported disease severity (0.46–0.72; all $p < 0.0001$). **CONCLUSION:** Results support the reliability and validity of the newly developed questionnaire as a measure of severity of nocturnal GERD symptoms, morning impact, and concern related to nocturnal GERD.

PGI23

PATIENT REPORTED PREVALENCE AND SEVERITY OF CONSTIPATION IN HOSPICE PATIENTS

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OBJECTIVE: To determine the prevalence and severity of constipation among persons receiving hospice care in the United States, using longitudinal patient-reported outcomes. **METHODS:** Data was obtained from excelleRx, Inc, a national hospice pharmacy. Patient-reported symptom outcome data were collected by telephone for each patient by trained research assistants within the first three days of hospice admission. Data collection continued every three to four days until patients were discharged, or unable or unwilling to report data or dead. Patients rated constipation on a four-point verbal rating scale of none, mild, moderate, and severe. The sample for our analysis came from five participating hospices and included all discharged or deceased patients receiving home hospice care with an admission assessment record and at least one subsequent telephone assessment for constipation between April 1, 2006 and October 20, 2007. The first patient reported constipation assessment score post hospice admission was used to estimate prevalence and severity of constipation. **RESULTS:** A total of 309 patients met the inclusion criteria, the majority of which were female (n = 167, 54%), Caucasian (n = 282, 91%), >65 years of age (n = 238, 77%) and had a primary diagnosis of cancer (n = 223, 72%). All patients were prescribed opioid therapy during their hospice experience. Constipation was reported at the first assessment post admission by 26% of the patients (n = 80), 28.7 % of patients with cancer (n = 64) and 18.6% of patients without cancer (n = 16). Most patients who reported constipation were female (58.8%) and >65 years (78.8%). Constipation intensity was rated as mild (n = 32; 40%), moderate (n = 23; 28.8%)

and severe (n = 25; 31%). **CONCLUSION:** Constipation was reported by approximately 25% of the hospice patients, a third of whom rated their constipation as severe. A substantial number of hospice patients may require aggressive management of constipation. This information may be useful as a process indicator of quality of care.

GASTROINTESTINAL DISORDERS—Health Care Use & Policy Studies

PGI24

RACIAL, SOCIAL, AND ECONOMIC DISPARITIES IN KNOWLEDGE AND CARE SEEKING BEHAVIORS FOR GASTRO-ESOPHAGEAL REFLUX DISEASE (GERD)

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OBJECTIVE: Assess knowledge and care seeking behaviors for gastro-esophageal reflux disease via a population-based approach. Identify variations in knowledge, attitude, and care seeking patterns between racial groups, while also investigating socio-economic disparities. **METHODS:** A questionnaire based upon previous work (Srinivansin, J Clin Gastro) was developed to assess knowledge, attitudes, and care seeking patterns for GERD and was translated into Chinese and Spanish. We worked with community and faith-based leaders to identify events for data collection. Four ethnic groups (White, Black, Asian, Hispanic) were compared. All descriptive and multivariate analyses were done using SAS 9.1. **RESULTS:** Although Hispanics had the highest prevalence rate for GERD, their familiarity with the condition was lower (61.2%), compared to Whites (68.9%) and Blacks (63.7%); Asians were the least familiar with GERD (44.6%) ($P < 0.0001$). There was a positive correlation between increased education level and awareness for GERD ($P < 0.0001$). In general, Whites were the most likely to recognize GERD symptoms and behaviors to control GERD, while Asians were the least likely. Blacks and Hispanics were more likely to go to the Emergency Room for severe heartburn compared to Asians and Whites ($P < 0.0001$). Asians were least likely to go see a doctor when presented with a complication of heartburn ($P < 0.0001$). A total of 40.8% of Asians and 35.5% of Hispanics indicated that cost and the lack of health insurance would prevent them from seeing a doctor, higher rates than Whites and Blacks ($P = 0.0073$). **CONCLUSION:** Minorities lack an equal understanding of GERD, compared to Whites. Asians were particularly inaccurate in assessing symptoms for GERD and were least likely to see a doctor. Further research should focus on improving minority understanding of GERD symptoms and at what point to consult a physician. The impact of cost and lack of insurance on care seeking behaviors amongst Hispanics and Asians should also be examined.

PGI25

COSTS OF A PRIOR AUTHORIZATION ON LUBIPROSTONE FOR ELDERLY (AGE > 65) PATIENTS WITH CHRONIC CONSTIPATION IN A MEDICARE PART D POPULATION

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OBJECTIVE: To examine pharmacy costs of a Prior Authorization (PA) on lubiprostone for elderly chronic constipation (CC) patients in a Medicare Part-D plan. **METHODS:** Cost impact of PA was calculated by estimating annual pharmacy cost differences with PA (PA administration costs + medication costs) and without PA (medication costs only). Model inputs included published estimates of CC prevalence; lubiprostone utilization from IMS Health, 2007; average PA approval rate, PA costs and co-payment from payer interviews; and lubiprostone wholesale acquisition costs. Annual medication costs in both scenarios included costs and utilization of lubiprostone less co-payment, assuming third-tier placement for lubiprostone. All previously rejected prescriptions were assumed to be approved after lifting PA, resulting in 21.24% increase in prescription volume. Sensitivity analyses were performed on PA cost, PA approval rate, and expected increase in prescription volume after lifting PA. **RESULTS:** CC prevalence was 14.7%, of which 1.14% were lubiprostone users. For a 1-million member plan, this resulted in 1264 PA requests costing $27 each. Annual cost of PA administration was $34,130. PA approval rate for the elderly was 77.7% (or 982 approved users). Average number of fills per person per year was 3.8. A 30-day lubiprostone prescription costed $28.40 ($86.40 WAC-$60 co-payment + $2 dispensing fee). Drug costs were $105,997, resulting in total annual cost with PA of $140,127. Total annual costs without PA were $128,506, based on an additional 209 users, resulting in annual savings of $11,621. Sensitivity analyses indicated break even scenarios from removing PA on lubiprostone when cost per PA > $17.81 or PA approval rate > 69.18%, or expected increase in prescriptions from lifting PA < 32.20%. **CONCLUSIONS:** PA program for lubiprostone offers no financial savings to a Medicare plan based on current approval rates and annual utilization for elderly patients with CC in the base case as well as in sensitivity analyses.

PGI26

FINANCIAL IMPACT OF LIFTING A PRIOR AUTHORIZATION ON LUBIPROSTONE FOR CHRONIC CONSTIPATION PATIENTS IN A COMMERCIAL MANAGED CARE POPULATION (AGE < 65 YEARS)

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OBJECTIVE: To examine pharmacy costs of a Prior Authorization (PA) restriction on lubiprostone for chronic constipation (CC) patients in a commercial managed care plan. **METHODS:** Cost impact of PA was calculated by estimating annual pharmacy cost differences with PA (medication costs + PA administration) and without PA (medication costs only). Model inputs included CC prevalence estimates from the literature; lubiprostone utilization from IMS Health, 2007; average PA approval rate, PA costs and co-payment from managed care interviews; and lubiprostone wholesale acquisition costs. Annual medication costs in both scenarios included costs and utilization of lubiprostone less co-payment, assuming third-tier placement for lubiprostone. All previously rejected prescriptions were assumed to be accepted after lifting PA, resulting in 11.36% increase in prescription volume. Sensitivity analyses were performed on cost per PA, PA approval rate, and expected increase in prescription volume after lifting PA. **RESULTS:** CC prevalence was 14.7%, of which 1.14% were lubiprostone users. For a 1-million member plan, this resulted in 1264 PA requests costing $27 each. Annual cost of PA administration was $34,130. PA acceptance rate was 81.90% (or 1035 approved users). Average number of fills per person per year was 3.8. A 30-day lubiprostone prescription costed $43.40 ($86.40 WAC-$45 co-payment + $2 dispensing fee). Drug costs were $170,737, resulting in total annual cost with PA of $204,867. Total costs without PA were $190,125, based on additional 118 approved users, resulting in annual savings of $14,742. Sensitivity analyses indicated break even

scenarios from removing a PA on lubiprostone when cost per PA >$15.34 or PA approval rate >74.83%, or expected increase in prescriptions from lifting PA <19.99%. **CONCLUSION:** PA program for lubiprostone offers no financial savings to a health plan based on current approval rates and annual utilization for patients suffering from CC in the base case as well as in sensitivity analyses.

PGI27

INFLAMMATORY BOWEL DISEASES (IBD) PATIENTS PROFILE: FACTS EXTRACTED FROM A MULTICENTER RETROSPECTIVE STUDY

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OBJECTIVE: Access the Brazilian inflammatory bowel diseases patients' profile **METHODS:** A retrospective database study was performed in 23 IBD treatment centers in 14 Brazilian reference cities. The centers collected data from the last 5 years about personal data, disease important aspects (like race and smoking habits), diagnosis and disease treatment. **RESULTS:** A total of 2529 medical records were analyzed. Crohnxs disease was the most prevalent (49%) IBD. Sixty-five percent of the patients are Caucasian and 9% are smokers. The median weight of the patients are 62.5 kg and the median age 40.18% of the patients came to the actual medical center with a previous IBD diagnostic and 64% of this diagnosticated group came with a previous treatment. **CONCLUSION:** This is the first time that significant information about the Brazilian IBD patient profile is evaluated. Knowledge of the IBD could be a useful tool for supply policy interventions. Combined with clinical data, this patient profile could contribute to the qualitative and quantitative evaluation of disease management policy for this group pf illness.

PGI28

IMPORTANT FACTORS WHEN CONSIDERING TREATMENT FOR ULCERATIVE COLITIS

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OBJECTIVE: To quantify preferences that ulcerative colitis (UC) patients place on treatment attributes when making therapy choices. **METHODS:** A telephonic survey of patients with UC > 18 years old who requested information from the website www.LivingWithUC.com from January to April 2006. Patients were presented with nine factors that might impact a UC patient's decision-making process regarding whether to use a biologic medication such as infliximab. A discreet choice methodology was employed using a complete block design, which presented 9 factors being tested in 36 discreet pairs and patients were asked to select the more important factor from each pair presented. **RESULTS:** A total of 427 UC patients were contacted to get 294 completed interviews. The median age was 50 years and 204 (69.4%) were female. Of respondents currently on medication, 71% indicated their symptoms were under control and 75% of these respondents were experiencing ≥2 flares per year. One third (34%) of respondents classified their UC as being moderate to severe. When asked about treatment options presented by their doctor, 42% had discussed surgery and 18% said doctors indicated surgery was a cure for UC. Half (50%) recalled their doctor presenting only one drug option, and of those presented with several options, 20% recall the physician emphasizing a particular drug. Respondents indicated healing the damage of the intestinal lining (74%) and avoiding surgery (73%) were important characteristics when deciding to use a product like infliximab to treat UC. Method of administration (23%) and cost of co-pay (19%) were given least importance. **CONCLUSION:** While doctors may focus on surgery as a cure for UC, patients in this study state healing intestinal damage and avoiding surgery would be their most important reasons to use a medication. Doctors and patients may need to discuss a wider variety of therapeutic options for treating UC before surgery is considered.

INFECTION—Clinical Outcomes Studies

PIN1

TREATMENT OF HEPATITIS C INFECTION FOR CURRENT OR FORMER SUBSTANCE ABUSERS IN A COMMUNITY SETTING

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OBJECTIVE: The Ontario Addiction Treatment Centres (OATC) operates 26 clinics offering methadone maintenance treatment (MMT) to clients with a dependence on opiates. Until recently, MMT was a contraindication to antiviral therapy for the treatment of Hepatitis C virus (HCV) infected patients. The purpose of this study was 1) to describe a care model for treating HCV infected MMT clients in a community-based setting, 2) to describe clinical and demographic characteristics of these clients, 3) to assess rates of adherence to antiviral therapy, and 4) to assess rates of sustained virological response (SVR). **METHODS:** A review of patient medical records was employed. Clients considered for antiviral therapy at the OATC had achieved "functional stability", characterized by stable housing and a low frequency of substance abuse, in addition to meeting clinical criteria. Clients were followed by a hepatitis nurse, clinic physician or infectious disease specialist at the clinic where they received methadone. Use of illicit substances was monitored before, during and after antiviral therapy with regular urinalysis. **RESULTS:** Between November 2002 and January 2006, 109 clients (75 with genotype 1/4 and 33 with genotype 2/3) received at least one injection with pegylated interferon. The majority of clients were single (60%), living in a permanent apartment or house (94%), with a high frequency of self-reported psychiatric disorders (68%). A large proportion had a criminal history (71%) and many had been incarcerated (52%). Rates of adherence to treatment of 57% and 70% were achieved for genotypes 1/4, and 2/3, respectively. Rates of SVR in an intention to treat analysis were 51% for genotypes 1/4 and 64% for genotypes 2/3. Six clients discontinued therapy due to on-going problems with substance abuse. **CONCLUSION:** HCV antiviral therapy for current or former substance abusers can be successful in the context of specialized care for substance abuse.

PIN2

A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF PEGYLATED INTERFERON, LAMIVUDINE, ADEFOVIR AND ENTECAVIR FOR THE TREATMENT OF HEPATITIS B

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OBJECTIVE: To systematically review the effectiveness of pegylated interferon (PEG), lamivudine (LAM), adefovir (ADF) and entecavir (ENT) in treating CHB. **METHODS:** Pubmed, Embase, Cochrane, and Econlit were searched for randomized controlled trials assessing the efficacy of the selected drugs for treating CHB

published in the English language from dates of inception to January 2007. Patients were considered to have CHB if they had elevated ALT levels and active viral replication. Monotherapy, combination and sequential therapies were included. Among trials that met our inclusion criteria, we abstracted data describing normalization of ALT, HBV DNA, sustained biochemical response, HBeAg seroconversion, histological improvement, drop-outs and adverse events. Intention-to-treat data were combined using a random-effects meta-analysis, with missing data considered as treatment failures. Outcomes were expressed as relative risks with 95% confidence intervals. **RESULTS:** The initial search yielded 2064 references, 127 were excluded due to inadequate blinding, allocation concealment, randomization and reporting of outcomes; 20 studies were included. Trials involved 5573 patients (4121 males, 1309 females), ranging in size from 200–814 patients. Mean age was 40.7. Eleven trials studied HBeAg-positive patients, four trials studied HBeAg-negative patients, and four trials studied both. Due to small numbers of trials for comparison led to pooling of HBeAg-positive and HBeAg-negative studies. No treatment was superior for all outcome measures. Monotherapy was superior to placebo. Comparisons of single drugs favored treatment with ADF or ENT over LAM or PEG. LAM was superior to PEG with better clinical outcomes and fewer adverse events and patient dropouts. Combination and sequential treatments were not superior, however comparisons were limited by our one-year follow-up. **CONCLUSION:** Monotherapy with ADF or ENT are the most attractive treatment options within the first year of treatment. Further research on combination and sequential therapies may provide better options but presently insufficient evidence exists to support this approach.

PIN3

DATA MINING PHYSICIAN DECISION AND INVESTIGATING TREATMENT OPTIONS OF OSTEOMYELITIS

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OBJECTIVE: The purpose of this study is to investigate treatment options of osteomyelitis based on physician decisions recorded in our dataset. **METHODS:** We want to find the frequency of a given input (code) for a variable, or more than one variable in health care data. Using the Thomson MedStat MarketScan data containing all patient claims for 40 million observations, the primary diagnosis code is given for each patient as well as fifteen possible secondary diagnoses. We use SAS Text Miner to demonstrate a simplified method to search these fifteen columns. We use ICD9 and CPT codes to find treatments for osteomyelitis. We also look for sequential treatments for recurrence of osteomyelitis. After filtering the data for Osteomyelitis, there are 18,721 observations in inpatients that contain 2661 patients, and 233,001 observations in outpatients with 78,957 patients. **RESULTS:** The difference between the number of observation and number of distinct patient IDs shows that most patients have a sequence of procedures during their treatment. After sorting the data by procedures, the most frequent (20%) is "Dorsal and dorsolumbar fusion, posterior technique", second is "Excisional debridement of wound, infection, or burn" (15%), third "Amputation of toe" (9%), and in forth place, "Revision of amputation stump" (7%). In the outpatient data, the most frequent procedure is code 86.59 (Closure of skin and subcutaneous tissue of other sites) with 4021 records out of 8711 records. We found that about 8 % of patients with osteomyelitis from inpatient data and about 0.3% from outpatient data had amputation. **CONCLUSION:** While amputation does not occur as often as debridement, we want to examine the sequence of treatments to see whether amputation follows a pattern of debridement.

PIN4

ANTIMICROBIAL RESISTANCE PREVALENCE OF ENTEROCOCCI FROM BOGOTA, COLOMBIA HOSPITALS 2001–2006

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OBJECTIVE: To determine antimicrobial resistance profiles for Enterococcus in 14 tertiary-level hospitals in Bogotá, Colombia. **METHODS:** Time series analyses were performed, as well as descriptive analyses of Enterococcus faecalis and Enterococcus faecium in hospitals belonging to the Bogotá Bacterial Resistance Control Group from January 1, 2001–January 1, 2007. We identified the presence and species of enterococcus according to anatomical site. **RESULTS:** During that period, a total of 5770 strains of Enterococci faecalis and 1259 of Enterococcus faecium were analyzed. Enterococcus was found in >20% of isolates from blood samples and abdominal fluid in critical care units (SUCI) and in >10% of samples from non-critical care services (SNUCI) in tertiary-level hospitals in Bogotá. Ampicillin was active against Enterococcus faecalis strains in Critical care units (SUCI) and other services (SNUCI), but >50% of E.faecium strains in SNUCI were resistant. Vancomycin-resistant strains occurred in >2% of E.faecalis strains identified in SUCI and >8% in SNUCI. The resistance trend in E.faecium to vancomycin in SNUCI was towards the low in the six years studied. **CONCLUSION:** This study confirms the worldwide trend towards an increase in infections due to Enterococcus. The emerging pattern of antimicrobial resistance among such isolates is alarming.

PIN5

INTEREST OF MULTI-CRITERIA MODELING APPROACH IN ASSESSMENT OF YELLOW FEVER EPIDEMIC RISK

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OBJECTIVE: The danger of widespread and intense epidemics of yellow fever (YF) in Africa has become very serious, requiring urgent immunization response. Because it is not possible to vaccinate 100% of the adult population, the challenge is to prioritize immunization of the population at highest risk. An original risk assessment has been performed at the initiative of the World Health Organization, using modeling to enable countries to define populations currently at highest risk, which will be vaccinated in priority. **METHODS:** Five exposure risk factors have been selected and collected at the district level in three African countries: Burkina Faso, Togo, Mali. The five indicators are: ecological risk zone, confirmed YF cases since 1960, suspected cases since 1960, number of years in which YF cases notified since 1960, district close to another district that has notified cases since 1960. A multi-criteria analysis based on multiple component analysis (MCA) has constructed a composite exposure indicator (CEi) from the five selected exposure risk factors. In reducing by mathematical projections the number of dimensions, MCA modeling synthesize complex data tables. **RESULTS:** For each of the three target countries, three analyses have been done for rural districts, urban districts and rural + urban districts. Four risk clusters have been determined from the lowest risk to the highest risks, allowing the construction of detailed YF risk maps in Burkina-Faso, Togo and Mali. These "YF risk assessment maps" present in four colors the four risk clusters at each

district level. **CONCLUSION:** This approach seem to be an original, robust and reproducible technique for risk assessment purpose, which can be applied to a number of diseases and technology assessment when the number of indicators (risk indicators, clinical indicators, biologic indicators, etc) make data interpretation, comparisons and decision making difficult.

WITHDRAWN **PIN6**

PIN7

MRSA: INVESTIGATING THE DANGEROUS HOSPITAL INFECTION

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OBJECTIVE: Methicillin-resistant Staphylococcus aureus, or MRSA, is a commonly acquired infection in the hospital environment. We examine data from the National Inpatient Sample (NIS) to diagnose trends to gain more insight about the infection. It is the purpose of this study to determine if race, age or gender are factors in the severity of the infection, and to ascertain what effects any secondary conditions may have on a patient with MRSA. **METHODS:** The data were collected from a 10% sample from 2004 from the NIS with information relevant to 5974 patients diagnosed with MRSA. The data were then imported into SAS Enterprise Guide 4. SAS is used to create tables of data and kernel density estimates, which give an estimate of the data's probability density, to develop a logistic regression model relating death risk to specific diagnoses, and to develop a linear model concerning a patient's total charges. **RESULTS:** There appears to be a correlation between the age of a patient and the length of inpatient stay. Asian American and African American patients experience a higher mortality rate with MRSA. Total charges were similar between males and females, although males showed a slightly higher mean; secondary conditions and age had a much more pronounced effect on charges. The three most common conditions present in patients with MRSA were hypertension, urinary tract infection (UTI), and congestive heart failure—UTI and heart failure appear to raise the risk of death to one with MRSA. **CONCLUSIONS:** Further studies should be conducted to investigate MRSA and how it affects people from various ethnic backgrounds and age groups. By analyzing medical data and performing kernel density estimates, it is possible to uncover important relationships that can be used to treat patients worldwide.

INFECTION—Cost Studies

PIN8

BUDGET IMPACT OF ADDING DORIPENEM TO A HOSPITAL FORMULARY

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OBJECTIVE: Quantify the budgetary impact of adding a new carbapenem, doripenem, to a hospital formulary for treatment of complicated intra-abdominal infection (cIAI), complicated urinary tract infection (cUTI) and nosocomial pneumonia (NP) including ventilator-associated pneumonia (VAP), in the United States. Doripenem has been approved in the US for cIAI and cUTI and is under FDA review for treatment of NP, including VAP. **METHODS:** This model was developed in accordance with Good Research Practices for Budget Impact Analysis disseminated by ISPOR to estimate the annual impact on a hospital's budget of adding doripenem. Carbapenem (doripenem, imipenem, meropenem) wholesale acquisition costs from 2007 National Drug Data File, hospitalization costs (2006 US dollars) from published literature, annual hospital admissions for NP, VAP, cIAI, and cUTI, current proportional share of imipenem and meropenem (50% each, no doripenem use), treatment duration and length of stay (LOS) from clinical trials were considered. A new proportional share of 50% doripenem, 30% imipenem and 20% meropenem was assumed for this analysis. Sensitivity of results on different proportions of doripenem use was examined. **RESULTS:** Total cost per treated patient was estimated to be $24,284 (range: $13,117 (cUTI) to $71,026 (VAP)), prior to introduction of doripenem. With the new proportional share, it would decrease to $23,305 (range: $12,987 (cUTI) to $65,289 (VAP)), a 4% reduction in the budget. Pharmacy costs made up 4% of overall treatment costs. The majority of savings came from shorter hospital LOS for VAP, observed in clinical trials comparing doripenem to comparators. Scenarios with a greater proportion of doripenem use resulted in larger savings to the hospital budget ($1927 per patient at 100% doripenem use). Results remained favorable for formulary with doripenem under various sensitivity analyses. **CONCLUSION:** Results indicate that adding doripenem to a hospital formulary will yield potential savings to a hospital's budget.

PIN9

THE WORKFORCE AND COST IMPLICATIONS OF SUBSTITUTING NURSES AND PHARMACISTS FOR DOCTORS IN THE FOLLOW-UP OF PATIENTS WITH AIDS ON ANTIRETROVIRAL THERAPY IN UGANDA

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OBJECTIVE: To quantify the workforce and cost implications of routine doctor-intensive (DI), nurse-intensive (NI) and pharmacist-intensive (PI) ART follow-up algorithms for HIV/AIDS treatment at the Infectious Diseases Institute, a large urban HIV clinic in Kampala, Uganda. **METHODS:** We performed a societal perspective cost analysis including health resource utilization and opportunity cost of patient waiting (PW) time. A time-motion survey was performed to estimate median health worker utilization (HWU) and PW times for different services. Unique personnel requirements were identified to determine hourly HWU per patient, which was multiplied by hourly wages for different cadres. PW times were multiplied by mean hourly wage for Ugandans. National workforce and cost implications were projected. **RESULTS:** Median HWU and PW times per visit (hours) were 0.20 and 0.24 for triage nurses, 0.12 and 1.10 for doctors, 0.08 and 0.27 for pharmacists, and 0.13 and 0.05 for nurses. HWU time for refill pharmacists was 0.03 with no waiting. Hourly wages were: nurses-$4.6, doctors-$8.3, and pharmacists-$3.3. The average Ugandan hourly wage was $0.99. Total annual societal per-patient cost of follow-up was $45.2 for DI, $28.3 for NI and $16.3 for PI. Total projected national annual follow-up cost was $13.5 million for DI, $8.5 million for NI and $4.9 million for PI. Extrapolating to a national level, we project that the substitution of nurses or pharmacists for doctors would save 404 full-time-equivalent doctors per year, 18.4% of the current number practicing in Uganda. **CONCLUSION:** The use of NI and PI innovations as substitutes for DI follow-up results in

substantial reductions in doctor demand and substantial societal cost savings. Since prior research suggests no adverse impact on adherence to drugs and follow-up of these innovations, serious consideration should be given to policy changes to adopt substituting for doctor for routine HIV follow-up care.

PIN10

COMPARATIVE (POSACONAZOLE VS. OTHER SYSTEMIC ANTIFUNGALS) ALL-CAUSE MORTALITY AND COST ANALYSIS IN PATIENTS WITH REFRACTORY INVASIVE ASPERGILLOSIS

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OBJECTIVE: To evaluate all-cause mortality and cost of treatment in patients with refractory invasive aspergillosis (rIA) treated with either posaconazole or other systemic anti-fungal (SAF) therapies. **METHODS:** All-cause mortality and cost of salvage therapy of posaconazole oral suspension (800 mg/day) and other SAF treatments were assessed using a multicenter clinical study in patients with IA refractory to or intolerant of conventional antifungal therapy. Data from external controls were collected retrospectively providing a comparative reference group. All patients had failed to improve or progress with prior SAF therapies. Prior SAF treatments for the majority of patients were liposomal amphotericin B, amphotericin B, or itraconazole. Cases of aspergillosis deemed evaluable by a blinded data review committee included 107 posaconazole and 86 control subjects (modified intent-to-treat population). The populations were comparable regarding pre-specified demographic and clinical characteristics. All-cause mortality were analyzed using the survival technique. Economic evaluations were conducted using survival data and costs of pharmacotherapy one year post therapy (2007 Canadian dollars). **RESULTS:** Significantly more posaconazole-treated patients responded to therapy as compared with other SAF therapies. Patients with rIA treated with posaconazole appeared to confer a highly significant survival benefit over the control cases. The cumulative rates of survival at 30 days and at the end of therapy were 74% and 38%, respectively. For controls, those survival rates were 49% and 22%, respectively. The Kaplan-Meier survival curves were significantly different ($P = 0.0003$). In addition, posaconazole appeared to be a cost-saving option for the treatment of rIA compared with the active comparator receiving standard SAF treatments ($14,839 vs. $38,158). Sensitivity analyses demonstrated the robustness of the results over a range of alternative values for costs and outcomes. **CONCLUSION:** Treatment with posaconazole compared with other SAF treatments provided a significant survival benefit in patients with rIA at lower cost of drug therapy.

PIN11

COST SAVINGS FROM REDUCED HIV INCIDENCE ESTIMATES

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OBJECTIVE: The "AIDS epidemic update" (2007) published by the United Nations (UN) and World Health Organization (WHO), reports lower estimates of incidences of persons infected with HIV globally. This study evaluates the cost savings of these lower estimates on costs associated with patients being treated by antiretroviral (ARV) drugs and opportunistic infection (OI) prophylaxis. **METHODS:** Estimated differences in incidences of persons infected with HIV for the eight global regions in years 2006 and 2007 were calculated from UN reports. This difference was then multiplied by the average percentage of patients on ARV and OI treatment. Further, to derive the total cost savings associated with the ARV cohort, the number of patients on ARV medication was multiplied by a weighted average of first and second line ARV drug costs, lab costs, counseling costs, inpatient costs and outpatient costs, for each region. Conversely, only counseling and OI drug costs were included in the total cost of patients receiving OI prophylaxis treatment, for each region. Costs were reported in 2006 US dollars. Sensitivity analysis performed on all key parameters. **RESULTS:** The reduction of incidences of persons infected with HIV from 2006 to 2007 resulted in a total cost savings of $309.5 million, or 42%. Separately, the patients being treated by ARV drugs attributed a cost savings of $274.7 million, contrary to patients on OI drugs attributing $34.8 million to cost savings. The greatest savings were shown in the Sub-Saharan Africa region ($191.1 million). **CONCLUSION:** Based on the revised estimates, the worldwide savings is a large percentage of the treatment budget. Notwithstanding increased incidence rates in subsequent years, these savings should continue beyond 2007.

PIN12

PHARMACOECONOMIC ANALYSIS BASED ON GUIDELINES FOR TREATING MILD DIABETIC FOOT INFECTIONS: A DECISION TREE MODEL FOR COLOMBIA

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OBJECTIVE: Restricted information exists to guide clinicians in selecting antibiotics for diabetic foot infections in Colombia. Because this serious complication causes substantial morbidity, mortality, and incurs major health care costs, we developed a decision tree model to determine, from the Ministry of Health's perspective, the cost-effectiveness in Colombia of the treatments recommended by the Infectious Diseases Society of America guidelines for mild diabetic foot infections. **METHODS:** A decision-tree model was developed using TreeAge® Pro-2007 and clinical experts. Success probabilities were derived from published randomized controlled trials. Drug costs were obtained from the Farmaprecios Guía de precios sugeridos al público, promedio del mercado para farmacias independientes. No 98 September–Octuber 2007. Thomson PLM. S.A. Bogotá D.C. and amputation and hospitalization costs from ISS 2001/2004 database, with values adjusted to 2007 using the Colombian inflation. One-way and two-way sensitivity analyses were performed to test the robustness of the decision tree model by varying the clinical success rates and costs of antibiotics. Probabilistic sensitivity analyses were also performed using Monte Carlo simulations. **RESULTS:** Clindamycin was cost-effective, dominating all other choices, and cephalexin had the next best profile. Expected success rates were 99.4% for clindamycin, 97.8% for cephalexin, 95.4% for amoxicillin-clavulanate, 95.2% for oxacillin and 95.0% for levofloxacin. The expected cost of clindamycin ($315,200 pesos (USD$157.28)) was lower than the next best alternative, cephalexin $366,560 pesos (USD$182.14); a cost difference of $51,360 pesos (USD$24.86) per patient treated. However, success rates were based on a single small trial for each drug ($n < 30$ for each). In sensitivity analyses, the model/decision was sensitive to changes in efficacy rates and costs within plausible ranges for clindamycin and cephalexin. **CONCLUSION:** Clindamycin was cost-effective in treating mild

diabetic foot infection but our model had several limitations/assumptions; consequently, the results should be interpreted cautiously. More clinical studies to evaluate oral antibiotics effectiveness are needed.

PIN13

ECONOMIC EVALUATION OF POSACONAZOLE VS. STANDARD AZOLE THERAPY IN THE PROPHYLAXIS AGAINST INVASIVE FUNGAL INFECTIONS IN PATIENTS WITH PROLONGED NEUTROPENIA IN CANADA

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OBJECTIVE: Posaconazole has been demonstrated to be significantly superior to standard azole therapy in preventing invasive fungal infections (IFIs) ($P < 0.001$) and in reducing overall mortality ($P = 0.048$) among patients with prolonged neutropenia. In this study, cost-effectiveness of posaconazole was evaluated from the Canadian health care system perspective. **METHODS:** A trial-based decision analytical model was developed. Patients were assumed to receive prophylaxis with posaconazole or standard azole therapy (fluconazole, 81%; itraconazole, 19%). The probabilities of experiencing an IFI, IFI-related death, and all-cause mortality over 100 days post treatment were estimated. To extrapolate results beyond the trial period, the model was extended to a lifetime horizon using 1-month Markov cycles in which mortality rate is specific to the underlying disease as estimated from Statistics Canada and Surveillance, Epidemiology, and End Result (SEER) data. Pharmacotherapy and treatment costs associated with IFIs were estimated using published literature. The model was used to estimate costs, IFIs avoided, life-years gained, and the incremental cost-effectiveness ratio (ICER) of posaconazole versus standard azole therapy (2007 Canadian dollars). **RESULTS:** Posaconazole is associated with significant fewer IFIs (0.05 vs. 0.11) ($P = 0.003$), increased life-years (0.744 vs. 0.728), and (excluding costs of the underlying condition) slightly lower costs ($7147 vs. $7332) per patient relative to standard azole therapy over a lifetime horizon. A second-order probabilistic Monte Carlo sensitivity analysis was conducted to assess the effects of parameter uncertainty, particularly as they relate to treatment efficacy and the costs of an IFI. Results indicate that there is a 53% probability that posaconazole is cost saving versus standard azole therapy and a 70% probability that the ICER for posaconazole is at or below the $50,000 per life-year saved threshold. **CONCLUSION:** In addition to the proven efficacy, posaconazole appeared to be cost saving relative to standard azole therapy in the prevention of IFIs among high-risk neutropenic patients.

PIN14

COST-EFFECTIVENESS OF PEGINTERFERON-ALFA-2A (40 KD) ASSOCIATED WITH RIBAVIRIN IN THE TREATMENT OF PATIENTS WITH CHRONIC HEPATITIS C IN BRAZIL UNDER THE PRIVATE HEALTH CARE SYSTEM

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OBJECTIVE: Hepatitis C is a disease affecting approximately 180 million people worldwide (WHO 2006) and is one of the main causes of chronic hepatic disease. HCV infection progresses to chronic form in 80% of infected individuals. Approximately 20% progress to cirrhosis over 20 years and, consequently, a high risk of developing hepatocellular carcinoma population. We assessed the incremental cost-effectiveness ratio (ICER) of peginterferon alfa-2a (40 KD) plus ribavirin (PEG + RBV) versus interferon alfa-2b plus ribavirin (IFN + RBV) in the treatment of patients with chronic hepatitis C under the Brazilian payer perspective. **METHODS:** A Markov model was built to estimate the clinical and economic impact related to the incorporation of peginterferon-alfa-2a (40 KD). Clinical stages were based on liver histology, forms of cirrhotic decompensation, liver cancer and liver transplantation. A Delphi panel was performed for evaluating the direct medical resources related to each clinical stage in chronic hepatitis C, as well as costs from treatment with peginterferon-alfa-2a (40 KD), interferon alfa-2b and ribavirin. Effectiveness of treatment with peginterferon-alfa-2a (40 KD) was obtained from a multicenter, controlled, randomized trial involving 1121 naive patients with chronic hepatitis C (Fried et al, 2002). The model comprises a life-time horizon. We have assumed a discount rate of 3% for both costs and outcomes according to international recommendations (Gold et al, 1996). A sensitivity analysis was conducted using second-order Monte Carlo simulation. Tested parameters were costs per stage, treatment costs, discount rate, response rate to treatment, inflation rate and early patient distribution. **RESULTS:** The ICER of PEG + RBV versus no treatment was approximately –R$62,521 per quality-adjusted life year (QALY) gained. The ICER of PEG + RBV versus IFN + RBV was approximately –R$20,087 per QALY. **CONCLUSION:** The study suggests peginterferon alfa-2a (40 KD) and ribavirin to be a dominant therapy for treating hepatitis C in the private health care system in Brazil.

PIN15

ECONOMIC EVALUATION OF TIPRANAVIR IN THE TREATMENT OF HUMAN IMMUNODEFICIENCY VIRUS

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OBJECTIVE: Tipranavir plus ritonavir (TPV/r) and an optimized background (OB) antiretroviral regimen delays virologic failure, reduces viral load and increases CD4 count compared to patients treated with comparator protease inhibitors, co-administered with ritonavir (CPI/r) and OB alone. The objective was to investigate the long-term cost, outcomes and cost-effectiveness of TPV/r + OB compared to CPI/r + OB in the Canadian health care system. **METHODS:** A Markov model was developed and populated with information on 48-week viral load and CD4 cell count response from two randomized controlled trials (RESIST 1 and RESIST 2) and HAART-era published literature. Resource use and cost data was obtained from a Canadian study and published sources. Future costs and outcomes were discounted at 5%. The analysis calculated costs and outcomes from time of starting these regimens, until 90% of patients in each strategy had died (lifetime analysis). Cost-effectiveness was calculated as cost per life year (LY) gained and cost per quality-adjusted life year (QALY) gained. **RESULTS:** Total discounted lifetime costs for TPV/r + OB was $221,541 compared to $194,466 with CPI + OB. discounted life expectancy and QALYs were greater for TPV/r + OB compared to CPI/r + OB by 0.530 yrs and 0.516 QALYs, respectively. Incremental cost-effectiveness of TPR/r + OB was $51,058 per LY gained and $52,517 per QALY gained. Sensitivity analysis showed results were robust. **CONCLUSION:** TPV/r + OB provides superior clinical improvement to a population of highly treated HIV patients with limited treatment options. TPV/r + OB is predicted to improve life

expectancy and QALYs compared to CPI/r + OB with an incremental cost per additional year of life gained of $51,058 and the incremental cost per QALY of $52,517.

PIN16

COST-EFFECTIVENESS OF POSACONAZOLE VS. FLUCONAZOLE IN THE PROPHYLAXIS AGAINST INVASIVE FUNGAL INFECTIONS IN PATIENTS WITH GRAFT-VERSUS-HOST DISEASE IN CANADA

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OBJECTIVE: Invasive fungal infections (IFIs) have emerged as the major infection-related cause of morbidity and mortality in patients undergoing transplantations. A recent RCT in allogeneic hematopoietic stem cell transplantation (HSCT) recipients with grade 2–4 or extensive chronic graft-versus-host disease compared the efficacy of posaconazole and fluconazole in the prevention of IFIs. At the end of the fixed 112-day treatment period, posaconazole was as effective as fluconazole in preventing IFIs (5% vs. 9%); significantly reduced breakthrough *Aspergillus* infections (2% vs. 7%, p = 0.0059); and decreased IFI-related mortality (1% vs. 4%; p = 0.0413). We evaluated posaconazole cost-effectiveness from the Canadian health care system perspective. **METHODS:** A trial-based decision-analytic model was developed. The probabilities of experiencing an IFI, IFI-related death, and death from other causes over 112 days post treatment were estimated. To extrapolate results beyond the trial, the model was extended to a lifetime horizon using 1-month Markov cycles in which mortality rate was specific to the underlying disease obtained from clinical data. Pharmacotherapy and IFI-related costs were estimated using published literature. The model was used to estimate costs, life-years saved (LYS), and the incremental cost-effectiveness ratio (ICER) of posaconazole vs. fluconazole (2007 CND$). **RESULTS:** Posaconazole appeared to be more effective with increased LYS (7.95 vs. 7.81) however, more costly ($16,784 vs. $11,760) than the alternative over a lifetime horizon. The ICER of posaconazole was $34,668/LYS compared to fluconazole. A second-order probabilistic Monte Carlo sensitivity analysis was conducted to assess the effects of parameter uncertainty, particularly concerning treatment efficacy and costs of IFIs. There was a 4% probability that posaconazole was both more effective and less costly than Fluconazole, and a 66% probability that posaconazole ICER was at or below the $50,000/LYS threshold. **CONCLUSION:** In addition to the proven efficacy, posaconazole appeared to be cost-effective relative to fluconazole in the prophylaxis of IFIs among patients undergoing allogeneic HSCT.

PIN17

DECISION ANALYTIC MODEL EVALUATING THE COST-EFFECTIVENESS OF LINEZOLID VERSUS VANCOMYCIN IN METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS COMPLICATED SKIN AND SOFT TISSUE INFECTION

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OBJECTIVE: To evaluate the cost-effectiveness of vancomycin versus linezolid in complicated skin and soft tissue infections (cSSTIs) with methicillin-resistant Staphylococcus aureus (MRSA) using a decision analytic (DA) model. **METHODS:** A decision model was created to evaluate the cost-effectiveness of vancomycin and linezolid in the treatment of MRSA cSSTIs. Outcome probabilities were determined from published clinical trials. The main dependent variables of interest were: total direct costs, cost-effectiveness ratios (CER), and incremental cost-effectiveness ratio (ICER). Univariate (one-way) sensitivity analyses were conducted for all probabilities and costs used in the model. Second-order Monte Carlo simulation (probabilistic sensitivity analysis) using 10,000 samples was also performed to test for robustness, and an acceptability curve was plotted along a willingness to pay axis. **RESULTS:** The DA model predicted that linezolid was the most cost-effective strategy from the base-case analysis. Average CER for linezolid and vancomycin were 11,089.70 (USD/cure) and 16,299.75 (USD/cure), respectively. Univariate sensitivity analyses revealed that vancomycin IV duration and linezolid responder probability were sensitive across the range. Other parameters did not significantly change the base-case result. Probabilistic sensitivity analysis showed that a majority of the points favored linezolid being dominant over vancomycin. Acceptability curve showed a 95% probability that linezolid was the most cost-effective strategy with a willingness to pay up to 200,000 (USD)/cure. **CONCLUSION:** Based on this decision model, linezolid was the most cost-effective strategy compared to vancomycin primarily because of shorter IV duration and higher responder probability.

PIN18

THE IMPACT OF PEDIATRIC ADVERSE EVENTS ON THE COST-EFFECTIVENESS OF OSELTAMIVIR

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OBJECTIVE: Oseltamivir has been shown to reduce the duration of influenza symptoms in children, but recent reports of neuropsychiatric adverse events deserve consideration. This study investigated the effect that these adverse events have on the estimated cost-effectiveness of oseltamivir treatment in children. **METHODS:** A decision analytic model was developed to project the costs and effectiveness of three clinical options for otherwise healthy five to eleven year old children with influenza-like illness: no antiviral treatment, rapid testing for influenza and treatment with oseltamivir if test is positive, and empirical oseltamivir treatment. The main outcome measure was the incremental cost-effectiveness ratio (ICER) of each intervention, in dollars per quality adjusted life year (QALY) gained. Deterministic and probabilistic sensitivity analyses were performed to quantify the effects of parameter uncertainty. **RESULTS:** In the base case analysis, which assumed neuropsychiatric adverse events occurred in 0.065% of treated patients, the test and treat strategy led to an ICER of $30,800 (95% CI: $12,700 to $207,700) per QALY gained, compared to no antiviral treatment. Empirical treatment was a more costly, but more effective strategy, with an ICER of $62,500 (95% CI: cost-saving to $2,138,300) per QALY gained. When the probability of neuropsychiatric adverse events was increased to 10 times the baseline estimate (0.65%), the test and treat strategy led to an ICER of $32,300/QALY, while empirical treatment was associated with an ICER of $75,000/QALY. These ratios increased to $53,300 and $410,000, respectively, when this adverse event rate was raised to 100 times its baseline value (6.5%). **CONCLUSION:** Despite recent concern surrounding the risk of neuropsychiatric adverse events, the use of oseltamivir is projected to remain a cost-effective treatment option in this pediatric population. This conclusion is robust to substantial increases in the likelihood of these events, particularly when oseltamivir is used in conjunction with rapid testing for influenza.

PIN19

ECONOMICAL EVALUATION OF DARUNAVIR + LOW DOSE RITONAVIR IN TREATMENT-EXPERIENCED HIV-1-INFECTED PATIENTS

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OBJECTIVE: To perform an economical evaluation of darunavir + low-dose ritonavir (DR) vs other protease inhibitors (PIs) in treatment-experienced HIV-1-infected patients in the Russian health care system. **METHODS:** The modeled study was performed. A proportion of patients receiving alternative PIs, dosing regimen, and efficacy of drugs were extracted from multicenter randomized studies POWER 1 and 2 (Lancet 2007; 369:1169–78). The effect was measured in proportion of patients with viral load reduction of 1 log 10 copies/ml or greater from baseline and with viral load less than 50 copies/ml. Other PIs in POWER studies were lopinavir + ritonavir, saquinavir, amprenavir, atazanavir, indinavir, nelfinavir; all patients in both groups received optimized background regimen. Cost of treatment with PIs for 48 weeks and cost-effectiveness ratio (CER) were calculated from the Russian reimbursement system point of view. **RESULTS:** According to POWER studies, DR was much more effective than other PIs (61 vs 15% of patients had viral load reduction ≥1 log 10 copies/ml and 45 vs 10% achieved viral load <50 copies/ml), while cost of treatment was a little more for DR than other PIs (370,786.08 vs. 330,747.59 rubles or 15,105.64 vs USD 13,474.47). Incremental CER was 87,000 rubles (USD 3544.34) for one patient with viral load reduction ≥1 log 10 copies/ml and 114,400 rubles (USD 4660.60) for one patient with viral load <50 copies/ml that seems reasonable for expensive antiHIV treatment. **CONCLUSION:** According to the model, DR seems to be much more effective than other PIs with affordable CER incremental ratio. Evaluation of DR treatment effectiveness and safety in common practice is needed.

PIN20

PHARMACOECONOMICS OF CHRONIC HEPATITIS B AND HEPATITIS C

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OBJECTIVE: Globally, an estimated 170 million persons are chronically infected with hepatitis C virus (HNV) and 350 million—with hepatitis B (HBV). New HCV and HBV medicines are 100%–400% more costly and have a negative impact on the budget. The aim of this study was to calculate, in the health care payer perspective, the cost effectiveness (CE) of new medicines for HCV and HBV treatment in comparison with the previous generation ones. **METHODS:** This analysis compares the CE of entecavir, adefovir dipivoxil versus lamivudinum in previous therapy refractory HBV patients and the CE of peginterferonum alfa with interferonum alfa in chronic HCV patients. Data of clinical effectiveness have been extracted from clinical studies published in electronic databases (PubMed, Embase com, Medscape, Cochrane Library) from 1990 to 2007 December. Only direct medical costs (medicines) have been estimated. Costs were based upon average wholesale price and State Reimbursement list prices. A decision analytic model, made by TreeAge DATA Professional program, has been used. **RESULTS:** The use of new generation medicines, such as adefovir dipivoxil and entecavir, is not cost effective for chronic HBV therapy in patients with unsuccessful previous therapy due to high prices; however the difference of effectiveness reaches 80%. Peginterferonum alfa for chronic HCV compared with nonpegilated interferonum is cost effective if the difference of effectiveness reaches 40% or the shorter (12 week) course of pegilated interferon is needed. **CONCLUSION:** Despite the high medicines clinical effectiveness, the new medicines are not cost effective compared with previous generation for the chronic HCB and HBV treatment due to high prices. Wherewith, the generic (cheaper?) medicines income to the market is inescapable. Prospective studies including indirect costs are necessary.

PIN21

COST-EFFECTIVENESS OF ANIDULAFUNGIN THERAPY IN CONFIRMED CANDIDEMIA AND OTHER FORMS OF INVASIVE CANDIDIASIS IN CANADA

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OBJECTIVE: Candidemia is a nosocomial bloodstream infection associated with considerable mortality and is costly to treat. A new echinocandin, anidulafungin, has been shown to be effective in treating candidemia and other forms of invasive candidiasis (henceforth, candidemia). The objective of this study was to compare cost and outcomes of anidulafungin with current standard of care in Canada, and fluconazole, for the treatment of candidemia in non-neutropenic adult patients. **METHODS:** A decision tree was constructed to examine the cost-effectiveness of anidulafungin compared with fluconazole, in the treatment of candidemia. Data on treatment success, renal toxicity, duration of intravenous and oral antifungal treatment, and patient survival were obtained from a published, randomized, double-blind trial comparing anidulafungin with fluconazole. Separate analyses of the clinical trial data were performed to obtain length of stay in the intensive care unit and general ward for each arm of the trial. Therapy switching and additional resource use were obtained from surveys of Canadian clinicians. Medical and drug costs were taken from standard Canadian costing sources and the published literature. The incremental cost per successfully treated patient was calculated. Sensitivity analyses were performed. **RESULTS:** The percentage of successfully treated patients is higher for patients treated with anidulafungin than with fluconazole (74.02% vs. 56.78%). Treating with anidulafungin results in higher antifungal drug costs $4792 vs. $2651; however, overall costs are lower for treatment with anidulafungin than for treatment with fluconazole ($62,949 vs. $65,954, respectively) due to an offset in other medical costs, mainly in ICU where anidulafungin is associated with savings of $6707. Thus, treating with anidulafungin is cost-savings (less costly and more efficacious) when compared to treating with fluconazole. **CONCLUSION:** Anidulafungin has demonstrated improved clinical efficacy versus standard of care in treating candidemia. Despite an increase in drug costs, treating candidemia with anidulafungin is a cost-saving strategy.

PIN22

PHARMACOECONOMIC ANALYSIS BASED ON GUIDELINES FOR TREATING MILD DIABETIC FOOT INFECTIONS: A DECISION TREE MODEL FOR CANADA

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OBJECTIVE: Limited information exists to guide clinicians in selecting antibiotics for diabetic foot infections. Because this serious complication causes substantial morbidity, mortality, and incurs major health care costs, we developed a decision tree model to determine, from the Ministry of Health's perspective,

the cost-effectiveness in Canada of the treatments recommended by the Infectious Diseases Society of America guidelines for mild diabetic foot infections. **METHODS:** A decision-tree model was developed using TreeAge Pro-2007 and clinical experts. Success probabilities were derived from published randomized controlled trials. Drug costs were obtained from the 2007 Ontario Drug Benefit Formulary and McKesson Inc., and amputation costs from CMG's 2002/2003 database, with values adjusted to 2007 using the Canadian Consumer Price Index. Hospitalization costs were obtained from Sunnybrook Hospital's 2003/3004 database, adjusted to 2007. One-way and two-way sensitivity analyses were performed to test the robustness of the decision tree model by varying the clinical success rates and costs of antibiotics. Probabilistic sensitivity analyses were also performed using Monte Carlo simulations. **RESULTS:** Clindamycin was cost-effective, dominating all other choices, and cephalexin had the next best profile. Expected success rates were 99.4% for clindamycin, 97.8% for cephalexin, 95.4% for amoxicillin-clavulanate, 95.2% for cloxacillin and 95.0% for levofloxacin. The expected cost of clindamycin ($361.33) was substantially lower than the next best alternative, cephalexin ($1239.99); a cost difference of $878.66 per patient treated. However, success rates were based on a single small trial for each drug ($n < 30$ for each). In sensitivity analyses, the model/decision was sensitive to changes in efficacy rates and costs within plausible ranges for clindamycin and cephalexin. **CONCLUSION:** Clindamycin was cost-effective in treating mild diabetic foot infection but our model had several limitations/assumptions; therefore, the results should be interpreted cautiously. In general, few clinical studies have evaluated oral antibiotics for treating these infections and more are needed.

PIN23

PHARMACOECONOMIC ANALYSIS OF ANTIFUNGAL AGENTS FOR THE MANAGEMENT OF NON NEUTROPENIC PATIENTS WITH INVASIVE CANDIDIASIS AT THE SOCIAL SECURITY MEXICAN INSTITUTE (IMSS)

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OBJECTIVE: Invasive candidiasis has become a frequent and a high economic impact disease in Mexican hospitals. The purpose of this study was to develop an economic assessment to evaluate the cost-effectiveness between different antifungal agents for the treatment of non neutropenic patients with invasive candidiasis at the Social Security Mexican Institute (IMSS) from the payer's perspective. **METHODS:** A 12-week Bayesian decision-tree model was performed to simulate costs and effectiveness outcomes. Effectiveness measures were the rate of clinical success without adverse events (AE) and the patient's stay length in intensive care units (ICU) at the end of the follow-up period. Effectiveness data and transition probabilities were taken from international published literature. The comparators were anidulafungin (100 mg/day); liposomal amphotericin B (3 mg/kg/day); amphotericin B (0.6 mg/kg/day); fluconazol (200 mg/day); caspofungin (initial dose 70 mg/day, subsequent 50 mg/day) and voriconazol (400 mg/day). Resource use data and costs were obtained from hospital records from one tertiary care hospital at IMSS ($n = 25$). The model was calibrated according to international pharmacoeconomics guidelines. One-way and probabilistic sensitivity analyses were performed using Monte Carlo Simulation second-order approach. **RESULTS:** Patients who received anidulafungin experienced 58.8%(CI95%51.0%–65.5%) of clinical success without AE, followed by limposomal amphotericin B (46.7%[CI95%35.9%–61.6%]) and fluconazol (45%[CI95%37.8%–51.8%]). Patients treated with anidulafungin were hospitalized with a mean of 15.4(CI95%8.5–22.2) days in ICU followed by limposomal amphotericin B (17.2[CI95%10.0–23.6]) and fluconazol (17.5[CI95%10.8–24.1]). Mean cost per patient were lower with anidulafungin (US$32,711[CI95%US$29,720–US$36,456) followed by limposomal amphotericin B (US$35,713[CI95%US$31,628–US$39,660]) and fluconazol (US$36,688[CI95%US$33,501–US$40,402]). Based on ICERs, anidulafungin was the dominant therapy. Acceptability curves and component analyses showed anidulafungin as the most cost-effective therapy in a range of 80%–90% ($p < 0.05$). **CONCLUSION:** In Mexico, anidulafungin was the most cost-effective antifungal therapy for invasive candidiasis. These results should be taken into account by Mexican decision makers in the management of non neutropenic patients with invasive candidiasis.

PIN24

COST-EFFECTIVENESS ANALYSIS OF ANIDULAFUNGIN FOR THE MANAGEMENT OF INVASIVE CANDIDIASIS IN NON-NEUTROPENIC PATIENTS IN MEXICO

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OBJECTIVE: Invasive candidiasis is a serious infectious disease with high incidence and important economic impact due to its long hospitalizations. The purpose of this study was to estimate the cost-effectiveness of anidulafungin and other antifungal agents in the management of invasive candidiasis in non-neutropenic patients from the payer's perspective. **METHODS:** A Bayesian decision tree model allowing switches among different antifungal treatments was performed. The model simulates costs and effectiveness in a 12-week-period. Effectiveness measures were the rate of clinical success and percentage of survival. Clinical efficacy and transition probabilities were obtained from published literature. Comparators were anidulafungin (100 mg/day), amphotericin B (0.6 mg/kg/day) and fluconazol (initial dose 400 mg/day, subsequent 200 mg/day). Resource use data and costs were obtained from a tertiary care hospital "Hospital de Especialidades" CMN Siglo XXI from the Social Security Mexican Institute ($n = 25$). Resource use include: inpatient services, intensive care unit, drugs and surgery. One-way sensitivity analysis was performed and other probabilistic sensitivity analyses were constructed. **RESULTS:** Patients treated with anidulafungin experienced the higher clinical success (74.02%) followed by amphotericin B (63.51%) and fluconazol (56.78%). On the other hand, anidulafungin yielded 77.17% of total-survival followed by fluconazol with 68.64% and amphotericin B with 62.19%. The mean total costs per patient were US$47,993 for anidulafungin; US$59,350 for fluconazol and US$60,349 for amphotericin B. ICERs estimated using amphotericin B as the baseline strategy using clinical success as effectiveness outcome were –US$117,633 for anidulafungin and US$14,847 for fluconazol. ICER's estimated using the same comparator for total-survival as effectiveness was –US$82,503 for anidulafungin and –US$15,482 for fluconazol. Sensitivity analyses showed that anidulafungin was the dominant strategy ($p < 0.05$). **CONCLUSION:** In Mexico, anidulafungin treatment was a cost-saving therapy not only because of its higher clinical success and survival but for its potential cost reduction. These results should be considered by Mexican decision-makers in future cost-containment policies.

PIN25

THE ECONOMIC IMPACT OF SINGLE-DOSE AZITHROMYCIN MICROSPHERES FORMULATION FOR THE MANAGEMENT OF ACUTE STREPTOCOCCAL PHARYNGITIS (ASP) IN MEXICO

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OBJECTIVE: The ASP is one of the most frequent infectious diseases and represents one of the principal causes of outpatient services demand in Mexico. The purpose of this study was to estimate the cost-effectiveness between single-dose azithromycin microspheres formulation vs. other usual antibiotics in the management of ASP from the Mexican Health Service perspective. **METHODS:** A three-month Bayesian decision tree model was performed to estimate costs and effectiveness. Effectiveness measure used was the percentage of clinical success rate (significant improvement of symptoms in a period not longer than a four-day treatment). Comparators employed were single-dose azithromycin oral suspension (60 ml); amoxicillin (1000 mg/day); penicillin (600,000 U/day); ampicillin (1500 mg/day); clarithromycin (500 mg/day); erythromycin (1000 mg/day) trimetoprim + sulfametoxazol and azithromycin (500 mg/day per 3 d). Clinical efficacy was obtained from international published literature. Resource use data and costs were obtained from a retrospective review of hospital records (n = 100) in patients treated at the Social Security Mexican Institute (IMSS) in Mexico City. The model was calibrated. One-way sensitivity analysis and probabilistic sensitivity analyses were performed. MonteCarlo first order sensitivity analysis was done using bootstrapping techniques. **RESULTS:** The patients treated with azithromycin oral-suspension experienced the highest effectiveness (93%; CI95% 90%–97%), followed for azithromycin (3-days) treatment (79%; CI95% 77%–81%) and erythromycin (67%, CI95% 66%–68%). On the other hand, amoxicillin and trimetoprim showed the less effectiveness compared to the baseline therapy (penicillin [57%; IC95% 56%–58%]). The mean treatment costs for azithromycin oral-suspension was US$110.9 (CI95% US$109.3–US$112.1); US$122.3 (CI95% $1329.10–$1365.56) for azithromycin (3-days) and US$128.1 (CI95% US$127.0–US$132.2) with erythromycin. The ICER's were US$–49.8 (CI95% –US$41.7,–US$60.4) for azithromycin oral-suspension, –US$30.6 (CI95% –US$20.0,–US$40.4) and –US$25.5 (CI95% –US$21.9,–US$30.36) for erythromycin. Probabilistic sensitivity analyses showed that the single-dose azithromycin oral-suspension was the dominant therapy ($p < 0.05$). **CONCLUSION:** Despite its higher cost, the study demonstrates that azithromycin oral-suspension treatment, due to its higher compliance rate, is a dominant therapy in the treatment of ASP in Mexico.

PIN26

ECONOMIC EVALUATION OF SUNITINIB VS. INTERFERON-ALFA (IFN-ALFA) IN FIRST-LINE TREATMENT OF METASTATIC RENAL CELL CARCINOMA (MRCC) IN COLOMBIA

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OBJECTIVE: To evaluate the cost effectiveness and cost utility of sunitinib compared with interferon-alfa (IFN-alfa) for first-line treatment of patients with Metastatic Renal Cell Carcinoma (mRCC) from Colombia third-party payer perspective. **METHODS:** A Markov model was developed and adapted to Colombian circumstances to evaluate the cost-effectiveness of sunitinib vs. IFN-alfa. The model projected survival and costs in 6-week cycles based on extrapolation of the trial survival data. The reference case analysis followed the patients until death or for up to 1 year, however longer time horizons were considered in the analysis (two, five, and ten years). Effectiveness was measured in terms of progression-free life years (PFLY), life-years (LY) gained and quality adjusted life-years (QALY) gained. Resource utilization and unit cost data were collected from: A series of 15 patients with mRCC treated in Colombia, Colombian expert clinical opinion and the cost of medication was extracted from a Colombian Cancer reference institution (Liga Colombiana de lucha contra el cáncer). Costs and benefits were discounted annually at 5%. All costs were calculated in 2006 Colombian pesos. Univariate sensitivity analyses was conducted. **RESULTS:** For the reference case: the cost analysis suggested a difference in favor of sunitinib of US$5711. The treatment with sunitinib was associated with incremental gain in: PFLY of 0.23, overall survival of 0.05 YL and QALY of 0.07. The incremental cost-effectiveness ratio (ICER) and incremental cost-utility ratio (ICUR) showed negative values, which indicated that sunitinib is cost saving versus IFN-alfa. In the longer time horizon analysis the sunitinib is dominant in the first two years; for 5 and 10 years analysis the ICER and the ICUR are around US$8200 and US$6400 respectively. **CONCLUSION:** This analysis indicated that sunitinib is a cost-effective treatment compared with IFN-alfa as a first-line treatment in mRCC in Colombia.

PIN27

ECONOMIC ANALYSIS OF MICAFUNGIN VERSUS LIPOSOMAL AMPHOTERICIN B FOR TREATMENT OF CANDIDAEMIA AND INVASIVE CANDIDIASIS IN THE UNITED KINGDOM

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OBJECTIVE: To investigate the economic impact of introducing micafungin (MICA) for the treatment of systemic candida infections (SCIs) (including invasive candidiasis and candidaemia) in the UK, a health economic analysis was performed comparing MICA with liposomal amphotericin B (L-AMB). **METHODS:** The model was based on data from a phase III, randomised, double-blind trial which compared MICA with L-AMB. The model period entails 14–20 weeks starting from initiation of treatment and was analysed from a UK hospital perspective. Hospitalisation and primary medication costs were included in the current analysis. Unit costs of these resources were taken from appropriate UK costing sources. As the price for MICA was not available at the time of analysis, the price per recommended daily dose (RDD) of MICA (100 mg) was assumed to be equal to the price per RDD of caspofungin (50 mg). The model endpoint was defined as the percentage of patients that achieved complete or partial clinical and mycological response after initial treatment, and were alive after the 12-week follow-up period. The model was analysed using cohort and second order Monte Carlo (MC) simulation. **RESULTS:** The analysis shows that with MICA 52.9% of patients were successfully treated and survived 12 weeks after treatment ends compared to 49.1% for L-AMB. MICA was also less expensive than L-AMB costing £26,838 and £29,549 per patient, respectively. Because the costs are lower and the effectiveness is higher for MICA (cost-effectiveness [C/E] ratio = £50,755) in comparison with L-AMB (C/E

ratio = £60,197), MICA dominates L-AMB. The results of the MC simulation and the sensitivity analyses showed that MICA remained the most cost-effective option. **CONCLUSION:** The lower costs and higher effectiveness reported for MICA versus L-AMB in this analysis indicate MICA is the more cost-effective therapy in the treatment of SCIs in the UK when compared to L-AMB.

PIN28

A REALISTIC-AGE-STRUCTURED, DETERMINISTIC, COMPARTMENTAL, TRANSMISSION MODEL TO ESTIMATE THE COST-EFFECTIVENESS OF VACCINATION AGAINST SEASONAL INFLUENZA

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OBJECTIVE: To estimate the cost-effectiveness of a national immunization program against seasonal influenza targeting children aged one to five years and adults aged 65+ years. **METHODS:** Dynamic models simulate the indirect effect of vaccination conferred by herd protection, therefore, in order to estimate the population effect of vaccination against influenza, a transmission model comprising annual age classes was developed to model the effects of age-specific infection, morbidity, and mortality due to seasonal influenza. The structure of the model followed the susceptible-latent-infected/morbid-recovered schema for each age class. Transition between age classes was modelled by either jumps to the next age class between influenza seasons, or at a continuous rate. Assumptions concerning antigenic drift of the influenza strain were incorporated in the model as the waning of vaccine-acquired immunity between successive influenza seasons. Health benefits were estimated using person-years with influenza. Further developments are intended to extend the outcome measures to include Quality-Adjusted Life Years. Cost analysis was from a societal perspective in the UK, however extension to other settings can be performed. **RESULTS:** Assuming 60% vaccination coverage of the target population in an influenza season, the ratio of person-years with influenza to the initial population size is 0.99% for no vaccination and 0.85% with vaccination. This indicates that in the UK, vaccination could prevent approximately 84,000 person-years of influenza, which corresponds to 2,184,000 influenza episodes per season, assuming infection lasts 2 weeks. The incremental cost per person-year with influenza, with vaccination versus no vaccination was ≤149. **CONCLUSION:** Initial results indicated that the national immunization program targeting children aged 1–5 years and 65+ adults could be highly cost effective.

PIN29

COST-EFFECTIVENESS EVALUATION OF THREE HEALTH CARE DELIVERY MODELS FOR HIV POSITIVE PATIENTS IN COLOMBIA

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OBJECTIVE: To estimate the CER of three health care delivery models (HCDM) for HIV+ patients in Colombia. **METHODS:** A review of 356 medical records from patients affiliated to institutions under the Contributive Regimen in the Colombian Health System was performed. The review incorporates data from 2002 to 2005, including disease status, treatment efficacy, and costs of care. VL and CD4 count data from the three-year analysis were used as clinical outcomes. Direct costs included medications, hospital expenses, doctor visits, laboratory tests, and other health care providers costs. Description of the three models and analyses of the services provided, team members, negotiations by plan were described for each model. **RESULTS:** After controlling by disease status and services utilization increase of CD4 count over the time of the study was significantly lower for patients in Model 3 (mean + 238 cells/mm3) than Model 1 (mean + 649 cells/mm3) and Model 2 (mean + 676 cells/mm3). When VL was analyzed patients in Model 1 had a higher decrease in VL levels –118,290 RNA copies vs. Model 2: –33,693 RNA copies and Model 3 = –33,504 RNA copies. Cost related to hospitalizations were comparable in the three models and high differences were found in the utilization and cost of outpatient services. However the overall cost including antiretrovirals for patients in Model 1 was $10,399.00, $11,617 for Model 2 and $11,002 for Model 3. After a sensitivity analyses was performed CER were calculated. The lower CER was $16.7 per CD4 cell/mm3 increased and $0.20 per RNA copies decreased in Model 2 compared to $19 and $0.30 for Model 1 and $26 and $0.58 for Model 3. **CONCLUSIONS:** Due to differences in the plan characteristics and services utilization of the Health Care Delivery Models, Model 2 appears to be a highly cost-effective program relative to Model 1 and 3 health care programs for HIV patients in Colombia.

PIN30

COST-MINIMIZATION ANALYSIS OF ORAL VALGANCICLOVIR VERSUS INTRAVENOUS GANCICLOVIR FOR THE PROPHYLAXIS OF CYTOMEGALOVIRUS INFECTION IN SOLID ORGAN TRANSPLANT RECIPIENTS IN BRAZIL

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OBJECTIVE: Cytomegalovirus (CMV) remains the leading opportunistic infection in the transplant population and is responsible for numerous direct and indirect consequences. Some clinical trials (Paya CV, et al. 2004; Ciancio G. et al. 2004) have shown that prophylaxis with oral valganciclovir (VAL) is safe, effective and less costly when compared with IV ganciclovir (GAN) for the prevention of CMV infection in solid organ transplant (SOT) recipients. Our aim was to compare costs and medical resources of CMV infection prophylaxis in SOT recipients with oral VAL versus IV GAN in Brazil. **METHODS:** Based on study of Paya CV, et al. 2004, we assumed the same efficacy for both oral VAL and IV GAN for the prevention of CMV infection in SOT recipients. Therefore, a cost-minimization analysis was developed to assess costs related to the prophylaxis of CMV with oral VAL (900 mg/day) versus IV GAN (5 mg/kg/day), under the payer's perspective in Brazil. Only direct medical costs (drugs, administration, physician fees and daily inpatient care) were considered in this study. A panel with specialists was conducted to reflect local practices. A 90-day timeframe was considered based on the prophylaxis period which begins until 10 days after the transplant is done; consequently a discount rate was not necessary. One-way sensitivity analyses were performed to assess the robustness of the outcomes. **RESULTS:** Total costs were R$17,673 for VAL and R$45,625, a savings of 61% per patient. Cost-savings observed for VAL were due to lower costs related to inpatient care (VAL: R$0 vs. GAN: R$29,520) and lower administration costs (VAL: R$0 vs. GAN: R$7564). One-way sensitivity analysis supported the robustness of the findings. **CONCLUSION:** Findings suggest oral valganciclovir as a cost-saving alternative for the prophylaxis of CMV infection in SOT recipients under the payer perspective in Brazil.

PIN31

TOTAL TREATMENT COST OF LINEZOLID COMPARED TO VANCOMYCIN IN MRSA INFECTIONS

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OBJECTIVE: This study estimated the total treatment cost of the orally administrated agent linezolid compared to vancomycin, administrated through intravenous infusion, in patients with methicillin resistant Staphylococcus aureus (MRSA) infections in Sweden. **METHODS:** Resource consumption for MRSA treatment was divided into four categories; hospital and home care, pharmaceuticals, administration of intravenous infusion, and diagnostic tests. Costs were assigned to each resource from official price lists and Statistics Sweden. Total treatment cost was investigated in a cost-minimization model for a base case where patients were treated for 14 days and remained at the hospital for the entire treatment duration. In a sensitivity analysis a range of parameters were varied and scenarios were investigated where linezolid patients were able to conclude the treatment at home, and where all patients were able to conclude treatment at home (using home care for vancomycin i.v.). Costs were given in 2007 Euro prices. **RESULTS:** In the base case, the total treatment cost during 14 days was €9526 for linezolid and €9459 for vancomycin. Pharmaceutical cost was €856 higher for linezolid; however this cost was offset by lower cost of intravenous administration and diagnostic tests. The sensitivity analysis showed that for each day linezolid patients could be treated at home, while vancomycin patients remained at hospital, the linezolid treatment cost decreased by €558 compared to vancomycin treatment. For each day both linezolid and vancomycin patients could be treated at home, the corresponding decrease was €254. **CONCLUSION:** When patients remain at the hospital for the entire treatment duration, the higher pharmaceutical cost of linezolid compared to vancomycin is almost entirely offset by lower cost of administration and diagnostic tests. The potential for significant cost reduction lies in enabling patients to conclude their treatment at home without home care visits. This potential has been shown to be realized by linezolid.

PIN32

THE CHILD AND HOUSEHOLD INFLUENZA-ILLNESS AND EMPLOYEE FUNCTION (CHIEF) STUDY—LINKING SURVEY AND CLAIMS DATA TO UNDERSTAND DISEASE IMPACT ON INDIRECT COSTS

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Administrative claims data provides tremendous utility in analyzing specific real world questions; however, as noted by the ISPOR Task Force for Retrospective Database Analysis, many research questions require information beyond the scope of claims-based databases. The CHIEF Study was designed to capture complementary survey data to supplement an existing claims database for evaluating how household cases of influenza impact employee productivity. Leveraging existing relationships with three large employers, the CHIEF Study links monthly web-based surveys collected during the 2007–2008 influenza season with administrative claims from the MarketScan Databases. Three employers, which include a national retail chain, a transportation company, and a durable goods manufacturing company, participate in CHIEF. Participant eligibility was based on having at least one child aged ≤17 years with employer-sponsored health insurance that lives in household ≥4 days per week. A total of 3686 employees completed the web-based screening questionnaire; 2295 (62%) of employees were eligible for study participation. Each month between October 2007 and May 2008, participants receive an email with an electronic link to the survey. The baseline surveys include questions about demographic, health status and health behaviors of all household members as well as the employee's workplace characteristics, absenteeism and presenteeism. The average household includes 2.08 adults and 1.85 children. Employees are approximately 40.77 years old and are predominately full-time workers (81.91%). Monthly surveys include questions about the presence of influenza in the household, the impact of influenza on employee productivity and influenza-related health care use. The completion rate for the first and second monthly surveys was 97.2% (n = 2230) and 96.5% (n = 2213) respectively. Prospective examination of household illness, absenteeism and presenteeism linked with administrative claims data is feasible and provides an opportunity to understand the impact of disease on indirect costs. This information can provide more credibility to future economic analyses and decision making.

PIN33

A DYNAMIC MODEL FOR ASSESSING THE IMPACT OF EMERGING VACCINE TECHNOLOGIES ON MEASLES DISEASE BURDEN IN DEVELOPING COUNTRIES

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OBJECTIVES: Measles continues to cause considerable morbidity and mortality worldwide. The current measles vaccine is administered in developing countries through a combination of routine immunization (RI) at nine months of age plus a second opportunity (SO)—either another routine injection after one year of age or via large-scale campaigns. Although these strategies have proven successful in eliminating measles in the Americas, measles continues to prove intractable in much of Asia and Africa due to challenges with vaccine delivery and effectiveness in current settings. However, several potential measles vaccine technologies are presently in R&D with the aim to further reduce measles disease burden compared to the conventional approach alone. Examples of such technologies include needle-free devices, DNA vaccines, and/or thermostable vaccines. **METHODS:** We developed an age-structured compartmental (dynamic) model of measles transmission in Nigeria, Uganda and Bihar, parameterized with available demographic, clinical, incidence and seroprevalence data. We thus projected future measles cases and deaths under scenarios of (1) RI alone with current technology; (2) RI with SO using current technology; (3) RI with new technologies; and (4) RI and SO with new technologies. We investigated the impact of new technologies under various alternative assumptions regarding how much they would increase vaccine coverage and/or vaccine efficacy. A dynamic model was used so that herd immunity effects can be captured and the estimated benefits of vaccine innovations thus better estimated. **RESULTS:** The effectiveness of RI and SO is enhanced with some of the new measles vaccine technologies. According to model projections, new technologies would further reduce the burden of disease in all three populations, especially at younger ages. **CONCLUSION:** New immunization technologies could help reduce the measles disease burden in developing countries. However, the potential cost-effectiveness of using these new technologies and strategies, including the likelihood of uptake, remains to be determined.

PIN34

HEALTH CARE UTILIZATION AND COSTS ASSOCIATED WITH CHRONIC HEPATITIS C IN A MANAGED CARE POPULATION

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OBJECTIVE: Hepatitis C virus (HCV) is one of the most common blood-borne infections in the US. Although it carries a potentially high economic burden for managed care systems, HCV-related medical costs have not been widely investigated using administrative data. Our objective was to analyze retrospective insurance claims to document resource utilization and costs associated with chronic HCV among managed care enrollees. **METHODS:** A large US claims database was analyzed from 1/1/2002 through 12/31/2006. Inclusion criteria were: ≥1 diagnosis of chronic HCV (ICD-9 070.44, 070.54, 070.70, or 070.71); no evidence of hepatitis B; ≥12 months of continuous plan enrollment post-diagnosis. Per patient use and costs of HCV-specific medical services and prescriptions were assessed over 12 months post-diagnosis. HCV-specific encounters were identified as claims on which HCV was a coded diagnosis. Encounters were stratified by setting of care (e.g. office visits, hospitalizations). HCV-specific pharmacy utilization included prescriptions for combination peginterferon or interferon with ribavirin, peginterferon and interferon monotherapies, and consensus interferon. **RESULTS:** 20,662 patients met all inclusion criteria. Mean age was 49 years and 61% were male. Total HCV-specific treatment costs were $6864 per patient. Patients had, on average, 14 HCV-specific encounters. Nearly 65% had an HCV-related office visit, with 3 visits on average. Over 48% had an HCV-specific laboratory test, with 5 tests on average and total costs of $281. More than 14% of patients had an HCV-related hospitalization, with average costs of $2078 per patient and 5 inpatient days. 19% of patients had an HCV-specific prescription with prescription costs ($3433) accounting for nearly half of the total costs. HCV-specific home visits, skilled nursing stays, and ER visits were seen in <5% of patients. **CONCLUSION:** Chronic HCV is a costly condition. Pharmacy and inpatient services are primary drivers of HCV-related expenditures. Expanded efforts in HCV treatment may result in cost savings for managed care systems.

PIN35

RESOURCE UTILIZATION IN UNITED KINGDOM DIAGNOSED HCV PATIENTS

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OBJECTIVE: Chronic hepatitis C (CHC) is a life threatening disease with long term consequences although the early stage is considered 'asymptomatic'. This study is to explore if higher resource utilization occurs for early-stage CHC patients (case) than non-CHC (control) subjects. **METHODS:** A large longitudinal database, Health Improvement Network (THIN), was retrospectively analyzed. THIN contains medical records of over 2.2 million anonymous subjects representing UK population. Cases were defined with confirmed CHC diagnosis and no records related to fibrosis, cirrhosis, decompensated liver conditions, and liver transplantation. Propensity matching techniques were applied to identify controls who did not have CHC diagnosis but matched cases on CHC propensity based on age, weight, height, gender, smoking, and alcohol consumption. Resource utilization patterns based on the retrieved medical records were compared between two groups. Odds ratios (OR) and 95% confidence intervals (CI) were derived from logistic regression models controlling for follow-up duration; 95%CI excluding 1 is considered statistically significant. **RESULTS:** The case group (N = 1576) and the control group (N = 5234) matched on all demographic factors. On average, case subjects were 45.0 (13.3) years old, 64.7% male, and were followed 4.21 years after CHC diagnosis in the database. Compared to the control, case subjects had 69% greater chance of having specialist referral/visits (OR: 1.69, 95%CI: 1.50–1.91), and 70% higher probability of hospitalization and emergency/accident visits (OR: 1.70; 1.46–1.98). Case subjects also had 90% more chance using additional tests/procedures (OR: 1.90; 1.68–2.15) with key drivers from endoscopy (OR: 3.56; 2.39–5.31), MRI (OR: 1.93; 1.23–3.03), and ultrasound (OR: 1.73; 1.17–2.57). Among CHC subjects, age 50–60 (N = 265) and >60 groups (N = 180) recorded significantly more health care resource uses than age < 40 (N = 545) and 40–50 (N = 586) group. **CONCLUSION:** CHC subjects consumed more health care resources than matching non-CHC controls in UK even at the early stage of this serious liver disease.

PIN36

BASELINE CHARACTERISTICS ASSOCIATED WITH HOSPITAL LENGTH OF STAY (LOS) FOR PATIENTS WITH STAPHYLOCOCCUS AUREUS SKIN INFECTIONS IN THE 1996–2005 NATIONAL HOSPITAL DISCHARGE SURVEY (NHDS)

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OBJECTIVE: *S. aureus* skin infections are a common cause of hospitalization. Though rarely lethal, these infections impose great morbidity on health care systems. Head-to-head therapeutics studies commonly use LOS as an outcome, but rarely account for differences in baseline characteristics. This study aims to identify baseline characteristics associated with LOS among patients with *S. aureus* skin infections. **METHODS:** Data were extracted from the 1996–2005 NHDS. Data included age, gender, race, geographic region, admission location, days of care, insurance status, discharge status, and location. Patients were included if they had both an ICD-9 code for skin infection (680–684) and *S. aureus* (041.11). Patients were excluded if they were <18 yrs, left against medical advice, transferred to a skilled nursing facility, died, transferred from another hospital or had a LOS <1 day. Each characteristic was individually tested for significance with a Cox regression model. Significant variables were entered into a multivariable Cox regression model to identify independent predictors of LOS. **RESULTS:** Overall, 7094 patients met inclusion criteria and 5354 remained after exclusions. Patients had a median (25th-75th percentile) LOS of 5 (4–8) days, age of 52 (40–69) years, 56% were male and 53% were White. The following characteristics were associated with longer LOS: advanced age (p = <0.0001), earlier survey year (p = <0.001), female gender (p = 0.0003), widower (p = 0.0001), Northeast geographic region (p = <0.0001), African American/Black (p = 0.04), and Medicare (p = <0.0001). In contrast, small hospital size was associated with a decreased LOS. In the multivariable regression model, advanced age, Medicare, earlier survey year, and Northeast geographic region were independently associated with an increased LOS while small hospital size was independently associated with an decreased LOS (all p-values were <0.0001). **CONCLUSION:** Five baseline characteristics were independent predictors of LOS. These factors should be considered in comparative retrospective evaluations of patients with *S. aureus* skin infections.

PIN37

AN EXAMINATION OF THE CORRELATION BETWEEN QUALITY OF PATIENT CARE AND PATIENT RACE OR SOCIAL CLASS IN INPATIENT APPENDICITIS CASES

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OBJECTIVE: It is the purpose of this study to examine the relationship between hospital stays and a patient's race or social class with respect to the occurrence of appendicitis. These cases are drawn from the Health care Cost and Utilization Project of the 2004 Nationwide Inpatient Sample (NIS). **METHODS:** We consider three outcomes: the amount of total charges the patient incurs; the length of the patient's stay; and whether or not the patient died. The sample was taken from 12,432 inpatient appendicitis cases from a 10% sample of the NIS. We used Kernel Density Estimates and multiple Logistic Regression Analyses to examine outcomes versus patient demographics and risk factors. Linear Regression Analysis examined charges and stay. **RESULTS:** Patients in the second income quartile had the lowest total charges, but the highest rate of death. White patients had some of the lowest total charges, but again, the highest rate of death. There was no direct relationship between Patient Death and Race, Zip Code Income Quartile, Insurance or Primary Diagnosis. There was also no relationship between Length of Stay and Race, Zip Code Income Quartile, or Insurance. The Primary Diagnoses found to be directly related to Length of Stay were Rectosigmoid Junction Malignant Neoplasm, Volume Depletion, Hypopotassemia, Unspecified Anemia, Unspecified Congestive Heart Failure, Acute Appendicitis with Generalized Peritonitis, Acute Appendicitis with Peritoneal Abscess, Other Specified Gastritis, and all others combined. The remaining diagnoses—Pure Hypercholesterolemia and Diaphragmatic Hernia—were both inversely related to Length of Stay. However, no direct correlation may be seen between to lower the quality of health care and minority race or lower social class. **CONCLUSION:** In the end, it seems that demographic characteristics have little or no effect on quality of care in appendicitis cases. Length of Stay is largely determined, not surprisingly, by the patient's primary DRG code.

INFECTION—Patient-Reported Outcomes

PIN38

RANDOMIZED CONTROLLED TRIAL OF TELEPHONE, EMAIL AND TEXT MESSAGING REMINDERS ON PATIENT COMPLIANCE WITH ANTIBIOTIC REGIMEN

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OBJECTIVE: Using the Health Belief Model (HBM) as a conceptual framework, this study tested whether telephone, email, or cell phone text messaging follow-up increased patient compliance with prescribed antibiotic therapy. **METHODS:** A randomized controlled trial was employed in a convenience sample of 201 patients receiving a new prescription for a 10-day oral antibiotic at a university student health center pharmacy. Subjects first completed a survey on their health beliefs about antibiotic-taking. They were then randomized into one of three intervention groups (telephone, email or text messaging follow-up) or a control group. Those in the intervention groups either received a telephone, email, or text message reminder on the 4th day of the antibiotic regimen. On the 9th day, every subject was interviewed over the phone on their antibiotic-taking behaviors. Compliance was defined as at least 90% of antibiotic consumption. Chi-square and logistic regression analyses were used to assess the relationships between explanatory variables and subjects' compliance with antibiotic regimen. **RESULTS:** One hundred and forty one subjects completed the study (telephone group = 30; email group = 35; text messaging group = 33; control group = 43) with the subject's average age being 20.4 ± 2.1 years. Of those who completed the study, 75.9% complied with their antibiotic regimen (telephone group = 86.7%; email group = 68.6%; text messaging group = 72.7%; control group = 76.7%). No statistically significant differences were found in compliance rates between the four groups. However, subjects with lower perceived barriers (e.g., side-effects, regimen inconvenience), higher self-confidence, and greater intent in following the doctor's directions were more likely to comply with their antibiotic regimen ($p < 0.05$). **CONCLUSION:** Although the compliance interventions in this study had a weak statistical effect on patients' antibiotic compliance, assessment of the HBM components is useful in detecting patients at high risk of medication non-compliance.

PIN39

ROLE OF DRUG DISTRIBUTION STRATEGIES TO IMPROVE HEALTH OUTCOME IN HIGH RISK PATIENTS

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OBJECTIVE: The objective of this study was to examine the effect of drug distribution methods, insurance type, and pharmacy access on antiretroviral adherence and persistence scores in HIV+ patients. **METHODS:** A longitudinal, retrospective study of patients ≥18 years old receiving antiretroviral therapy from January 1, 2004 to June 30, 2006 was collected from an independent pharmacy in Houston and followed for a period of five refills. Data collected included: demographics, drug distribution method (pick up vs. delivery), insurance type (public vs. private), and distance from pharmacy. A modified medication possession ratio was used to calculate adherence and persistence scores. Differences in adherence and persistence scores by groups were evaluated by conducting t-tests. The association between adherence and persistence scores with distance from pharmacy was analyzed using Spearman correlation analysis. **RESULTS:** Of 181 patients included in the analysis, 50% were male, average age 38.0 (SD10.6) years. Patients who had medications delivered to their home (62%) had significantly greater adherence (95% vs. 81%, $p < 0.0001$) and persistence scores (78% vs. 51%, $p < 0.0001$) compared to those that picked up their medications. For patients who had public insurance (64%) and those who had private plans (36%), adherence (91% vs. 93%, $p = 0.210$) and persistence scores (67% vs. 68, $p = 0.921$) were similar. There were no significant associations between adherence ($r = -0.19$, $p = 0.11$) and persistence ($r = -2133$, $p = 0.0776$) with distance from pharmacy. No differences in adherence were seen for gender, age, or drug class, either. **CONCLUSION:** Medication delivery services increases adherence to antiretroviral therapy in HIV+ patients. These results were significant, irrespective to the insurance type they had or the distance of the pharmacy from a patient's residence. Further research should be conducted to evaluate how such drug distribution strategies can be implemented universally and the economic impact on cost of care.

PIN40

ASSESSMENT OF THE CROSS-CULTURAL VALIDITY OF AN HIV SYMPTOM DISTRESS MODULE IN AN INTERNATIONAL HIV CLINICAL TRIAL

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OBJECTIVE: To assess whether the Symptom Distress Module (SDM) developed by the AIDS Clinical Trial Group showed

cross-cultural validity in an international HIV clinical trial. **METHODS:** The SDM was included in a Phase IIb/III trial to assess symptoms perceived by HIV-1-infected treatment-naïve patients. The cross-cultural validity of 25 language versions of the SDM was assessed using baseline data of 759 patients from 3 treatment arms, each having received zidovudine and lamivudine in addition to one of the following: maraviroc 300 mg QD, maraviroc 300 mg BID (approved dose for treatment-experienced patients) and efavirenz 600 mg QD. Given the large number of versions, creating relatively homogeneous cultural groups was necessary for analysis. Seven cultural groups were defined according to language and geographical considerations: European Germanic, Polish, European Romance, Occidental English, American Spanish, Bantu and African Indo-European. The cross-cultural validity of the SDM was assessed by applying ordinal logistic regressions to detect Differential Item Functioning (DIF), and using the STATIS approach, which explores distances between item correlation matrices. **RESULTS:** Most items did not function differentially between cultural groups: only four symptoms showed DIF (fatigue, fevers, feeling anxious and headache) and the greatest cultural differences were observed for fatigue. The African Indo-European versions of the ASDM presented the highest number of differences from the other versions. With the STATIS approach, the Bantu and European Germanic groups were the furthest from the Occidental English but no clear meaningful difference was found in the expressed symptom pattern across cultural groups. **CONCLUSION:** Considering the substantial heterogeneity of cultures included in the study, these statistical findings, together with the rigorous methodology applied for the linguistic validation of the questionnaire, support the cross-cultural validity of the SDM. These findings also indicate that culture has a limited impact on the symptoms expressed by HIV-1-positive individuals starting antiretroviral therapy.

PIN41

COMPLEMENTARY AND ALTERNATIVE MEDICATION USE AND ADVERSE EVENTS IN HIV-INFECTED PATIENTS

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OBJECTIVE: An estimated 29% to 91% of HIV-infected patients use complementary and alternative medications (CAM). The objective was to identify the most commonly used CAM by HIV-infected patients and determine the prevalence of associated adverse events (AEs). **METHODS:** A single-center, prospective, cross-sectional study was conducted from February to July 2007 via convenient sampling. Inclusion criteria were: HIV-positive adults and using at least one CAM in the prior 12 weeks. Patient information (including demographics, CAM use, concomitant medication use, CAM-related AEs, purchasing behavior) was obtained using self-administered questionnaire and personal interview techniques. This study was approved by the institution's IRB and informed consent was obtained prior to enrollment. Descriptive statistics were performed to evaluate trends and assess AE outcomes (SAS Version 9.0). **RESULTS:** One hundred individuals participated in the survey, with a response rate of 71.9%. Subjects were 45.0(9.9) mean(SD) years, 70% male, 54% Black, 32% Caucasian, 8% Hispanic, and 2% Asian. Fifty-five percent had a current/previous AIDS diagnosis. Forty-eight different CAM were used, and 96% of respondents were taking concomitant antiretroviral medications. The most common CAM consumed were: cranberry juice (72%), vitamin C (37%), green tea (34%), and garlic (8%). Most respondents (87%) purchased herbal medications on their own, and mostly from the grocery store (56%). Sixty-four percent of respondents did not inform their providers about CAM use. Fifteen percent experienced AEs that were CAM-related. Nausea and vomiting (33%) were the most frequent AEs reported. Eighty-six percent of subjects experiencing AEs neither consulted their physicians nor stopped using CAM that were thought to cause the AE. **CONCLUSION:** HIV-infected patients frequently use CAM concomitantly with traditional antiretroviral medications. Physicians and pharmacists should document and provide adequate education/counseling regarding CAM, especially for HIV-infected patients, to prevent drug interactions and AEs. More studies are needed regarding CAM utilization, safety, and its economic impact.

PIN42

DESIGNING AND TESTING A HIV-PATIENT SATISFACTION SURVEY FOR A COMPARITIVE ANALYSIS OF MAIL-ORDER PHARMACY VS. COMMUNITY PHARMACY SERVICES

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OBJECTIVE: Designing and testing a reliable and valid survey for comparing HIV patients' satisfaction with services provided by mail order with those provided by a community pharmacy. **METHODS:** Exploratory cross-sectional design using convenience sample of HIV patients at a University Clinic. The satisfaction scale was developed from previously validated instrument ($\alpha = 0.957$ & $\alpha = 0.962$ for factor 1 & 2 respectively). This scale was used for all three settings i.e. mail-order, independent, and chain pharmacies. Practicing pharmacists, graduate students, and pharmacy faculty assessed face and content validity. Clinical pharmacists checked for patient ease of understanding, length, and sensitive items. Students evaluated survey completion time. Faculty members determined ease of understanding, time of completion, research soundness, and objective match. Modifications were made followed by data collection for six-weeks. Reliability tests and item analyses were conducted. Data were entered using SPSS v.15. **RESULTS:** Forty-seven surveys were completed. Item-objective match ranged from 75–90%. Item means ranged from 2.50 to 4.44 for factor 1 and 2.27 to 4.36 for factor 2 for mail-order, 2.33 to 3.93 and 2.85 to 3.85 for independent, and 3.00 to 4.69 and 3.09 to 4.09 for chain. Response variability for most items were above 0.9 using Factor 'V'. Corrected item-total correlations ranged from 0.484 to 0.902 and 0.606 to 0.907 for factor 1 and 2 respectively for mail-order, 0.577 to 0.965 and 0.858 to 0.960 for independent, and –0.35 to 0.862 and 0.599 to 0.932 for chain. None of the items if deleted would increase alpha. Cronbach's alpha for factor 1 were 0.879 for mail, 0.960 for independent, and 0.803 for chain and for factor 2 were 0.950 for mail, 0.983 for independent, and 0.969 for chain. **CONCLUSION:** Analysis indicates good face and content validity, and high reliability. Item analyses indicate items are well written and have good response location, variability, and discrimination.

INFECTION—Health Care Use & Policy Studies

PIN43

NATURAL HISTORY OF CHRONIC HCV INFECTION OBTAINED THROUGH INJECTION DRUG USE: A BAYESIAN META-ANALYSIS

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OBJECTIVE: To estimate the rate of progression to cirrhosis for those infected with Chronic Hepatitis C virus (HCV) through

injection drug use (IDU) in order to inform health care policy. **METHODS:** Systematic review of the literature identified articles with information on the mean duration of infection and the prevalence of cirrhosis for those who obtained HCV infection through IDU. Data on mean age, mean alanine aminotransferase (ALT) enzyme levels, proportion male, proportion with HIV co-infection, proportion with alcohol abuse, and study setting (academic liver clinic, community-based clinic or addiction therapy) were abstracted. Summary progression rates were estimated using random effects Poisson meta-regression, fitted with WinBUGS software. Uninformative prior distributions were used. The impact of study co-variates on the progression rate was assessed by estimating the posterior probability that the relative risk (RR) exceeds 1.0. **RESULTS:** Systematic review identified 5225 abstracts. Abstract review identified 459 relevant articles and a total of 41 articles met the inclusion criteria. Each of the 41 studies had a retrospective study design. The progression rate estimate (adjusted for all co-variates) was 11.2 per 1000 person-years (95% Credible Region, 4.9 to 27.2 per 1000 person-years) corresponding to a 20-year cirrhosis prevalence of 20.2% for patients with chronic HCV infection, in a community-based clinic/addiction therapy setting, in which patients at advanced stage of disease are excluded. Faster progression was associated with a greater proportion male and a greater proportion with alcohol abuse, but not a greater proportion co-infected with HIV (probability RR > 1 = 0.90, 0.84, and 0.56, respectively). Two studies (one with a large sample size) that demonstrated no difference in prognosis associated with HIV co-infection may explain this counterintuitive result. **CONCLUSION:** Progression rate estimates for patients who contracted HCV through substance abuse are similar to estimates derived from post-transfusion or liver clinic cohorts.

PIN44

ANTIBIOTIC PRESCRIBING IN THE HOSPITAL EMERGENCY DEPARTMENT

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OBJECTIVE: Patients seen in a hospital emergency department (ED) require acute care. There is no time to culture an infection for a specific antibiotic. Therefore, broad spectrum antibiotics are used most commonly for the unknown infections. It is the purpose of this project to examine physician choices of antibiotics, and the patient conditions for which they are prescribed. **METHODS:** Data was collected in a mid-sized, urban hospital for a six month period. All antibiotics prescribed to the patients during this time period were recorded, a total of approximately 3100 prescriptions. Because the patients have very different complaints in the ED, it is difficult to isolate specific diagnoses to determine whether different diagnoses result in different antibiotic prescriptions. To handle this problem, we reduce the patient diagnoses to ten clusters to determine whether there is uniformity of prescribing within the clusters. **RESULTS:** Levaquin was prescribed for approximately 40% of the patients receiving antibiotics in the hospital ED followed by Azithromycin and Cefotaxime at 10%. Vancomycin was used for 8% of the antibiotic prescriptions as was Piperacillin/Taxobactam (Zosyn). However, the prescriptions were not uniform across physicians. In particular, one physician favored Zosyn over Levaquin while another used as much Cipro as Levaquin. A total of eight antibiotics account for 96% of the total use. Two of the least used include Linezolid and Tobramycin, both of which are expensive and should have a definite culture to support use. Although physicians differed considerably in their prescribing habits, there was no statistical difference in the patient conditions treated. **CONCLUSION:** Different physicians have different antibiotic prescribing habits. It is important to examine the prescribing to reach a consensus of best practices in the ED.

PIN45

COMPREHENSIVE EDUCATIONAL APPROACH HOW TO INFLUENCE PRESCRIPTION HABITS AND ANTIBIOTIC RESISTANCE IN AMBULATORY PRACTICE

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OBJECTIVE: Due to the increasing costs for antibiotics and increasing resistance in Slovakia the educative project S-MedDial was established in the cooperation with professional companies, under the guarantee of the General Health Insurance Fund. The project evaluates prescription habits in respiratory infections, monitors antibiotics resistance for main bacterial pathogens and provides individual feedback to paediatrists with the aim to rationalize the antibiotics prescription and to decrease the resistance risk. **METHODS:** Antibiotic prescription habits were analysed from 2003 to 2006 for 73 doctors in 5 region based on both the prospective data from protocols (14537 protocols in y.2006) and the retrospective claims insurance data. Analysis was based on the established comparison system of prescription profiles and individual feedback was provided to each practitioner during regional meetings of project members. **RESULTS:** Every second child with respiratory infection was treated with antibiotics. In the whole patient group the most frequently indicated drugs were macrolides (25.9%), followed by basic penicillins (20.4%) and penicillins potentiated with beta-lactamase inhibitors (19.9%). Macrolides were most frequently prescribed in region Bratislava (37.3%) and Nitra (35.4%). In region Presov there were aminopenicillins potentiated with beta-lactamase inhibitors indicated mostly (22.5%), in Trebisov broad-spectrum penicillins (28.4%) and in Zvolen basic penicillins (30%). From macrolides the most frequently prescribed was azitromycin followed by claritromycin. In all cooperating regions the antibiotics costs were reduced by 5.1% per patient. Significant differences in antibiotics prescription in regions were not only in the number of indicated antibiotics but also in their spectrum. The usage of antibiotics in the prospective study was decrease the most in Presov, from 67.8 % to 49.6%. **CONCLUSION:** S-MedDial project represents an option for increase of antibiotics prescription quality while using the prescribing practitioners' education. Analysis of antibiotics prescription habits is suitable not only for cost control but also for antibiotics prescription implications on resistance trends.

PIN46

COUNTRY ASSESSMENT TO DETERMINE FACTORS INFLUENCING THE COST, AVAILABILITY AND DISTRIBUTION OF ACYCLOVIR IN EIGHT SUB-SAHARAN AFRICAN COUNTRIES

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OBJECTIVE: To assess the availability and accessibility of acyclovir in the public and private sectors of eight sub-Saharan African countries. **METHODS:** A qualitative study was carried out in Botswana, Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia and Zimbabwe over a 2-month period. Two standardised questionnaires were used: one targeting Ministry of Health officials to elicit information on drug procurement and distribution in the public sector including treatment policies for

genital ulcer disease (GUD). The second questionnaire targeted pharmacists working in both public and private health care facilities to elicit information on prescribing and dispensing practices. **RESULTS:** The availability of acyclovir in the public sector was a function of funding and prioritisation by policy makers. In Zimbabwe and Zambia for example, acyclovir was unavailable in the public sector because of a paucity of funds, while in Kenya, Tanzania and South Africa, accessibility to acyclovir in the public sector was poor because of low prioritisation by policy makers. Acyclovir was available in the private sector, albeit at higher prices than the private sector. Despite the availability of generic formulations and the presence of competitive markets, acyclovir was described as "poorly affordable" in the private sectors of all countries except Botswana, South Africa and Zambia. Moreover, private sector pharmacies used information asymmetry to inflate the price of acyclovir generics from European countries as a signal of quality. **CONCLUSION:** On-going clinical trials may determine acyclovir to be effective in preventing the transmission of human immunodeficiency virus (HIV) to susceptible patients. However, for this research to transition into policy, certain fundamental issues will need to be addressed. These include: information dissemination on the importance of acyclovir in GUD and HIV to policy makers and the general public; and the need for government intervention into competitive markets because of inequalities to access and information asymmetry.

PIN47

INPATIENT COSTS AND OUTCOMES ASSOCIATED WITH CHRONIC HEPATITIS C RELATED COMPLICATIONS IN THE UNITED STATES

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OBJECTIVE: Hepatitis C virus (HCV) is a common blood-borne infection in the US. Over time, patients with chronic HCV can encounter serious complications that impose a significant cost burden to third party payers. In this study, we generated national estimates of inpatient costs, length of stay (LOS), and probability of death associated with four major chronic HCV-related complications. **METHODS:** Discharge data for patients with chronic HCV (ICD-9 070.44, 070.54, 070.70, or 070.71) were analyzed using the 2005 HCUP Nationwide Inpatient Sample. Discharges related to ascites, variceal bleeding, hepatic encephalopathy, and hepatocellular carcinoma (hepatoma) were identified using relevant ICD-9 diagnosis codes. Weighted estimates of costs, LOS, and probability of death were calculated for stays related to these complications. **RESULTS:** We identified a weighted total of 275,737 chronic HCV-related discharges. Approximately 11.5% of these discharges were for ascites and 5.6% were for hepatic encephalopathy. Admissions for variceal bleeding and hepatoma were less common at 0.3% and 2.8%, respectively. Hepatoma, however, was associated with the highest total inpatient costs ($17,609) and LOS (6.3 days). The probability of death from hepatoma was 11%. Patients had 7.3 inpatient days on average for ascites with a cost per day of $2125 and total inpatient cost of $14,858. The probability of death from ascites was 9%. The average number of inpatient days for hepatic encephalopathy was 7 days with a cost per day of $1936, total inpatient cost of $13,380, and probability of death of 11%. Patients with variceal bleeding had the lowest inpatient costs ($12,128) and LOS (5.4 days). The probability of death from variceal bleeding (8%) was lower compared to the other complications. **CONCLUSION:** Advanced chronic HCV can lead to serious and costly complications. Efforts to improve HCV treatment may help slow disease progression and thus result in cost savings from avoided complications.

PIN48

TRENDS FOR NOSOCOMIAL SOFT TISSUE INFECTIONS, STAPHLOCOCCOUS AUREUS INFECTIONS, AND MRSA IN US HOSPITALS: 1998–2004

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OBJECTIVE: Nosocomial infections are increasing. This study focuses on soft tissue infections, S aureus infections and MRSA nosocomial infections. Trends are quantified and analyzed for hospital and patient characteristics. **METHODS:** Data from the HCUP National Inpatient Sample (NIS) of US hospital discharges for 1998 through 2004 were used to estimate national trends in hospitalizations for three infectious conditions. Discharges where ICD9-CMs were recorded for soft tissue infections (680.xx, 681.xx, and 682.xx), S aureus infections (038.11, 041.11, and 482.41), and MRSA (V09.0) were included in the study. NIS discharge weights were used to generate nationally representative estimates of discharges for each infection and for their combinations with MRSA. Logistic regression was used to obtain odds ratios (ORs) for each infection and MRSA combination (1 = yes, 0 = no) and the independent variables of patient age, race, gender, income, hospital bedsize, location (urban/rural), mission (teaching/non-teaching), and expected payment source. **RESULTS:** From 1998 to 2004 discharges for soft tissue infections increased 47%, S aureus infections increased 28%, MRSA increased 223%, MRSA with S aureus increased 317%, and MRSA with soft tissue infection increased 608%. Regression results for the S aureus with MRSA combination in 1998 revealed that being white, and older increased the odds of this infection (ORs = 1.160 and 1.020 respectively) while being female reduced the odds (OR = 0.692). Larger hospitals had a lower odds (OR = 0.918) as did teaching hospitals (OR = 0.681). However urban hospitals odds were higher (OR = 1.384) and being a Medicare or Medicaid patient also was associated with an increased odds of the infection (ORs = 1.486 and 1.743 respectively). Only patient income was not significant ($p < 0.001$ for all other variables). Results for 2004 were similar but not the same. **CONCLUSION:** Nosocomial infections continue to increase as a percent of hospital stays, and the odds of infection are not equal across patient and hospital types.

PIN49

SPREAD PATTERN FORMATION OF H5N1-AVIAN INFLUENZA AND ITS IMPLICATIONS FOR CONTROL STRATEGIES

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To develop deterministic models for comparing the relative effectiveness of various control measures, estimation of the spread speed of the virus in the environment and the interactions between spatial diffusion of birds and virus. Deterministic models were developed based on the H5N1 transmission cycle by partitioning the birds into three classes based on their epidemiological characteristics for the disease under consideration: poultry (c), wild birds—susceptible and die after H5N1 infection (w), and wild birds—susceptible but survive after H5N1 infection without apparent disease symptoms (d). Model parameters were obtained from existing literatures. Ordinary differential equations (ODE) and partial differential equations (PDE) analogues were utilized for the construction of models as described below. ODE was used to access the effects of control measures, one-dimensional PDE to study the spread speed of the disease,

and two-dimensional PDE to examine how the epicenter moves in space and time under different assumptions about the speed and direction of poultry. ODE Simulations showed that by reducing 95% of the initial susceptible poultry population or by culling all infected poultry birds within one day disease outbreak could control lead in a local setting. Results further elucidated that cleaning the environment is also a feasible and useful control measure, but culling wild birds and destroying their habitat are ineffective control measures. We noticed from the PDE models that the diffusion rate of the (w) has very little impact on the spread speed (1.69–1.74 km/day) where as (d) has shown substantial raise of spread speed (2–7.8 km/day) depending on the transmission direction indicating significant role of migration. Finally, we assumed that epicenter progresses dominantly along the convection direction of the domestic poultry and the disease spread to other direction via random diffusion. Mathematical modeling could prove effective in answering epidemiological issues.

PIN50

INITIAL THERAPIES FOR ACUTE OTITIS EXTERNA IN THE LOUISIANA MEDICAID POPULATION

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OBJECTIVE: Determine the initial therapy choices for newly-diagnosed episodes of acute otitis externa (AOE) in the Louisiana Medicaid population. **METHODS:** Louisiana Medicaid claims were retrospectively analyzed for the period of January 1, 2004, through December 31, 2005. Recipients aged 1–64 who had a paid medical claim (index claim) with a diagnosis of AOE (ICD-9-CM codes 380.10 or 380.12) were identified in the dataset. Additional inclusion criteria included a paid pharmacy claim for an oral antibiotic or an otic preparation within five days of the index claim. Recipients were excluded if they had multiple insurances, dual antibiotic or additional numbing agent therapy, co-morbid conditions, or concomitant infections. Recipients were also excluded if they had a medical claim for an AOE diagnosis or a prescription claim for an antibiotic or steroid during a 30-day washout period prior to the index claim. The initial pharmacy claims were grouped into five drug categories, and physicians were grouped as pediatricians, general practitioners, and other physicians. **RESULTS:** There were 32,059 recipients who met the initial eligibility criteria. After exclusions, a sample of 8090 recipients remained. The initial drug therapies prescribed for these recipients included topical fluoroquinolone antibiotic-steroid combination drugs (n = 2290), topical non-fluoroquinolone antibiotic-steroid combination drugs (n = 2006), otic antibiotics (n = 1406), oral antibiotics (n = 1507), and other otic preparations including acidifying agents, numbing agents, and combinations (n = 881). **CONCLUSION:** Topical fluoroquinolone or non-fluoroquinolone antibiotic-steroid combinations were the most frequently prescribed medications, together representing 53% of the initial therapy choices for AOE. These were followed by oral antibiotics (19%), otic antibiotics (17%), and other otic preparations (11%). Pediatricians prescribed fluoroquinolone containing combinations more frequently than general practitioners, who tended to prescribe non-fluoroquinolone containing combinations most frequently.

PIN51

A PICTURE OF DEMOGRAPHIC DISPARITIES IN THE RECEIPT OF ANTIRETROVIRAL THERAPY AMONG HIV PATIENTS IN THE 2000–2005 NATIONAL AMBULATORY MEDICAL CARE SURVEYS (NAMCS)

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OBJECTIVE: Despite numerous advances in antiretroviral therapy (ART) for HIV patients over the past decade, many patients fail to receive appropriate ART. This study sought to identify demographic factors associated with failure to receive guideline-concordant ART. **METHODS:** Data was extracted from the 2000–2005 NAMCS. HIV patients were defined as those that received at least one antiretroviral during an ambulatory care visit. Data collected included patient age, gender, race, ethnicity, geographic region, insurance status, and medications. Antiretroviral regimens were evaluated for appropriateness according to antiretroviral guidelines published by the Department of Health and Human Services. Appropriate and inappropriate regimens were compared using the Chi-square or Fisher's Exact test. **RESULTS:** Antiretroviral therapy was mentioned in 107 of 156,627 visits. These patients had a median (25th–75th percentile) age of 45 (38–54) years, 66% were male, 64% were white, and 42% had Medicaid/SCHIP. Only 58% of patient visits documented appropriate ART. These consisted of two nucleoside reverse transcriptase inhibitors (NRTIs) plus one non-nucleoside reverse transcriptase inhibitor (NNRTI) (36%), two NRTIs plus two protease inhibitors (PIs) (26%), or two NRTIs plus PI (11%). Inappropriate monotherapy was commonly reported: NRTI (30%), PI (16%), or NNRTI (12%) monotherapy. Patients were less likely to receive appropriate therapy if they were $\geq$50 years of age (23% vs. 49%, $p = 0.003$) or had Medicare (5% vs. 23%, $p = 0.005$). All Asian patients in the surveys received inappropriate therapy ($p = 0.007$ vs. non-Asians). Comparisons of appropriate ART use among females vs. males (30% vs. 47%, $p = 0.08$) and whites vs. non-whites (63% vs. 67%, $p = 0.6$); failed to achieve statistical significance. However, the post-hoc power for these statistics was only 42% and 6%, respectively. **CONCLUSION:** Nearly half of patients in the 2000–2005 NAMCS received suboptimal HIV therapy. Asian patients, Medicare patients, and those patients over the age of 50 years were significantly less likely to receive guideline-endorsed therapies.

PIN52

PRESCRIBING TRENDS IN ANTIVIRAL PRESCRIPTIONS AMONG PATIENTS WITH INFLUENZA IN THE UNTED STATES FROM 1999–2005

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OBJECTIVE: To analyze the trend in antiviral prescriptions for patients with influenza from 1999–2005. **METHODS:** This is a cross-sectional database analysis using data from the NAMCS (National ambulatory medical care survey) and NHAMCS (National hospital ambulatory medical care survey) for the years 1999–2005. Records were extracted for office and hospital based physician-patient encounters having a diagnosis of influenza (ICD-9-CM codes 487.0, 487.1, 487.8). The rate of neuraminidase inhibitors (NI) and adamantanes prescribed per 1000 patients with influenza was determined. The association between the type of antiviral drug and the physician specialty, region, patient sex, and patient age was evaluated by adjusted odd ratios. Data were analyzed with Proc logistic regression with adjusted odds ratios by years using SAS® 9.1.3. **RESULTS:** The prescrib-

ing rates of NI per 1000 cases ranged from 11 to 175 per year for office-based encounters and 0 to 311 for hospital-based encounters. Adamantane prescribing rates ranged from 23 to 194 for office-based encounters and 5 to 172 for hospital-based encounters. Odds ratios of adamantanes rather than NIs were 26.6 ($P < 0.0001$) for 1999, 0.034 for 2000, 0.011 for 2001, 0.058 for 2002, 0.002 for 2003, 0.178 for 2004 ($p < 0.001$). Whites (OR: 9.4, $p < 0.001$), females (OR: 1.8. $p < 0.001$), patients under 55 (OR: 0.4–0.53, $p < 0.001$), and patients from the West (OR: 2.7–33.9, $p < 0.001$) were most likely to get adamantanes. **CONCLUSION:** NI usage slowly increased from 1999–2005. Office-based encounters had a greater rate of prescriptions for adamantanes than hospital-based encounters. In months other than flu season patients were less likely (OR: 0.06, $p < 0.001$) to get adamantanes. General practitioners were less likely (OR: 0.5, $p < 0.001$) to prescribe adamantanes than other specialties. Patient age, race, sex, physician specialty, and geographic region were significantly related to prescribing patterns. In 2005, patients were more likely to get adamantanes in spite of high incidence of adamantane resistant viruses.

MENTAL HEALTH—Clinical Outcomes Studies

PMH1

ESTIMATING THE MAGNITUDE OF ORAL ANTIPSYCHOTIC DRUG-DRUG INTERACTIONS

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OBJECTIVE: To estimate the number of patients with potential major, moderate or major/moderate drug-drug interactions (DDI) between oral antipsychotics and coprescribed drugs within a managed care population (MCP). **METHODS:** Literature and drug information resources were used to identify and classify clinical severity of potential antipsychotic DDIs based on cytochrome P450 metabolism of antipsychotics and coprescribed drugs. PHARMetrics pharmacy claims for one year (June 2004 –C July 2005) from individuals with antipsychotic claims (including oral risperidone, olanzapine, quetiapine, ziprasidone, aripiprazole, clozapine, oral haloperidol and perphenazine) were evaluated. Patients with ≥10 days of overlap with a potentially interacting drug of severity grade 1 (major), 2 (moderate) or 4 (major/moderate) were identified. Drug Facts & Comparisons severity grading scale was used to determine drugs that met these criteria. Results were extrapolated to provide a population-based prediction of the risk for potential DDIs. Recent national market-share (MS) data (IMS prescription audit 4Q06) for each antipsychotic were multiplied by the percentage of potential projected interactions to determine the number of patients at risk for DDIs in a cohort of 10,000 patients prescribed antipsychotics. **RESULTS:** Of the 73,562 patients who met study inclusion criteria, 8551 (11.6%) patients had at least one potential DDI of severity grade 1, 2 or 4. Depending on the antipsychotic dispensed, percentage of potential DDIs ranged from 0% to 26.8%. Applied to a cohort of 10,000 patients, over 1162 (11.6%) patients could potentially experience a grade 1, 2 or 4 DDI. Oral risperidone (26.8% MS) had the highest potential for DDIs (n = 676) and quetiapine (30.4% MS) had the second highest potential for DDIs (n = 137). Ziprasidone (5.7% MS) had no potential P450 DDI interactions of severity grade 1, 2 or 4. **CONCLUSION:** Prevalence of potentially serious DDIs due to interactions with cytochrome P450 metabolic activity is high in patients being treated with antipsychotics.

PMH2

BENCHMARKING SCHIZOPHRENIA WITH A FOCUS ON PHARMACOTHERAPY AND METABOLIC SYNDROME

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OBJECTIVE: The objectives of this analysis were to: Identify a population of schizophrenia patients treated within a commercial managed care environment. Describe and compare the prevalence of conditions associated with metabolic syndrome in patients treated with antipsychotics agents. **METHODS:** Using integrated medical and pharmacy claims data (obtained from the IMS/Pharmetrics Patient-centric Database), patients were included in this analysis based on the presence of a diagnosis of schizophrenia (ICD-9 code 295.*) in 2005. Clinical and economic information related to the treatment of schizophrenia were captured using Episode Treatment Group™ (ETG™) episode-building software. **RESULTS:** In 2005, 8594 schizophrenia patients were identified; within this population, the average age was 45.7 years and 46% was male. Co-morbid conditions included bipolar disorders (in 23.7% of patients), anxiety disorder (12.7%), substance dependence (11.7%), and depression (7.9%). Overall (among the entire identified patient population), 75.6% of patients used antipsychotics; 57.4% used only atypical agents, 9.1% used only conventional agents and 9.1% used both. Overall, 48.6% of patients had at least one of the following conditions, considered markers for metabolic syndrome: diabetes, hyperlipidemia, hypertension, or obesity. Among patients treated with antipsychotics, prevalence of these conditions was lowest in those treated only with atypical agents (46.5% with at least one condition), higher in patients treated only with conventional agents (55.5% with at least one condition), and highest in patients with use of both classes of antipsychotic agents. **CONCLUSION:** The schizophrenia population observed in this analysis reflected a lower prevalence of presumed metabolic syndrome in groups treated with atypical antipsychotic agents. This observation contradicts other research. This disparity may be attributable to differences in patient demographics or other confounding factors, but nonetheless warrants further study.

PMH3

STATISTICAL ANALYSIS OF SIGNIFICANT VARIABLES IN DEALING WITH DRUG ABUSE INPATIENTS

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OBJECTIVE: To examine a sample of patients admitted to hospitals with drug abuse for some inpatient treatment in order to look for trends that may lead to a better understanding of the data and of which groups seem to be most at risk for this ailment. **METHODS:** Data were taken from a ten percent sample of the National Inpatient Sample from 2004. A data sample of 7903 inpatients from 2004 was organized, plotted, graphed, and put into tables in order to best understand the patterns and variances. Logistic regression models were created to compare variables and help to predict age and mortality of the inpatients. The data were preprocessed to include only the most frequently occurring diagnosis and procedure codes. **RESULTS:** Frequency of cases of drug abuse showed spikes near the ages of 40 and 80, with the African Americans and males dominant at the 40 spike and the Caucasians and males at the 80 spike. Code variables for rehabilitation, blood transfusion, respiratory intubation, hypertension, heart disease, congestive heart failure, urinary tract infection, cardiac dysrhythmias, pulmonary disease, fluid disorder, CT head scan, gastrointestinal endoscopy, psychiatric therapy, physical

therapy, and various mental disorders were combined with these results to create a model that is almost 80 percent accurate. Mortality can be predicted using the variables vascular catheterization, respiratory intubation, and coronary atherosclerosis with an accuracy of 63.4 percent. **CONCLUSION:** A bimodal trend in the age of drug abusers suggests two different types of drug abuse. The most likely explanation is the abuse of recreational drugs around the age of 40 and the abuse or misuse of prescription drugs around the age of 80. Mortality can be predicted so accurately using only three variables because these procedures are associated with the highest probability of death.

PMH4

ATYPICAL ANTIPSYCHOTIC MEDICATIONS IN THE TREATMENT OF SCHIZOPHRENIA: A BAYESIAN META-ANALYSIS OF DIRECT AND INDIRECT COMPARISONS

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OBJECTIVE: The purpose of this study was to evaluate the relative efficacy of different atypical antipsychotic medications (AAPs) in the treatment of schizophrenia using a Bayesian mixed treatment comparison (MTC) model. **METHODS:** The Cochran central register of controlled trials and PubMed database were searched to identify randomized controlled clinical trials assessing the efficacy of AAPs (olanzapine, risperidone, clozapine, aripiprazole, quetiapine, ziprasidone) in the treatment of schizophrenia. Studies were included if they used change in the Positive and Negative Syndrome Scale (PANSS) as an outcome measure. Findings from these studies were analyzed using Bayesian meta-analysis of direct and indirect comparisons. Both, fixed and random effects models were employed in the analysis. **RESULTS:** Twenty eight trials were identified, which included a total of 6023 patients. The fixed effects model indicated that clozapine and olanzapine had significantly greater improvements on the PANSS overall scale (median change from baseline: 19.4 (95% credible interval [CrI] 19.2–19.5) and 19.3 (95% [CrI] 19.3–19.4) for clozapine and olanzapine respectively) than all other AAPs. In the rank order analysis, clozapine had a 82% probability of being the best treatment. Clozapine showed significantly more improvements on the positive subscale (mean change from baseline 5.4 (95% [CrI] 5.2–5.5), and 100% probability of being the best treatment). On the negative subscale, clozapine and olanzapine showed significantly more improvements than other APPs. However, the random effects model found no significant differences among the AAPs in the magnitude of improvements on the PANSS overall scale, as well as the positive and negative subscales. This may be due to substantial inter-study variation. **CONCLUSION:** Using a fixed effects model, clozapine and olanzapine were found to be significantly more efficacious, but these findings were not supported by the random effects analysis. More direct comparisons are needed to make definitive conclusions about the relative efficacy of these agents.

PMH5

REHOSPITALIZATION AFTER DISCONTINUATION OF PALIPERIDONE ER IN PATIENTS WITH SCHIZOPHRENIA

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OBJECTIVE: One way to evaluate effectiveness of antipsychotics is to measure frequency of symptomatic relapses in patients with schizophrenia. The occurrence and duration of hospitalizations are important markers of potential relapses. This study assessed differences in days hospitalized among schizophrenic patients receiving paliperidone extended-release tablets (paliperidone ER) during the 52-week open-label extension (OLE) phases of three double-blind (DB) trials as compared to treatment as usual (TAU) in the six months following the OLE phases of these trials. **METHODS:** Data on resource use was collected through retrospective chart review. Average number of hospital days during OLE and TAU phases was calculated including the use of bootstrap resampling methods to assess statistical significance of differences. Total person years were calculated for OLE and TAU phases to account for different lengths of observation. Antipsychotic use during TAU phase was also evaluated. Paliperidone ER was not commercially available during TAU phase. **RESULTS:** In this analysis, patients (n = 71) were from the US (31.0%), Canada (21.1%) and Malaysia (47.9%). Mean (±SD) patient age was 37.9 (±10.5) years; and the majority were male (70.4%). During the OLE, the mean paliperidone ER treatment duration (±SD) was 212.9 (±141.2) days, and the mean dose was 11.4 (±2.1) mg. Patients experienced an average of 5.0 and 15.3 hospital days per person year in OLE and TAU phases, respectively, indicating that a mean increase of 10.3 days of hospitalization was observed during TAU phase (95%CI 2.3,19.2, P = 0.006). During TAU phase, the treatments received were second-generation antipsychotics (SGAs) (52.1%), first-generation antipsychotics (FGAs) (9.9%), or both FGAs and SGAs (14.1%). **CONCLUSION:** Patients discontinuing paliperidone ER after the OLE phases experienced more hospital days compared to the OLE phases where they received paliperidone ER. Whether this increase in hospital days is associated with a greater frequency or severity of relapses remains to be tested.

PMH6

OPTIMAL THRESHOLDS OF EARLY NON-RESPONSE TO ATYPICAL ANTIPSYCHOTICS: APPLICATION OF SIGNAL DETECTION ANALYSIS

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OBJECTIVE: This study used signal detection methods to identify the optimal magnitude of early non-response to antipsychotic medication at various early time points that best predicts subsequent non-response at eight weeks, using different criteria of subsequent non-response. This analysis was implemented separately for schizophrenia patients with at least moderate symptom severity, and for patients with lesser symptom severity. **METHODS:** Data were pooled from five randomized, double-blind clinical trials of atypical antipsychotics in the treatment of patients with schizophrenia, schizoaffective disorder, or schizophreniform disorder, and included 1437 patients (n = 1137 with at least moderate symptom severity; n = 300 with lesser symptom severity). Signal detection methods were used to identify the optimal response threshold based on improvement from baseline on the Positive and Negative Syndrome Scale (PANSS) total score at different early time points (Week 1 to Week 4 of treatment) to predict subsequent non-response at eight weeks, while controlling the false positive rate at 30% or less. **RESULTS:** The optimal thresholds for patients with at least moderate symptom severity were 7–12% at Week 1, 14–23% at Week 2, 20–38% at Week 3, and 26–45% at Week 4. For patients with lesser symptom severity, the optimal thresholds were 3–4% at Week 1, 7–12% at Week 2, 6–14% at Week 3, and 15–20% at Week 4. Results were validated using data from another clinical trial. **CONCLUSION:** Different early response thresholds appear to maximize identification of subsequent non-responders to antipsychotic medica-

tions, reflecting differences in early time points and in illness severity levels. For schizophrenia patients with at least moderate symptom severity, the lack of at least 14–23% improvement on the PANSS total score at two weeks is an optimal predictor of subsequent non-response following eight weeks of treatment. This early response threshold appears to be an important clinical marker of subsequent non-response to antipsychotic therapy.

PMH7

CLINICAL AND FUNCTIONAL IMPROVEMENTS IN PATIENTS WITH SCHIZOPHRENIA TREATED WITH RISPERIDONE LONG ACTING INJECTION: INTERIM RESULTS FROM OBSERVATIONAL STUDIES CONDUCTED IN AUSTRALIA, BELGIUM AND THE UNITED STATES

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OBJECTIVE: To evaluate the 12-month clinical and functional outcomes in patients with schizophrenia who received RLAI treatment and were enrolled in the electronic-Schizophrenia Treatment Adherence Registry (e-STAR) in Australia and Belgium, and the Schizophrenia Outcomes Utilization, Relapse, and Clinical Evaluation (SOURCE) in the United States. **METHODS:** e-Star and SOURCE are long-term, prospective, observational studies of patients with schizophrenia who commence RLAI treatment. Data are collected both retrospectively and prospectively and clinical effectiveness was measured by the Clinical Global Impression Severity (CGI-S) scale and patient functioning was measured by the Global Assessment of Functioning (GAF) scale. **RESULTS:** Seven hundred sixty-nine patients (Australia = 493, Belgium = 163, USA = 113) with 12-months of follow-up data were included. Australia had significantly younger patients than Belgium and the United States (mean ages: Australia = 38.6, Belgium = 41.6, USA = 43.5; $p = 0.0003$). Time since diagnosis (in years) was significantly higher in the United States than Australia and Belgium (USA = 17.6, Australia = 11.6, Belgium = 9.8; $p < 0.0001$). United Stats patients had significantly higher baseline GAF scores than the Australian and Belgian patients (USA = 50.9, Australia = 42.7, Belgium = 43.1; $p < 0.0001$). Despite baseline differences, GAF and CGI-S scores at 12-months for patients treated with RLAI significantly improved from baseline in all three countries. CGI-S scores significantly decreased by 0.8 ($p < 0.001$), 1.08 ($p < 0.001$) and 0.83 ($p < 0.001$) points and GAF scores significantly increased by 12.7 ($p < 0.001$), 14.8 ($p < 0.001$), and 11.1 ($p < 0.001$) points in Australia, Belgium, and the United States respectively. **CONCLUSION:** This interim analysis from the two observational studies shows that despite differences in patient characteristics among countries, treatment with RLAI resulted in significant improvements in disease severity and patient functioning in patients with schizophrenia from all three countries.

PMH8

TREATMENT DURATION FOLLOWING INITIATION ON ATYPICAL ANTIPSYCHOTICS AMONG SCHIZOPHRENIA PATIENTS WITH VERSUS WITHOUT A METABOLIC SYNDROME

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OBJECTIVE: To assess differences in treatment duration and resource utilization following initiation on atypical antipsychotics among schizophrenia patients with versus without metabolic syndrome who were treated at the Veteran Health Administration. **METHODS:** We used electronic medical records data for October 2002-August 2005 from a large Veterans Integrated Service Network (VISN16) to identify schizophrenia patients who were initiated on an atypical antipsychotic and have undergone metabolic monitoring in the 180 days prior to medication initiation. Those found to have a metabolic syndrome (MetSyn+) were compared to those without (MetSyn–) on patient characteristics, treatment duration, medication adherence per medication possession ratio (MPR), and resource utilization in the 1-year post medication initiation. Kaplan-Meyer (K-M) estimation compared the difference in treatment duration. A Cox proportional hazard regression was used to compare all-cause medication discontinuation, controlling for group differences at baseline. **RESULTS:** A minority of schizophrenia patients who have undergone metabolic monitoring was found to have a metabolic syndrome (83 of 593, or 14.0%). The MetSyn+ and MetSyn– groups did not significantly differ on baseline characteristics except that the MetSyn+ group had a higher rate of non-VA insurance. Adherence (MPR) during the year following medication initiation was higher for the MetSyn+ group (81% vs. 68%; $p = 0.031$). K-M estimators (log-rank test $p = 0.471$; Wilcoxon test $p = 0.512$) and a Cox model ($p = 0.671$) indicated lack of statistically significant group difference in all-cause medication discontinuation. **CONCLUSION:** Among schizophrenia patients who have undergone metabolic monitoring, those with a metabolic syndrome and those without do not appear to differ on treatment duration and resource utilization following initiation on an atypical antipsychotic medication in the Veterans Health Administration.

PMH9

RETENTION RATES FOR ORAL AND DEPOT ANTIPSYCHOTIC MEDICATIONS OVER ONE YEAR IN ONTARIO, CANADA

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OBJECTIVE: Continuous treatment is an important goal in the management of schizophrenia. Retention rate is a well-recognized global measure of effectiveness that integrates patients' and clinicians' judgment of efficacy, safety and tolerability. Furthermore, all-cause discontinuation was used as a primary outcome measure in a large effectiveness study (Clinical Antipsychotic trial of Intervention Effectiveness or CATIE). The current study utilized longitudinal claims data from Ontario Drug Benefit (ODB) recipients in Ontario, Canada to compare retention rates for typical and atypical antipsychotic medications with different formulations. **METHODS:** Longitudinal data were obtained for ODB recipients that were initiated on antipsychotic therapy in July 2006. ODB recipients were followed from their first claim for the specific target drug to their last claim in a 12-month period. Rates of retention were determined throughout and up until 12 months. Descriptive analyses were performed. Retention rates were reported for depot (long-acting injectable) risperidone; oral atypical antipsychotics including olanzapine, risperidone, and quetiapine; orally disintegrating tablet formulations of risperidone and olanzapine; oral typical antipsychotics (pooled); and depot typical antipsychotics (pooled). **RESULTS:** From July 2006–June 2007, 12-month retention rates were lowest with oral typical (29% of recipients), depot typical antipsychotics (30%), and risperidone orally disintegrating formulations (30%). Retention rates for oral atypical antipsychotics were 41% for olanzapine, 46% for risperidone and 50% for quetiapine. Retention on risperidone long-acting injectable were the highest with 73% of recipients retained over 12-months. **CONCLUSION:** Retention rates were lowest

with typical antipsychotics and risperidone orally disintegrating tablets and highest with depot risperidone formulation. This finding is consistent with the results reported in the CATIE study where only 25–45% of patients continued on oral treatment after one year. Retention on medication is an important aspect of patient outcomes in schizophrenia; these data suggest that retention on depot risperidone may be improved compared to other treatments.

PMH10

TREATMENT PATTERNS PRIOR TO INITIATING DEPOT TYPICAL ANTIPSYCHOTICS FOR NON-ADHERENT SCHIZOPHRENIA PATIENTS

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OBJECTIVE: To identify treatment patterns and illness characteristics preceding the initiation of depot typical antipsychotics in the treatment of schizophrenia patients who are non-adherent with oral antipsychotic regimens. **METHODS:** Data were drawn from a large, multi-site, 3-year prospective non-interventional observational study of schizophrenia patients in the U.S, conducted between July 1997 and September 2003. The analytical sample included patients who—in the six months prior to enrollment—were non-adherent with oral antipsychotics and were not treated with depot antipsychotics (N = 314). Non-adherent patients who were subsequently initiated on typical depots during the 3-year follow-up were compared with patients continuing therapy with only oral agents. Comparisons were made on clinical, functional, and treatment variables assessed at predetermined intervals with standard psychiatric measures, a patient self-report questionnaire, and medical record information. **RESULTS:** A small proportion of patients (12.4%) previously non-adherent with oral antipsychotics were subsequently initiated on a depot therapy during the 3-year study. Compared to patients treated with only oral antipsychotics, those subsequently initiated on a depot were significantly more likely to be hospitalized at depot initiation or during the previous six months, were more likely to have recent legal involvement, illicit drug use, and treatment with more antipsychotics during the 3 months prior to initiation. **CONCLUSION:** Despite prior non-adherence with antipsychotic medication, only a small proportion of non-adherent schizophrenia patients were initiated on depot antipsychotics in this 3-year prospective study. Patients who were subsequently initiated on depot had a distinct treatment pattern and illness profile preceding initiation of the depot medication.

PMH11

ASSESSING THE REPORTING AND SCIENTIFIC QUALITY OF META-ANALYTIC RESEARCH SYNTHESISING RANDOMIZED CONTROLLED TRIALS FOR ANXIETY DISORDER TREATMENTS

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OBJECTIVES: To assess the reporting and scientific quality of meta-analyses (MAs) of randomized controlled trials (RCTs) as treatments for anxiety disorders. **METHODS:** We searched EMBASE, EBM Reviews, MEDLINE, Healthstar and IPA from inception to August 2007. Search terms included: MA, RCTs, anxiety, anxiolytic, anti-depressant/antidepressant and cognitive therapy with no language restrictions. Titles and abstracts were assessed by two reviewers independently. Criteria for full-text retrieval included: MA, statistical pooling, anxiety disorder, RCT, pharmacotherapy, cognitive therapy. RCTs examining anxiety symptoms were excluded. A manual search of references was performed. Quality was assessed independently by two raters, using the Quality of Reporting of Meta-analyses checklist (QUOROM) and the Overview Quality Assessment Questionnaire (OQAQ). Kendall's tau measured inter-rater reliability with statistical significance at $P \leq 0.05$. Means and standard deviations described the overall quality. A time series analysis was performed. **RESULTS:** In total, 136 titles and abstracts were reviewed; 48 were retrieved, including six from the manual search. Twelve were excluded (not pooled analyses, inappropriate condition or treatment or were duplicates), leaving 36 studies. Publication dates ranged from 1990–2007. Agreement was high; tau = 0.856 ($P < 0.05$) for QUOROM and 0.865 ($P < 0.05$) for OQAQ. The mean overall QUOROM score was 65% (SD = 18%). The 'results' category yielded the lowest quality scores while the introductions and discussions yielded the highest. The mean overall OQAQ score was 59% (SD = 25%). Flaws in scientific quality were observed regarding 'avoidance of bias' and 'validity' while most studies linked the results to the primary objective appropriately. There was a small, non-significant increase in quality of MAs over the years observed. **CONCLUSIONS:** Reporting and scientific quality of MAs in anxiety were only fair. They were, however, higher than those previously reported for depression and critical care.

PMH12

TREATMENT OUTCOMES OF RISPERIDONE LONG ACTING INJECTION (RLAI) IN SCHIZOPHRENIA: 18-MONTH RESULTS FROM THE ELECTRONIC SCHIZOPHRENIA TREATMENT ADHERENCE REGISTRY (E-STAR) IN CZECH REPUBLIC AND SLOVAKIA

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OBJECTIVE: To evaluate clinical and functioning outcomes of risperidone long-acting injection (RLAI) treatment in patients with schizophrenia enrolled in the electronic-Schizophrenia Treatment Adherence Registry (e-STAR) from Czech Republic and Slovakia. **METHODS:** e-STAR is an international, long-term, prospective, observational study of patients with schizophrenia who commence RLAI treatment. Data are collected retrospectively for one year and prospectively every three months for two years. Clinical outcomes were measured by Clinical Global Impression-Severity (CGI-S) scale and patient functioning was assessed using Global Assessment of Functioning (GAF) scale. This interim report is based on data from patients who have completed their 18-month follow-up visit. **RESULTS:** To date, a total of 1324 patients have been enrolled in e-STAR from the Czech Republic and Slovakia; 296 patients with at least 18-months of data available (97.3% still on RLAI) were included in this analysis. Of the 296 patients, 53.7% were male with a mean age of 37.6 ± 12.0 years and a mean time since diagnosis of 9.6 ± 9.0 years. Mean CGI-S score significantly decreased from 4.6 plusmn; 1.1 at baseline to 2.9 ± 1.0 at 18 months ($p < 0.001$). Proportion of patients with not ill/very mild/mild illness increased from 13.5% to 75.6% and that of patients with marked/severe/extremely severe decreased from 48.8% to 6.3% ($p < 0.001$) compared to baseline. Meanwhile, patient global functioning has significantly improved as the mean GAF score increased significantly from 49.9 ± 15.2 at baseline to 73.8 ± 14.5 at 18 months ($p < 0.001$). **CONCLUSION:** Significant improvements in disease severity and functioning from base-

line were observed during 18-month treatment with risperidone long-acting injection in patients with schizophrenia.

WITHDRAWN **PMH13**

PMH14

DIFFERENTIAL EFFECTS OF OLANZAPINE AND CLOZAPINE ON TYPE II DIABETES: FINDINGS FROM A CLAIMS DATABASE

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OBJECTIVE: Olanzapine and clozapine are two atypical antipsychotics associated with high risk of developing diabetes mellitus. However, a head to head comparison between these two medications is not available. The objective of our study is to compare the risk of developing type II diabetes with the use of olanzapine vs. clozapine. **METHODS:** The study was a retrospective, longitudinal cohort analysis using 2001 Georgia Medicaid claims data. Patients who had psychosis (ICD-CM-9: 290.xx–299.xx) and had received at least one prescription of olanzapine or clozapine from March through November were identified. The two study groups were defined as patients who initiated new treatment episodes of olanzapine and clozapine after a 60 days window free of these medications. Patients who received diabetes diagnosis (ICD-CM-9: 250.x0–250.x2) or antidiabetic prescriptions 60 days prior and 30 days post the index date (the date of treatment initiation) were regarded as having pre-existing diabetes and excluded from the study. Logistic regression analysis was employed to assess the association between newly developed diabetes mellitus and the use of antipsychotics. Confounders such as age, gender, race, treatment duration, use of other antipyschotics, use of beta blockers and thiazide diuretics were included in the final model. **RESULTS:** Out of 18,373 patients with an antipsychotic prescription in 2001, 4934 patients were olanzapine users and 376 patients were clozapine users. The incidence rate of type 2 diabetes was 1.05% among olanzapine users and 0.21% among clozapine users. After controlling the confounders, it was found that the risk of developing type 2 diabetes was significantly less for olanzapine users as compared to clozapine users (OR 0.346 [CI 0.18–0.67]). **CONCLUSION:** Patients taking clozapine are associated with greater risk of developing type II diabetes as compared to patients taking olanzapine.

PMH15

ANALYSIS OF POTENTIAL DRUG-DRUG INTERACTION PAIRS ASSOCIATED WITH ANTIPSYCHOTICS AMONG MEDICAID PATIENTS WITH SCHIZOPHRENIA OR BIPOLAR DISORDER

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OBJECTIVE: Since many antipsychotics are metabolized by cytochrome P450 (CYP450) isoenzymes (1A2, 2D6, and 3A4), we proposed to assess the risk of receiving potential drug-drug interaction (DDI) pairs associated with the inhibition or induction of CYP450 isoenzymes. **METHODS:** Using the Ohio Medicaid claims database from January 1, 2001 to December 31, 2003, a total of 44,511 patients ($18 \leq$ age ≤ 65) with a schizophrenia or bipolar disorder diagnosis and receiving at least one study antipsychotic were selected for this study. Any clinically significant (moderate or severe) DDI pair was defined to have concomitant exposure if any of the days supply for an antipsychotic prescription overlapped with the days supply of an interacting medication by at least one day. Patients with schizophrenia and bipolar disorder were analyzed separately. Multivariable logistic regression analysis was used to assess risk factors associated with the receipt of a potential DDI pair. **RESULTS:** Of the 44,511 study patients, potential DDI pairs were received by 12.1% (11.9% in schizophrenia, 12.9% in schizoaffective, and 11.8% in bipolar sub-cohorts) as same-day prescriptions dispensed and by 24.5% (24.7% in schizophrenia, 26.5% in schizoaffective, and 24.5% in bipolar sub-cohorts) as prescriptions with at least a one-day overlap. The most frequent DDI pairs were observed with olanzapine (45.0%), risperidone (23.5%), and quetiapine (13.4%). A higher risk of receiving a potential DDI pair was associated with being Caucasian(odds ratio [OR] = 1.27, 95% confidence interval [CI]: 1.21–1.34), treatment duration over 12 months (OR = 1.13, 95% CI: 1.07–1.19), depression (OR = 1.20, 95% CI: 1.14–1.27), impulse control disorder (OR = 1.53, 95% CI: 1.30–1.79), diabetes mellitus (OR = 1.12, 95% CI: 1.05–1.20), cerebrovascular disease (OR = 1.34, 95% CI: 1.13–1.59). **CONCLUSION:** The potential drug-drug interactions should be considered when treating patients with some antipsychotics, especially during the long-term maintenance use. Patients with key psychiatric and medical co-morbidities had a higher risk of receiving potential DDI pairs.

PMH16

METABOLIC SAFETY AND TOLERABILITY OF ZIPRASIDONE VS. OLANZAPINE IN SCHIZOPHRENIA PATIENTS: SYSTEMATIC REVIEW AND META-ANALYSIS

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OBJECTIVE: There is growing awareness of the increased prevalence of metabolic abnormalities in patients with schizophrenia. Thus, the safety and tolerability of atypical antipsychotic (AAP) medications are important considerations in the choice of agents to treat severe mental illness. In a systematic review of the published literature on AAPs, we explored differences in metabolic effects between ziprasidone and olanzapine. **METHODS:** We identified 300 published studies of AAPs in schizophrenia, including head-to-head, placebo-controlled trials and observational studies. A meta-analysis was performed on the safety and tolerability of ziprasidone and olanzapine in areas with sufficient data (i.e., at least three studies for each outcome). Studies were included in meta-analyses if they provided sample size, mean change, and measure of variance, or if they reported data to allow for imputation of these values. We considered changes in total cholesterol, triglycerides, body weight, QTc interval, and discontinuation due to adverse events. **RESULTS:** Of 13 publications reporting a head-to-head comparison of ziprasidone vs. olanzapine, four provided data useful for pooled analyses. When compared to ziprasidone, olanzapine use was associated with increased total cholesterol (mean difference 20.0 mg/dL [95% CI 9.8 mg/dL, 30.2 mg/dL]), triglycerides (mean difference 66.6 mg/dL [95% CI 43.6 mg/dL, 89.7 mg/dL]), and body weight (mean difference 4.97 kg [95% CI 4.1 kg, 5.8 kg]). Mean daily doses ranged from 112.8 mg to 135.2 mg (ziprasidone) and from 12.6 mg to 20.5 mg (olanzapine). Mean changes in the QTc interval and rates of discontinuation due to adverse events were similar for ziprasidone vs. olanzapine (studies not pooled). Limitations of the study included heterogeneity across the head-to-head trials: study durations ranged from 6 to 18 months. **CONCLUSION:** These results point to clinically important and statistically significant advantages for ziprasidone in metabolic safety compared with olanzapine. Ziprasidone's effect on the QTc interval and tolerability are similar to olanzapine.

PMH17

METABOLIC MONITORING AMONG SCHIZOPHRENIA PATIENTS INITIATED ON ATYPICAL ANTIPSYCHOTICS IN THE VETERAN HEALTH ADMINISTRATION

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OBJECTIVE: A large Veterans Integrated Service Network (VISN16) mandated in October 2003 metabolic monitoring prior to initiation of any antipsychotic. This study focused on schizophrenia patients who were initiated at VISN 16 on any atypical antipsychotic, and compared patient characteristics and resource utilization of patients who have undergone metabolic monitoring versus those who have not. **METHODS:** We used VISN16 electronic medical records data for October 2002–August 2005 to identify schizophrenia patients who were initiated on any atypical antipsychotic. Patients who have undergone metabolic monitoring in the 180 days prior to medication initiation (MetMon+) were compared to patients who did not (MetMon–), on patient characteristics and resource utilization in the 1-year prior to medication initiation. Logistic regression was used to identify predictors of undergoing metabolic monitoring. **RESULTS:** Most patients (3568 of 4709, or 75.8%) have undergone metabolic monitoring. Compared to the MetMon- group, the MetMon+ patients were more likely to be overweight or obese (40.8% vs. 19.4%, $p < 0.001$), were more likely to be hospitalized in the prior year (49.6% vs. 31.5%, $p < 0.001$), had a higher Charlson Comorbidity Index score (0.67 versus 0.46 $p < 0.001$), a higher rate of substance use disorders (45.3% vs. 35.8% $p < 0.001$), more office visits (23.5 vs. 15.9, $p < 0.001$), a longer duration of antipsychotic use (208.7 days vs. 160.0 days $p < 0.001$), a higher medication possession ratio (59% vs. 47% $p < 0.001$), and a larger number of different antipsychotic drugs (1.6 vs. 1.5, $p < 0.001$). The logistic regression model confirmed differences in patient characteristics and utilization patterns. **CONCLUSION:** A majority of the VISN 16 schizophrenia patients have undergone metabolic monitoring prior to initiation of atypical antipsychotics. Compared to patients who did not undergo metabolic monitoring, those who did were more likely to be overweight or obese and manifest a more severe illness profile.

PMH18

RISK OF NEUROLEPTIC MALIGNANT SYNDROME ASSOCIATED WITH ANTIPSYCHOTICS USE IN PATIENTS WITH BIPOLAR DISORDER: A RETROSPECTIVE POPULATION-BASED CASE-CONTROL STUDY

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OBJECTIVE: Although a few of case reports and two case-controls studies were available, the data regarding the risk of neuroleptic malignant syndrome (NMS) associated with the use of antipsychotic, particularly the potency of Dopamine 2 (D2) inhibitions, and other risk factors is limited. It aims to examine the risk of NMS associated with the use of antipsychotic, in particular potency of D2 inhibition, and other risk factors. **METHODS:** A retrospective, population-based case-control study is performed using a managed care medical claims database. Among 154,474 patients with bipolar disorder, a total of 50 cases with NMS during the study period are identified and matched with 800 controls by age, and the year of the index date of bipolar disorder. Antipsychotics are grouped based upon the potency of D2 receptor that is measured by Ki values. Persons with ever other antipsychoitcs (except the high-potency antipsychotics) prescribed are then defined as low-potency antipsychotic users ($Ki \geq 1$ nM). **RESULTS:** The use of antipsychotic is associated with a 2.36-fold increased risk of NMS after controlling the other risk factors (95% confidence interval [CI] = 1.08 to 5.19). Besides the use of antipsychotic, being male is associated with a 2-fold increased risk of NMS. Other risk factors, including the previous history of delirium, confusion, dehydration, and extrapyramdial signs, can significantly increase the risk of NMS . The adjusted ORs for the patients with the use of low-potency antipsychotics and high-potency antipsychotics are 1.47 (95%CI = 0.49 to 4.42), and 3.91 (95%CI = 1.38 to 11.14), respectively, as compared to non-users. **CONCLUSION:** Besides the use of antipsychotic, other factors including being male, presence of delirium, confusion, dehydration, and extrapyramdial signs could significantly increase the risk of NMS. The magnitude of the risk of NMS seems to be related to an antipsychotic potency of D2 inhibition.

MENTAL HEALTH—Cost Studies

PMH19

MONOTHERAPY WITH ATYPICAL ANTIPSYCHOTICS FOR SCHIZOPHRENIA: A CLINICAL REVIEW AND ECONOMIC EVALUATION OF FIRST TWELVE MONTHS OF TREATMENT

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OBJECTIVE: To evaluate the clinical effectiveness and economic implications of the first year of treatment with atypical antipsychotics (AAPs) (risperidone, olanzapine, quetiapine, and clozapine) in patients with schizophrenia, to the Canadian publicly funded drug plans. **METHODS:** We synthesized the findings from a recent drug class review on AAPs and conducted a review of pharmacoeconomic studies. A decision tree model estimated the costs of the first year of treatment, accounting for the likelihood of switching from one AAP to another as patients progress from first to second line (risperidone, olanzapine and quetiapine) and third-line therapy options (clozapine). **RESULTS:** We could identify no high-quality evidence that could directly inform public policy questions regarding which atypical antipsychotics represent optimal treatment decisions for first-line therapy. The results of this study were based largely on two trials and one observational study, with patient populations of potentially limited generalizability. The first-year prescription costs for each new patient with risperidone, quetiapine, olanzapine, and clozapine are $1703, $3454, $4285, and $6989, respectively (using the publicly drug plan costs in 2005). Accounting for the total treatment costs to the ministries of health (e.g., prescription, hospitalization, outpatients, group home, laboratory, and DM and EPS), the first year cost of treatment starting with risperidone, olanzapine, quetiapine and clozapine respectively are: $17,950, $18,327, $19,695, and $44,172 (all in 2005 Canadian dollars). Depending on dose used and drug costs and accounting for significant clinical events (e.g. relapse), total treatment costs to the ministries of health range from $16,188 to $19,167 starting with risperidone, $16,096 to $19,718 with olanzapine, and $18,050 to $20,556 with quetiapine. **CONCLUSION:** Olanzapine and risperidone are clinically more effective over quetiapine when used as first- or second-line therapy options for schizophrenia. Their lower relapse and discontinuation rates resulted to more attractive economic implications to payers from the public sector.

PMH20

A COST-BENEFIT ANALYSIS OF HIGHER MEDICATION COPAYMENTS IN VETERANS WITH SCHIZOPHRENIA

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OBJECTIVE: Medication non-adherence is already a significant problem for patients with schizophrenia, possibly exacerbated by medication copayments increases from $2 to $7 (2002). From the VA's perspective, such health policy decisions balance financial benefits with unintended cost-related adherence consequences. This study examines the cost-offset of copayment revenue versus higher inpatient and emergency department (ER) costs. **METHODS:** Pharmacy prescriptions, health services utilization, and VA costs for all veterans (N = 69,986) diagnosed with schizophrenia were analyzed 33 months Pre and Post policy change. We calculated additional copayment revenue versus utilization costs (1999 adjusted dollars), contrasting veterans subject to copayment increases with a natural control group of exempt patients. **RESULTS:** In comparison to the pre-policy period and exempt patients, total prescriptions for copayment veterans (N = 33,431) continued increasing slightly after the copayment change, but psychotropic fills dropped 18%. Psychiatric admissions and hospital days rose 4%, reversing downward trends. Higher copayments yielded $17.3 million in additional revenue, but higher pharmacy costs of $5.5 million. Inpatient and ER costs increased $13.3 million and $0.6 million, respectively. Therefore, the VA's net cost-benefit revenue change was negative $2.1 million, or $745,000 annualized losses. Sensitivity analyses altering utilization costs and the proportion of post-policy changes due to higher copayments produced annualized cost-benefits ranging from –$1.4 million to $0.3 million. **CONCLUSION:** This descriptive study suggests that the policy change translated into greater copayment revenue while dampening overall pharmacy cost increases. However, unanticipated consequences included sharply reduced psychotropic fills leading to poorer adherence and higher utilization. Recognizing complex causal assumptions, the VA nevertheless appeared to experience financial losses at the expense of clinical ramifications. Policy changes targeting pharmacy benefits for vulnerable psychiatric patients should be implemented carefully, recognizing trade-offs between financial gains and costs associated with clinical deterioration. Longer term studies are needed to gauge sustained effects as veterans reconcile behaviors with higher medication expenses.

PMH21

PHARMACY COST IMPACT OF GUIDELINE-RECOMMENDED DOSING OF SECOND GERNERATION ANTIPSYCHOTICS IN SCHIZOPHRENIA

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OBJECTIVE: To compare the cost impact of real-world versus guideline recommended dosing of second generation antipsychotics (SGAs) in treating schizophrenia. **METHODS:** A retrospective cohort analysis was conducted on a commercially-insured population (Pharmetrics data 2000–2006) to determine the real-world frequency distribution of SGA monotherapy doses in patients aged 18–64 with schizophrenia with at least 90 days of continuous SGA monotherapy. We also determined the frequency distribution within the dosing ranges recommended in the 2004 American Psychiatric Association (APA) Practice Guideline for Schizophrenia. Average daily dose was calculated based on the last prescription during a 6-month post-index follow-up period. Based on these dosing distributions, acquisition costs for each SGA were estimated using the 2007 wholesale list price. A sensitivity analysis was conducted to examine the impact of different distribution assumptions for APA-recommended doses on pharmacy cost impact. **RESULTS:** The mean per-patient-per month (PPPM) costs for the real world (median dose) and APA-recommended dose range were: aripiprazole US$434 (15 mg/day) and US$382 (10–30 mg/day); quetiapine US$355 (300 mg/day) and US$460 (300–800 mg/day); risperidone US$293 (3 mg/day) and US$315 (2–8 mg/day); olanzapine US$414 (10 mg/day) and US$447 (10–30 mg/day); ziprasidone US$372 (120 mg/day) and US$354(120–200 mg/day). All cost differences were significant ($p < 0.01$). Various types of distribution for APA-recommended doses were examined and the pharmacy cost impact did not significantly change following a sensitivity analysis. **CONCLUSION:** When dosed within APA-recommended ranges, per-patient SGA costs differ from that of real-world dosing. Underdosing of certain SGAs may lead to an inaccurate perception of a lower relative cost compared to other SGAs.

PMH22

ECONOMIC ASSESSMENT OF THREE COMMONLY USED ANTIPSYCHOTIC AGENTS IN THE PUBLIC SECTOR OF HONG KONG USING A DECISION ANALYTIC MODEL

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OBJECTIVE: To compare the economic outcomes of 3 hypothetical cohorts of schizophrenic patients receiving 3 different antipsychotic agents over 6 weeks and 12 months from a public hospital perspective of Hong Kong **METHODS:** Three hypothetical cohorts of 100 patients were given paliperidone 6 mg (PP), olanzapine 10 mg (OL) and quetiapine 750 mg (QT) for acute exacerbation of schizophrenia. A decision analytic model was used to project the economic outcomes 6 weeks and 12 months after the start of therapy. The categories of inputs required in populating the model were: characteristics of relapse, rates of adverse effects, health care resource utilization, unit costs of health care resources, and switch rate to other oral atypical antipsychotics. Published randomized controlled trial data were used for obtaining response rates of the three drugs. Published data from long-term clinical trials were adopted for rates of discontinuation, switching, relapse and adverse events in the model. Cost of hospitalization, drug costs and other laboratory procedural costs were obtained from the available information of the local health authority. Other unit costs of health care resource data were from published information of the government. Sensitivity analyses were performed on the key parameters to test the robustness of the results. **RESULTS:** Several conservative approaches were adopted in data analysis. The overall costs of treatment per patient were: US$169(PP), US$235(OL), and US$225(QT) after 6 weeks; and US$5505(PP), US$5576(OL), and US$5809(QT) after 12 months. Sensitivity analyses of the key parameters had no effects on the results. **CONCLUSION:** In the public hospital setting in Hong Kong, estimation using a decision analytic model revealed that the overall cost of treatment using PP for schizophrenic patients with acute exacerbation appears to be less than OL and QT both 6 weeks and 12 months after therapy.

PMH23

A COMPARISION OF HEALTH CARE UTILIZATION AND COST OF CHILDREN AND ADOLESCENTS WITH BIPOLAR DISORDER TREATED WITH ATYPICAL ANTIPSYCHOTIC MONOTHERAPY VERSUS MOOD STABILIZER MONOTHERAPY

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OBJECTIVE: To compare health care utilization and cost of children and adolescents with bipolar disorder treated with atypical antipsychotic (ATYP) versus with mood stabilizer (MS) monotherapy. **METHODS:** We conducted a retrospective cohort study using Pharmetrics administrative claims data from January 1, 1998 to December 31, 2002. The study population included youths ($6 < AGE < 19$). **RESULTS:** After matching on the propensity score, 486 subject pairs were retained. On average, ATYP monotherapy subjects had fewer bipolar-related office visits ($p = 0.0041$), but similar bipolar-related outpatient hospitalization ($p = 0.084$), bipolar-related days of hospitalization ($p = 0.1707$), and bipolar-related emergency department visits ($p = 1.00$). ATYP monotherapy subjects had a lower cost of bipolar-related office visits ($p = 0.0246$) but higher medication costs ($p < 0.0001$). There were no cost differences between groups for bipolar-related emergency department visits ($p = 0.5477$), bipolar-related outpatient hospitalization ($p = 0.9817$), and bipolar-related inpatient hospitalizations ($p = 0.521$). Total bipolar-related medical service ($p = 0.6501$) and general health-related medical service ($p = 0.885$) costs were also not significantly different between the two groups. **CONCLUSION:** Compared to patients with MS monotherapy, patients with ATYP monotherapy had fewer bipolar-related office visits and higher medication costs, but similar total bipolar-related and overall medical service costs.

PMH24

INITIATING TREATMENT ON GENERIC ANTIDEPRESSANTS MAY NOT SAVE HEALTH CARE COSTS

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OBJECTIVE: To compare health care costs associated with initiating treatment on escitalopram or one of several generic selective serotonin reuptake inhibitors. **METHODS:** A retrospective patient cohort with antidepressant fills was selected from a large claims database. Patients were included if they had a depression-related diagnosis and at least six months of health plan eligibility before and after the date of their first study antidepressant claim. Dependent variables included total health care costs and component pharmacy, medical (non-pharmacy ambulatory and inpatient), inpatient, and mental health treatment costs in the six months after initiation of antidepressant therapy. A propensity score analysis was used to account for selection bias in antidepressant choice (escitalopram versus other antidepressants). Incorporating this adjustment, generalized linear models were estimated to examine the association between antidepressant choice and subsequent costs. **RESULTS:** Sample members were approximately 40 years old, nearly one-third were male, and more than 85% were enrolled in a health maintenance organization or preferred provider organization. Although patients initiating treatment on escitalopram had higher pharmacy costs ($587 versus $503, $p < 0.01$), total health care costs ($2327 versus $2383, $p < 0.05$) were lower in the six months after initiation compared with patients initiating with generic antidepressants. Component costs also varied among drug cohorts, but these differences were small with medical costs offsetting higher drug costs. **CONCLUSION:** Despite higher medication costs, total health care costs were lower for patients initiating treatment on escitalopram. These reductions in costs suggest that therapeutic substitution of generic for branded antidepressants might not be an effective cost-containment strategy and should be considered when making formulary decisions regarding antidepressants.

PMH25

HEALTH CARE USE AND COSTS OF PATIENTS WITH "PURE OBSESSIVE-COMPULSIVE DISORDER" VERSUS "PURE DEPRESSION": 9-YEAR (1997–2006), LARGE-SCALE, RETROSPECTIVE CLAIMS ANALYSIS OF FLORIDA MEDICAID ADULT ENROLLEES

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OBJECTIVE: To compare 2-year health care use and costs of newly-diagnosed patients with "pure OCD" (P-OCD; OCD sans bipolar disorder, psychoses, or depression) to a matched sample with "pure depression" (P-D; depression sans bipolar disorder, psychoses, or OCD). **METHODS:** Retrospective (1997–2006) analysis of Florida Medicaid claims. Among patients with ≥1 OCD claim (ICD-9 300.3), we identified their first occurring ("index") OCD claim. P-OCD patients had no depression (ICD-9 296.2/296.3/296.9/300.4/309.0/309.1/311), psychoses (ICD-9 295/298) or bipolar disorder (ICD-9 296) in the 2 years before and after their index claim. P-D patients were identified similarly, except that the index claim was depression and the exclusion diagnoses included OCD rather than depression. Each P-OCD patient was matched to ≥1 P-D patient on sex, race/ethnicity, medical illness severity (Charlson Comorbidity Index), and age and year at index diagnosis. P-OCD patients without matches were excluded from analysis. We compared 2-year health care utilization and costs post-index diagnosis. **RESULTS:** Among 2,924,412 enrollees, 156 met criteria for P-OCD and 16,055 for P-D. Of these, we matched 135 P-OCD patients to 1510 P-D patients (21 P-OCD patients could not be matched). Total 2-year, median number of health care claims was approximately 2 times greater (P-OCD 126.0 versus P-D 68.4, $p < 0.0001$), and costs were approximately 3 times higher (P-OCD $25,666 versus P-D $7732, $p < 0.0001$) among P-OCD patients. P-OCD patients had significantly more outpatient visits for medical treatment (median 2-year number of outpatient visits P-OCD 86.0 versus P-D 56.0, $p = 0.0007$) and approximately 2 times higher median outpatient medical costs (P-OCD $4820 versus P-D $2525, $p < 0.0001$). **CONCLUSION:** Although patients were matched on medical illness severity, P-OCD patients used significantly more outpatient medical services and incurred two times greater outpatient medical costs than counterparts with P-D. Findings suggest that much of the care for OCD may occur within the outpatient medical setting.

PMH26

IMPROVED WORK PRODUCTIVITY IN THE UNITED STATES (US) FOR PATIENTS TREATED WITH ESCITALOPRAM COMPARED TO DULOXETINE

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OBJECTIVE: To evaluate work productivity and associated costs in patients with Major Depressive Disorder (MDD) treated with escitalopram compared to patients treated with the Serotonin-Noradrenaline Reuptake Inhibitor (SNRI) duloxetine, from the perspective of US employers. **METHODS:** A multinational pharmacoeconomic evaluation was conducted in parallel with a 24-week double-blind randomized study [1] [escitalopram 20 mg/day (n = 139) and duloxetine 60 mg/day (n = 144)] in adult outpatients with MDD, with a baseline Montgomery-Åsberg Depression Rating Scale score of ≥26 and a Clinical Global Impression of Severity (CGI-S) score of a current MDD episode of 12 weeks to 1 year. Sick leave due to depression was evaluated prospectively in a Health Economic Assessment questionnaire. Wage rates were obtained from the US Bureau of Labor Statistics for 2006 (mean $18.8/hour, all occupations). **RESULTS:** Escitalopram was associated with shorter sick leave duration compared to duloxetine (30.7 vs. 62.2 days/patient with sick leave, p = 0.007; 7.3 days vs. 13.0 days/patient overall, p = 0.10). By study end, the total number of workdays lost for the 33 patients reporting sick leave in the escitalopram arm was 1014 vs. 1866 days for the 30 patients with sick leave in the duloxetine arm. This resulted in total costs due to lost work productivity of $152,830 in the escitalopram group compared with $281,244 in the duloxetine group, yielding savings over the study timeframe (24 weeks) of $128,413 in favor of escitalopram (p = 0.044). **CONCLUSION:** Escitalopram was superior to the SNRI duloxetine in improvement of work productivity for patients with MDD, and resulted in associated cost savings to the US payer. With indirect cost due to sick leave accounting for the largest portion of the total social MDD burden, these advantages support the use of escitalopram as a first-line treatment of MDD in the US. [1] Wade AG, Gembert K, Florea I. Curr Med Res Opin 2007;23:1605–1614.

PMH27

COST-EFFECTIVENESS OF A MINIMAL INTERVENTION STRATEGY FOR STRESS-RELATED SICK LEAVE IN GENERAL PRACTICE: RESULTS OF AN ECONOMIC EVALUATION ALONGSIDE A PRAGMATIC RANDOMIZED CONTROLLED TRIAL

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OBJECTIVE: From a societal perspective, we determined the cost-effectiveness of a general practitioner-based minimal intervention strategy for workers with stress-related sick leave (MISS) compared to usual care (UC) in terms of: 1. quality-adjusted life years (QALYs) and 2. total sick leave. **METHODS:** We conducted a pragmatic, cluster-randomized controlled trial with a 12-month follow-up. Forty-six general practitioners (GPs) were randomized to either MISS (N = 24) or UC (N = 22). From a total source population of 22,740 patients, 433 participated (MISS = 227; UC = 206). Data were collected from GP databases, questionnaires (e.g. EuroQol) and telephone interviews. A cost-utility and net monetary benefit (NMB) analysis were conducted to address each objective, respectively. Missing values were imputed by multiple imputation. The main analyses were based on the imputed dataset. Uncertainty was estimated by 95% confidence intervals, cost-effectiveness planes and acceptability curves. Sensitivity analyses were conducted, and ancillary analyses based on three preplanned subgroups were performed. **RESULTS:** No statistically between-group differences in resource use, costs or outcomes were observed. The mean cost per QALY was –€7356 whereby the MISS was slightly more effective and less expensive than UC. The probability of MISS being cost-effective ranged from 0.58–0.90 for willingness-to-pay (λ) thresholds from €0–€100,000 per QALY. The mean NMB of the MISS was €937 (95% CI: –1602;3476) for a λ-value of €35 for an hour less of sick leave; the corresponding probability was 0.72. Sensitivity analysis did not alter our conclusions. For the subgroup, stress mental disorders, the mean cost per QALY was –€28,278 (Quadrant II); the probability of MISS being cost-effective was 0.92 or greater for all λ-values. The mean NMB was €4584 (95% CI: 306;8861). **CONCLUSION:** The minimal intervention was not found to be more cost-effective than usual care. It may, however, be cost-effective for the subgroup, stress-related mental disorders. Future research is needed to confirm this observation.

PMH28

COST-EFFECTIVENESS OF ONCE-DAILY STIMULANT, NON-STIMULANT & COMBINED STIMULANT/BEHAVIORAL THERAPY INTERVENTIONS IN THE TREATMENT OF ADHD IN CHILDREN

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OBJECTIVE: To compare the cost-effectiveness of once-daily methylphenidate (OROS-MPH), atomoxetine and combined MPH/behavioral therapy in the treatment of ADHD in children 6–18 years of age, from a societal perspective. **METHODS:** A decision tree was used to model response rates, costs and utilities for the three treatment arms over a two-year period (base-case) using evidence from clinical and economic literature. Costs & utilities were extrapolated for a 16-year period beyond base-case period until the patient reached adulthood. Both costs and utilities were discounted at the rate of 3%. A one-way sensitivity analysis of the ICERs was conducted to test assumptions made while modeling and to determine drivers of cost. **RESULTS:** The base-case costs and QALYs for OROS-MPH, atomoxetine and combined therapy were US$ 8314, 9716, 10,723 and, 1.71, 1.73, 1.50 respectively. The extrapolated 12-year costs and QALYs were US$ 21,804, 25,435, 28,759 and, 6.28, 6.21, 6.08 respectively. The base-case CE ratios for stimulant, non-stimulant and combined therapy against no-treatment are US$ 8690.2, 12577 and 57,971.9 respectively. The base-case cost-effectiveness ratio of atomoxetine versus OROS-MPH is $60,782, while that of combined therapy against each of the other two interventions was negative. Sensitivity analysis showed that maintenance rates and utilities were the main drivers of cost-effectiveness. **CONCLUSION:** All three interventions are cost-effective as compared to no treatment option. Combined therapy was 'dominated' both during the base-case as well as over long term periods. While atomoxetine is more cost-effective than OROS-MPH over a two-year period, the latter is the 'dominant' strategy over the long term.

WITHDRAWN **PMH29**

PMH30

COST-EFFECTIVENESS OF QUETIAPINE IN COMBINATION WITH LITHIUM OR DIVALPROEX: IN THE MAINTENANCE TREATMENT OF BIPOLAR I DISORDER

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OBJECTIVE: Bipolar I disorder (BPD1), is a recurrent illness that affects 1% of the US population (1) and severely impacts both patient and caregiver quality of life. Although BPD1 constitutes a large economic burden, few studies have investigated the cost-effectiveness of maintenance treatment options (2). **METHODS:** The cost-effectiveness of two years of maintenance treatment with quetiapine (QTP) in combination with the traditional mood stabilizers [divalproex (DVP) or lithium (Li)], and placebo (PBO) in combination with Li or DVP, was compared using a Markov model, from a societal perspective. The model simulates a cohort of 1000 stabilized BPD1 patients (i.e., successful remission from prior acute mood episode) and estimates the quarterly risk in three health states: euthymia, mania, and depression. Efficacy data were derived from Studies D1447C00126 and D1447C00127, multicenter, randomized, double-blind, parallel-group trials comparing QTP + Li/DVP with PBO + Li/DVP for up to 2 years. Resource data were obtained from published literature. Drug acquisition costs, hospitalizations, and physician visits were among the direct costs and indirect costs included absenteeism (2). Mortality rates included suicide. Benefits and costs were discounted at 3% and the price reference year was 2007. The major endpoints included costs per episode avoided and costs per quality-adjusted-life-years (QALY). Probabilistic sensitivity analysis was conducted to evaluate uncertainty in the results. **RESULTS:** Treatment with QTP + Li/DVP was associated with reductions in acute mania (45%), acute depression (41%), and related hospitalizations (44%). In the base case analysis, QTP + Li/DVP dominated PBO + Li/DVP. Probabilistic sensitivity analysis showed these results to be robust. **CONCLUSION:** Quetiapine in combination with lithium or divalproex is a cost-effective maintenance treatment for patients with bipolar I disorder.

PMH31

A PHARMACOECONOMIC ANALYSIS OF SCHIZOPHRENIC PATIENTS SWITCHING FROM BRANDED TO GENERIC RISPERIDONE INVOLVING A POSSIBLE COMPLIANCE LOSS

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OBJECTIVE: Patients might be reluctant to accept generic substitution, due to differences in colorants, shape, package design, etc. This may result in poorer compliance, especially amongst patients suffering from schizophrenia. Generic substitution for schizophrenic patients decreases drug costs, possibly counteracted by more hospitalizations resulting from poorer compliance. This study quantifies the health-economic impact of generic substitution of oral risperidone in Germany. **METHODS:** An existing five-year discrete event simulation (DES) model was adapted to compare patients staying on branded risperidone (BR) with patients switching to generic risperidone (GR). Differences between treatment arms include compliance and medication costs. The compliance loss for patients subject to generic substitution was varied between 0 and 10%. The generic price was assumed to be 40% of the branded price (= €7.41). Incremental costs and effects were recorded and analyzed. **RESULTS:** With 2.5%, 5.0%, 7.5% and 10% difference in compliance, incremental effects of BR over GR are 0.003, 0.006, 0.009 and 0.011 QALYs respectively. Incremental costs are €871, €551, €231 and –€195. Health benefits are realized through improved symptom reduction resulting from better compliance. Improved symptom reduction also decreases the number of hospitalizations, counteracting the higher drug costs for BR. On average, each 2.5%-point compliance difference causes a 0.003 QALY gain, while incremental costs decrease with ~€355. Thus, for compliance differences ≥6.5%, the model predicts BR to be cost-effective compared to GR (using NICE threshold of ≤30,000 (~€42,000)). For compliance differences ≥8.5%, the model predicts BR to dominate GR. **CONCLUSION:** The DES model predicts staying on BR may be cost-effective compared to generic substitution if the latter causes a compliance loss ≥6.5%. For a compliance loss ≥8.5%, BR is predicted to dominate GR. Better compliance involves improved symptom reduction resulting in health benefits and fewer hospitalizations. The latter counteracts the higher medication costs associated with BR.

PMH32

ACAMPROSATE IN TREATMENT OF ALCOHOL DEPENDENCE—ECONOMIC BENEFITS REVISITED

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OBJECTIVE: Acamprosate has been reported to be cost-effective in maintaining abstinence in alcohol-dependent patients initiating psychosocial rehabilitation. This analysis updates earlier estimates of the economic benefits of such therapy. **METHODS:** Estimated costs (2006 USA dollars) were compared over one year between patients assumed to receive acamprosate as an adjunct to psychosocial rehabilitation versus psychosocial rehabilitation alone. Costs included acamprosate therapy, psychosocial rehabilitation services, and alcohol-related hospitalizations and physician visits. Resource use estimates were obtained from a prospective open-label cohort study. The cost of acamprosate was based on average wholesale price, and an assumed standard 15% discount; all other unit costs were estimated using a large USA health care claims database. **RESULTS:** The estimated cost of acamprosate therapy over one year was $652 per patient (mean duration of treatment, 180 days). Estimated costs of psychosocial rehabilitation services were similar in the two groups. Estimated costs of alcohol-related hospitalizations and physician visits, however, were $1059 lower per patient among those assumed to receive acamprosate. Accordingly, the estimated total 1-year cost of alcohol-related care was $407 lower per patient among those assumed to receive acamprosate plus psychosocial rehabilitation versus psychosocial rehabilitation alone. **CONCLUSION:** Overall costs of alcohol-related care may be substantially lower among alcohol-dependent patients receiving acamprosate plus psychosocial rehabilitation in comparison with psychosocial rehabilitation alone.

PMH33

COST-EFFECTIVENESS OF ARIPIPRAZOLE FOR THE MANAGEMENT OF SCHIZOPHRENIA IN THE UNITED KINGDOM

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OBJECTIVE: To evaluate the cost-effectiveness of atypical antipsychotic treatment sequences for the management of stable schizophrenia in the UK. **METHODS:** A Markov model was developed to assess the cost per quality adjusted life year (QALY) gained from 12 alternative treatment sequences each containing two atypical antipsychotics (aripiprazole (ARI), olanzapine (OLZ), quetiapine (QTP), and risperidone (RSP)), followed by clozapine. The main model parameters were populated with data from the CATIE study, which provides a direct comparison of the effectiveness of OLZ, QTP and RSP, a recent trial of ARI compared with OLZ in the long-term treatment of schizophrenia, and a recent study of diabetes incidence in atypical treated patients. Patients enter the model with stable schizophrenia. On each treatment patients may relapse, discontinue, or continue and experience adverse events (extrapyramidal symptoms, weight gain, hyperprolactinemia), or develop diabetes. Population mortality was adjusted for schizophrenia and diabetes. Utility decrements applied to stable schizophrenia, relapse, diabetes, and treatment related adverse events were taken from a direct UK utility elicitation study. Dosing for OLZ, QTP, and RSP was based on CATIE. ARI is flat priced within the ranges of 5–15 mg and 20–30 mg; we assumed a simple average of these doses. Resource use and unit costs were taken from published sources. A time horizon of 10 years was adopted. **RESULTS:** ARI followed by RSP produced the greatest number of QALYs, an additional 0.03 compared to RSP followed by OLZ, at an incremental cost of £222 (incremental cost per QALY: £7942). ARI followed by RSP had the greatest probability among evaluated sequences of being cost effective at a threshold of £10,000 per QALY or higher. **CONCLUSION:** First-line atypical treatment with aripiprazole offers a cost-effective option for patients with stable schizophrenia.

PMH34

TREATMENT OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD): ESTIMATING THE MAXIMUM ALLOWABLE COST OF PSYCHOSOCIAL INTERVENTIONS IN THE UNITED STATES, GERMANY, THE NETHERLANDS, SWEDEN, AND THE UNITED KINGDOM

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OBJECTIVE: ADHD is the most common behavioral disorder of childhood and adolescence in the US and Europe. The NIMH-initiated MTA Study still is the clinical landmark trial in the field, including 579 children age 7–9.9 years with ADHD (DSM-IV), who were randomly assigned to 14 months of medication management (MedMgt), intense behavioral treatment (Beh), both combined (Comb), or community care (CC). All MTA treatment strategies were clinically effective. The intensity of the MTA Beh strategy, designed to maximize clinical effectiveness, resulted in disappointing incremental cost-effectiveness ratios, being invariably dominated by MedMgt. Applying current cost-effectiveness benchmarks, this study aimed to estimate the maximum allowable cost (MAC) of better-targeted psychosocial interventions, assuming they replicate the effectiveness achieved in the MTA Study. **METHODS:** For costing, medical resource utilization data from the MTA, excluding its research component, were combined with unit costs (year 2005) from a societal and from a third-party payer's perspective for the United States as well as for Germany, Netherlands, Sweden, and UK. Treatment response was defined as normalization of core symptoms. QALYs were estimated using utility weights derived from expert and parent-proxy-ratings. **RESULTS:** MACs for Beh were determined (a) for ADHD and for subgroups (b) with "pure" ADHD (without co-morbidity, n = 184) and (c) hyperkinetic disorder (HKD, with or without conduct disorder, n = 145), assuming (1) Beh meeting the ICERs of MedMgt (versus CC), or meeting an ICER threshold (when added to MedMgt) of (2) €50,000 or (3) €100,000 per QALY. MACs (US) were (1) €1130, (2) €2470, and (3) €3720 (exchange rate [2005]: USD$1 = €0.85). Estimates for Germany and Netherlands were broadly similar, whereas British and Swedish estimates were substantially higher, up to (1) €2250, (2) €3600, and (3) €5420. **CONCLUSION:** Despite limitations, these estimates may assist clinical study planners aiming at showing acceptable cost-effectiveness of psychosocial treatment strategies for ADHD.

PMH35

COST-EFFECTIVENESS OF ORALLY DISSOLVING OLANZAPINE TABLETS IN THE TREATMENT OF SCHIZOPHRENIA IN THE USA

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OBJECTIVE: To assess the cost-effectiveness of olanzapine orally dissolving tablets (ODT) and olanzapine standard oral tablets (SOT) during the usual treatment of schizophrenia patients from a U.S. health care perspective. The model also compared olanzapine ODT with other antipsychotics in SOT and ODT formulations. **METHODS:** Published medical literature, unpublished data, and a clinical expert panel were used to populate a one-year micro-simulation model comparing olanzapine ODT with olanzapine SOT, and with other antipsychotics in SOT (risperidone, quetiapine, ziprasidone, aripiprazole and perphenazine) and ODT formulations (risperidone and aripiprazole). The model captures clinical and cost parameters including adherence levels, treatment discontinuation by reason, relapse with and without inpatient hospitalization, quality-adjusted life years (QALYs), treatment-emergent adverse events, health care resource utilization and associated costs. Key results were annual direct cost per treatment and incremental cost-effectiveness values per one inpatient relapse avoided and per one QALY gained. **RESULTS:** Based on model projections, olanzapine ODT therapy was slightly more costly ($9674 vs. $9602) but more effective in terms of a lower hospitalization rate (14% vs. 16%) and better QALY (0.78 vs. 0.75) than olanzapine SOT therapy, with favorable incremental cost per inpatient relapse avoided ($2157) and QALY gained ($2454). Olanzapine ODT was more cost-effective than olanzapine SOT and also more cost-effective compared to other comparators. **CONCLUSION:** The utilization of olanzapine ODT for the treatment of schizophrenia is predicted in this model to be more cost-effective than olanzapine in standard oral tablets and more cost-effective than other comparators in either orally dissolving tablet or standard tablet formulations.

WITHDRAWN **PMH36**

PMH37

UNITED KINGDOM COST-CONSEQUENCE ANALYSIS OF ARIPIPRAZOLE IN SCHIZOPHRENIA: DIABETES AND CORONARY HEART DISEASE RISK PROJECTIONS (STAR STUDY)

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OBJECTIVE: Schizophrenia is associated with increased morbidity and mortality compared to the general population, largely resulting from increased incidence of cardiovascular disease and diabetes. Some atypical antipsychotics are associated with adverse metabolic symptoms, such as weight gain, dyslipidaemia and glucose dysregulation, which may further increase the risk of coronary heart disease (CHD) and diabetes. This study aimed to assess the impact of these symptoms on cost of treating patients' physical health. **METHODS:** Data from the Schizophrenia Trial for Aripiprazole (STAR) study showed that metabolic side effects of aripiprazole treatment are less than those experienced by patients receiving standard-of-care (SOC) treatment (physicians' selection of olanzapine/quetiapine/risperidone). In a post-hoc analysis, projected risks for diabetes/coronary heart disease (CHD) were calculated using the Stern and Framingham models. These risks were used to estimate the difference in direct and indirect cost consequences of diabetes and CHD in schizophrenia patients treated with aripiprazole or SOC over a 10-year period, assuming risk of diabetes onset/CHD events remained linear. Diabetes costs were estimated from UKPDS and UK T2ARDIS studies, respectively, and CHD costs were estimated using prevalence data from the Health Survey of England and published literature. All costs were inflated to 2007 costs using the UK government's Pay and Prices Index inflation rates. **RESULTS:** The number of avoided diabetes cases (23.4 cases/1000 treated patients) in patients treated with aripiprazole compared with SOC was associated with estimated total (direct and indirect) cost savings of ≤37,261,293 over ten years for the UK population. Similarly, the number of avoided CHD events (3.9 events/1000 treated patients) was associated with estimated total cost savings of ≤7,506,770 over ten years. **CONCLUSION:** Compared with SOC, the favourable metabolic profile of aripiprazole treatment may provide reductions in health and economic burden to schizophrenia patients and psychiatric health care services in the UK.

PMH38

GENERALIZED ANXIETY DISORDER: A COMPREHENSIVE LITERATURE REVIEW OF THE BURDEN OF ILLNESS IN NORTH AMERICA

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OBJECTIVE: To review the economic burden of Generalized Anxiety Disorder (GAD) by examining published North American studies and to use this information to define burden and cost of illness among patients with GAD. **METHODS:** A systematic review of the literature was conducted using a PICO (Population, Intervention, Comparison, Outcomes) form to guide the search strategy. MEDLINE, EMBASE, and Cochrane Library databases, and selected websites, were examined. The search was limited to papers published in English between 1987 and 2007. Studies examining outcomes from mixed patient populations, combination therapies or non-pharmacological interventions were excluded. **RESULTS:** The initial search yielded a total of 1999 articles, of which approximately 100 met predetermined inclusion criteria. The studies revealed 12-month prevalence rates ranging from 1.6–3.0%. GAD prevalence was higher among females compared with males and generally decreased with age. Comorbid mental disorders were common among patients with GAD, particularly depressive disorders, and were highly predictive of GAD onset and persistence. GAD was also associated with a substantive reduction in health-related quality of life. SF-36 scores in one study were 12–28 points lower among patients with GAD compared with the general US population (1). The health care resource utilization costs associated with GAD were considerable, although varying patterns of disease identification and treatment made the extent of this utilization difficult to quantify. Patients with GAD showed significantly higher medical care charges ($2375 vs. $1448, P = 0.006) than patients without GAD (2). **CONCLUSION:** GAD, along with other anxiety disorders, exerts substantial cost-related burdens on society, driven in part by under-recognition and under-treatment of the disorder. Increased awareness, evidence-based treatment selection and appropriate early intervention could help to alleviate this burden.

PMH39

THE PREVALENCE AND COSTS OF METABOLIC CONDITIONS AMONG PATIENTS WITH BIPOLAR DISORDERS AS COMPARED TO MATCHED CONTROLS

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OBJECTIVE: Patients with bipolar disorder are vulnerable to developing metabolic illnesses such as hypertension, dyslipidemia, and type 2 diabetes mellitus. In addition, mood stabilizers, anticonvulsants, and antipsychotic medications, which are commonly used to treat bipolar disorder, have been linked to risk for adverse metabolic changes. This study uses a large insurance claims database to examine the prevalence and costs of metabolic conditions among patients with a bipolar diagnosis relative to a matched non-bipolar sample. **METHODS:** A retrospective analysis was conducted of medical service and prescription claims from the Thomson Health care MarketScan® Commercial Database (includes claims information on more than 12 million employees with employer-based insurance and their dependents in the United States). Claims data for 28,531 patients with bipolar disorder were compared over one year with data for 85,593 age and gender 1–3: matched control patients with no mental health disorders and no psychotropic medication use. The prevalence and health care costs of metabolic conditions in bipolar patients were compared with those of their matched controls. **RESULTS:** The bipolar cohort had significantly higher overall medical service and prescription drug costs than the control cohort ($12,764 versus $3,140, $p < 0.0001$). Bipolar patients had a significantly higher prevalence of metabolic co-morbidities than the general population (37% versus 30%, $p < 0.0001$), and medical service treatment costs for metabolic conditions were twice that of the control cohort ($531 versus $233, $p < 0.0001$). Prescription medication costs for metabolic conditions were higher as well, with bipolar cohort per-patient

costs of $571 versus $301 for the control cohort ($p < 0.0001$). **CONCLUSION:** Bipolar patients have significantly more metabolic co-morbidities and higher medical costs than in age- and gender-matched controls. To reduce the medical and economic burden of bipolar disorder, strategies should be identified to prevent the development of metabolic co-morbidities and improve medication adherence.

PMH40

TREATMENT COST AND COMORBIDITIES ASSOCIATED WITH OBESITY AMONG MEDICAID PATIENTS WITH BIPOLAR DISORDER

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OBJECTIVE: Obesity, a known risk factor associated with bipolar disorder, complicates its treatment, potentially adding significantly to overall treatment cost. The difference in bipolar treatment cost between obese patients and normal weight patients has not been adequately evaluated. The purpose of this study is to assess treatment costs and co-morbidities associated with obesity in Medicaid patients with bipolar disorder. **METHODS:** From a multi-state managed care Medicaid claims database, a total of 13,242 patients with bipolar disorder during the period January 1, 1998 to December 31, 2002 were selected for this study. Patients had to be older than six years or younger than 65 at the first date of bipolar diagnosis. Annual treatment cost per patient was constructed as the sum of reimbursed amounts (in 2002 constant dollars) for hospitalizations, physician encounters, drugs, and other medical services. A log-linear regression analysis was used to assess factors influencing annual treatment costs. Logistic regression analysis was conducted to assess the association between overweight and related clinical factors. **RESULTS:** A total of 3192 (24.1%) were treated with atypical antipsychotics, 1700 (12.8%) with lithium, and 4575 (34.5%) with other anticonvulsants. A total of 1064 (8.0%) patients received an obesity or overweight diagnosis during the study period. The average annual treatment costs were $11,780 (SD $\pm$ 15,290) for patients experiencing obesity and $8546 (SD $\pm$ 17,971) otherwise. Other major determinants of higher treatment cost included bipolar I or NOS ($p < 0.0001$), being female ($p < 0.0001$), the use of anticonvulsants ($p < 0.0001$) and atypical antipsychotics ($p < 0.0001$), alcohol and substance abuse disorder ($p < 0.0001$), and diabetes mellitus ($p < 0.0001$). The risk of being overweight was statistically associated with co-morbidities like anxiety disorder (odds ratio [OR] = 1.43, 95% CI: 1.25–1.64), hypertension (OR = 3.02, 95% CI: 2.54–3.59), etc. **CONCLUSION:** Significant treatment costs are associated with obesity in patients with bipolar disorder. Metabolic complications should be considered by clinical practitioners when prescribing medication in this population.

PMH41

COST UTILITY OF EEG BIOMARKERS FOR PERSONALIZED TREATMENT OF MAJOR DEPRESSION

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OBJECTIVE: Fewer than half of patients diagnosed with Major Depressive Disorder (MDD) respond to the first medication used, but an adequate trial may take seven weeks. The BRITE-MD study reported that a frontal quantitative EEG biomarker, Antidepressant Treatment Response [ATR] Index, was 74% accurate in predicting response/no-response to escitalopram after 1 week of treatment. The objective is to examine the economic and quality of life consequences of early switching of medication. **METHODS:** We modeled the economic and quality of life consequences of using ATR to individualize treatment of MDD as a mixed decision tree-Markov model using the seven week results from the BRITE-MD study. Other potential benefits of the technology, such as improved adherence, were not considered in this analysis. **RESULTS:** The short-term model estimated an increase of 7.1 responders at seven weeks per 100 treated patients. Based on published utility weights for responders ranging from 0.73 to 0.78, and an average utility weight for non-responders of 0.47, the model estimated a 10% gain in QALYs for the ATR group over the initial 7 weeks of treatment. The incremental cost effectiveness ratio for the base estimate was $11,441. Sensitivity analysis indicated that ATR was cost saving at modest unit cost values, and that the $50,000/QALY threshold was not reached until the unit cost reached $179. Long-term model estimates, and the cost effectiveness of ATR use under different treatment and cost assumptions, along with optimized ATR performance, will also be presented. **CONCLUSION:** The modeling estimates indicate that the use of ATR would be a cost effective method for individualizing care for patients with MDD. Under the assumptions and cost weights used in our short-term model, ATR fell well below the $50,000 per QALY threshold for all reasonable model assumptions, and thus met the usual benchmark for good value for money for US economic analyses.

PMH42

IMPACT OF RISPERIDONE LONG-ACTING INJECTION VERSUS ORAL ANTIPSYCHOTIC TREATMENTS ON HOSPITALIZATION IN SCHIZOPHRENIA

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OBJECTIVE: To evaluate impact of risperidone long-acting injection (RLAI) versus oral antipsychotic treatments on hospitalization outcomes for patients participating in the electronic Schizophrenia Treatment Adherence Registry (e-STAR) in Spain. **METHODS:** e-STAR is a two year, multi-national, prospective, observational study of patients with schizophrenia who were initiated on RLAI or an oral antipsychotic. This report is based on the final, complete e-STAR data from Spain. Hospitalization outcomes including number of hospitalizations and number of days in hospital were collected retrospectively for one year and prospectively every three months for two years. Changes in hospital stays and days in hospital were compared between RLAI patients and oral patients using a linear mixed model controlling for age, gender, disease duration, and baseline antipsychotic use patterns. **RESULTS:** A total of 1622 patients (63.6% male, mean age 38.4 $\pm$ 11.2 years) participated in e-STAR from Spain, 1345 were initiated on RLAI and 277 were treated with oral antipsychotics. RLAI patients had significantly longer disease duration (12.6 $\pm$ 9.5 years vs. 10.9 $\pm$ 9.7 in oral patients, $p < 0.01$). Average hospital stay at baseline was five days longer for RLAI patients than oral patients. During the two year study, both treatments showed reductions in mean number of hospitalizations and mean number of days in hospital. As revealed by the mixed-model regression, RLAI patients, compared to oral patients, had a significantly greater reduction in mean number of hospitalizations (–0.28 vs. –0.18 in followup-year1 and –0.37 vs. –0.20 in followup-year2, $p < 0.05$) and mean number of days in hospital (–17.23 vs. –12.96 in followup-year1 and –18.75 vs.

–12.99 in followup-year2, $p < 0.01$). **CONCLUSION:** This two year, prospective, observational study showed that compared to oral antipsychotics, RLAI treatment was associated with greater reduction in hospital stays and days in hospital in patients with schizophrenia.

PMH43

MENTAL HEALTH CARE RESOURCE USE BEFORE AND AFTER INITIATION OF PALIPERIDONE ER IN PATIENTS WITH SCHIZOPHRENIA

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OBJECTIVES: Schizophrenia care produces a substantial economic burden. Interventions that reduce the need for resource use are of interest to clinicians and payers. This study assessed changes in mental health resource use following initiation of paliperidone extended-release tablets (paliperidone ER) in the three double-blind (DB) trials and their open-label extensions (OLE). **METHODS:** A retrospective chart review generated data on resource use during the 12 months before and after the DB trials. Additional IRB approval and informed consent were obtained for these reviews. Average number of inpatient and ambulatory care services in the pre- and post-periods was calculated, including use of bootstrap resampling methods to assess statistical significance of differences. Total person years were calculated for the pre- and post-periods to account for different lengths of observation. Separate analyses were also performed by country. **RESULTS:** In this analysis, patients (n = 79) were from the United States (38.0%), Canada (19.0%) and Malaysia (43.0%). Mean (±SD) patient age was 38.0 (±10.4) years; and the majority of patients were male (73.4%). Most (70.9%) patients received prior treatment with antipsychotics. During the OLE, the mean paliperidone ER treatment duration (±SD) was 226.4 (±142.3) days, and the mean dose was 11.5 (±2.2) mg. Overall, paliperidone ER patients used fewer resources after drug initiation (mean reduction per person year: days hospitalized = 12.1, $p = 0.002$; number of emergency room visits = 0.3, $p = 0.038$; number of psychiatric-related office visits = 2.3, $p < 0.001$; number of psychotherapy sessions = 0.4, $p = 0.004$). Subgroup analyses revealed that the greatest reduction in most resource categories was found in the US sites (e.g. mean reduction in days hospitalized per person year = 19.7 in the US, 6.3 in Canada, and 7.1 in Malaysia). **CONCLUSIONS:** In this post-hoc analysis, paliperidone ER was associated with a statistically significant reduction in mental health resource use. Prospective studies are needed to confirm the findings.

PMH44

HEALTH CARE RESOURCE UTILIZATION AND COSTS COMPARISON FOR MDD PATIENTS ON 10 MG ESCITALOPRAM WHO INCREASED TO 20 MG DOSE VS. THOSE WHO WERE SWITCHED TO SNRI

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OBJECTIVE: To compare health care resource utilization and costs of Major Depressive Disorder (MDD) adult patients treated with escitalopram 10 mg who increase to 20 mg vs. those who were switched to a SNRI. **METHODS:** Adult MDD patients initiated on escitalopram 10 mg who either increased to 20 mg escitalopram or switched to a SNRI were identified in the IHCIS National Managed Care Database (2003–2006). Patients who changed therapy within 60 days from escitalopram initiation date (index date) were excluded. Outcomes included rates of hospitalization and emergency visits, number of emergency visits days, and health care costs, and were reported for all cause and MDD-related. All outcomes were estimated over a 3 months period post-therapy change (dose increase or switching) and were descriptively compared between the two groups. Multivariate regression analyses were performed to further adjust for patient demographics, comorbidities and baseline health care resource use. **RESULTS:** Study samples included 9379 patients who increased escitalopram from 10 mg to 20 mg and 1215 patients who were switched from 10 mg escitalopram to a SNRI. Compared to patients who increased escitalopram dose, SNRI switchers experienced higher rates of MDD-related hospitalizations (RR = 1.2, $p = 0.566$), higher rates of MDD-related emergency visit (RR = 1.6, $p < 0.05$), and higher number of emergency visit days (RR = 1.5, $p < 0.01$) in the 3-month post-therapy change period. Patients who switched to SNRI also had on average $413 higher total costs ($p < 0.001$), which include $390 higher drug costs ($p < 0.001$). Results from multivariate regression analyses were consistent with findings from descriptive analyses. SNRI switchers incurred $430 higher risk-adjusted total costs ($p < 0.0001$). **CONCLUSION:** Compared to adult MDD patients who increased escitalopram from 10 mg to 20 mg, patients who switched to a SNRI had more MDD-related emergency visits, as well as higher drug and total health care costs during the 3-month post-therapy change period.

PMH45

COST OF PSYCHIATRIC HOSPITALIZATIONS IN THE UNITED SSTATES IN 2006

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OBJECTIVE: Acute psychiatric hospitalizations represent a major cost driver of care for psychiatric disorders. This analysis characterized the costs of psychiatric hospitalization in the United States by major psychiatric disorders and payer type. **METHODS:** The analysis utilized Premier's Perspective database of de-identified inpatient administrative claims. Data from 263,252 psychiatric hospitalizations were classified into: Schizophrenia, Bipolar Disorder, Depression, Substance Use, and Other Psychiatric Disorder based on All Patient Refined—Diagnosis Related Group codes. Results were inflated to national estimates by weighting each hospitalization based on representative demographics of all hospitals in the nation. Because reimbursed values were not available, the primary metric for analyses was the cost of providing service rather than charges. **RESULTS:** The total cost of all psychiatric hospitalizations in 2006 dollars was $10.6 billion with charges of $26.5 billion. Public payers covered most psychiatric hospitalizations, particularly for schizophrenia with a much smaller difference for bipolar disorder, depression, and substance use disorders. Length of stay was longest for schizophrenia (11.0 days) followed by bipolar disorder (7.8 days), depression (6.2 days), and substance use disorders (5.0 days). Regardless of disorder, length of stay was longer for public payers (8.7 days) than private payers (5.6 days) or self-pay (4.6 days). The average per day was inversely related to length of stay with the highest cost for substance use disorders ($1034) followed by depression ($888), bipolar disorder ($852), and schizophrenia ($806). **CONCLUSION:** The cost of delivering care for psychiatric hospitalizations in the US was approximately $10.6 billion in 2006. This estimate does not include some physicians fees and does not capture the amount reimbursed to the hospitals. Although most of

the cost is covered by public payers, a sizable proportion (33–37%) of the hospitalizations for bipolar disorder, depression, and substance use disorders are covered by private payers.

MENTAL HEALTH—Patient-Reported Outcomes

PMH46

PREDICTORS OF MEDICATION ADHERENCE AMONG SCHIZOPHRENIA PATIENTS TREATED WITH CONVENTIONAL AND ATYPICAL ANTIPSYCHOTICS IN A LARGE STATE MEDICAID PROGRAM

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OBJECTIVE: This study evaluated antipsychotic use in Medicaid beneficiaries with a schizophrenic disorder and identified factors associated with poor adherence. **METHODS:** This study involved a retrospective cohort analysis of non-dual Florida Medicaid recipients who had a medical claim indicating a schizophrenic disorder (ICD-9-CM 295.XX) and received an antipsychotic (APS) medication between July 1, 2004 and June 30, 2005. Patients were followed for one year after the first APS prescription. Adherence was measured using the Medication Possession Ratio (MPR: defined as unduplicated ambulatory treatment days divided by the number of ambulatory days in the period), medication persistence (days between the first and last antipsychotic in the follow-up period), and number of untreated days. Logistic regression models were used to identify predictors of poor adherence (MPR < 0.80). **RESULTS:** A total of 8828 patients met inclusion criteria. Mean (±SD) age was 42.3 (±13.7) years, 49% were female, and 36.8% were white. Approximately 18% and 39% had pre-existing diagnoses of substance abuse or other psychiatric conditions, respectively. Mean (±SD) MPR was 0.72 (±0.3). The mean number of untreated days was 47.4 (±60.8), and mean persistence was 311.9 (±102.5) days. Approximately 57% of patients had MPR values between 0.8 and 1. Logistic regression indicated that younger patients (<18 years), females, nonwhites, those with a substance abuse diagnosis or who received antidepressants, and those newly starting APS therapy were significantly more likely to be poorly adherent, while those treated with atypical or injectable antipsychotics (vs. conventional orals) were less likely to be poorly adherent. **CONCLUSION:** Several patient characteristics are predictive of poor adherence to APS therapy. Study findings may be informative to health plan administrators interested in identifying patients at risk for medication non-adherence.

PMH47

THE RELATIONSHIP BETWEEN THE ANTIPSYCHOTIC MEDICATION ADHERENCE AND PATIENT OUTCOMES AMONG BIPOLAR DISORDER PATIENTS

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OBJECTIVE: To examine the impact of antipsychotic medication adherence on outcomes among individuals diagnosed with bipolar disorder. **METHODS:** An administrative claims database for a commercially-insured population was used to identify patients with bipolar disorder who were newly initiating treatment with antipsychotics (January 2000–December 2006). Patients were included if they were aged between 18–64 years, had no diagnoses of dementia or schizophrenia, and were continuously insured from 6 months prior through 12 months post-index date (N = 7769). Logistic stepwise regressions examined the association between achievement of adherence goals and patient outcomes (hospitalization or emergency room (ER) visit for any reason, mental-health related hospitalizations or ER visit), while controlling for demographic characteristics, type of bipolar disorder, general health, and comorbidities. Adherence was measured by the medication possession ratio (MPR). **RESULTS:** The mean MPR was 41.65%, with 61.68% of individuals having an MPR of less than 0.50 and 78.67% having an MPR of less than 0.75. A significant reduction in the risk of hospitalization (odds ratio [OR = 0.854]; 95% CI: 0.746–0.978) or an ER visit for any cause (OR = 0.843; 95% CI: 0.744–0.955) was associated with an MPR of 0.75 or more. An MPR of 0.80 or more was associated with a significant reduction in the risk of a mental-health related hospitalization (OR = 0.817; 95% CI: 0.699–0.954) while an MPR of 0.90 or more was associated with a significant reduction in the risk of a mental-health related ER visit (OR = 0.705; 95% CI: 0.544–0.912). Incremental improvements in MPR from 0.75 to 0.95 were associated with corresponding reductions (20 to 30%) in the risk of any hospitalization or ER visit. **CONCLUSION:** As medication adherence improved, risk of hospitalization or ER visit declined, illustrating the link between adherence and better outcomes among patients with bipolar disorder.

PMH48

BETTER PERSISTENCE ON TREATMENT WITH ESCITALOPRAM COMPARED WITH CITALOPRAM

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OBJECTIVE: Guidelines recommend use of antidepressants for a minimum of six months in major depressive disorder in order to decrease the risk of relapse. Persistence on treatment depends both on efficacy and tolerability. In clinical trials, escitalopram has shown a better efficacy and equivalent tolerability compared with citalopram. This work compares persistence on treatment at six months and associated economic consequences, for treatment with escitalopram vs. citalopram. **METHODS:** Using US denominator-based claims database PharMetrics (includes data from 86 managed care health plans covering 45 million patients), we included adult patients diagnosed with depression who started escitalopram or citalopram between January 1, 2003 and December 31, 2004. Six-months persistence was defined as the percentage of patients still on treatment at 6 months. We compared persistence over time using Cox model, and health care costs at 6 months using log-linear regression. Propensity scoring was used to account for channelling by indication. **RESULTS:** A total of 13,227 patients started escitalopram; 3,624 patients started citalopram. Persistence at 6 months was 20.4% with escitalopram vs. 16.2% with citalopram ($p < 0.001$). Escitalopram-treated patients were more likely to be persistent over 6-months than citalopram-treated patients adjusted for their baseline characteristics (HR = 0.896; 95%CI = [0.859–0.934]). More were observed on citalopram than on escitalopram (7.8 vs. 6.2; $p < 0.001$). Total health care costs over 6-months (including treatment cost) were non-significantly lower for escitalopram-treated patients than for citalopram-treated patients (-USD232 per patient; $p = 0.2$). Persisters at 6 months incurred less total health care costs than non-persisters (-USD280 over the 6 months). **CONCLUSION:** Persistence at 6 months is higher on escitalopram than on citalopram, in consistency with its better

efficacy profile. Persistence at 6 months is recommended to maximise chances of sustained remission and to avoid relapse; interestingly these results show that persistence is also associated with decreased health care costs. Efforts should be made to promote persistence on antidepressant treatment.

PMH49

EARLY DISCONTINUATION ON TREATMENT AND ITS CONSEQUENCES IN PATIENTS TREATED WITH VENLAFAXINE OR ESCITALOPRAM

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OBJECTIVE: Two-month head-to-head clinical trials of escitalopram and venlafaxine demonstrated similar efficacy and better tolerability for escitalopram. As routine practice may differ from controlled trial, policy makers wonder how clinical trial findings translate into real life outcomes in community practice. This work compares early treatment discontinuation (ETD) rates at 1 and 2 months and its economic consequences at 6 months, for patients with depression treated with venlafaxine and escitalopram. **METHODS:** Using US denominator-based claims database PharMetrics (includes data from 86 managed care health plans covering 45 million patients), we included adult patients diagnosed with depression who started venlafaxine or escitalopram between January 1, and December 31, 2004. We compared ETD at 1 and 2 months using Cox proportional hazard models and health care costs at 6 months, using log-linear regression. Propensity scoring was used to account for channelling by indication. **RESULTS:** A total of 13,227 patients started escitalopram; 5,922 patients started venlafaxine. ETD at 2 months was 47% for venlafaxine, 45% for escitalopram. At 1 month, venlafaxine patients had a 50% greater risk of ETD than escitalopram patients (Hazard Ratio = 0.493 [95%CI 0.432–0.564]); this difference decreased at 2 months (Hazard Ratio = 0.955 [95%CI 0.912–0.999]). Six-month health care costs were higher with venlafaxine (+USD626, $p < 0,01$). Patients continuing treatment at 2 months had 36% chance of still being on treatment at 6 months. Patients (all treatments) with ETD at 2 months incurred more costs over 6 months (+USD350) compared to patients continuing treatments. **CONCLUSION:** Early treatment discontinuation rate was higher with venlafaxine than escitalopram, possibly due to intolerance to venlafaxine. Absence of ETD was associated with long term persistence and lower total treatment costs.

PMH50

MEDICATION ADHERENCE, ETHNICITY, AND THE INFLUENCE OF MULTIPLE PSYCHOSOCIAL AND FINANCIAL BARRIERS IN VETERANS WITH BIPOLAR DISORDER

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OBJECTIVE: Patients with bipolar disorder are often poorly medication adherent, resulting in deteriorating symptomology, higher admission rates, and diminished quality of life. Many factors are strongly associated with adherence, including financial burdens and multiple psychosocial barriers. However, analyses typically consider these barriers independently rather than conjointly from the patient's perspective. Such approaches neglect the complex interplay of risk factors, many of which are amenable to health policy or clinical interventions. This study evaluates the differential and cumulative impact of nine barriers upon medication adherence. **METHODS:** We recruited 435 patients from the Continuous Improvement for Veterans in Care—Mood Disorders study (FY04–06). Surveys collected information on multiple adherence barriers: medication copayments, foregoing treatment due to cost, binge drinking, access difficulty, social support problems, poor therapeutic alliance, and low medication insight. Multivariable logistic regression modeled adherence as a function of perceived adherence barriers, controlling for demographics, homelessness, and affective symptomology. **RESULTS:** Nearly half of the respondents reported adherence difficulty. Patients experienced an average of 2.8 barriers, with 41% perceiving at least 3. Minority veterans reported poorer adherence than white patients (56% versus 40%, $p = .01$), while claiming more overall barriers, particularly financial burden, binge drinking, and difficulty obtaining psychiatric care when needed. Multivariable models indicated the total number of barriers was significantly associated with poor adherence (OR = 1.24 per barrier). The most significant were low medication insight, binge drinking, and problems accessing care (ORs of 2.41, 1.95 and 1.73, respectively). **CONCLUSION:** Veterans with bipolar disorder experience multiple barriers to medication adherence, a scenario possibly exacerbated by recent copayment increases. Certain psychosocial and financial obstacles proved especially pernicious in connection to worse adherence. Recognizing multiple barriers can assist developing tailored clinical interventions to improve poor adherence by reducing psychosocial risk factors. The interaction with health benefit polices potentially contributes to burdens faced by patients already experiencing adherence problems.

PMH51

A NEW MEASURE OF ADHERENCE—THE DAILY POSSESSION RATIO (DPR): COMPARISONS WITH THE MEDICATION POSSESSION RATIO (MPR) IN THE PRESENCE OF MEDICATION SWITCHING AND THERAPEUTIC DUPLICATION

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OBJECTIVE: The objectives of this study are to describe and define a new adherence measure, the Daily Possession Ratio (DPR), and to contrast that measure with two variants of the Medication Possession Ratio (MPR, truncated MPR). **METHODS:** This study was a retrospective analysis of the North Carolina Medicaid administrative claims data from July 1999 to June 2000. Data for non-HMO, non-hospitalized, non-pregnant schizophrenia patients (ICD-9-CM = 295.**) with at least one antipsychotic were aggregated to the person-quarter level. The daily possession ratio was defined as the number of days one or more antipsychotics was available divided by the total days in the quarter. Adherence rates were also estimated for subjects that switched medications or had therapeutic duplication in the quarter. **RESULTS:** The final sample consisted of 25,200 person-quarters from 7,069 individuals. For person quarters with single antipsychotic use, adherence to antipsychotics as a class was: DPR = 0.607; truncated MPR = 0.640; MPR = 0.695 ($p < 0.0001$). For person quarters with therapeutic duplication, the following adherence measures were observed: DPR = 0.669; truncated MPR = 0.774; MPR = 1.238 ($p < 0.0001$). **CONCLUSION:** The DPR provides a more conservative estimate of adherence than the MPR across all type of users, however the differences between the two methods are more substantial for persons switching therapy and prescribed therapeutic duplica-

tion, where MPR may overstate true adherence. DPR should be considered when a measure of adherence to a class of medications is sought, particularly in clinical situations where multiple medications within a class are often used concurrently.

PMH52

COSTS OF NON-COMPLIANCE WITH ANTIPSYCHOTIC MEDICATIONS AMONG PATIENTS WITH SCHIZOPHRENIA

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OBJECTIVE: The proportion of patients with schizophrenia considered as being non-compliant with antipsychotic medications ranges from 20% to 89%. Non-compliance has been associated with increase relapse rates, more frequent and longer hospitalizations. Costs of schizophrenia in the U.S. vary from $32 to $65 billion, but contradictory results have been reported for the costs of non-compliance among these patients. The objective was to estimate the costs of non-compliance with antipsychotic medications among patients with schizophrenia. **METHODS:** A literature review of studies published in the last decade was conducted. We utilized PubMed, Cochrane, EMBASE and CINADHL databases. The key terms included: (first: adherence, non-adherence, compliance, non-compliance), AND (second: schizophrenia, antipsychotics, atypical and typical antipsychotics, neuroleptics) AND (third: resource utilization, resource use, costs, economics, hospitalizations). Studies with data on costs of non-compliance or compliance were included. Two independent researchers reviewed the titles and abstracts and any differences were agreed by consensus. Costs were transformed in 2007 US dollars using the medical care price index. **RESULTS:** Of 43 studies, six fulfilled the inclusion criteria, including five retrospective cohort studies that used Medicaid paid claims, and a cross-sectional study that used the UK Psychiatric Morbidity Survey. Most studies had <3 years of follow-up. A total of 52,512 participants were studied. The percentage of non-compliant patients ranged from 11% to 31%. A study found that users of atypical antipsychotics (72%) have higher compliance than users of typical antipsychotics (56%). Non-compliant patients spent, on average, ten more days in the hospital, and have 22% more rehospitalizations than compliant patients. Costs of care for non-compliant patients were on average $3,104 higher than for compliant patients. **CONCLUSION:** Patients non-compliant with antipsychotics had more and longer hospitalizations, and higher total costs than compliant patients. Non-compliance with antipsychotics has significant clinical and economic implications for patients with schizophrenia.

PMH53

IMPACT OF ALTERNATIVE TREATMENTS ON DURATION OF DRUG THERAPY BY PATIENTS WITH BIPOLAR DISORDER

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OBJECTIVE: To compare time to all-cause discontinuation (TTAD) across alternative antipsychotics in the treatment of bipolar disorder (BD). **METHODS:** Data from a commercial health plan from July 1, 2003 to June 30, 2006 were used to identify non-institutionalized patients with bipolar disorder (ICD-9 296.4–296.8) but no history of schizophrenia (ICD-9 295.xx). Patients initiating treatment using a typical antipsychotic (TAP), atypical antipsychotic (AAP: aripiprazole, olanzapine, quetiapine, risperidone or ziprasidone), mood stabilizer or antidepressant were included. Episodes were divided into three categories: restarting treatment after a break in drug therapy >15 days with the drug used in the previous episode, switching therapy with or without a break in treatment, and augmentation therapy. First observed episodes were excluded from the analysis due to uncertainty concerning the patient's prior treatment history. A total of 106,447 episodes were included in the analyses using ordinary least squares (OLS) regression models of TTAD adjusting for age, gender, geographic region, drug use history, prior medical care use, bipolar disorder diagnosis and co-morbid medical conditions. **RESULTS:** Augmentation constituted over half of all treatment episodes (55.3%) and only 20% of all episodes included an antipsychotic. Patients initiating augmentation episodes achieved significantly longer TTAD initial therapy than patients initiating restart (+80 days, $p < 0.0001$) or switching episodes (+13 days, $p < 0.0001$). Moreover, these estimated differences increased significantly when TTAD was measured over all BD-related therapies (+155 days and +284 respectively). OLS results comparing initial therapies favored quetiapine, ziprasidone and aripiprazole relative to TAP in restart (+15 to +36 days), switching (+18 to +25 days) and augmentation episodes (+28 to +48 days)($p < 0.05$ for 7 of 9 estimates). **CONCLUSION:** In a commercially-insured population, patients with bipolar disorders initiating therapy using ziprasidone, aripiprazole or quetiapine have longer TTAD that TAP patients. Patients initiating augmentation therapy have much longer TTAD than other patients, especially when measured across all psychotropic medications.

PMH54

IMPACT OF ALTERNATIVE TREATMENTS ON DURATION OF DRUG THERAPY BY PATIENTS WITH SCHIZOPHRENIA

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OBJECTIVE: To compare time to all-cause discontinuation (TTAD) across alternative antipsychotics in the treatment of schizophrenia. **METHODS:** Data from a commercial health plan from July 1, 2003 to June 30, 2006 were used to identify non-institutionalized patients with schizophrenia (ICD-9 codes 295.xx) who initiated treatment using a typical antipsychotic (TAP), atypical antipsychotic (AAP: aripiprazole, olanzapine, quetiapine, risperidone or ziprasidone), mood stabilizer or antidepressant. Episodes were divided into three categories: restarting treatment after a break in drug therapy >15 days with the drug used in the previous episode, switching therapy with or without a break in treatment, and augmentation therapy. First observed episodes were excluded from the analysis due to uncertainty concerning the patient's prior treatment history. A total of 21,872 episodes were included in the analyses using ordinary least squares (OLS) regression models of TTAD adjusting for age, gender, geographic region, drug use history, prior medical care use, schizophrenia diagnosis and co-morbid medical conditions. **RESULTS:** Only 39.3% of all episodes involved an antipsychotic. Antipsychotics were used predominately as augmentation therapy (55%) with the remaining episodes of antipsychotic drug therapy evenly divided between restart (23%) and switching

(22%) episodes. Unadjusted mean TTAD in days on initial therapy measured across all episode types was 172 for TAP and risperidone; 177 for olanzapine; 180 for antidepressants; 196 for mood stabilizers; 202 for quetiapine; 206 for aripiprazole; and 213 for ziprasidone. We estimated that TTAD on initial therapy was shorter for AAP patients restarting therapy relative to TAP patients (range +2 to –33 days), but generally longer for AAP patients switching therapies (range –14 to +27 days). Three AAPs displayed significantly longer TTAD in augmentation: +23 days for quetiapine ($p < 0.05$); +43 days for aripiprazole ($p < 0.0001$) and +56 days for ziprasidone ($p < 0.0001$). **CONCLUSION:** In a commercially-insured population, AAPs are associated with longer TTAD than TAPs in augmentation therapy.

PMH55

MEDICATION COMPLIANCE IN THOSE WITH SCHIZOPHRENIA RECEIVING PSYCHIATRIC SERVICES FROM A VETERANS HOSPITAL IN TAIWAN

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OBJECTIVE: Medication complication is one of the important determinants in schizophrenia treatment outcomes, as it has been found that approximately two thirds of those with schizophrenia are readmitted to hospitals due to partial or non- compliance. This study aimed to investigate medication compliance in those with schizophrenia, and examine factors associated with their compliance. **METHODS:** Subjects who had ever received any outpatient antipsychotic therapy (amisulpride, risperidone, olanzapine, quetiapine, ziprasidone, haloperidol, or sulpiride) from the Yuli Veterans Hospital, Taiwan, during August and November 2006 were identified from medical chart review. The selected subjects were surveyed on information such as their medication compliance, sociodemographics, treatment-related side effects, perceived social support, and perceived treatment-related benefits. Their physicians were surveyed for their medication compliance, and clinical characteristics such as CGI and comorbidities. Chi-square test and logistic regression model were adopted to evaluate associations of characteristics with the medication compliance. **RESULTS:** Of the 81 subjects surveyed, 41 (51%) had 100% self-reported medication compliance confirmed by their physicians. The average age was 41, and 64% of the sample was male. Age, education level, and work were significantly associated with different medication compliance. The regression result showed that more than nine years of education and work were significantly associated with an increased likelihood of 100% medication compliance. **CONCLUSION:** According to our preliminary findings, higher education level and work were associated with 100% medication compliance. This study selected those who had ever received certain first-generation and second-generation antipsychotics. However, second-generation antipsychotics were not found to be associated with 100% medication compliance.

PMH56

THE IMPACT OF DULOXETINE, VENLAFAXINE AND ESCITALOPRAM USE AND PRESCRIPTION COPAYS ON MEDICATION PERSISTENCE, HEDIS MEASURES AND EXPENDITURES

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OBJECTIVE: To examine the impact of duloxetine, venlafaxine and escitalopram use and associated copays on medication persistence, HEDIS standards for depression, medical utilization and health care costs. **METHODS:** Medical and pharmacy claims data were used to develop a sample of adult users with: a) minimum two claims for duloxetine, escitalopram or venlafaxine XR; b) maximum 120 days between the index (initial)and last claim for a target drug; and c) minimum of 6 months enrollment following the index claim. Propensity analysis was used to match individuals in each drug group based on age, gender, risk adjuster, and disease severity. Multiple regression was used to examine the impact of anti-depressant use and prescription copays on the change in days supply (persistence), likelihood of meeting HEDIS standards, total pharmacy and medical expenditures, and medical utilization. **RESULTS:** Over a 6-month period, a $10 increase in prescription copay resulted in a one day decrease in persistence for duloxetine users and a half day increase in persistence for venlafaxine users compared to escitalopram users. Increase in prescription copay was associated with greater likelihood of meeting HEDIS standards for all drug therapy groups. Venlafaxine users were 1.06 times more likely to meet HEDIS standards than escitalopram users. A $10 increase in prescription copay increased pharmacy costs by $12 per member for duloxetine users and $15 per member for venlafaxine users compared to escitalopram users. A $10 increase in prescription copay decreased total health care costs by $4.30 per member. Increased prescription copay resulted in non-significant reductions in the utilization of inpatient admissions, ER and outpatient visits. **CONCLUSION:** Higher prescription copays reduced persistence and pharmacy expenditures for antidepressant users. Smaller decreases in health care expenditures were also seen. Health plan decision makers should consider the impact of prescription copays on patient behavior and all components of health care expenditures.

PMH57

MEDICATION PERSISTENCE AND ASSOCIATED HEALTH CARE COSTS IN AN OLDER POPULATION WITH DEMENTIA: A LONGITUDINAL COHORT STUDY

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OBJECTIVE: We examined the relationship between self-reported health status data, subsequent cholinesterase inhibitor medication adherence and health care service use in older adults with dementia in a managed care setting. **METHODS:** This was a longitudinal cohort study of older adults in the southeastern USA with dementia who completed a health status assessment, used cholinesterase medications and were enrolled in an HMO continuously for one year after start of cholinesterase medications for dementia. Demographic, clinical and use related economic variables were also retrieved from the administrative claims data of patient HMOs. Prescription refills were used to measure medication persistence using a proportional hazards model. Associations were examined with a sequential, mixed model regression approach. **RESULTS:** A total of 116 patients were included. The overall persistence rate in this population was 58.7% and 81% of the study population had a persistence rate of 80% or higher. After controlling for other confounding variables, persistence (of 80% and higher) to cholinesterase therapy remained the strongest predictor of decreased total annual health care costs ($p < 0.05$). Other factors independently associated with increased costs included increased comorbidity severity, poor general health status, and increased number of prescription medications (all $p < 0.05$). **CONCLUSION:** We found strong associations between decreased cholinesterase medication persis-

tence and increased health care costs in older adults with dementia in a managed care setting. Health status assessments completed at enrollment had the potential to identify enrollees at higher risk for nonadherent behaviors and poor health related outcomes.

PMH58

IMPROVEMENT IN PERSONAL AND SOCIAL FUNCTIONING IN SCHIZOPHRENIA PATIENTS TREATED WITH RISPERIDONE LONG ACTING INJECTION): 6-MONTH RESULTS FROM E-STAR

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OBJECTIVE: To evaluate the effectiveness of risperidone long-acting injection (RLAI) treatment on personal and social functioning in patients with schizophrenia enrolled in the electronic-Schizophrenia Treatment Adherence Registry (e-STAR) from six countries (Canada, Czech Republic, Denmark, Netherlands, Slovakia, Sweden) that collected Personal and Social Performance (PSP) data. **METHODS:** e-STAR is an international, long-term, prospective, observational study of patients with schizophrenia who commence RLAI. Data are collected retrospectively for one year and prospectively every three months for two years. Personal and social functioning is measured using the PSP scale which evaluates four areas, socially useful activities, personal and social relationships, self-care, and disturbing and aggressive behaviour. Pooled results presented are based on data from patients who have completed their six-month follow-up visit. **RESULTS:** To date, 1831 are enrolled in e-STAR from the six countries, 1232 patients who have been followed for at least 6 months are included in this analysis. Mean age was 38.4 ± 12.5 years, 58.6% were male and mean time since diagnosis was 9.6 ± 11.6 years. At 6 months, 95.5% of patients are still on RLAI. The mean PSP score significantly improved from 48.0 ± 17.3 at baseline to 64.2 ± 15.2 at 6 months ($p < 0.001$). Improvement in PSP was similar for patients hospitalized at baseline versus those who were ambulatory patients (PSP score increased by 17.2 and 16.1, respectively, $p < 0.001$ for both). Furthermore, significant improvement in PSP was seen as soon as the first assessment after RLAI treatment at three months. **CONCLUSION:** These 6-month interim results indicate that personal and social functioning as measured by the PSP improved with risperidone long-acting injection treatment in patients with schizophrenia.

PMH59

HEALTH RELATED QUALITY OF LIFE IN PATIENTS TREATED WITH ANTIPSYCHOTIC DRUGS: RESULTS AT BASELINE FROM THE COMETA STUDY

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OBJECTIVE: To measure adherence and persistence in patients undergoing antipsychotic treatment and their impact on costs and health-related quality-of-life (HRQoL). **METHODS:** A naturalistic, prospective, multicentre cohort study, named COMETA, was begun in subjects aged 18–40 years, diagnosed with schizophrenia or schizophreniform disorder 10 years before the enrolment. Subjects were enrolled and observed for up to 52 weeks in psychiatric centres throughout Italy. Socio-demographic, clinical, HRQoL and data on resource use were collected. **RESULTS:** Six-hundred-sixty-one patients (mean age 31.1 + 5.6, 65.4% male) with schizophrenia (86.5%) or schizophreniform disorder (13.5%) were enrolled in 86 centres during 2006–2007. Most patients had primary/lower secondary level education (51.9%), and were single (85.9%). A total of 56.6% of the subjects received help for their disease from relatives/friends, 37.3% of patients were employed, 10.3% were students. The PANSS (Positive and Negative Syndrome Scale) mean + SD score was 86.1 + 27.4. The CGI-S (Clinical Global Impression Severity) mean + SD score was 4.27 + 1.1, the GAF (Global Assessment of Functioning) mean + SD score was 54.3 + 13.8. Ninety days prior, patients were treated with olanzapine (32.5%), risperidone (31.5%), haloperidol (18.3%), aripiprazole (14.4%), quetiapine (12.4%) and clozapine (11.2%). Thirty percent of the patients took >2 different drugs (up to 5) in that period. Regarding HRQoL, 68.7% of patients reported problems on the anxiety/depression-domain of the EQ-5D, 52.3% on usual activities, 37.7% on pain/discomfort, 21.4% on mobility and 16.8% on self-care. The EQ-5D Visual Analogue Scale score was 63.6 + 17.8 (mean + SD). The SF-36 Physical-Summary-Score was 47.3 ± 9.4 and the Mental Summary Score was 39.0 ± 9.6. **CONCLUSION:** Improvement of patients' well-being is an important objective of antipsychotic treatment. Baseline characteristics of this schizophrenic cohort show that there is ample space for improvement. Future analyses will focus on the relationship between adherence with therapy, symptomatology, costs, and quality of life.

PMH60

HEALTH STATUS AND WORK-RELATED OUTCOMES OF PATIENTS WITH ANXIETY DISORDERS AND DEPRESSION

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OBJECTIVE: To determine the association between various levels of comorbid anxiety and depression with health-related quality of life and work-performance. **METHODS:** Patients from an anxiety disorders program clinic completed the SF-36, Work Limitations Questionnaire, Work Productivity and Activity Impairment Questionnaire, Endicott Work Productivity Scale, and Work Performance Scale. The Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) were used to determine the severity of anxiety and depression, respectively. Patients were categorized as lowBAI/lowBDI, highBAI/lowBDI, highBAI/lowBDI, and highBAI/highBDI. The influence of severity of anxiety/depression on the eight SF-36 scales, the SF-36 PCS and MCS, and each work-performance instrument scale score was determined using ANOVA with Scheffe post-hoc analyses. Multivariate linear regression assessed the combined association of BAI and BDI on SF-36 and work-performance scales, controlling for patient demographics. P values of <0.05 were statistically significant. **RESULTS:** Ninety-one patients provided complete SF-36, BAI and BDI. Of these, 61 were employed. There were no differences in demographics between groups. Post-hoc analysis indicated that lowBAI/lowBDI patients had significantly higher MCS (41.2 + 10.9) compared to highBAI/lowBDI (MCS = 29.9 + 8.3), lowBAI/highBDI (MCS = 23.7 + 15.8), and highBAI/highBDI (MCS = 17.4 + 9.9). The difference between highBAI/lowBDI and lowBAI/highBDI were not signifi-

cant. HighBAI/highBDI was significantly different than the other groups ($p < 0.01$). This pattern was similar for social function, role emotion, mental health. Physical-related SF-36 domains were generally not different between groups. The difference in work-performance scale scores followed the same general pattern of less impairment with lowBAI/lowBDI (for example, WPAI-Percent Impairment While Working scale $0.22 + 0.3$) and highBAI/highBDI (WPAI Percent Impairment While Working $0.77 + 0.2$), $p < 0.01$. Other work scales followed a similar pattern. BDI routinely was more significant in regression models compared to BAI. **CONCLUSION:** Comorbid anxiety and depression greatly impair patients. Clinicians and researchers should measure the presence and severity of both mental illnesses when assessing their influence on health-related quality of life and work-performance.

PMH61

PATIENT PREFERENCES IN THE THERAPY OF ADHD—A DISCRETE CHOICE EXPERIMENT

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OBJECTIVE: While the clinical efficacy of drugs for ADHD is widely studied in clinical trials (usually randomised controlled trials, RCTs), patient preferences with regard to their treatments are not well understood and therefore considered to a less extent. Aim of this study therefore was to explore the patients' perceptions of an "ideal treatment" for ADHD. **METHODS:** Examination of the state of the art as reported in the literature was followed by a qualitative study with four focus groups consisting of 6–8 parents of ADHD-patients each. In a subsequent quantitative study phase, data was collected in an online or paper-pencil self-fill-in questionnaire for parents of patients and patient (age >14 years) themselves. It included sociodemographic data, treatment history and actual treatment and patients' preferences of therapy characteristics using direct measurement (23 items on a 5-point Likert-scale) as well as a discrete-choice-experiment (DCE, 8 pairs with 6 characteristics). **RESULTS:** N = 213 questionnaires were filled; most of them by the parents of patients (79% by the mothers, 9% by the fathers). Most of the patients were male (83%) and most of them (83%) had actual medical treatment of ADHD. Direct measurement showed "good emotional quality of live", "no addiction on medication", "improvement of concentration capability," and "few side effects" in the first places. In the DCE, alternatives with "better social quality of life (friendships etc. possible)", "better emotional quality of life (disease not all of the time mentally present)", and "longer duration of medication effect" were more likely to be chosen, giving thus similar results. **CONCLUSION:** This unique study demonstrates that it is possible to obtain valid and robust information from patients on what constitutes relevant patient outcomes. Such information should play a critical role in appraisal of treatment alternatives by HTA bodies.

PMH62

ASSESSING THE VALIDITY OF DERIVING CLINICAL DEMENTIA RATING (CDR) GLOBAL SCORES FROM INDEPENDENTLY OBTAINED FUNCTIONAL RATING SCALE (FRS) SCORES IN VASCULAR DEMENTIA AND MIXED VASCULAR DEMENTIA PATIENTS

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OBJECTIVE: The functional rating scale (FRS) and clinical dementia rating (CDR) scale are two different tests used to assess the severity and progression of dementia. Although the FRS covers more domains and requires less time to administer than the CDR, the CDR categorizes severity of dementia while the FRS does not. The purpose of this research was to calculate the agreement between the FRS and CDR scales and to determine if they could be used interchangeably for diagnosis of disease severity in vascular dementia (VaD). **METHODS:** Inpatients and outpatients diagnosed with VaD/mixed VaD were evaluated using the FRS and CDR scales. The tests were administered independently by two separate raters. Since the FRS contains all of the domains that are rated in the CDR, CDR scores were extracted from the corresponding FRS domains and used to derive global scores of severity. FRS-derived global scores were then compared to original CDR global scores by a weighted kappa analysis to measure concordance. **RESULTS:** A total of 28 VaD/mixed VaD patients were involved in the study. In the patient population, 60.7% were males and average age was 78.6 ± 7.7 years. Average MMSE score was 19.9 ± 4.8 while mean Hachinski score was 8.1 ± 2.8. The modal value obtained for both the FRS-derived CDR scores and original CDR scores was 2; in both groups scores ranged from 0.5–3 with 43% of patients diagnosed in category 2 (moderate dementia). The weighted kappa analysis showed substantial concordance (kappa = 0.75) between FRS-derived CDR and original CDR-global scores. **CONCLUSION:** These results suggest that FRS scores can be used to derive global scores that are in agreement with those produced by the validated CDR method. This serves as a powerful tool since it allows for easy comparison of the diagnostic distribution, natural history and treatment outcomes of individuals with dementia.

PMH63

PATIENT REPORTED MEASURES AS QUALITY ASSURANCE TOOLS IN CNS CLINICAL TRIALS

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OBJECTIVE: Signal detection and, ultimately, regulatory approval depend on high-quality, valid and reliable data. The subjective rating scales utilized in CNS clinical trials may be vulnerable to spurious ratings and intentional or unintentional manipulation of ratings by investigators at screening or baseline visits. The objective of this study was to evaluate the feasibility of utilizing a patient reported outcome as a quality assurance measure for evaluation of the quality of a clinician rated primary efficacy measure in a CNS clinical trial. **METHODS:** A proprietary ratings surveillance system was utilized in a multi-center, double blind, randomized, placebo-controlled clinical trial in which the Hamilton Anxiety Rating Scale (HARS) was the primary efficacy measure. The patient rated Beck Anxiety Inventory (BAI) was added to the baseline visit for quality assurance purposes. Based on published guidelines of the expected relationship between HARS and BAI scores, a computer program flagged aberrant ratings and three flags with the same rater triggered a teaching intervention. The ratings surveillance system was intended both to detect aberrant rating patterns and to deter intentional inflation of ratings in order to qualify subjects. **RESULTS:** The clinical trial is ongoing. 91 pairs of HARS and BAI ratings have been examined from the randomization visit. 61/91 (67%) pairs were flagged for discordance, in most cases (79%) due to disproportionately high HARS scores compared to the BAI. In 8 cases, the BAI was under 10 with the HARS 22 or greater. In 11 cases, there were at least 3 flags for the same rater and the pattern of discordance was considered to be of sufficient clinical significance to warrant a teaching intervention. **CONCLUSION:** Use of

patient reported outcomes as a measure of quality of clinician reported outcomes appears to be a feasible tactic in a site-based ratings surveillance quality assurance system.

PMH64

MAJOR DEPRESSIVE DISORDER: A COMPREHENSIVE LITERATURE REVIEW OF THE BURDEN OF ILLNESS IN NORTH AMERICA

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OBJECTIVE: Major depressive disorder (MDD) is a leading cause of disability worldwide. This study analyzed the literature describing the burden of MDD in North America (USA and Canada), with particular focus on patients with treatment-resistant depression (TRD). **METHODS:** Systematic searches were conducted of English-language papers published between 1987 and 2007, utilizing MEDLINE, EMBASE, and the Cochrane Library, relevant websites, and hand searches. Major areas for review were the humanistic and economic burden of MDD. Additional areas for analysis included treatment options and costs, treatment efficacy and response rates, treatment guidelines, and reimbursements. **RESULTS:** A total of 908 articles were identified, of which 107 studies from North America fulfilled the inclusion criteria (humanistic burden, N = 45; economic burden, N = 49; and treatment guidelines, N = 13). Analysis of these studies identified an increased humanistic and economic burden in patients with MDD and TRD in North America. MDD was associated with a high prevalence (3–31%), was chronic in nature, and had a high frequency of comorbid mental disorders. Health-related quality of life (HRQL) instruments identified a significant negative impact from MDD, including domains of mental well-being (independence, alertness, role emotional, personal/spiritual beliefs) and perceived physical functioning (energy and fatigue, bodily care). In a study that compared HRQL in responders and non-responders to therapy, HRQL was significantly lower in non-responders ($P < 0.001$). Patients with TRD were particularly severely affected, through higher medical costs and greater losses in work productivity. **CONCLUSION:** Patients with MDD and their families suffer greater humanistic and economic burden than healthy individuals. Treatment reduces the burden of MDD, although current evidence-based guidelines for MDD offer limited recommendations on the choice of pharmacological treatments based on their potential to reduce burden of illness and resource use.

MENTAL HEALTH—Health Care Use & Policy Studies

PMH65

EFFECT OF PRIOR AUTHORIZATION ON ANTIPSYCHOTIC DRUG USE IN LONG-TERM CARE: POPULATION-BASED NATURAL EXPERIMENT

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OBJECTIVE: Though antipsychotics were originally developed to treat schizophrenia, their use in older adults with dementia has grown substantially. Given concern about the safety of these drugs, we assessed the impact of a prior authorization (PA) policy upon use and choice of antipsychotic medication in long-term care. **METHODS:** We conducted a retrospective cohort study using administrative data from two Canadian provinces—one in which access to newer antipsychotics (risperidone, olanzapine, and quetiapine) was unrestricted (Ontario), and another in which access required PA (British Columbia (BC)). Subjects were all 37,057 Ontario and 13,569 BC residents aged 66 years or older who were newly admitted to a nursing home between April 1, 1998 and March 31, 2002, who had no history of schizophrenia or psychosis in the 5 years preceding admission, and who had no evidence of antipsychotic drug use in the preceding year. We assessed crude and adjusted exposure to antipsychotic medication over the year following nursing home admission, as well as the types of medications used. **RESULTS:** Nineteen percent of Ontario residents were newly dispensed an antipsychotic within 100 days of nursing home admission vs. 16% in BC. Male sex, younger age, fewer comorbidities, and history of dementia all were strongly associated with receipt of an antipsychotic. Adjustment for these factors reduced the cross-provincial difference in drug use. However, fewer BC residents received newer antipsychotics, particularly after risperidone received an approved indication for the management of behavioural symptoms of dementia. Olanzapine, which required PA throughout the study, was dispensed to 11% and 3% of Ontario and BC residents, respectively. **CONCLUSION:** Although BC's PA policy had negligible impact upon the incidence of antipsychotic drug use as a whole, it appeared to influence drug choice. Questions remain about the impact of such policies upon health outcomes and costs.

PMH66

ETHNICITY AND THE IMPACT OF HIGHER MEDICATION COPAYMENTS AMONG VETERANS WITH SCHIZOPHRENIA

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OBJECTIVE: The 2002 Veterans Health Care Act raised medication copayments from $2 to $7 for lower priority patients. Veterans with schizophrenia constitute a multiply disadvantaged population; 40% are antipsychotic non-adherent, substantially increasing psychiatric admission risks. Certain patient subgroups might be particularly sensitive to medication costs with significant clinical ramifications. Diverse cultural expressions of health beliefs and priorities contribute additional layers of complexity. This study examines potential inequities stemming from higher copayments. **METHODS:** All veterans with schizophrenia were followed 33 months Pre and Post copayment increase. Longitudinal models analyzed effects of higher medication costs in copayment veterans versus a natural control group of exempt patients, controlling for demographics, substance abuse, functional status, and other comorbidities. Adjusted means compared prescription patterns and inpatient utilization among four ethnic groups: white (N = 36,452), African-American (N = 17,602), Hispanic (N = 5,225), and Other (N = 10,707). **RESULTS:** African-Americans were relatively younger with higher substance abuse rates. Hispanic veterans were more likely to be unmarried and have multiple illnesses, though fewer (39%) faced copayments than other patients. Minorities filled 10–35% fewer prescriptions than white veterans, and ethnic differences were evident in pharmacy fills and inpatient days. White veterans reduced psychotropic fills 15% after the policy change, decreasing hospital days by nearly the same amount. However, minorities dropped psychotropics 19%–22% while subsequently

increasing inpatient utilization, the latter especially true for Hispanics. **CONCLUSION:** Although all veterans dramatically adjusted pharmacy use following the copayment change, ethnic minorities appeared particularly sensitive to drug costs. Similarly, while white veterans appeared to reduce psychotropic use with minimal consequences, minorities experienced substantially elevated admission risks associated with lower cost-related adherence. Benefit changes for veterans with chronic conditions should be implemented cautiously and carefully evaluated. Reconciling budgetary concerns with quality care provision requires sensitive attention to unique patient groups to ensure equity while minimizing economic and health disparities.

PMH67

CLINICAL CHARACTERISTICS AMONG ANTIDEPRESSANT INITIATORS

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OBJECTIVE: To compare clinical characteristics of patients initiating treatment on duloxetine vs. those initiating on venlafaxine XR, escitalopram, and fluoxetine over a two year period. **METHODS:** Retrospective claims analysis of Pharmetrics managed care health plan patients initiating on select antidepressants between September 1, 2004 and August 31, 2006. A total of 798,259 patients were assigned to cohorts based on their most recent antidepressant prescription. Cochran-Mantel-Haenszel test was used to test the proportional differences among the four cohorts. **RESULTS:** Overall, 72.1% of study patients were female with a mean age of 44.3 years. Demographic differences between cohorts were modest. Based on comparison of medical claims within +/–30 days of initiation on venlafaxine XR, escitalopram, and fluoxetine, respectively, duloxetine initiators were more likely to have visited a mental health specialist (24.2% vs. 18.2%, 18.6%, and 16.5%) and been diagnosed with depression (29.2% vs. 24.1%, 25.4%, 24.9%). Among the depressed, duloxetine patients were more frequently diagnosed with major depressive disorder (MDD) (52.8% vs. 44.3%, 40.5%, and 36.4%) and, among those diagnosed with MDD, were more frequently diagnosed with recurrent MDD (78.2% vs. 73.8%, 66.2%, and 64.1%). Duloxetine initiators were more frequently diagnosed with a pain condition (44.8% vs. 27.7%, 27.3%, and 24.9%) , particularly for back (15.5% vs. 7.5%, 7.0%, and 6.3%) or musculoskeletal pain (28.2% vs. 15.5%, 14.4%. and 13.1%), and were more likely to have been treated previously with a narcotic analgesic (24.2% vs. 11.1%, 9.8%, and 9.2%) ($p < 0.05$ for all reported differences). **CONCLUSION:** Duloxetine patients are more likely to present with more severe depression diagnoses and pain than patients on other antidepressants. Case mix adjustments should be made when comparing outcomes and costs associated with treatment with different antidepressants. These findings are broadly consistent with earlier analyses of data from the first four months following introduction of duloxetine in the U.S.

PMH68

CHANGES OVER TIME IN PATIENT CHARACTERISTICS FOLLOWING THE INTRODUCTION OF DULOXETINE: A 24 MONTHS STUDY

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OBJECTIVE: To assess month-by-month changes in clinical characteristics of patients initiating on duloxetine, a new antidepressant, during the first two years following its initial availability in the United States. **METHODS:** Retrospective claims analysis of Pharmetrics managed care health plan patients initiating on duloxetine between September 1, 2004 and August 31, 2006. A total of 102,567 duloxetine initiators were identified for inclusion in this study. Monthly data series for demographic and clinical characteristics were created on the basis of Cymbalta initiation date. Claims within +/–30 days of initiation were used to identify clinical characteristics. **RESULTS:** Demographic patterns of patients initiating on duloxetine remained stable over the two year period (average monthly percent female 73.0%; average monthly age 47.4 years), as did proportions of patients with any anxiety (20.7%) or a GAD diagnosis (5.6%). The average monthly % of patients treated by mental health specialists trended downward over the first 16 months of the study period (from 32.3% to 23.7%), while the % with a depression diagnosis trended downward (51.0% to 45.4%) for the first 12 months, before stabilizing thereafter. The % of patients with a pain diagnosis increased over the first three months (62.4% to 66.6%) and remained stable thereafter. Of those with a depression diagnosis, the % with an MDD diagnosis trended downward (55.8% to 45.8%) for 15 months before stabilizing, while the % of those with MDD diagnosed with Recurrent MDD remained stable over the entire study period (77.8%). **CONCLUSION:** Demographic characteristics of patients initiating on duloxetine in the two years following initial availability in the United States have remained relatively stable. Clinical characteristics have shown some variation, particularly over the first 12 to 16 months following initial availability. These trends in utilization have implications for the selection of appropriate methodologies for developing cohorts for comparing utilization and costs between new and established antidepressant medications.

WITHDRAWN **PMH69**

PMH70

AN INVESTIGATION OF EVIDENCE-BASED USE OF ATYPICAL ANTIPSYCHOTICS IN ARKANSAS MEDICAID PEDIATRIC

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OBJECTIVE: There has been a rapid increase in the use of atypical antipsychotics in pediatric populations over the past few years. Most of these drugs are unapproved in pediatric populations. Study objectives were: 1) To identify the trend of new users of atypical antipsychotics in the Arkansas Medicaid population under the age of 18 for years 2001 through 2005; 2) to classify the use of each atypical antipsychotic as evidence-based or not depending on the diagnoses for which it was prescribed; and 3) to determine which pediatric patients are more likely to receive an evidence-based atypical antipsychotic prescription. **METHODS:** Study was a retrospective database analysis of Arkansas Medicaid for the period from January 2000 to December 2006. Participants were the subjects under 18 years of age, with their first atypical antipsychotic prescription claim between 2001 and 2005, with no prior antipsychotic use and having a continuous two-year Medicaid enrollment. Main outcome measure was the proportion of study cohort with at least one evidence-based atypical antipsychotic prescription claim, which was defined as any use of atypical antipsychotic supported by a clinical study in the literature. **RESULTS:** The final study cohort was 11,700. The trend of new pediatric users of atypical antipsychotic therapy increased from 1482 to 3110 new atypical users from 2001 to 2005. After identifying 86 clinical studies from the literature and defining the evidence-based use for each atypical antipsychotic, it was found that 41.32% of the new pediatric users did not have

any evidence-based conditions. Risperidone had the lowest levels of non-evidence base use of (30.59%) and aripiprazole had the highest (77.13%). **CONCLUSION:** The rate of atypical antipsychotic use in pediatrics has doubled between 2001 and 2005 and a large proportion of the usage in the Arkansas Medicaid pediatric population is not based on strong clinical evidence.

PMH71

PREVALENCE OF CONCOMITANT USE OF ANTICHOLINERGIC MEDICATIONS AND CHOLINESTERASE INHIBITORS IN A MEDICAID NURSING HOME POPULATION

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OBJECTIVE: Anticholinergic medications (ACH) have clinical benefits but also impair cognitive function in older adults and may counteract benefits of cholinesterase inhibitors (CHI) in Alzheimer's and other dementias. Prevalence of ACH use and concomitant ACH and CHI use among Indiana Medicaid recipients in nursing homes with dementia was determined. **METHODS:** A retrospective cross-sectional analysis of Indiana Medicaid claims and enrollment files identified persons 65 y/o or older with dementia who took CHI anytime in 2004 and were Medicaid-eligible and in nursing homes continuously in 2004. Dementia was identified using 26 ICD-9 diagnosis codes determined in a prior study as specific for dementia. To exclude persons with just a trial of CHI, only persons receiving a second CHI prescription within 30 days of the end of the indicated days-supply of a prior CHI prescription were classified as CHI users. Only users of drugs identified in published reports as having clinically significant ACH adverse effects (Level 2) or markedly ACH adverse effects (Level 3) were classified as ACH users. Concomitant use was defined as overlap in periods covered by CHI and ACH supply. Days of concomitant use and ACH activity levels also were examined. **RESULTS:** The sample of 3251 individuals had a mean age of 83 years, was 75% female and, 89% white. Among these, 1,888, 58.07%, (95% CI = 56.38–59.77) received an ACH some time during the year and 1519, 46.72% (95% CI = 45.01–48.44) received an ACH concomitantly with CHI. Among concomitant users, mean number of days of concomitant use was 158.96 days (95% CI = 152.61–165.31) and a majority, 58.13% (95% CI = 55.65–60.61) received a Level 3 ACH concomitantly with CHI. **CONCLUSION:** Concomitant ACH and CHI use was high among nursing home residents with dementia. Assessing opportunities for alternatives might lead to strategies for tackling this therapeutic dilemma.

PMH72

OFF-LABEL USE OF SECOND-GENERATION ANTIPSYCHOTICS AMONG ADULT PATIENTS WITH BIPOLAR DISORDER IN A LARGE MANAGED CARE POPULATION

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OBJECTIVE: This study was designed to determine the degree to which second-generation antipsychotics were used off-label for patients with bipolar disorder (BPD) and to identify patient characteristics which were most associated with off-label second-generation antipsychotic use. **METHODS:** The multi-state (PHARMetrics) medical claims database was used to evaluate 105,771 adult patients with a diagnosis of bipolar disorder. The study period was between 1998–2002. The off-label use of a second-generation antipsychotic medication was defined as a patient either receiving olanzapine before March 2000 or any second-generation antipsychotic, other than olanzapine, during the entire study period. Olanzapine was differentiated from the others in its class because it was approved for use in BPD in 2000. Multivariate logistic regression analysis was used to assess the risk of receiving a drug off-label. **RESULTS:** Sixty-three percent of the patients were female, and the mean age was 40.3 years. Eleven percent of patients were on lithium, 25% received other anticonvulsants, 34% were treated with antidepressants, and 10.5% (7.1% off-label) took second-generation antipsychotics. A higher risk of off-label use was associated with psychiatry specialist prescribers (Odds Ratio = 1.52, 95% Confidence Interval 1.44–1.59) and certain comorbidities such as substance abuse (OR = 1.51, 1.38–1.66), anxiety disorder (OR = 1.20, 1.14–1.26), diabetes mellitus (OR = 1.26, 1.16–1.37), cerebral vascular disease (OR = 1.26, 1.10–1.45), and hypertension (OR = 1.12, 1.05–1.20). **CONCLUSION:** The off-label use of second-generation antipsychotics in treating BPD was fairly common from 1998–2002 and their use was associated with some key clinical factors. Our results add to a growing literature that relationship links the use of newer antipsychotics with diabetes, hypertension, obesity, and cerebral-vascular disease.

PMH73

INITIATION OF ATOMOXETINE VS. STIMULANTS FOR CHILDREN WITH ADHD IN MEDICAID SETTINGS

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OBJECTIVE: To identify factors associated with treatment initiation of atomoxetine (ATX), stimulants (STIM), or long-acting stimulants (LA-STIM) in children with ADHD using Medicaid. **METHODS:** Data were from the IMS Health LRx Database. Patients covered by Medicaid age <18 years old were selected if they initiated treatment with an ADHD medication categorized as ATX, any STIM, or LA-STIM between January 2005 and December 2005. Initiation was defined as the first use of a medication preceded by 120 days without a prescription in the same category. Stepwise logistic regression was used to identify the factors associated with initiations of ATX vs. STIM or ATX vs. LA-STIM adjusting for age (0–5 vs. 6–12, 13–17 vs. 6–12), gender, prior ADHD medications, other concomitant psychiatric medications, provider specialty, and a number of unique of previous ADHD medications used. **RESULTS:** A total of 24,141 patients (68.62% male) most recently initiated treatment with ATX, 144,451(68.84% male) with STIM, and 129,323 (68.82% male) with LA-STIM. Increasing age was associated with increased likelihood of ATX initiation ($p < .05$) relative to STIM. Other significant factors (all p-value < 0.001) were initiation concomitant with use of antidepressants (OR = 1.29), antimanics (OR = 1.34), antipsychotics (OR = 1.49), anxiolytics (OR = 1.69), or anticonvulsants (OR = 1.33). ATX initiation also became more likely with increasing number of historical ADHD treatment episodes. Pediatricians were more likely to prescribe STIM over ATX relative to general psychiatrists (OR = 0.76). Factors for initiation of ATX vs. LA-STIM were similar to those for the STIM comparisons. **CONCLUSION:** The factors associated with initiation of ATX vs. STIM or ATX vs. LA-STIM suggest that despite common indications, atomoxetine and stimulants may be addressing different needs. The findings suggest that ATX is preferentially prescribed for patients with psychiatric comorbidities or potentially complicated treatment profiles.

PMH74

IMPACT OF ALTERNATIVE TREATMENTS ON POST TREATMENT COSTS FOR PATIENTS WITH BIPOLAR DISORDER

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OBJECTIVE: To compare post-treatment costs across alternative antipsychotics in the treatment of bipolar disorder (BD). **METHODS:** Data from a commercial health plan from July 1, 2003 to June 30, 2006 were used to identify non-institutionalized patients with bipolar disorder (ICD-9 296.4-296.8) but no history of schizophrenia (ICD-9 295.xx). Patients initiating treatment using a typical antipsychotic (TAP), atypical antipsychotic (AAP: aripiprazole, olanzapine, quetiapine, risperidone or ziprasidone), mood stabilizer or antidepressant were included. Episodes were divided into three categories: restarting treatment after a break in drug therapy >15 days with the drug used in the previous episode, switching therapy with or without a break in treatment, and augmentation therapy. First observed episodes were excluded from the analysis due to uncertainty concerning the patient's prior treatment history. A total of 106,447 episodes were included in the analyses using ordinary least squares (OLS) regression models of post-treatment cost adjusting for age, gender, geographic region, drug use history, prior medical care use, bipolar disorder diagnosis and co-morbid medical conditions. **RESULTS:** Average total post-treatment cost measured across all episode types ranged from $17,837 (olanzapine) to $22,292 (ziprasidone). OLS results found augmentation episodes to be significantly more costly than restart episodes (+$6836, $p < 0.0001$) or switching episodes (+$4109, $p < 0.0001$). AAPs were found to be more costly relative to TAP in patients restarting therapy and these estimates were significant for quetiapine (+$3126, $p < 0.01$) and ziprasidone (+$4811, $p < 0.05$). Patients initiating augmentation episodes with an AAP were also consistently more costly relative to TAP, again significantly so for quetiapine (+$2534, $p < 0.05$) and ziprasidone (+$2846, $p < 0.05$). However, most AAPs achieved significantly lower total costs relative to TAP for switching episodes ranging from –$1817 for ziprasidone ($p > 0.05$) to –$7632 ($p < 0.0001$) for olanzapine. **CONCLUSION:** In a commercially-insured population, AAPs are only associated with lower total post-treatment costs in patients with bipolar disorder who switch therapies.

PMH75

IMPACT OF ALTERNATIVE TREATMENTS ON POST-TREATMENT COSTS FOR PATIENTS WITH SCHIZOPHRENIA

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OBJECTIVE: To compare one-year post treatment costs across alternative antipsychotics in the treatment of schizophrenia. **METHODS:** Data from a commercial health plan from July 1, 2003 to June 30, 2006 were used to identify non-institutionalized patients with schizophrenia (ICD-9 codes 295.xx) who initiated treatment a typical antipsychotic (TAP), atypical antipsychotic (AAP: aripiprazole, olanzapine, quetiapine, risperidone or ziprasidone), mood stabilizer or antidepressant. Episodes were divided into three categories: restarting treatment after a break in drug therapy >15 days with the drug used in the previous episode, switching therapy with or without a break in treatment, and augmentation therapy. First observed episodes were excluded from the analysis due to uncertainty concerning the patient's prior treatment history. A total of 21,876 episodes were included in the analyses using ordinary least squares (OLS) regression models of post-treatment costs adjusting for age, gender, geographic region, drug use history, prior medical care use, schizophrenia diagnosis and co-morbid medical conditions. **RESULTS:** Average total cost measured across all episodes ranged from $22,804 for TAPs to $32,357 for mood stabilizers. Augmentation episodes were estimated to be significantly more costly than switching episodes (+$4222, $p < 0.0001$) or restart episodes (+$6970, $p < 0.0001$). There is considerable variability in total cost across medications. However, in this commercially insured population, there is no significant difference in post-treatment costs between patients receiving individual AAPs and TAP. Patients with schizophrenia treated with mood stabilizers were significantly more costly than TAP patients for restart episodes (+$4951, $p < 0.05$) and augmentation episodes (+$2990, $p < 0.05$). **CONCLUSION:** In a commercially-insured population, there are no significant differences in total post-treatment costs for AAPs patients relative to TAPs patients. Treating patients with schizophrenia with a mood stabilizer may lead to significantly higher cost.

PMH76

COST ESTIMATION OF PSYCHIATRIC CARE IN THE JAPANESE HOSPITAL USING SYSTEM DYNAMICS SIMULATION

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OBJECTIVE: Long hospital-stay of psychiatric patients is recognized as a problem in Japan compared with the western countries. In order to address this issue, the Japanese government initiated a reform plan in 2004 to make the beds largely downsized in the next decade, and raised the official fees of hospitalization to make a shift from out-patient to in-patient care. The aim of our study is to estimate how such a shift can affect and project the total costs of psychiatric care in a hospital when the hospital complies with the government new plan. **METHODS:** A system dynamics model for computing simulation was developed to estimate the total medical costs per hospital over a three-year period, employing the data from the published literature such as The 2006 Comprehensive Survey Report of the Japanese Association of Psychiatric Hospitals, etc. The model consists of four compartments for one out-patient care unit and three types of in-patient units such as short-term, mid-term and long-term care. The flows of patients and the relevant costs were analyzed and figured out alongside the compartments in the model. Hypothetical scenarios were simulated, assuming different rates of in- and out-patients flows. **RESULTS:** The simulated estimation resulted in the highest cost, $27,933,166, of one scenario with maximizing both a discharge rate of long-hospitalized patients and an acquisition rate of new out-patients. On the contrary, the lowest cost, $22,789,521, was identified in another scenario with no acceleration for discharge of long-hospitalized patients and no acquisition of new out-patients. **CONCLUSION:** A system dynamics simulation suggested that the government new policy for psychiatric care does not lead to cost-saving in a hospital perspective, but could be cost-increasing against the government intention to control the increasing cost. The evaluation of incremental cost-effectiveness ratio is the next step for further assessment.

PMH77

ANTIPSYCHOTIC METABOLIC PROPENSITY AND POLYTHERAPY: INFLUENCE ON HOSPITALIZATION

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OBJECTIVE: We used a large, employer-sponsored, administrative claims database of enrollees using second generation antipsychotics (SGAs) to address two study objectives: 1) describe patterns of SGA utilization by metabolic profile (MP) and polytherapy, and 2) examine the influences of MP and SGA polytherapy on hospitalization. **METHODS:** Using descriptive and logistic regression analyses, we examined patterns of SGA polytherapy by MP, focusing on SGA use patterns and their association with hospitalization. MP status was categorized as low (aripiprazole, ziprasidone), moderate (risperidone, quetiapine), and high (olanzapine). Polytherapy of two or more SGAs was defined as long-term (i.e., augmentation for ≥90 days) and short-term (i.e., switching for <90 days). We controlled for sociodemographics, payor source, comorbidities, concurrent clozapine and typical use, and drug burden. **RESULTS:** On average, individuals received 10.2 SGA scripts annually; 23.8% used low, 70.2% used moderate, and 22.8% used high MP SGAs. Second generation antipsychotics polytherapy occurred in 9.6% of all SGA users (7.3% in low MP, 8.4% in moderate MP, and 7.3% in high MP SGA users). Switching accounted for 77.4% of all polytherapy. Relative to high MP users, moderate MP users were slightly more likely to be hospitalized (moderate MP OR = 1.2 [$p < 0.0001$]). Low MP use was not significantly different from high MP use with respect to hospitalization. Relative to monotherapy SGA users, polytherapy users had hospitalization odds of 1.9 ($p < 0.0001$). Other positive significant covariates included diagnoses of schizophrenia, bipolar disorder, depression, substance use disorders, obesity, increasing drug burden and atypical antipsychotic exposure. Clozapine use was negatively associated with all hospitalizations. Similar findings were found for psychiatric hospitalizations. **CONCLUSION:** Polytherapy and moderate MP SGAs are associated with higher risk of hospitalization compared to high MP SGAs and monotherapy use. These findings suggest the need for prudent selection of SGAs taking into account patients' comorbidities and pill burden.

PMH78

EFFECTS OF DIRECT-TO-CONSUMER ADVERTISING AND DETAILING SPENDING ON ANTIDEPRESSANT SWITCH AND TREATMENT COMPLETION

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OBJECTIVE: Antidepressant discontinuation is a common problem in treating major depressive disorder (MDD). We examined the effects of antidepressant-related direct-to-consumer advertising (DTCA) and detail spending on medication switching, acute phase completion, and continuation phase completion among antidepressant users newly diagnosed with MDD. **METHODS:** A retrospective cohort study of medical and prescription claims from a large national health plan affiliated with i3 Innovus from 2000 to 2004 was conducted. A total of 5010 individuals with MDD were identified. Antidepressant switch, acute phase completion, and continuation completion were determined by prescription refill records. Logistic regressions were run with DTCA and detailing spending variables as main explanatory variables. **RESULTS:** In the switch model, own product detailing spending was negatively associated with the likelihood of switching (OR = 0.61, 95% CI: 0.53–0.69). Own product detail spending was also positively associated with acute phase antidepressant completion ($P < 0.05$). Other product DTCA was positively associated with continuation phase completion. **CONCLUSION:** Pharmaceutical spending on physician detail appears to impact antidepressant switching and completion of acute phase treatment by patients, while DTCA spending appears to have its greatest impact on successful completion of the continuation phase of antidepressant treatment.

PMH79

PHYSICAL MORBIDITY AMONG PATIENTS WITH SCHIZOPHRENIA: ANALYSIS OF THE NATIONAL HOSPITAL DISCHARGE REGISTRY

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OBJECTIVE: Schizophrenia is a serious public health concern that affects about 1% of people and poses an increasing burden on societies all over the world. There is a growing recognition that schizophrenia associates with an increased risk of premature death. However, little is known about the prevalence of medical disorders among persons with schizophrenia. Our aim is to assess the frequency and characteristics of medical disorders among patients with schizophrenia in Spain. **METHODS:** From the 2000–2004 National Hospital Discharge Register, records for all patients ≥15 yr with schizophrenia were retrieved. This official database is representative of the national population and contains information on each episode of patient care, with the clinical information coded in the ICD-9-CM format. Physical disorders were defined using their specific ICD-9-CM block codes. A validated Charlson's index was also employed. **RESULTS:** Of the 105,152 entries registered, a total of 60,912 patients (mean age 43 yr; 64% men) were identified and eligible for analysis. About 50% of patients had associated at least one ICD-9-CM physical disorder and 21% had associated at least one physical disorder of clinical relevance according to Charlson's index. Concerning specific physical conditions our data show that endocrine, cardiovascular, respiratory and digestive disorders were the most common appearing in 13.9%, 12% and 11% of patients respectively. Additionally, 11.5% and 8.8% of patients had an associated diagnosis of drug and alcohol addiction. About 38.3% of patients were hospitalised because a physical disorder. Mortality was significantly higher in this specific group of patients (5.3% vs. 0.2%, $P < 0.001$). **CONCLUSION:** Physical disorders are frequent and account for a high number of hospitalisations and associated mortality in schizophrenia. These findings have implications for a wide variety of concerned parties, settings of care and organizational systems and might provide a health care policy perspective on interventions designed to control physical health in this population.

PMH80

THE CHANGE OF PRICES AND EXPENDITURES OF THE ORIGINAL AND GENERIC DRUGS OF FLUOXETINE— A LONGITUDINAL ANALYSIS ON REIMBURSEMENT DATABASE OF THE NATIONAL HEALTH INSURANCE

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OBJECTIVE: To investigate the change of prices and expenditure of the original and generic fluoxetine in Taiwan. **METHODS:** The uses of fluoxetine between 1997–2004 were initially selected

from the 200,000-cohort claim database of the National Health Insurance (NHI). The prices, total amounts and the market shares in different levels of health care setting were analyzed. **RESULTS:** Among 5 SSRI antidepressants, fluoxetine used 43.5% of the total SSRI expenditures. Compared with other SSRIs, fluoxetine also had the most number of different generic items, the shortest time lags, higher prices of the generics, and the fastest replacement rate by other generics. In 1997 the total expenditure of fluoxetine in medical centers and the district hospitals was 82.8% and 17.2% in the local hospital and the clinics. After the first entry the original drug 15 years ago, the market share of the original drug had shrunk to 1.46%. In general the prices of original drugs fell 0–6.4% in the first year while the first generic entered the market with the 80–87.7% original price. **CONCLUSION:** This study presented the profiles of generic competitions of SSRI antidepressants, which could provide an approach for both policy maker and industry to investigate the drug usage at national level. Except for fluoxetine, the generic market of SSRI antidepressants seem still promising.

PMH81

EXAMINING THE PERCEIVED BURDEN OF PRIOR AUTHORIZATION OF PSYCHOTHERAPEUTICS AMONG TEXAS MEDICAID PRESCRIBERS

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OBJECTIVE: To examine Texas Medicaid prescribers' perceptions of the prior authorization (PA) process for non-preferred psychotherapeutics among patients with severe mental illness. **METHODS:** A 54-item survey instrument was used to assess the perceived burden of prior authorization for psychotherapeutics (BoPAP) held among mental health prescribers. The BoPAP instrument was developed based on responses from three expert focus group panels and was comprised of three sub-scales ('patient care process and outcomes', 'system/societal costs', and 'administrative issues'). The survey was pre-tested and then mailed to 1650 Texas prescribers of psychiatric medications. Exploratory factor analyses (EFA) techniques were used to refine the BoPAP scale(s). **RESULTS:** The study yielded an 18.3% (n = 237) response rate with a majority of respondents being family physicians (43%). Most (95.4%) reported treating Medicaid patients. Respondents prescribed an average of 64 (Median = 40, SD = 102) Medicaid prescriptions per week with 17.8% requiring PA for non-preferred psychotherapeutics. Overall, prescribers reported PA as a moderate burden (BoPAP scale mean = 3.90, SD = 1.48; possible range 1 = 'low burden' to 5 = 'high burden') to their practice. Regarding the 'administrative issues' subscale, respondents reported a moderate to strong burden (Mean = 4.5, SD = 0.54); prescribers felt the PA process led to uncompensated administrative time (Mean = 4.56, SD = 0.63) and introduced an extra step in providing patient care (Mean = 4.55, SD = 0.65). Prescribers reported a moderate burden (Mean = 3.90, SD = 1.48) on the 'patient care processes and outcomes' subscale, citing the PA process added another level of bureaucracy (Mean = 4.51, SD = 0.64), led to patient frustration (Mean = 4.21, SD = 0.77), and took focus away from patient care (Mean = 4.08, SD = 0.87). The third subscale, 'system/social costs,' was less burdensome (Mean = 3.29, SD = 0.67) among respondents. **CONCLUSION:** Overall, Texas mental health providers felt that the PA process negatively impacted the quality and continuity of care they provide to their mentally ill patients. Future studies should be conducted in other states to determine the utility of the BoPAP instrument.

PMH82

PREVALENCE AND PATTERNS OF NEWER ANTIDEPRSSANTS USED IN CHILDREN AND ADOLESCENTS IN A STATE MEDICAID PROGRAM OVER SEVEN YEARS

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OBJECTIVE: To describe the temporal prescribing patterns of selective serotonin reuptake inhibitors (SSRI) and similar antidepressant medications among pediatric patients covered through a state child health insurance and Medicaid program from 2000 through 2007. **METHODS:** Administrative claims data from the health insurance programs of the Arkansas Department of Human Services were examined from July 2000 through June 2007. Continuously eligible patients under age 18 were identified in 14 6-month time periods. Pharmacy claims data identified all covered recipients receiving a prescription for any antidepressant obtained from an outpatient pharmacy. Considering published data on use in children, antidepressant medications were characterized as FDA approved, supported with evidence, lacking adequate evidence, or relatively contraindicated. **RESULTS:** Prevalence of SSRI and similar product use was 20 per 1000 children aged 6 to 12 years, and 48 per 1000 children aged 12 to 18 years in the initial 6 month period. Use peaked for 6 to 12 year old children at a rate of 24 per 1000 in the last half of 2002, and for 12 to 18 year old children at a rate of 63 per thousand in the first half of 2004. In the first half of 2007, the prevalence of use was 16 per 1000 and 53 per 1000 for the younger and older age groups respectively. Since 2002, the proportion of SSRI products with minimal or no supporting evidence of safety or effectiveness in children increased from 20% to more than 45% of patient treatments. **CONCLUSION:** Decreases in use of SSRI and similar medications were seen among children covered by Arkansas medical assistance plans after FDA advisories were issued in 2003 and 2004. Additionally, young patients appear to be increasingly treated with SSRI and similar medications having minimal or no data supporting safety and effectiveness in children or adolescents.

PMH83

USING RETAIL PHARMACY PRESCRIPTION DATA TO INVESTIGATE THE SEASONALITY OF ADHD TREATMENT: JANUARY 2003-OCTOBER 2007

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OBJECTIVE: Anecdotal evidence suggests that prescribing of ADHD therapies among children in the United States decreases over the summer months when children and adolescents are out of school. **METHODS:** We used retail pharmacy prescription data to investigate monthly and annual ADHD prescribing trends from January 2003 to October 2007 to determine if there is any variation in prescribing, especially over the summer months. The prescription data was obtained from Verispan's Vector One National (VONA), which captures nearly half of all prescription activity in the United States. The Verispan prescription data is age-specific; thus we were able to examine monthly total prescriptions for two age groups: 0 to 17 years and 18 years and older. **RESULTS:** There was a significant dip in total prescription volume in the summer months for the 0–17 age group. The magnitude of the seasonality observed between May and July ranged from a 22% to 29% decrease in total prescriptions, depending on the year. In contrast, total prescriptions in the 18 and older age group have been rising steadily since January 2003, and there is no observed seasonality. **CONCLUSION:** Our findings suggest that as many as 30% of children and adolescents use

ADHD medications only during the school year and stop treatment in the summer months. Assuming that a child meets the DSM-IV-TR criteria for ADHD, taking him/her off treatment, even outside the school setting, could impair his/her ability to function in everyday life. At the same time, it provides the child with a holiday from potentially serious side effects associated with stimulant use. Further research is needed to compare these and other benefits/risks associated with discontinuing ADHD therapy during the summer months.

PMH84

PREDICTORS OF TREATMENT INITIATION OF DULOXETINE VS. VENLAFAXINE XR FOR PATIENTS WITH MAJOR DEPRESSION DISORDER IN MANAGED CARE SETTINGS

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OBJECTIVE: To assess the impact of prior medication use and comorbidities on treatment initiation with duloxetine vs. venlafaxine XR for patients with major depression disorder (MDD) using retrospective claims data. **METHODS:** Using the PharMetrics Database, we studied commercially insured individuals aged 18–64 who initiated treatment with duloxetine or venlafaxine XR between July 2005 and July 2006, and had ≥1 prior diagnosis with MDD and continuous enrollment during 12 months prior to initiation date. Initiation was defined as the first use of a medication preceded by three months without a prescription of the same medication. Chi-square and Logistic regression analysis of patients' demographics, past-year medication use and comorbidities assessed predictors of initiations with duloxetine vs. venlafaxine XR. **RESULTS:** A total of 12,662 patients (73.8% female) initiated treatment with duloxetine, and 14,801 (72.1% female) with venlafaxine XR. Compared to venlafaxine XR patients, significantly more duloxetine patients received ≥3 unique antidepressants (39.5% vs. 25.2%), ≥3 unique pain medications (25.8% vs. 15.1%), SSRIs (55.5% vs. 41.2%), TCAs (12.5% vs. 7.5%), analgesics (63.6% vs. 51.6%), anticonvulsants (31.3% vs. 19.2%), or hypnotics (31.5% vs. 22.0%), and had ≥8 unique co-morbid medical conditions (38.8% vs. 29.5%) and diagnoses with pain (76.4% vs. 67.1%) (all p-values <0.001). Regression results revealed that the significant factors for duloxetine initiation vs. venlafaxine XR were prior use of ≥3 unique antidepressants (OR = 1.34), ≥3 unique pain medications (OR = 1.24), SSRIs (OR = 1.51), TCAs (OR = 1.19), analgesics (OR = 1.12), anticonvulsants (OR = 1.45), hypnotics (OR = 1.25), and prior medical comorbidities of pain (OR = 1.11) (all p-values <0.001). **CONCLUSION:** The results suggest that duloxetine patients with MDD are more likely to have more medical conditions and complex prior medication treatments than venlafaxine XR patients.

PMH85

PSYCHOTHERAPY AND MEDICATION USE AMONG DEPRESSION PATIENTS

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OBJECTIVE: This study examined the health service utilization and treatment costs among depression patients who received antidepressant medication, psychotherapy or both. **METHODS:** This study used medical and pharmacy claims data from 220,620 employees from three employer groups from September 2002 to December 2003. Depression patients (n = 4653) were identified using ICD-9 diagnosis codes from medical claims data. Differences in treatment costs and comorbid conditions were examined between depression patients who received psychotherapy and those who did not. **RESULTS:** Among eligible members, 4,653 (2.1%) had a primary diagnosis of depression. Nearly 70% were female with an average age of 39.7 years. Approximately half of the depression patients (46.9%) received antidepressant medication alone while 34.2% of patients received both psychotherapy and medication. Only 19.3% of depression patients received psychotherapy without medications. The average total treatment cost for depression patients who received both psychotherapy and medications was $10,565, while the average treatment cost for patients who only used medication was $10,014. These treatment costs were not significantly different. The average treatment cost for psychotherapy alone was $3,945. The most frequent comorbid conditions among depression patients were musculoskeletal and chronic pain (29.9%), anxiety (26.6%), injuries (18.7%), hypertension (14.4%), asthma (6.5%), diabetes (6.1%), arthritis (5.4%), urinary tract infection (4.4%) and drug dependence and alcohol abuse (4.1%). Depression patients who received both medication and psychotherapy had significantly more comorbid anxiety (33.1%) and drug and alcohol abuse (5.8%) than those who received medications or psychotherapy alone ($p < 0.001$). **CONCLUSION:** Depression patients who used psychotherapy including antidepressant medications did not have significantly different health care costs than depression patients who did not receive psychotherapy treatments. Depression patients with comorbid psychological conditions such as anxiety or drug abuse were more likely to receive psychotherapy treatment ($p < 0.001$).

PMH86

THE STANDARDS FOR BIPOLAR EXCELLENCE (STABLE) PROJECT: A BIPOLAR DISORDER QUALITY IMPROVEMENT INITIATIVE TO DEVELOP AND VALIDATE EVIDENCE-BASED PERFORMANCE MEASURES FOR ENDORSEMENT BY THE NATIONAL QUALITY FORUM (NQF)

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OBJECTIVE: Those with BPD often present when depressed leading to potential misdiagnosed and treatment as depression, particularly in primary care. Inappropriate treatment increases risk for suicide and rapid cycling. STABLE was initiated to develop and field test evidence-based clinical performance measures (PM) for endorsment by the National Quality Forum, and eventual implementation for quality improvement. **METHODS:** An expert panel used a validated method to develop 15 performance measures for BPD and depression. Field testing was conducted on 802 medical records among 80 practices (48 psychiatry, 32 primary care) in 28 states. Feasibility was evaluated using standard parameters with inter-rater reliability evaluated in a subset of records (proportion agreement and kappa). **RESULTS:** Fifteen measures were developed and validated in four domains: initial assessment, appropriate pharmacotherapy, adjunctive treatment, monitoring treatment response and antipsychotic-related metabolic changes. A total of 802 cases (419 BPD; 383 depression) were audited. In those with depressive symptoms, primary care and specialists assessed patients for mania or family history of mental health disorders in only 47.6% and 40.8%, respectively. Suicide risk assessment was only conducted in 71.5% of patients, and substance abuse assessment in only 60.5%. For BPD specific measures, results indicated adequate assessment of functional status at baseline

and within 12 weeks of treatmet of only 41.4%. Appropriate psychosocial interventions were recommended in only 39.9%, condition education in 33.4%, assessment for hyperglycemia after initiation an atypical antipsychotic in 19.7% and weight measurement in 15.5%) Psychiatric practices performed better than primary care on most measures. A subset of patients were double abstracted and demonstrated substantial simple agreement ranging from 89.5% to 100% and kappa from 0.75 to 1.0. **CONCLUSION:** The need to improve quality of care for individuals with bipolar disorder is significant. These PM can be implemented using chart audits and be a useful component of quality improvement efforts.

PMH87

SUPPORTING PRODUCT CLAIMS IN DRUG DEVELOPMENT: A FRAMEWORK FOR INTEGRATING PATIENT REPORTED OUTCOMES AND HEALTH ECONOMICS CONCEPTS AND ENDPOINTS

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To introduce, define and differentiate between conceptual models, endpoint models and conceptual frameworks, and to discuss how they fit together in the context of supporting product claims in drug development. In addition, to explore the added benefit of including health economic concepts and endpoints within the same framework. Using alcohol dependence (AD) as an illustrative example, a conceptual model, hypothetical endpoint model and conceptual framework (for a selected AD-specific PRO measure) were developed, following the newly issued guidance from the FDA relating to label claims. The potential for combining each of these elements together with related documents, such as the Target Product Profile to support a product claim, was assessed as was the feasibility of including health economic claims within a similar framework. The development of a holistic framework to support not only label claims, but also value claims is presented. The framework develops the recent guidance by the FDA for PROs and suggests that it may be possible to include health economic outcomes within the general framework. Doing so offers potential benefits in relation to applying the same rigorous treatment now required for PROs, encourages genuine collaboration between different stakeholders and provides a framework for communicating value concepts outside the discipline of outcomes research. In particular, clear specification of health economic outcomes within an endpoint model may assist with the design of prospective studies. Nevertheless, it is clear that value claims remain the responsibility of reimbursement authorities rather than regulators. Each of the models discussed are useful in supporting product claims in drug development and, from a PRO perspective, endpoint models and conceptual frameworks are essential. From a health economics perspective, employing a similar framework encourages scientific rigour, facilitates communication and could help design of appropriate data collection in clinical trials.

NEUROLOGICAL DISORDERS— Clinical Outcomes Studies

PND1

PREVALENCE AND COSTS OF COMORBIDITIES AMONG PERSONS WITH AND WITHOUT MULTIPLE SCLEROSIS: AN ANALYSIS OF THE AHRQ MAJOR AND SPECIFIC DIAGNOSTIC CATEGORIES

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OBJECTIVE: Evaluate the prevalence and costs of co-morbidities in employees with/without multiple sclerosis (MS). **METHODS:** A United States employee health care claims database from 2001–2007 was used to identify subjects with MS (ICD-9 code = 340.XX) and a control cohort without MS. The control group was matched 20:1 to the MS subjects on demographics, job-information, geography, and Charlson Co-morbidity Index. Based on ICD-9 codes, direct medical costs associated with the Agency for Health care Research and Quality 17 Major and 261 Specific Diagnostic Categories (MDCs and SCs) were identified. Index dates for the MS cohort were the diagnosis or therapy initiation date, and for Controls the average MS date. The 12-month post-index date utilization and costs were analyzed. Prevalence comparisons were tested using z-scores of log odds ratios and cohort cost comparisons using t-tests ($P < 0.05$). **RESULTS:** A total of 765 employees with MS and 15,300 matched controls were analyzed. The MS cohort had significantly higher prevalence of 15/17 MDCs and were significantly costlier in 7. The top more prevalent MDCs were: Nervous System+Sense Organs, Musculo Connective Tissue, and "Other Conditions" which had 53.4%, 18.2% and 17.1% higher prevalence, respectively and were $1837, $256, and $241 more costly, respectively. However, it was surprising to see the prevalence and higher cost of conditions like: Circulatory System (31.1%–21.9%; $568–$235) Mental Disorders (20.7%–11.6%; $147–$61) Digestive System (23.9%–16.2%; $369–$193); Skin & Subcutaneous Tissue (25.4%–19.7%; $129–$69). Evaluating these using the "specific categories", significantly higher prevalence and costs were reported among the MS cohort in: other nervous system disorders, headache and migraine, epilepsy convulsions, blindness and vision defects, dizziness/vertigo, other mental conditions. **CONCLUSION:** Employees with MS have more prevalent co-morbid conditions than subjects without MS. From an insurer's perspective, this increased burden for MS sufferers is also associated with higher costs.

PND2

THE FABRY OUTCOME SURVEY (FOS): A DATABASE OF PROSPECTIVE OBSERVATIONS ON THE NATURAL HISTORY AND MANAGEMENT OF A RARE DISEASE

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OBJECTIVES: To analyse how the development of an industry-sponsored, but physician directed, multinational database has facilitated collection and interpretation of serial clinical and laboratory observations on patients with Fabry disease—a rare lysosomal storage disorder caused by deficiency of the enzyme α-galactosidase A. **METHODS:** In 2001, physicians established

the operating principles and protocols for collection, retention, retrieval, and analysis of demographic information, signs and symptoms—including laboratory findings—and the response to enzyme replacement therapy with agalsidase alfa in patients with a confirmed diagnosis of Fabry disease. **RESULTS:** As of December 2007, 190 centres have enrolled 1453 patients from 19 countries worldwide (754 females, 699 males). Of these, 133 are girls and 118 boys less than 18 years of age. Data from these patients have added significantly to our understanding of Fabry disease, with 24 peer-reviewed publications describing the pre-treatment characteristics of the disease and the response to agalsidase alfa. Problems encountered include: 1) incomplete ascertainment of patients with different manifestations of Fabry disease; 2) some systematic lacunae in the data; and 3) uncertainty about the quality of some data. Progress has been made in overcoming these problems by: 1) convening regular meetings of investigators to review protocols, data collection, and findings from data analysis; 2) focusing on 'core data'; 3) concentrating on achieving comprehensive data collection from centres where enrolment is especially high; and 4) employing clinical research associates to increase data collection and ensure data quality. **CONCLUSIONS:** FOS has contributed significantly to the understanding of the clinical features of Fabry disease in patients of all ages. Problems with data collection and quality have been addressed by a multi-faceted approach, including focusing on a core panel of data to be collected, together with the use of clinical research associates to check data completeness and quality.

PND3

TRENDS IN THE PREVALENCE OF AUTISM SPECTRUM DISORDERS AND RELATED HEALTH CARE UTILIZATION AND COSTS IN A STATE MEDICAID PROGRAM

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OBJECTIVE: Over the past decade, there has been a tremendous increase in the prevalence of autism spectrum disorders (ASD) in the United States. With increasing ASD prevalence, the health care utilization and costs associated with these neurodevelopmental disabilities are also expected to increase. The purpose of this study is to determine the trends in the prevalence of ASD and ASD-related health care utilization and costs among recipients enrolled in a state Medicaid program. **METHODS:** A retrospective descriptive analysis of a state Medicaid fee-for-service administrative claims dataset was conducted. Medical services claims with a primary, secondary, or tertiary diagnosis code of ASD (ICD-9-CM 299.0/299.8) were extracted to determine the prevalence of ASD. Claims for psychotropic medications prescribed to recipients with ASD were then extracted using de-identified unique recipient numbers obtained from the medical services claims. Prevalence and health care utilization numbers and rates were reported by demographic categories. Costs were reported from the state Medicaid perspective. **RESULTS:** Between 1996 and 2003, the number of recipients identified with ASD increased from 246 to 1399, respectively. In terms of age distribution, recipients in the age group 6–14 years represented the highest proportion in all the study years, with the proportion increasing from 38.6% in 1996 to 47.0% in 2003. A majority of the recipients with ASD were males, who made 69.1% of the sample in 1996 and 74.6% in 2003. Whites constituted a majority (>90%) with respect to ethnicity in all the study years. The increase in the prevalence of ASD was accompanied by an increase in ASD-related health care utilization and costs. **CONCLUSION:** Similar to national trends, the prevalence of ASD increased considerably over the years in the state Medicaid program. In addition, the prevalence of ASD among Medicaid recipients varied by demographic characteristics. The study provides useful data to better serve the needs of this growing population.

PND4

TRENDS AMONG HOSPITALIZED CYSTIC FIBROSIS PATIENTS

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OBJECTIVES: Few studies have evaluated trends among inpatients with cystic fibrosis. The purpose of this paper is to explore patient demographics, diagnosis, and procedures to gather a general picture of cystic fibrosis treatment. Exploration of the cystic fibrosis data set to find trends among the variables, race, gender, mortality, total charges, length of stay, age diagnosis, and procedures provides insight into better methods to treat individuals with cystic fibrosis. **METHODS:** The data used were taken from the National Inpatient Sample (NIS). The cystic fibrosis data set was formed by isolating the NIS patients diagnosed with cystic fibrosis, using a 10% sample from 2004. The cystic fibrosis data set contained 1582 observations. Descriptive statistics were used to examine the data; chi-square tests and logistic regressions were employed to analyze the data. **RESULTS:** Statistics showed that patients with a longer length of stay were more likely to die during hospitalization and to be older. Most races had two high density ages; one around 20 years of age and the other around 60 years of age with the exception of African Americans and Native Americans. The three procedures: transfusion of packed cells (ICD-9 99.04), continuous ventilation <96 consecutive hours (ICD-9 96.71), and endotracheal tube insertion (ICD-9 96.04) and two diagnoses pneumonia (ICD-9 486) and amyloidosis (ICD-9 277.3, accumulate deposits of abnormal proteins) were found to be directly related to mortality. The data also showed that none of the patients with esophageal reflux (ICD-9 530.81) died during hospitalization. **CONCLUSIONS:** From the results, older patients, patients with long lengths of stay, or those diagnosed with amyloidosis could be considered high-risk for hospital mortality. However, these results are limited; no information about outpatient factors, medications, or test results could be assessed. Also, there were few patients who died during hospitalization on which to base the analysis.

PND5

SUBSTANCE ABUSE AMONG PATIENTS DIAGNOSED WITH INSOMNIA

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OBJECTIVE: To assess the rate of substance abuse among insomnia patients prescribed nonbenzodiazepine receptor agonists (nBZRAs), benzodiazepines (BZDs), and melatonin receptor agonists (MRAs). **METHODS:** This analysis used a retrospective matched cohort design with data from Florida Medicaid recipients 18 to 64 years old. Patients initiating nBZRA, BZD, or MRA therapy between July 1, 2002 and March 31, 2006, without a history of substance abuse, were included in this analysis. One MRA patient was matched to three nBZRA and three BZD patients based n demographic and clinical (history of insomnia, depression, anxiety) characteristics. Service dates and days of medication supply variables from pharmacy claims established periods of treatment exposure, while substance abuse related to sedatives and hypnotics was identified using International Classification of Diseases 9th edition Clinical Modification (ICD-9-CM) codes for the same time frame. Rates of substance abuse (SA) were calculated as the number of

patients with a claim for SA per 100 patient-years of treatment exposure. **RESULTS:** A total of 140 MRA patients were identified and matched to 420 nBZRA and 420 BZD patients by age (mean 46 years), sex (64% female), race (57% white), depression (50%), and anxiety (14%). The mean Charlson co-morbidity score was higher for MRA patients (1.4) than nBZRA or BZD patients (0.6 and 0.7, respectively, $P < 0.01$). The SA rate per 100 patient-years of exposure was 1.84 and 2.51 for nBZRA and BZD patients, respectively. There was no evidence of substance abuse among the MRA cohort. **CONCLUSION:** These initial data suggest that MRA patients were less likely to use medical services for substance abuse than nBZRA or BZD patients. However, given the small number of patients in this study, no definitive conclusions can be drawn. Additional data will be needed to confirm these findings.

NEUROLOGICAL DISORDERS—Cost Studies

PND6

MODELING THE IMPACT OF A FIXED-DOSE COMBINATION OF SUMATRIPTAN AND NAPROXEN SODIUM ON TRIPTAN CONSUMPTION IN A US MANAGED CARE POPULATION

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OBJECTIVE: To estimate the potential impact of a fixed-dose combination of sumatriptan 85mg and naproxen sodium 500mg (suma/nap) on triptan consumption in a United States managed care population of moderate-to-severe adult migraineurs. **METHODS:** A payer-perspective pharmacy budget impact model was developed using Microsoft Excel®. Dose-specific efficacy was drawn from published meta-analyses for sumatriptan, eletriptan, rizatriptan, zolmitriptan, almotriptan, and naratriptan, and derived from published trials for suma/nap. Initial response rates at two hours, recurrence rates, and 24-hour sustained pain free rates were used to model mean triptans consumed per migraine episode. Nationally representative data for market share and quantity dispensed from commercial sources as well as prevalence data from the literature were combined with modeled triptan consumption to estimate the number of total annual prescriptions (TRx) filled. Probabilistic and scenario-based sensitivity analyses were used to assess model uncertainty. **RESULTS:** In a hypothetical plan of 1,000,000 covered lives, an estimated 14,540 moderate-to-severe adult migraineurs treated with currently available triptans filled 102,206 TRx. Of the 12 triptan doses evaluated, suma/nap had the lowest mean triptan consumption per migraine episode (1.08; CI 1.06–1.09), followed by naratriptan 2.5mg (1.10; CI 1.06–1.14), eletriptan 20mg (1.14; CI 1.09–1.19), and sumatriptan 25mg (1.15; CI 1.13–1.18). After converting 8.6% of TRx share (58.3% from sumatriptan and 41.7% from other triptans according to market share) to suma/nap, migraineurs filled only 100,356 TRx, a net reduction of 1,850 prescriptions [CI 1,714–1,965]. In a second scenario converting 8.6% of TRx share (100% from sumatriptan), migraineurs filled 101,253 TRx, a net reduction of 953 prescriptions [CI 811–1,076]. **CONCLUSION:** Treating a portion of moderate-to-severe migraineurs with suma/nap reduced triptan consumption in a hypothetical nationally representative managed care plan. Further research is required to quantify the potential economic impact of this reduction once suma/nap pricing is established.

PND7

BUDGET IMPACT OF TRANSDERMAL ADHESIVES OF RIVASTIGMINE IN BRAZILIAN PUBLIC HEALTH SYSTEM

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OBJECTIVE: To estimate the budget impact of switching from Rivastigmine capsules to Rivastigmine Transdermal Adhesives in Brazilian Public Health System. **METHODS:** A simulation model from Public Health System perspective, with a time horizon of three years was developed. In order to explore the minimum and maximum possible budget impact, two scenarios were performed. In the scenario A the patients are kept in the current treatment dosage profile using transdermal adhesive. In scenario B the patients are successfully switched to higher doses using transdermal adhesives as label and clinical studies recommendations. The capsules formulations analyzed were: 1.5 mg; 3 mg; 4.5 mg e 6 mg. The transdermal formulations evaluated were 5 cm^2 and 10 cm^2. The indication of target dose of 10 cm^2 rivastigmine transdermal adhesives provides efficacy similar to the highest doses of capsules was based on clinical and pharmacological trials. Data from medication unit's dispensation were collected from public health database, ranging from October 2004 to September 2007. Cost information was collected from official reimbursement list. The rate of switching from capsules to transdermal adhesives was based on randomized controlled trial related to caregiver preference. Results were converted in US Dollars (R$ 1,8/USD 1.00). A one-way sensitivity analysis was performed. **RESULTS:** In scenario A it was estimated that the government could obtain a reduction of USD$2.7 million, or 6.02% of expenses. A reduction of 37% of pharmacy dispensation activities was associated with lowest health service resource utilization. On the other hand in scenario B government expenses are 6.36% higher (USD$3.2 million) but with reduction of 31% of pharmacy dispensation activities. All scenarios are sensible to transdermal adhesives costs. **CONCLUSION:** Rivastigmine transdermal adhesives would be advantageous to Brazilian Public Health System providing budget savings with lower resource utilization. Although higher dosage of medication increases expenses, pharmacy dispensation activities would be lower.

PND8

MEDICAL COSTS ASSOCIATED WITH TREATMENT CHANGE IN MULTIPLE SCLEROSIS

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OBJECTIVE: To compare medical costs among switching, discontinuing and persisting patients on multiple sclerosis (MS) treatment. **METHODS:** Using the PharMetrics medical claims database, adults diagnosed with MS who initiated treatment with interferon beta (A-Avonex, B-Betaseron, R-Rebif) or glatiramer acetate (C-Copaxone) in 1996–2005 were identified. Within each drug initiator group, patients who persisted with the index treatment, switched drugs, and discontinued MS medications, during the first 18 months after drug start were identified. Total medical costs for the 18 months following treatment switch or discontinuation, and for a randomly selected 18-month period among those who persisted, were compared using multivariate linear regression models. **RESULTS:** Among 6073 patients who initiated treatment, the mean age was 43 years, 78% were female, and 16% had treatment with a different MS drug prior to index drug start. At 18 months after start of the index drug, 3365 (55%) of patients persisted; 685 (11%) switched, and 2023 (33%) of patients discontinued treatment for at least 90 days. Mean medical costs over 18 months were $10,718, $8,786, and

$7,098 among those switching, discontinuing or persisting, respectively. The costs associated with switching and discontinuing treatment were significantly higher ($p < 0.0001$) than with persistence, even when adjusting for patient characteristics, MS drug use, and medical costs during the six months preceding treatment start. Hospitalizations were the primary source of the increased costs (means of $2597, $2191, and $1160 for switching, discontinuing, and persisting, respectively). **CONCLUSION:** One year after treatment initiation with index drug, over a third of MS patients discontinue or switch ABCR treatment and incur higher hospitalization related medical costs than those persisting with therapy. Discontinuation or switches due to potential suboptimal treatment and subsequent hospitalizations may be driven by disease relapses, suggesting a need for more highly effective MS therapies.

PND9

COST-EFFECTIVENESS OF PREGABALIN IN PATIENTS WITH FIBROMYALGIA: A US PERSPECTIVE

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OBJECTIVE: To assess the cost-effectiveness of pregabalin in the treatment of fibromyalgia (FM) from a US perspective. **METHODS:** We developed a micro-simulation model to assess the cost-effectiveness of pregabalin therapy (450 mg/d) in a hypothetical cohort of patients with moderate or worse pain due to FM. The model simulates pain experience on a weekly basis over 14 weeks, using data from a randomized, placebo-controlled clinical trial. Pain levels were estimated using an 11-point numeric rating scale; moderate or worse pain was assumed to be a pain score ≥4. Health-state utilities were assigned based on estimated pain level, using published values for the Health Utilities Index [HUI]—Mark II. Costs of drug therapy only were considered. Cost-effectiveness of pregabalin therapy was considered alternatively versus placebo and no therapy, the latter because pregabalin is the only drug currently indicated for the treatment of FM. Cost-effectiveness was expressed in terms of both incremental cost per additional day without moderate or worse pain and incremental cost per quality-adjusted life-year (QALY) gained. **RESULTS:** In comparison with no treatment, pregabalin therapy was estimated to yield an average of 29.4 additional days without moderate or worse pain over 14 weeks, and a gain of 0.019 QALYs. Corresponding estimates for the comparison with placebo were 11.4 additional days without moderate or worse pain, and 0.009 additional QALYs. Assuming a daily cost of therapy of $3.30, the incremental cost (95% CI) of pregabalin therapy per additional day without moderate or worse pain was $11 ($9, $14) versus no treatment, and $32 ($18, $72) versus placebo. Corresponding estimates of the incremental cost per QALY gained were $39,266 ($27,167, $57,269) and $17,220 ($15,289, $20,153), respectively. **CONCLUSION:** In patients with moderate or worse pain due to FM, the cost-effectiveness of pregabalin falls within accepted published thresholds.

PND10

SWITCHING TO HIGH-DOSE HIGH-FREQUENCY INTERFERONS OR NATALIZUMAB IN PATIENTS WITH MULTIPLE SCLEROSIS: A COST-EFFECTIVENESS ANALYSIS

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OBJECTIVE: Studies in patients with multiple sclerosis (MS) have shown that disease-modifying drugs (DMDs) lower the frequency and severity of relapses and slow disease progression. The clinical and economic consequences of regimens involving switches between DMDs have not been studied fully. The following analysis sought to examine clinical and economic outcomes in MS patients who switch from one of the two leading DMDs in the United States (IFNβ-1a intramuscular [IM] and glatiramer acetate [GA]) to a high-dose high-frequency (HDHF) interferon beta (IFNβ-1b subcutaneous [SC], IFNβ-1a SC) or natalizumab, a second-line agent. **METHODS:** A previously published pharmacoeconomic model was modified to evaluate switching scenarios and estimate total cost of MS care and the number of relapses avoided over a four year period. The model assumes that switches from the first agent occurred at the end of the first year and that the second agent is continued through the end of the four year period. Clinical data inputs were derived from Class I clinical trials. The costs of relapses and disability steps were based on published literature, and drug prices were obtained from the *Red Book*. Relative cost-effectiveness between switching scenarios was compared by calculating the cost per relapse avoided over the four year time frame. **RESULTS:** The cost of avoiding one relapse in patients switching from IFNβ-1a IM to IFNβ-1a SC or IFNβ-1b SC was $84,401 and $87,090, respectively. The most costly switch was from IFNβ-1a IM to natalizumab ($104,568 per relapse avoided). Switching from GA to IFNβ-1a SC, IFNβ-1b SC, or natalizumab resulted in costs per relapse avoided of $70,822, $73,511, and $90,989, respectively. **CONCLUSION:** This analysis suggests that MS patients switched from IFNβ-1a IM or GA to an HDHF IFNβ benefited from the lowest cost to avoid a relapse.

PND11

TRIPTANS FOR ACUTE MIGRAINE: A SYSTEMATIC REVIEW OF COST-EFFECTIVENESS STUDIES

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OBJECTIVE: Triptans (almotriptan, eletriptan, naratriptan, rizatriptan, sumatriptan, and zolmitriptan) have become the preferred migraine therapy in Canada and elsewhere. Currently, health care decision makers are considering developing a consistent listing policy for triptans in publicly-funded drug plans across Canada. Compelling evidence on cost-effectiveness of triptans applicable to Canadian health care setting is important in aiding decision-making process. This study examines the validity and applicability of available evidence of cost-effectiveness studies of triptans to the Canadian health care system. **METHODS:** Cost-effectiveness studies were obtained by searching PubMed and the Cochrane Library and cross-searching BIOSIS Previews®, EMBASE®, and MEDLINE® databases on the OVID® search system. A Systematic review was performed on selected studies. The validity of evidence was assessed by appraising each study with regards to inclusion of all triptans; major costs and benefits in the model; resource use in the model; and use of credible clinical data. **RESULTS:** Twelve relevant studies were identified and reviewed. Of them, two considered major cost and benefits and resources use but compared only a few triptans and used unreliable clinical data; eight studies considered only drug cost with only two out of eight studies compared all triptans using unreliable clinical data; and two studies considered resource use and major costs/benefits, compared only a few triptans, and used unreliable clinical data. **CONCLUSION:** Available studies on cost-effectiveness of triptans are of limited utility to Canadian decision markers as they harbour flaws such as failure to compare all triptans, adoption of less credible clinical estimates, exclusion of major costs/benefits, and failure to

model resources use. A reliable clinical and primary cost-effectiveness study is warranted to take into account Canadian publicly-funded health care system.

PND12

COST-EFFECTIVENESS ASSESSMENT OF ANTIEPILEPTIC DRUGS AS ADJUVANT TREATMENTS FOR THE MANAGEMENT OF REFRACTORY PARTIAL SEIZURES IN ADULT MEXICAN PATIENTS

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OBJECTIVE: Epilepsy represents a national health problem. In Mexico there are between 1.2 and 2.2 million diagnosed patients who raise the demand for health care services. The aim of this study was to analyze which antiepileptic drug is a cost-effective therapy as an adjuvant treatment for the management of refractory partial seizures using a health care payer's perspective. **METHODS:** A three-stage Markov model was used with a follow-up period of one-year (4 cycles). Effectiveness measures were the percentage of patients under control (no seizures) and the number of hospitalizations avoided. The transition probabilities were obtained from national and international published literature. Comparators used in the assessment were topiramate (300–800 mg/day), levetiracetam (2000–3000 mg/day), gabapentin (1200–1800 mg/day), lamotrigine (75–400 mg/day), vigabatrin (1000–3000 mg/day) and pregabalin (150–600 mg/day). Estimation of resource use was performed employing hospital records from hospitals of the Social Security Mexican Institute (IMSS). They include days of hospitalization, emergency, outpatient services and drugs costs. The model was calibrated and probabilistic sensitivity analyses were conducted using bootstrapping techniques. **RESULTS:** The highest rate of controlled-patients was for pregabalin (54.1%;CI95% 53.3%–55.1%) followed by topiramate (42.2%;CI95%41.5%–43.1%); levetiracetam (34.1%;CI95% 33.4%–34.8%); vigabatrin (32.6%;CI95% 32.0%–33.4%); gabapentin (27.4%;CI95% 26.9%–28.1%) and lamotrigine (24.7%;CI95% 24.1%–25.3%). The annual expected mean cost per patient resulted in US$3136.4 (CI95% US$3076.2–US$3139.8) for pregabalin; US$4295.9 (CI95% US$4269.8–US$4318.3) for topiramate; US$4037.7 (CI95% US$4015.6–US$4059.8) for levetiracetam; US$3470.9 (CI95% US$3450.1–US$3493.3) for vigabatrin; US$3581.6 (CI95% US$3,552.3–US$3615.8) for gabapentin; and US$2807.2 (CI95% US$2789.1–US$2825.4) for lamotrigine. The ICER's of the alternatives choosing gabapentin as the gold standard were –US$1,769 (CI95%, –US$1,685.3–US$1,812.8) for pregabalin, US$4,826.5 (CI95% US$4,143.7–US$4,895.8) for topiramate; US$6,807.9 (CI95% US$5,821.4–US$6986.7) for levetiracetam; –US$2,127.9 (CI95% –US$2,381.8,–US$1,561.2) for vigabatrin and US$28,681.6 (CI95% US$28,569.1–US$49,547.0) for lamotrigine. Acceptability curves and component analyses showed that these results remain robust. **CONCLUSION:** Pregabalin demonstrated to be a cost-saving and cost-effectiveness adjuvant therapy in the management of refractory partial seizures in Mexican patients.

PND13

A COST-EFFECTIVENESS ANALYSIS OF NATALIZUMAB VS. INTERFERON-BETA AND GLATIRAMER ACETATE IN PATIENTS WITH ACTIVE RELAPSING-REMITTING MULTIPLE SCLEROSIS CURRENTLY FAILING ON EXISTING THERAPY

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OBJECTIVE: Natalizumab is a new disease modifying therapy currently licensed for use in patients with relapsing-remitting multiple sclerosis (RRMS), and has recently been the subject of a cost-effectiveness evaluation by the National Institute for Health and Clinical Excellence (NICE) in the UK. NICE accepted that natalizumab was cost-effective in a highly-active subgroup of RRMS patients, but not in all patients failing on current therapy (sub-optimal therapy, SOT patients). In the SOT patients, the basecase ICERs exceeded £43,400 and NICE essentially concluded that natalizumab would not be a cost-effective use of NHS resources in these patients unless they were having two or more relapses per year. However, NICE recognised that the evaluation may have underestimated the incremental QALY in two areas. The first was that the relapse disutility was underestimated, and the second was that the time horizon of the evaluation was too short. Here we re-evaluated the ICERs for natalizumab vs. interferon-beta and glatiramer acetate in SOT patients taking into account the points raised by NICE. **METHODS:** The original model submitted to NICE was a 20-year markov-model parameterised for the UK from a direct health care perspective. Disutilities for relapse were updated using values from a previous UK Health Technology Assessment, and the cost of relapse was changed in line with contemporary studies. The time-horizon for the model was extended from 20 years to 30 years. **RESULTS:** The ICER from a direct medical costs perspective for natalizumab vs. interferon-beta was £29,900 per QALY. For natalizumab vs. glatiramer acetate the ICER was £29,300 per QALY. **CONCLUSION:** The European Medicines Evaluation Agency has approved natalizumab for use in highly active RRMS, including SOT patients. Given the willingness-to-pay threshold of £30,000 per QALY commonly associated with NICE guidance, the results here show that natalizumab is a cost-effective treatment for all patients failing on current therapy in the UK.

PND14

ECONOMIC EVALUATION OF SATIVEX® FOR TREATMENT OF NEUROPATHIC PAIN IN PATIENTS WITH MULTIPLE SCLEROSIS

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OBJECTIVE: To determine the incremental cost-utility ratio (ICUR) of Sativex®, a novel, cannabis-based therapy, as adjunctive treatment for neuropathic pain in MS adults from a Canadian provincial government payer perspective over a one-year time horizon. **METHODS:** Efficacy and safety of Sativex® were extracted from the pivotal phase III trial comparing Sativex®+standard analgesic care (SAC) to SAC alone. Direct medical resources (medication, health professionals, lab and diagnostic) were taken from a burden of illness study. Sativex® utilization for the economic analysis was based on the utilization in the pivotal study (# sprays per day). Costs (2006 CND$) were based on provincial sources. Utilities were based on a mapping exercise whereby pain severity (BS-11) from the pivotal trial was mapped onto Health Utilities Index Mark 3 (HUI) pain attribute

level. The primary outcome was the cost per additional quality adjusted life year (QALY). The incremental cost per additional pain-controlled day was a secondary economic outcome. Sensitivity analyses were conducted to investigate the robustness of the results. **RESULTS:** The total direct cost of treatment over one-year was $12,691 for Sativex® + SAC and $3,340 for SAC. The total QALYs for Sativex® + SAC were 0.3793 and 0.2459 for SAC. The ICUR for Sativex® + SAC compared to SAC was $70,103/QALY. The number of pain controlled days over a one-year time horizon was 196 for Sativex® + SAC and 122 for SAC. Cost drivers were Sativex® utilization (5 daily sprays = $36,512/QALY; 11 sprays = $80,327/QALY). The incremental cost per pain-controlled day was $127. **CONCLUSION:** Results indicated that Sativex® + SAC was more expensive than SAC, but provided increased QALYs and pain-control in MS patients with neuropathic pain.

PND15

COST-UTILITY OF INTERFERON BETA-1B IN THE TREATMENT OF PATIENTS WITH A CLINICALLY ISOLATED SYNDROME SUGGESTIVE OF MULTIPLE SCLEROSIS

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OBJECTIVE: To estimate the cost-utility of interferon beta-1b (IFNB-1b) in the treatment of patients with a clinically isolated syndrome (CIS) suggestive of multiple sclerosis (MS). **METHODS:** We developed a Markov model of the epidemiology and treatment of CIS and MS. The model allows users to simulate outcomes over varying time horizons. A hypothetical cohort of 1000 patients with incident CIS was specified, with initial health states defined by Kurtzke Expanded Disability Symptom Scale (EDSS). The cohort was assumed alternatively to be treated with IFNB-1b (250mg eod) following an initial demyelinating event suggestive of MS or not treated until confirmation of MS. Data from a published clinical study (BENEFIT) were used to model EDSS progression over time and transitions from CIS to MS. Relapses were estimated from BENEFIT and published natural history data. Following transition to MS, all patients were assumed to be treated with IFNB-1b until EDSS 6.5. Direct and indirect costs of MS treatment and IFNB-1b were estimated from published literature and pricing schedules. Patient utilities were derived from EQ-5D data from BENEFIT, supplemented by published data defined by EDSS score and relapse occurrence. Mortality was estimated using life tables and EDSS data. Costs (2007 currency) and outcomes were discounted at 5% per annum. Sensitivity analyses were performed on key model parameters. **RESULTS:** Use of IFNB-1b was associated with slower EDSS progression (hence, longer time to MS diagnosis), and reduced relapse burden. In the base case (Australian perspective; 25-year simulation), incremental cost-utility of IFNB-1b versus no treatment was AUD58,600 (USD$51,400) per quality-adjusted life year (QALY) gained. Findings were sensitive to years simulated, IFNB-1b cost and treatment effect, and underlying rate of disease progression. **CONCLUSION:** IFNB-1b treatment of patients with CIS apparently offers reasonable value for money relative to many well-accepted health care interventions.

PND16

THE CONCENTRATION AND PERSISTENCE OF HEALTH CARE EXPENDITURES AND PRESCRIPTION DRUG EXPENDITURES IN PATIENTS WITH ALZHEIMER'S DISEASE

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OBJECTIVE: Health care expenditures in Medicare are highly concentrated in a small proportion of beneficiaries. The purpose of this study was to quantify the concentration and persistence of overall and prescription drug expenditures in individuals with Alzheimer's disease (AD) and to determine the characteristics associated with future expenditure levels. **METHODS:** Data were obtained from the 1999–2004 Medicare Current Beneficiary Survey linked with Medicare claims. Elderly, community-dwelling individuals with AD were rank-ordered by overall and drug expenditures. The proportion of expenditures accounted for by the top 10%, top 25% and top 50% of spenders was calculated. A transition probability matrix was used to illustrate the change in expenditure percentiles from one year to the next. Ordered logit models incorporating prior expenditure, Charlson Comorbidity Index, functional status and other background covariates were performed to predict the level of subsequent-year expenditures. **RESULTS:** The top 10% of spenders accounted for 38%–47% of overall health expenditures and incurred 31%–36% of overall drug expenditures depending on the year. One-quarter of the highest-spending 10% for total health expenditures remained in the top decile in the next year, whereas 21% of them moved to the bottom half in the subsequent year. Half of the highest 10% of drug spenders retained this ranking and 9% moved to the bottom 50% in the next year. Prior expenditures and Charlson comorbidity scores, but not functional status, were strong predictors of the level of future expenditures. **CONCLUSION:** Overall health care and drug expenditures were highly concentrated and persistent over a two-year period in this AD population. Prescription drug expenditures exhibited less concentration but more persistence than did overall health expenditures. Results from this study may further our knowledge of how expected high expenditures in AD patients may be reduced with improved care coordination and effective case management.

PND17

SEVERITY OF ILLNESS AMONG PERSONS WITH AND WITHOUT MULTIPLE SCLEROSIS: AN ANALYSIS OF COST QUINTILES

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Retrospective claims databases often lack disease severity measures. As a proxy for illness severity, a quintile analysis of employees with multiple sclerosis (MS) was conducted. A 2001–2007 U.S. health care claims database was used to identify employees with MS (ICD-9 code=340.XX). Subjects were followed for 1 year after their index dates, based on the first disease-modifying therapy (DMT) prescription (IFNâ-1a [SC or IM], IFNâ-1b, or glatiramer acetate) or for those with no therapy, the average date of those treated. MS-specific medical costs were defined as total claims costs with primary ICD-9=340.XX. MS-specific drug costs were defined as all DMT expenditures. Employees were rank ordered by MS-specific (medical and drug) costs and assigned to cost quintiles. In total, 765 employees with MS were analyzed, and 71.9% (n = 550) with lowest cost (Quintile 1) incurred $1593 in MS-specific (medical and drug) costs/employee. Quintiles 2–4 (8.9%, 8.0%,

and 6.8% of patients, respectively) incurred MS-specific costs of $12,830, $14,348, and $17,028/employee, respectively. Finally, employees in Quintile 5 (highest cost, 4.4%, n = 34) incurred MS-specific costs of $26,048/employee. Only 18% of Quintile 1 had DMT, all subjects in Quintiles 2–4 used DMTs, and 8.8% of Quintile 5 used no DMTs. Although not used for quintile assignments, "other conditions" costs/employee were higher in higher cost quintiles, and Quintile 5 non-MS drug costs/employee were 6.1–8.6 times higher than Quintiles 1–4. Similarly, indirect costs were generally higher in the more expensive quintiles. Average ages were similar between quintiles. Quintile 5 was only 47.1% female, while other quintiles were >60% female. Wide variation in MS-specific and non-specific costs exists among employees with MS. However, patients in the highest cost quintile may have the most severe disease, suffer from multiple conditions and receive other drug treatments. Further investigation is needed to understand the impact of comorbid conditions on severity.

PND18

HIGHER INPATIENT COSTS AMONG PATIENTS WITH SUBARACHNOID HEMORRHAGE COMPLICATED BY VASOSPASM

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OBJECTIVE: Vasospasm is a common complication of aneurysmal subarachnoid hemorrhage (SAH), but its economic impact has not been studied. In this study, we estimated the incremental impact of angiographic and clinical vasospasm on inpatient costs and length of stay (LOS) in a cohort of patients hospitalized for SAH. **METHODS:** The study cohort consisted of 198 consecutive patients who underwent either endovascular or surgical treatment for SAH at Duke University Medical Center (DUMC) from February 1999 to October 2004. Patients were divided into three subgroups: clinical (+angiographic) vasospasm (n = 64), angiographic vasospasm only (n = 51), and patients without vasospasm (n = 83). Direct and overhead inpatient costs were obtained from the DUMC cost accounting system. Costs for physician services were assigned using 2006 Medicare reimbursement rates for North Carolina based on CPT codes billed for physician services provided to patients in the study cohort. Generalized linear regression models were applied to assess the incremental impact of vasospasm on inpatient costs and LOS while adjusting for potentially confounding variables. A counterfactual approach was applied to estimate the adjusted mean cost difference between subgroups defined by the presence or absence of vasospasm. **RESULTS:** The adjusted incremental cost attributable to clinical vasospasm was $41,877, a 41% increase relative to no vasospasm (95% CI: 23–62%, $p < 0.0001$). Angiographic vasospasm was associated with a $24,528 incremental cost, a 24% increase (95% CI: 7–44%, $p = 0.0043$). LOS was estimated to be 6.3 days or 39% longer with clinical vasospasm (95% CI: 21–61%, $p < 0.0001$), and 4.5 days or 28% longer with angiographic vasospasm (95% CI: 9–50%, $p = 0.0026$) relative to no vasospasm. Higher costs related to vasospasm remained significant after adjusting for differences in LOS. **CONCLUSION:** Patients with clinical and/or angiographic vasospasm incur higher inpatient costs than those without due to longer hospital stays and receipt of higher intensity care.

PND19

THE ECONOMIC IMPACT OF ACUTE MEDICATION OVERUSE AMONG PATIENTS WITH MIGRAINE OR HEADACHE: A MANAGED CARE PERSPECTIVE

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OBJECTIVE: To determine the economic impact of acute medication overuse among members with migraine or headache enrolled in a large, national managed care organization (MCO). **METHODS:** Commercial MCO members with a diagnosis of migraine or headache and acute medication prescriptions from 2002–2006 comprised the study population. A novel claims-based algorithm based on literature review and clinical expert input was created to establish thresholds of potential overuse. Two cohorts were identified: members with evidence of acute medication overuse (MO) and members without evidence of medication overuse (non-MO). Cohorts were followed over variable time periods and compared on demographics, comorbidities, health care resource utilization and costs. **RESULTS:** A total of 17,202 individuals met the criteria for medication overuse, 45,659 comprised the non-MO cohort. Most MO patients met the criteria for medication overuse by exceeding the threshold for opiates (62%) or triptans (38%). The MO cohort had significantly greater migraine/headache-related and all-cause resource utilization compared with the non-MO cohort. On a per subject per month basis, all-cause medical costs for the MO cohort were $1236 compared with $185 for the non-MO cohort (<0.0001); all-cause pharmacy costs were $483 for the MO cohort and $105 for the non-MO cohort (<0.0001). For migraine/headache-related medical and pharmacy costs, total medical costs per subject per month were $209 for the MO cohort and $33 (<0.0001) for the non-MO cohort, while pharmacy costs were $286 for the MO cohort and $46 (<0.0001) for the non-MO cohort. **CONCLUSION:** Members of this MCO with migraine or headache who overused acute medications utilized more health care resources and incurred greater costs compared with members without acute medication overuse. These results suggest the possibility that alternate treatment strategies that decrease medication overuse may result in less health care resource utilization and lower costs.

PND20

ECONOMIC CONSEQUENCES OF MULTIPLE SCLEROSIS: A POPULATION-BASED STUDY

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OBJECTIVE: Little is known about medical expenditures in the multiple sclerosis population after the introduction of expensive disease modifying agents in the 1990s. This study examines new data from 2000–2005 population-based survey of MS to provide estimates of health services utilization by disease severity and controlling for other risk factors. **METHODS:** We used a subsample (n = 919) of patients with relapsing remitting and secondary progressive MS from the Sonya Slifka Longitudinal Multiple Sclerosis Study that follows a nationally representative cohort of MS patients. We examined utilization of hospital and outpatient care, emergency room (ER), therapy, mental health services, alternative medicine, home health and personal care. For most utilization categories, we used log-linear negative binomial regression models to estimate mean utilization, accounted for possible correlation of observations for the same person by using

robust standard errors, and applied baseline sampling weights to obtain estimates representative for the entire US population with MS. For provider visits and amount of personal care (conditional on using it), we estimated similar GLS Gaussian models with logarithmic transformation of the number of services as dependent variable. **RESULTS:** Use of most medical services increased significantly with the worsening of MS. However, patients with severe MS (EDSS > 7.0) used the same or fewer services than patients with EDSS 6.5–7 except for home health and personal care. Having relapses significantly increased use of most categories of health services. Longer time since diagnosis, after adjusting for MS stage, was associated with a lower level of utilization of ER, hospital outpatient care, therapy, and alternative medicine. Patients who were not married generally used more services than married patients. **CONCLUSION:** While MS places a substantial financial burden on individuals as well as private and public payers, use of specific categories of health services varies significantly with MS severity, presence of relapses, and availability of informal help.

PND21

COST-UTILITY OF PRAMIPEXOL COMPARED WITH L-DOPA/CARBIDOPA IN THE TREATMENT OF PARKINSON'S DISEASE IN MEXICO

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OBJECTIVE: The population over 60 years old is increasing in Mexico, and thus, the prevalence of chronic-degenerative diseases such as the Parkinson's Disease is increasing. The objective of this study was to compare the cost-utility of the treatment with pramipexol vs. the treatment with l-dopa/carbidopa and sustained release l-dopa/carbidopa, from an institutional perspective in Mexico. **METHODS:** A cost-utility analysis was performed using a decision tree model that simulates the cost and Quality Adjusted Life Years (QALYs) for a hypothetical cohort of patients recently diagnosed with Parkinson's Disease, considering development or not of dyskinesias throughout a temporary horizon of four years. The utilities for each health state were obtained from reports in international literature. The model also considers changes in drug's dosage or the possibility that the patient received treatment with both drugs, according to the response and associated adverse events. Only annual costs per drug were considered for this analysis, as the rest of the costs are similar for buyers. Costs were estimated using 2006 prices and are expressed in US dollars (exchange rate of 10.9 pesos per US dollar). **RESULTS:** It was estimated that a patient treated with pramipexol would have 3.07 QALYs on average vs. 1.96 QALYs for a patient treated with L-DOPA/carbidopa, and 1.98 QALYs for sustained release L-DOPA/carbidopa. Annual costs associated with each treatment are $1177.50 for pramipexol, $225.60 for L-DOPA/carbidopa and $449.90 for sustained release L-DOPA/carbidopa. The incremental cost per QALY gained was $3441.70 for pramipexol vs. l-dopa/carbidopa and $2649.8 for pramipexol compared with sustained release l-dopa/carbidopa. **CONCLUSION:** In Mexico, the treatment with pramipexol is a highly cost-effective alternative to manage Parkinson's disease considering the WHO cost-effectiveness threshold of 1GDP.

PND22

THE COST OF DISABILITY AND MEDICALLY-RELATED ABSENTEEISM AMONG EMPLOYEES WITH MULTIPLE SCLEROSIS

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OBJECTIVE: Compare annual indirect costs between privately insured USA employees with multiple sclerosis (MS) and matched employee controls. **METHODS:** Employees with ≥1 MS diagnosis (ICD-9-CM: 340.x) after January 1, 2002, ages 18–64 years, were selected from a privately insured claims database containing disability data from 17 USA companies. Employees with MS were matched by age and gender to employee controls without MS. All were required to have continuous health coverage 3 months before MS diagnosis (baseline) and 12 months after (study period). Chi-squared tests were used to compare baseline comorbidities and differences in indirect resource use (disability and medically-related absenteeism). Wilcoxon rank-sum tests were used for univariate comparisons of mean disability and medically-related absenteeism days and associated annual indirect costs during the study period. **RESULTS:** Employees with MS (n = 989) averaged 44 years old, and 66% were female. Compared with employee controls, employees with MS had significantly higher rates of mental health disorders and other neurological disorders and physical disorders as measured by the Charlson Comorbidity Index. Employees with MS were more likely to have short-term or long-term disability compared to employee controls (21.4% vs 5.2%, respectively; $P < 0.0001$), resulting in a higher mean number of disability days per year (29.8 vs 4.5, respectively, $P < 0.0001$). Employees with MS also had a higher rate of medically-related absenteeism and associated absenteeism days compared to employee controls. On average, annual costs for disability were significantly higher for employees with MS ($3868) compared with employee controls ($414); $P < 0.0001$. Medically-related absenteeism costs were also higher for employees with MS compared with controls ($1901 vs $1003, respectively; $P < 0.0001$). On average, total indirect costs for employees with MS was $5769 compared with controls, $1417 ($P < 0.0001$). **CONCLUSION:** Indirect costs of employees with MS were >4 times those of employee controls. Effective treatments may reduce the burden of this disease in the workplace.

PND23

MIGRAINE SUFFERERS SHOW SIGNIFICANT HEALTH CARE UTILIZATION AND EXPENDITURES

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OBJECTIVE: Migraines afflict about 30 million people in the United States. Determining how migraineurs differ from non-migraneurs from the viewpoint of health resource utilization may provide insights that could lead to more effective care strategies. The objective of this study is to compare resource utilization between migraineurs and non-migraineurs. **METHODS:** Caremark administrative pharmacy and medical claims data were analyzed in this study over a one year period. Individuals with at least one migraine medical claim (ICD-9 of 346.xx) and one triptan/ergot claim were used to identify participants with Migraine. Propensity score matching was used to sample participants without migraine (controls) matched for age, gender, and number of co-morbidities. Outcomes included number of visits and expenditures associated with office visits (MD), emergency

room visits (ER), hospitalizations (HOS) using medical claims data, and prescription costs (Rx) using pharmacy claims data. Analysis of covariance was used to determine differences in health care use and expenditures, adjusting for age, gender, and number of co-morbidities. **RESULTS:** There were 13,796 participants in the analysis. Baseline characteristics (age, gender, and number of co-morbidities) were comparable in the two groups after matching. Eighty percent of migraine participants identified were female. Analyses involving the complete models showed that migraineurs incurred significantly higher expenditure than non-migraineurs. After adjusting for age, sex and number of co-morbidities, migraineurs had significantly more ER visits per year (0.7 vs. 0.2, $p < 0.0001$). Annual ER, HOS, and Total expenditures were significantly higher in the Migraine cohort (ER: \$480 vs. \$125, $p < 0.0001$ and HOS: \$980 vs. \$588, $p < 0.00001$ and Total: \$4233 vs. \$2004, $p < 0.0001$). **CONCLUSION:** Migraine patients utilize more health care resources and incur higher health care expenditures. Study findings highlight the benefits to be realized by managing individuals with migraine.

NEUROLOGICAL DISORDERS— Patient-Reported Outcomes

PND24

IMPACT OF NON-ADHERENCE TO ANTIEPILEPTIC DRUGS ON MORBIDITY

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OBJECTIVE: Medication non-adherence among patients with chronic conditions can have both clinical and economic consequences. The objective is to investigate whether non-adherence to antiepileptic drugs (AEDs) is associated with increased morbidity relative to adherence, as proxied by health care utilization and costs, in a Medicaid population with epilepsy. **METHODS:** A retrospective open-cohort design using state Medicaid claims data from Florida, Iowa and New Jersey in the period of January 1997–June 2006 was employed. Patients aged ≥18 with ≥1 diagnosis of epilepsy, ≥1 neurologist visit, ≥2 AED dispensings, and ≥6 months of baseline period were included. Medication possession ratio (MPR) was used to evaluate AED adherence on a quarterly basis with MPR ≥0.8 considered adherent and <0.8 non-adherent. The association of non-adherence with health care utilization was assessed using univariate and multivariate Poisson regressions to model frequency of hospitalizations, inpatient days, emergency room (ER), and outpatient visits per person-year of observation. Quarterly per-patient inpatient, outpatient, ER, and pharmacy costs were calculated across non-adherent and adherent quarters for the under-65 population and cost differences computed. Adjusted incremental costs of non-adherence were estimated with multivariate Tobit regression models. **RESULTS:** A total of 33,658 patients met the study inclusion criteria (28,470 under-65), together contributing 388,564 (74%) adherent and 136,550 (26%) non-adherent quarters. Non-adherence was associated with significantly higher incidence of hospitalizations (incidence rate ratio [IRR] = 1.39, 95% confidence interval [CI] = 1.37–1.41), inpatient days (IRR = 1.76, 95% CI = 1.75–1.78), and ER visits (IRR = 1.19. 95% CI = 1.18–1.21). Non-adherence was associated with positive quarterly incremental costs related to serious outcomes, including inpatient (\$4320, 95% CI = \$4077–\$4564) and ER (\$303, 95% CI = \$273–\$334) services. **CONCLUSION:** Non-adherence to AEDs is relatively common and appears to be associated with increased morbidity as represented by higher health care utilization and costs.

PND25

EXPLORING THE RELATIONSHIP BETWEEN DIFFERENT DISPENSING SYSTEMS AND MEDICATION COMPLIANCE AND PERSISTENCY IN MULTIPLE SCLEROSIS PATIENTS USING PHARMACY CLAIMS DATA

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OBJECTIVE: Our study explores the relationship between 30-day and 90-day pharmacy dispensing systems and patient medication compliance, persistency, and financial incentive. **METHODS:** Retrospective pharmacy claims data of multiple sclerosis (MS) patients using four different medications were extracted from a pharmacy database. Patients were followed one year. Compliance was measured using the medication possession ratio (MPR), calculated using the ISPOR method. Anniversary method and Kaplan-Meier survival curves were applied to describe patients' persistency. Associations with drop-off and different systems were assessed using Cox regression model. Wilcoxon-Mann-Whitney test was used to compare the mean patient out-of-pocket and payers' costs for two systems. **RESULTS:** Study sample consisted of 29,808 eligible MS patients predominantly female (77.01%), mean age of 48.4 years. Therapy-specific MPRs on the 30-day and the 90-day system, respectively, were 89.39% and 93.77% with a hazard ratio (HR) for drop-off of 1.657 for Interferon beta-1a (Avonex), 82.72% vs. 88.92% (HR = 1.486) for Interferon beta-1b, 81.48% vs. 88.21% (HR = 1.480) for glatiramer acetate and 87.46% vs. 90.73% (HR = 1.606) for Interferon beta-1a (Rebif). Overall MPR comparison between 30-day and 90-day was 85.55% vs. 90.79% (HR = 1.557). Cost per dose for patients out-of-pocket and payers for a 30-day supply was \$70.78 and \$1402.10, respectively. In contrast, a 90-day supply was \$30.59 and \$1404.70, respectively. Significance tests showed the comparison was statistically significant at level 0.05, except comparison between payer's costs with a p-value of 0.46. **CONCLUSION:** MS patients using 90-day have higher MPR than patients using 30-day. The patients using 30-day are more likely to drop off, with a 55.7% higher risk of discontinuation. Results suggest that providing a 90-day supply improves MS patients' compliance and persistency within the one-year study period. Patients spend less when using 90-day system. Future study focuses on pharmacoeconomic impact of the dispensing system, incorporating outcome variables for MS patients' quality of life.

PND26

COMPARISON OF COMPLIANCE AND PERSISTENCE WITH IMMUNOMODULATING AGENTS FOR MULTIPLE SCLEROSIS IN A COMMERCIALLY INSURED POPULATION

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OBJECTIVE: To examine compliance rates, measured with the medication possession ratio (MPR) and 12-month persistence rates of patients initiating 1 of 4 immunomodulating treatments for multiple sclerosis (MS). **METHODS:** The study population consisted of patients aged 18–64 years initiating MS treatment from January 2, 2004, to July 5, 2005. Patients were identified from an administrative claims database (PharMetrics, Inc.,

Watertown, MA). Patients had continuous health plan enrollment for ≥12 months before and ≥15 months after their first MS prescription. The proportion of patients with MPR >85% (appropriate compliance) and 12-month persistence rates (proportion of patients with drug therapy at month 12 without a lapse of therapy >90 d) were evaluated across 4 treatment groups: interferon beta (IFNβ)-1a subcutaneous (SC), IFNβ-1a intramuscular (IM), IFNβ-1b, and glatiramer acetate (GA). Treatment comparisons were evaluated by using Wilcoxon rank sum and chi-square tests for continuous and dichotomous variables, respectively. **RESULTS:** Immunomodulating treatment was initiated in 3195 patients (IFNβ-1a SC, n = 799; IFNβ-1a IM, n = 905; IFNβ-1b, n = 344, and GA, n = 1147). Sex, geographic region, and health plan and product types were similar across all treatment groups. Mean age was statistically higher in the IFNβ-1a IM groups vs the IFNβ-1a SC and GA groups (44.9 vs 43.5 and 43.8 y, respectively, $P < 0.01$) but not with the IFNβ-1b group (44.4 y). Compliance (MPR ≥ 85%) was significantly higher with IFNβ-1a SC vs IFNβ-1b (49.7% vs 39.8%; $P = 0.002$) but not with GA (45.7%) or IFNβ-1a IM (48.1%). IFNβ-1a SC patients had a persistence rate of 60.3%, significantly higher than that of IFNβ-1a IM (54.9%) and IFNβ-1b (52.9%; $P < 0.03$, for both) but not GA (60.5%; $P = 0.936$). **CONCLUSION:** All 4 groups were comparable in terms of demographic characteristics. Although differences in compliance were less pronounced, the IFNß-1a SC and GA treatment groups had the highest persistence rates.

PND27

RELATIONSHIP BETWEEN GAPS IN DRUG TREATMENT FOR MULTIPLE SCLEROSIS AND INCIDENCE OF EXACERBATIONS: FINDINGS FROM A NATIONAL MANAGED CARE DATABASE

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OBJECTIVE: This study examined the relationship between medication gaps and severe MS relapses. **METHODS:** Subjects were selected from the PHARMetrics database if they had at least one MS drug (Avonex®, Betaseron®, Copaxone®, Rebif®) claim from January 1, 2000 through December 31, 2004, and, were continuously eligible for 24-months following their first disease modifying prescription (index date), in addition to 6-months prior to the index date. Subjects were excluded if the were <18 or >65 years of age, exposed to Tysabri® after the index date, had evidence of study medication use in a health care facility, or lived in a long-term care facility. A severe MS relapse was defined as an "MS-related" hospitalization or emergency room visit. Maximum gap in therapy (Maxgap), was defined as the longest continuous period with no evidence of study medication availability (based on dispensing date and days supply). Maxgap was categorized as 0–10 days, 11–89 days, and 90+ days. Covariates included, age, gender, region, and treatment status (new or existing), comorbidities, and therapy type (mono- or multi-drug therapy). **RESULTS:** Subjects (N = 2388) had a mean age of 43.9 years, 76.7% were new patients, 8.1% had at least 1 severe MS relapse over the 24-month study period, and 76.4% were female. Maxgap had a significant odds ratio (OR) of 1.925 (p = 0.007) for the 90+ day group (0–10 day reference). Monotherapy use for the 4 study drugs was associated with reduced risk of severe relapse (ORs between 0.450 and 0.552). Other significant covariates were comorbidity and East region (ORs = 1.090 and 1.495 respectively). Age, gender, and the other regions were not significant at alpha = 0.05. **CONCLUSION:** Gaps in MS drug therapy longer than 90 days are associated with a higher risk of severe MS relapse compared to short or no gaps in treatment.

PND28

IMPROVEMENTS IN QUALITY OF LIFE FOLLOWING TREATMENT WITH BOTULINUM TOXIN TYPE A FOR CERVICAL DYSTONIA

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OBJECTIVE: The objective of this analysis was to evaluate the effect of botulinum toxin type A on quality of life in patients with cervical dystonia. **METHODS:** The study consisted of a 10-week, nonrandomized, open-label period followed by a 10-week, randomized, double-blind, placebo-controlled, multicenter, parallel-group period. Patients were randomized to receive either botulinum toxin type A, at a dose determined by the physician based on the patient's established prestudy treatment regimen and the patient's presentation, or placebo. Patients completed the SF-36 Health Survey to evaluate the following quality of life attributes: physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health. **RESULTS:** A total of 170 patients were randomized to treatment. A significant difference was seen in the change from week 0 to week 6 for the physical functioning domain in which the botulinum toxin group had a mean change of 2.00 (improvement) and the placebo group had a mean change of −3.03 (worsening) (P = 0.036). Botulinum toxin produced greater improvement than placebo for all other domains except social functioning; however, the differences between groups were not significantly different. Rates of adverse events were nearly equivalent between groups (59.1% BoNT-A vs. 58.5% placebo group). **CONCLUSION:** Prior literature indicates that the SF-36 is not a sensitive measure of the change in quality of life due to treatment in the cervical dystonia population. Despite this, the botulinum toxin type A treatment group showed significantly improved physical functioning. Furthermore, important trends were identified in other domains.

PND29

REVIEW OF QUALITY OF LIFE INSTRUMENTS IN MIGRAINE

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OBJECTIVE: Migraine, affecting 11% of the US population, is a vastly under diagnosed and underreported disease. Migraine can impact patients' work and studies, family relationships, social relationships and emotional well-being thus undermining quality of life. A review of quality of life instruments in migraine is summarized. **METHODS:** Review of literature using Pubmed with combinations of search terms 'migraine', 'quality of life', 'questionnaire' was conducted. Articles were selected based on measurement of disability or quality of life in migraine. Fields extracted from articles for each instrument and on the basis of which analyzed included name and type of instrument, applicable age group, types of respondent, means of administration, items and domains, scaling, item selection and psychometric properties. Pediatric versions of questionnaires were not included in the study. **RESULTS:** Of the instruments that were identified 3 were generic, 11 were migraine specific questionnaires for quality of life in migraine and 3 were migraine specific questionnaires testing patients' response to therapy. The average age of participants ranged from 36.5 years to 44 years. The items varied in

range from 5 to 45 with domains ranging from 2 to 8. Quality of life was assessed by most instruments on the basis of physical disability such as the MIDAS and MIGSEV. However, instruments such as HDI and MSQOL have also included emotional disability in the assessment of quality of life. Cronbach's alpha of reported ranged from 0.77 to 0.9 and one or more validities was established in all instruments. **CONCLUSION:** Although all instruments claim to assess the quality of life of patients, not all include physical and emotional functions. The MSQ seems most complete in this aspect, considering the psychometric properties that are reported. In the future, instruments assessing response to therapy should include domains measuring emotional and physical disability to improve treatment schedules.

PND30

PERFORMANCE OF THE EURO QOL 5D (EQ-5D) IN PRIMARY CARE PATIENTS WITH CO-MORBID INSOMNIA

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OBJECTIVE: Use of the EQ-5D in an insomnia population has not been reported before. **METHODS:** Primary care patients (18 to 64 years of age) in a large hospital outpatient clinic were mailed a survey packet containing EQ-5D, Insomnia Severity Index (ISI), and MOS Short Form 36 (SF-36). Patients were selected based on visit(s) to the clinic in the past six months and grouped into one of the following five groups: cardiovascular (CVD), diabetes (D), gastrointestinal (GI), musculoskeletal (MS), and obstructive airways diseases (OAD) based on presence of diagnostic codes related to these chronic conditions in their medical records. **RESULTS:** Of 2,190 surveys mailed, 1,020 responses were received. After controlling for the relevant potential confounders, mean EQ-5D scores (i.e., average health state utilities) for patients with insomnia were 0.68 in cardiovascular group, 0.69 in diabetes group, 0.54 in musculoskeletal group, 0.75 in obstructive airways diseases group, and 0.61 in patients with gastrointestinal disorders. Utilities in patients, who did not screen positive for insomnia in the above groups, were 0.81, 0.82, 0.72, 0.83, and 0.83, respectively. Utilities for health states experienced by patients with severe insomnia were the lowest, with progressively higher scores in patients with milder insomnia, and no insomnia. Correlations between EQ-5D mobility and SF-36 physical function domains, and SF-36 social functioning domains were –0.64 and –0.49, respectively; between EQ-5D pain/discomfort and bodily pain and physical functioning domains of the SF-36 were –0.70 and –0.57, respectively; between EQ-5D anxiety/depression and the SF-36 mental health and vitality domains were –0.71 and –0.58, and between EQ-5DVAS and the SF-36 general health domain was 0.74. **CONCLUSION:** EQ-5D utilities in the insomnia and no-insomnia groups, and the direction and strength of correlations with the SF-36 domains were as hypothesized thereby assuring satisfactory psychometric performance of the EQ-5D and confirming its usefulness for studying utilities in an insomnia population.

PND31

CO-MORBID INSOMNIA IN PRIMARY CARE PATIENTS AFFECTS HEALTH-RELATED QUALITY OF LIFE (HRQL) INDEPENDENT OF OTHER FACTORS

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OBJECTIVE: To understand the association between insomnia and HRQoL after statistically controlling for socio-demographic characteristics, health habits, BMI, a number of medical conditions, and the presence of depressive symptoms. **METHODS:** A sample of primary care patients (18 to 64 years of age) in a large hospital outpatient clinic was mailed a survey packet that contained the MOS Short Form 36 (SF-36), and Insomnia Severity Index (ISI). These patients were selected based on their visit(s) to the clinic in the past six months and grouped into one of the following five groups: cardiovascular (CVD), diabetes (D), gastrointestinal (GI), musculoskeletal (MS), and obstructive airways diseases (OAD) based on the presence of diagnostic codes related to these chronic conditions in their medical records. Group differences in SF-36 domain scores were analyzed using ANOVA techniques. **RESULTS:** Based on 1,020 responses (46.58% response rate), in patients with insomnia, mean SF-36 Physical Component Summary (PCS) scores were: CVD: 37.8 + 2.9; D: 37.6 + 3.9; GI: 45.3 + 2.9; MS: 32.4 + 3.2; OAD: 44.6 + 3.2. Mean Mental Component Summary (MCS) scores were: CVD: 39.2 + 2.6; D: 42.7 + 4.0; GI: 33.9 + 3.8; MS: 41.1 + 3.6; OAD: 41.1 + 3.8. In patients without insomnia PCS scores were: CVD: 47.0 + 2.4; D: 46.4 + 3.3; GI: 49.2 + 2.2; MS: 39.9 + 3.0; OAD: 51.7 + 2.9. In the same patients MCS scores were CVD: 47.5 + 2.1; D: 47.0 + 3.3; GI: 50.0 + 2.9; MS: 50.0 + 3.4; OAD: 45.0 + 3.4. In addition, SF-36 scores for all individual domains in patients with insomnia were lower than those of patients without insomnia across all disease groups. **CONCLUSION:** A significant independent relationship between insomnia and HRQoL remained even after controlling for all relevant potential confounders. No domain of HRQoL was disproportionately influenced by insomnia.

PND32

DETERMINATION OF THE LONGITUDINAL VALIDITY AND MINIMALLY IMPORTANT DIFFERENCE OF THE 8-ITEM PARKINSON'S DISEASE QUESTIONNAIRE (PDQ-8)

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OBJECTIVE: This study was carried out to determine the responsiveness, test-retest reliability and the minimally important difference (MID) of the 8-item Parkinson's disease Questionnaire (PDQ-8) in Asians with Parkinson's disease (PD) in Singapore. **METHODS:** A convenience sample of PD patients attending a tertiary neuroscience clinic in Singapore completed the English or Chinese version of PDQ-8 twice during two different clinic visits. On the second visit, patients also rated changes in their health in general, their PD severity, and the overall impact of PD on their life using a 5-point response scale (i.e., a lot better, a little bit better, about the same, a little bit worse, and a lot worse). **RESULTS:** A total of 98 patients participated in the study. For patients who reported better conditions in the second visit, Cohen's effect size, standardized response mean and responsiveness statistic ranged from 0.21 to 0.58; for patients who experienced worse conditions, the responsiveness index values ranged from 0.24 to 0.68. The intra-class correlation coefficient calculated using stable patients ranged from 0.64 to 0.76. MID values estimated using the anchor-based method ranged from 5.8 to 7.4. **CONCLUSION:** The PDQ-8 instrument is longitudinally valid in Singaporean patients with PD. The MIDs estimated in the study can be used for sample size calculation and interpretation of treatment benefits in clinical trials where the PDQ-8 summary index is used as the primary outcome measure.

PND33

IMPROVED QUALITY OF LIFE AMONG RELAPSING-REMITTING MULTIPLE SCLEROSIS PATIENTS TREATED LONG-TERM WITH GLATIRAMER ACETATE

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OBJECTIVE: To compare health-related quality of life (HRQoL) among relapsing-remitting multiple sclerosis (RRMS) patients receiving long-term glatiramer acetate (GA) treatment with those having similar disease duration but remaining untreated or treated short-term with GA or beta-interferons. **METHODS:** Patients followed in year nine of the prospective, open-label continuation of the US pivotal study of GA were consented for this cross-sectional survey [GA Group] at office visits. MS Surveys were presented for home completion and mail-back. Concurrent RRMS comparators from the North American Research Committee on MS registry were selected by matching 4:1 (untreated) and 1:1 (per treatment) on gender, education level, present age +2 years, and duration of MS (years). Returned postcards affirming participation prompted mailed MS Surveys. Each survey included the validated MS Quality of Life Inventory (MSQLI), and Goodin's MS Questionnaire (disability), satisfaction with life, health, therapy, and sociodemographic characteristics. Matched paired comparisons used Hotelling multivariate T-square analysis and McNemar's test. **RESULTS:** Response rates were 94.8% for GA Group and 78.4% for comparators. The GA Group reported significantly more life satisfaction (Mean [M]: 2.20 vs. 3.03; 95%CI = 0.03, 1.45) and better health on the Mental Component Summary score (M: 49.55 vs. 44.59; 95%CI = –10.43, –0.09) of the SF-36 in the MSQLI than matched untreated comparators. Relative to matched comparators treated with short-term GA or beta-interferons, the GA Group had significantly lower mean disability scores and better health on the Physical Component Summary score of the SF-36 and they reported greater satisfaction with therapy. **CONCLUSION:** This comparative study of HRQOL suggests that patients with RRMS who have been treated with GA long-term have realized more life satisfaction and better mental health than those with a similar disease duration who remain untreated, and their physical function may be better than those who have been treated short-term with GA or beta-interferons.

PND34

ASSOCIATION BETWEEN CHANGE IN OVERALL QUALITY OF LIFE (QOL), DISEASE LEVEL AND FUNCTIONAL STATUS SINCE NATALIZUMAB INITIATION

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OBJECTIVE: To assess the relationship between changes in patient-reported QoL, disease level and functional status after three months on natalizumab (TYSABRI). **METHODS:** MS patients who received their 3rd natalizumab infusion and were enrolled in the manufacturer's restricted distribution program (TOUCH), participated in a 20-minute cross-sectional internet or telephone survey. Outcome measures included overall quality of life (QoL) change since initiating natalizumab using a 3-point scale (1—worse, 2—no change, 3—better), and pre/post disease level and functional status change. Disease level was measured on a 7 point scale: 0—"normal with no limitations on activity" through 6—"wheelchair bound" whereas functional status was measured on a 5 point scale: 1—"able to carry out usual daily activities" through 5—"required assistance". Paired and independent sample t-tests were used based on the outcome metric. **RESULTS:** Results from 319 patients in this ongoing survey (expected $n \geq 400$) indicated that 75% were female. Overall QoL improved among 47% of patients, even in the short time on natalizumab. Only 3% of patients reported a worsening in QoL. On average, these patients were diagnosed with MS 15 years ago compared with the sample mean of 11 years. Increases in mean disease level change scores (0.30 ± 1.13, $p < 0.001$) and functional status change scores (0.36 ± 0.80, $p < 0.001$) were reported, indicating significant improvements. Compared to patients reporting no change or worsening QoL, patients reporting improved QoL had significantly higher mean disease change scores (0.56 ± 1.28 vs. 0.08 ± 0.92, $p < 0.001$) and functional status change scores (0.71 ± 0.82 vs. 0.04 ± 0.63, $p < 0.001$). **CONCLUSION:** After three months on natalizumab, patients reported improvements in overall QoL, disease level and functional status. These outcomes were positively and significantly associated with one another suggesting that, in a real world setting, patients may begin experiencing improvements in disease progression and QoL as early as three months after natalizumab initiation.

PND35

IMPACT OF NATALIZUMAB ON PATIENT OUTCOMES IN MULTIPLE SCLEROSIS: A CROSS-SECTIONAL SURVEY

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OBJECTIVE: To assess multiple sclerosis (MS) patient-reported experiences with natalizumab (TYSABRI) in a real-world setting. **METHODS:** MS patients who received their 3rd natalizumab infusion and were enrolled in the manufacturer's restricted distribution program (TOUCH), participated in a 20-minute cross-sectional internet or telephone survey. Patient-reported measures included an adapted version of the Multiple Sclerosis Impact Scale-29 (MSIS-29), pre/post disease level and functional status scores and prior MS drug use. MSIS-29 responses were modified to measure patient-perceived change since initiating natalizumab. Paired t-tests assessed pre/post changes in disease level and functional status, where positive change indicated improvement. **RESULTS:** Results from 319 patients in this ongoing survey (expected $n \geq 400$) indicated that 75% were female and, on average, were diagnosed with MS over 11 years ago. Almost all (97%) patients used ≥1 MS drug before natalizumab. The most frequently used drugs were: interferon beta-1a (Avonex) (67%), glatiramer acetate (Copaxone) (49%), interferon beta-1b (Betaseron) (36%) and interferon beta-1a (Rebif) (35%). Despite the short treatment duration, there were significant improvements in disease level (0.30 ± 1.13; $t = 4.78$; $p < 0.001$) and functional status (0.36 ± 0.80; $t = 7.96$; $p < 0.001$). MSIS-29 items with greatest reported improvement since initiating natalizumab were: "worries related to MS" (66%), "feeling unwell" (64%), ability to do "physically demanding tasks" (63%), "problems with balance" (61%), "feeling mentally fatigued" (61%) and "difficulties moving about indoors" (60%). Items with least reported improvement were: "tremors of your arms or legs" (49%), "being stuck at home" (49%), "problems sleeping" (49%) and "problems using transport" (42%). On average, patients reported improvement on 13 of 29 (45%) MSIS-29 items. **CONCLUSION:** After only 3 months on natalizumab, patients reported improvements on MSIS-29 items, disease level and functional status. While preliminary, these early results are suggestive of natalizumab's beneficial effect on patients and warrant further long term investigation of its impact on patient outcomes in a real-world setting.

PND36

OBSERVED DIFFERENCES BETWEEN DAILY DIARY AND WEEKLY REPORT OF CYSTIC FIBROSIS SYMPTOMS

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OBJECTIVE: Recent reviews of human memory processes in cognitive psychology suggest that shorter recall periods in patient-reported outcome (PRO) measures capture daily experience more accurately. Few empirical studies quantify patient symptom reporting by length of the recall period. This study compares 7-day recall of symptoms during the past week with 24-hour recall in a daily diary to determine whether the recall period yields significant differences in measures of patient reported symptom occurrence and severity. **METHODS:** The Cystic Fibrosis Respiratory Diary (CFRD) is a recently developed PRO including 13 symptoms (e.g. cough, tiredness, frustration) in which patients record the occurrence and severity of symptoms for six consecutive days using a 24-hour recall period and on the seventh day using a 7-day recall period. Cystic fibrosis patients age 2 and older (parents for children age 11 or younger), completed two diaries while clinically stable and one during a pulmonary exacerbation requiring medical attention beyond their usual care. This analysis identifies how often patients' 7-day recall of symptom occurrence (a symptom-specific item with yes/no response) matches their six day pattern of 24-hour recall (none/any), and compares 7-day recall of symptom severity (4-category response scale, 0 to 3, most severe is 3) to averaged daily 24-hour recall using a paired t-test. **RESULTS:** A total of 1235 week-long symptom observations analyzed from 95 out of 145 diaries completed for all seven days, represent 52 out of 56 participants. A total of 1,080/1235 (87%) of the 7-day recalls of symptom occurrence matched the 6 day none/any pattern of daily 24-hour recall. 7-day recall of symptom severity (Mean, 0.42; SD, 0.77) was greater than averaged daily 24-hour recall (Mean, 0.34; SD, 0.62) ($p < 0.001$). **CONCLUSION:** A 7-day recall period does not produce the same results as daily 24-hour recall in a week-long symptom diary.

PND37

REDUCTIONS IN FREQUENCY AND INTENSITY OF PAIN WITH BOTULINUM TOXIN TYPE A FOR THE TREATMENT OF CERVICAL DYSTONIA

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OBJECTIVE: The objective of this study was to assess reductions in pain frequency and intensity in cervical dystonia patients treated with botulinium toxin (BoNT-A). **METHODS:** A total of 170 patients were randomized to receive (BoNT-A) or placebo as part of a 10-week, double-blind study. Patients assessed their pain frequency on a scale from 0 (never) to 4 (constant) and their pain intensity on a scale from 0 (none) to 4 (very severe). Pain frequency and intensity were measured at follow-up visits at weeks 2, 4, 6, 8, and 10. **RESULTS:** The mean baseline pain frequency scores were 1.79 for the BoNT-A group and 1.91 for the placebo group. The reduction in mean change of pain frequency ranged from –0.19 to –0.37 in the BoNT-A group and from –0.01 to –0.20 in the placebo group. A greater reduction in the mean change in pain frequency was seen at all timepoints in the botulinium toxin group; the difference was statistically significant at week 6 (–0.31 vs –0.01; $P = 0.018$). The mean baseline pain intensity scores were 1.78 in the BoNT-A group and 1.80 in the placebo group. The reduction in the mean change of pain intensity ranged from –0.20 to –0.47 in the BoNT-A group, while the placebo group had an increase in pain intensity at week 6, no change from baseline at week 10, and reductions ranging from –0.06 to –0.18 at other timepoints. The mean change in pain intensity showed a greater reduction at all timepoints in the BoNT-A group compared to placebo, with the difference being statistically significant at week 2 (–0.39 vs –0.07; $P = 0.026$) and week 6 (–0.36 vs 0.06; $P \leq 0.001$). Adverse events rates were nearly equivalent between groups (59.1% BoNT-A vs. 58.5% placebo group). **CONCLUSION:** Treatment with BoNT-A lowered frequency and intensity of patient-assessed pain as compared to placebo.

PND38

EVALUATION OF INTERVIEWER TRAINING FOR AN INTERVIEWER ADMINISTERED PATIENT-REPORTED OUTCOME IN A GLOBAL CLINICAL TRIAL

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OBJECTIVE: Patient reported outcomes (PROs) play an increasingly important role in pharmaceutical clinical trials. The Food and Drug Administration (FDA) recognizes that interviewer training affects PRO study results. Further, the FDA asserts that implementation of standardized interviewer training can optimize study quality by minimizing inconsistencies in trial conduct. Presently, there is no standard PRO interviewer training method, and many registration trials neglect this important aspect of ensuring quality data. To test the effectiveness of such training, United BioSource Corporation (UBC) analyzed outcomes of PRO interviewer training in a global clinical trial. **METHODS:** United BioSource Corporation worked in conjunction with a pharmaceutical sponsor to develop a training program for an interviewer administered PRO designed to assess symptom severity and resultant distress to patients. Custom training on instrument content, format and administration guidelines was provided to 519 potential interviewers live (70%) at 4 separate investigator meetings (Nashville, Geneva, Kuala Lumpur, Buenos Aires), or via the internet for those unable to attend an IM (30%). Following training, interviewer knowledge was independently assessed using an exam specifically created for that purpose. **RESULTS:** A total of 519 interviewers completed the training. Seventy-four percent of interviewers had no previous instrument specific experience. A total of 506 (97.5%) demonstrated scale knowledge mastery (80% or greater). As shown by one-way ANOVAs, performance was not affected by nationality, clinical experience, clinical trials experience, or prior experience with the instrument (all F ratios <1). **CONCLUSION:** We report the global delivery of a comprehensive PRO interviewer training package consistent with FDA goals. The study suggests that comprehensive PRO interviewer training is feasible in multinational trials, is effective in live or remote delivery platforms, and results in high levels of demonstrable scale knowledge across a wide range of clinical and research experience levels.

PND39

PATIENT- AND PHYSICIAN-ASSESSED FUNCTIONAL DISABILITY IN PATIENTS TREATED WITH BOTULINUM TOXIN TYPE A FOR CERVICAL DYSTONIA

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OBJECTIVE: The objective of this analysis was to evaluate functional disability in patients with cervical dystonia. **METHODS:** The study consisted of a 10-week, non-randomized, open-label

period followed by a 10-week, randomized, double-blind, placebo-controlled period. A total of 170 patients were randomized to receive a physician-determined dose of botulinium toxin type A (BoNT-A) or placebo. Functional disability was measured by patients and physicians using a scale from 0 (no functional disability) to 4 (very severe disability). Functional disability was measured at study visits at weeks 2, 4, 6, 8, and 10 of the randomized, double-blind period of the study. **RESULTS:** The baseline mean physician-assessed functional disability scores were 1.87 for botulinium toxin and 1.88 for placebo. The mean change in physician-assessed functional disability showed a greater reduction in the BoNT-A group compared with the placebo group at all timepoints, with the difference being significant at weeks 4, 6, and 8 ($P \leq 0.029$). A higher proportion of patients had a decrease of one grade or more in physician-assessed functional disability in the BoNT-A group at all time periods. The baseline mean patient-assessed functional disability scores were 1.95 in the BoNT-A group and 1.78 in the placebo group. A greater reduction in the mean change of patient-assessed functional disability was seen with BoNT-A compared with placebo at all timepoints. The patient-assessed functional disability between the two groups was significantly different at weeks 2, 6, 8, and 10 ($P \leq 0.008$). A one grade or greater reduction in patient-assessed functional disability was experienced by a higher proportion of botulinium toxin patients at all timepoints compared with placebo. Rates of adverse events were nearly equivalent between groups (59.1% BoNT-A vs. 58.5% placebo group). **CONCLUSION:** Treatment with BoNT-A showed significant and sustained improvements in functional disability when assessed by both the physician and the patient.

PND40

PHYSICAL AND PATIENT REPORTED OUTCOMES IN MULTIPLE SCLEROSIS

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OBJECTIVE: Most Multiple Sclerosis (MS) clinical trials focus on relapses and MRI measures of disease activity. Disease outcome measures in clinical trials and practice focus on physical outcomes and, in particular, the ambulation oriented Expanded Disability Severity Scale (EDSS). This study evaluated the relationships between various physical and patient reported outcomes (PROs) in MS patients. **METHODS:** Charts were abstracted for 98 MS patients in a single MS center that captured both physician-evaluated outcomes and PROs. This study reports the last available evaluation. Spearman rank correlations and a recursive partitioning algorithm were used to evaluate relationships between five physical (box/blocks, 9-hole peg, timed walk, Tinetti balance, and EDSS) and 3 PRO (modified fatigue impact scale, Beck depression inventory, and Espworth sleepiness scale) measures in addition to standard demographic and disease characterizing variables. **RESULTS:** The rank correlation between the box/blocks and nine-hole peg tests (standard tests for fine motor control) was 0.9 ($p < 0.001$) while the rank correlation between box/blocks and timed walk was 0.71 ($p < 0.001$). Moderate correlations were observed for the PROs: fatigue and depression was 0.57 ($p < 0.001$); fatigue and sleepiness was 0.52 ($p < 0.001$); and depression and sleepiness was 0.39 ($p < 0.001$). No significant correlations were observed between either depression or sleepiness and any physical outcome measure. Fatigue was correlated with 9-hole peg (0.41, $p = 0.023$), timed walk (0.44, $p = 0.014$), and EDSS (0.34, $p = 0.013$). The recursive partitioning algorithm found the strongest physical outcome associated with fatigue to be EDSS and the best split was at EDSS <= ("minimal" versus "mild" disability). **CONCLUSION:** Moderate correlations were found within the physical outcome measures and within PROs; but the relationship between physical outcomes and PROs was weak. Because most clinical trials and evaluating neurologists focus on physical measures in MS, it is likely that much of the disease impact is being missed.

PND41

PHYSICIAN AND PATIENT REPORTED OUTCOMES REVEAL RAPID ONSET OF IMPROVEMENT AND OVERALL CONVENIENCE, TOLERABILITY AND EASE-OF-USE WITH RASAGILINE IN PARKINSON'S DISEASE (PD) IN LEGATO

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OBJECTIVE: To evaluate investigator and patient-reported satisfaction and ease-of-use of Azilect(r) (rasagiline tablets) in community neurological practices. Rasagiline is a potent, once daily, novel, irreversible MAO-B inhibitor approved for PD as initial monotherapy or adjunct therapy. Pivotal trials showed improvement in the Unified Parkinson's Disease Rating Scale for monotherapy and reduced OFF time for adjunct therapy. Other measures of patient- and investigator-reported outcomes may be important such as ease-of-use and patient satisfaction. **METHODS:** LEGATO is an open-label study of once-daily rasagiline 0.5 mg and 1 mg in PD patients at 38 community-based centers. Baseline treatment determined patients' stratification to adjunct or monotherapy. Evaluations were at weeks 1, 2, 4, and 12. Endpoints included: patient and investigator reported Clinical Global Improvement(CGI) score; investigator-and patient-reported change from baseline in Schwab & England Activities of Daily (ADL) score; and investigator-and patient-reported satisfaction/ease-of-use ratings. **RESULTS:** A total of 272 patients were enrolled: 123 monotherapy patients and 149 adjunct patients with 245 completers. At all visits, investigator reported CGI was significantly improved for both mono and adjunct therapy ($p < 0.001$). At all visits, patient reported CGI was also significantly improved for both mono and adjunct therapy ($p < 0.001$). Patient-reported CGI was similar to Investigators', although maximal improvement occurred later for patients. Median satisfaction/ease-of-use scores were 9 for monotherapy (range 6 to 30 with 6 being best) and 10 for adjunct therapy (range of 8 to 40 with 8 being best) for both patients and investigators. Investigators noted statistically significant improvement in ADL of 3 points at the end of 12 weeks, whereas patients did not note changes from baseline. **CONCLUSION:** Both investigators and patients noted significant effectiveness beginning at week one as measured by CGI, found rasagiline convenient and easy to use, and were satisfied with the dosing frequency and tolerability of once-daily rasagiline.

PND42

THE DEVELOPMENT OF A PATIENT SATISFACTION INSTRUMENT FOR INSOMNIA: A PSYCHOMETRIC APPROACH

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OBJECTIVE: The purpose of this study was to develop an instrument to assess treatment satisfaction for patients with insomnia. **METHODS:** Specific patient satisfaction items were identified from the existing literature by an expert panel of physicians,

researchers, and clinicians. Two focus groups containing eight to ten patients who met the inclusion criteria for insomnia (diagnosis, history) were surveyed. A preliminary instrument containing 42 items (scale: 1 = not important at all to 5 = extremely important), including demographic characteristics and co-morbidities, was developed and then pretested in 14 additional patients prior to validation testing. **RESULTS:** Currently, 109 patients have participated in the testing of the instrument (mean age 50 + 11.5 years, 67.9% female). Principal components exploratory factor analysis (KMO = 0.85) reduced the instrument to 17 items (Cronbach á = 0.90) in 5 domains. Cronbach á for the 5 domains (contentment, dosing flexibility, outlook, value, and treatment satisfaction) ranged from 0.73 to 0.86. Convergent and discriminant validity were assessed to determine scale acceptability for further analysis. Goodness of fit measures for the measurement model (AMOS, version 7) were $\chi^2 = 50.8$, df = 53, p = 0.559; CFI = 1.00, GFI = 0.94, NFI = 0.92, RMSEA = 0.001, which support the relationship between the data and the hypothesized model. We anticipate recruiting more patients to ensure that the data are consistent. **CONCLUSION:** Preliminary data from the structural equation model revealed a 17-item instrument with 5 important domains (contentment with therapy, dosing flexibility, and outlook with respect to treatment satisfaction and value). Further assessment and validation of the instrument is planned. This novel instrument may provide greater knowledge regarding the impact of psychological domains on treatment satisfaction for patients with insomnia.

PND43

LEVEL OF SATISFACTION OF SPANISH MULTIPLE SCLEROSIS PATIENTS TREATED WITH A NEW FORMULATION OF AVONEX® (INTERFERON BETA-1A 30 MCG INTRAMUSCULAR, ONCE WEEKLY, SOLUTION FOR INJECTION READY TO USE)

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OBJECTIVE: Multiple sclerosis (MS) is a chronic neurodegenerative disease which is the second most frequent cause of neurological disability in young adults. The relapsing forms of the disease are primarily treated with interferon beta or glatiramer acetate. The aim of this study was to evaluate the level of satisfaction of Spanish MS patients treated with the new formulation of Avonex®, and whether this influences adherence. **METHODS:** Data were obtained from the Global Adherence Project, a multicenter open-label, post-marketing surveillance study, performed in 17 centers in Spain. This included assessment of the level of patient and neurologist satisfaction with the new Avonex® formulation after 6 months of therapy. Two questionnaires were administered, one for patients and another for neurologists. The study was approved by ethics committees and patients signed informed consent. Descriptive statistical analyses were performed. **RESULTS:** Of 257 patients included, 57 (22.2%) were treated with Avonex®; 55.4% of patients and 5.9% of neurologists were fully satisfied with the new formulation. Most neurologists (88.3%) had intermediate satisfaction scores. For patients and for neurologists, the most noteworthy aspect of the change of formulation was the ease of use (73.2% and 82.4%, respectively), followed by ease of storage (44.6% and 29.4%), ease of injection (39.3% and 70.6%), less medication administered (25.0% and 11.8%) and for patients only, better tolerability (8.9%). Adherence with Avonex® was 96.4%, the highest among the therapies evaluated. **CONCLUSION:** Both patients and neurologists were satisfied with Avonex® as solution for injection. The most noteworthy aspect was the ease of use. This seems to have a positive influence in the overall patients' adherence to the therapy.

NEUROLOGICAL DISORDERS—Health Care Use & Policy Studies

PND44

CANADIAN PATIENT SURVEY TO ASSESS PATIENTS' PLIGHT TO DYSTONIA DIAGNOSES AND BOTULINUM TOXIN TYPE A TREATMENT

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OBJECTIVE: Assess the types and number of health care professionals seen by patients before diagnosis with dystonia and the length of time from onset of symptoms. Describe the common types of dystonias that are treated by the movement disorder specialists and when appropriate, receive Botulinum Toxin Type A treatment. **METHODS:** Patients with dystonia were asked to complete a 19-question survey developed by the Canadian Movement Disorders Survey Group. Questions included patient demographics, length of time from onset, number and types of physicians seen, other diagnoses made, number treated with Botulinum Toxin Type A and distance traveled. **RESULTS:** In this interim analysis, 550 patients with dystonia were surveyed. Majority of the patients were female (71%), traveling an average of 99 km one-way. Most common dystonia diagnoses were cervical dystonia (51%), hemifacial spasm (20%), and blepharospasm (11%). Common diagnoses made prior to the dystonia diagnoses were nerve/muscle problem (34%), stress/psychological problem (39%), tremor (20%), fibromyalgia (19%), TMJ (16%), joint/tendon problem (15%) and spine (11%). The average number of physicians seen before the dystonia diagnosis was 3.2. Amongst these were family physician (78%), neurologist (78%), movement disorder specialist (29%), chiropractor (18%), eye care doctor (17%), neurosurgeon (11%), and physiotherapist (15%). Most physicians who made the dystonia diagnosis were neurologist (69%) and movement disorder specialist (27%). The average time in years from onset of symptoms to dystonia diagnosis were: cervical dystonia 5.2 (n = 278), blepharospasm 3.5 (n = 60), spasmodic dysphonia 4.0 (n = 10), limb dystonia 1.2 (n = 17), Meige syndrome 2.6 (n = 14), hemifacial spasm 3.2 (n = 112), generalized dystonia 8.0 (n = 8), oromandibular dystonia 5.0 (n = 8). 94% of patients were treated with Botulinum Toxin Type A following their diagnosis with dystonia. **CONCLUSION:** The number of physicians seen and length of time from onset to dystonia diagnosis is substantial. Increased awareness of dystonia at the primary care level may improve these rates.

PND45

USE OF DISEASE-MODIFYING DRUGS IN MULTIPLE SCLEROSIS: A POPULATION BASED STUDY

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OBJECTIVE: Highly expensive disease modifying agents (DMAs) were introduced in the 1990s to reduce the frequency of relapse and to slow disease progression in patients with multiple sclerosis (MS). However, the patterns of DMAs use remain largely unknown. This study examines data from 2001–2005 population-based survey of MS patients to estimate duration of DMA use and switching behavior, controlling for patient risk factors. **METHODS:** We examined patterns of DMA use of 670 patients with relapsing remitting (RR) and secondary progressive (SP) MS from the Sonya Slifka Longitudinal Multiple Sclerosis Study. We generated Kaplan Meier covariate-adjusted estimates

of survival functions, used Cox proportional hazard models, and adjusted standard errors to account for survey design. **RESULTS:** The duration of treatment was not different for the 3 interferons and Copaxone, with 72% of patients continuing with the therapy after 3 years, while 1.7% of patients on Novantrone continued treatment after 3 years. Having SPMS increased the risk of terminating DMA by 67% (p = 0.01) and having moderate disability increased the risk by 77% (p = 0.001) compared with less advanced disease. Older patients and those with longer duration of MS were more likely to stay on DMA. Doctor's advice was the main reason for starting (47%) or stopping (20%) DMA therapy, followed by side effects (10% and 27%, respectively), and burden of drug administration (15% and 10%, respectively). After Avonex, 37% of patients did not take any DMA for at least 6 months, 17% switched to Copaxone and 15% to Rebif. After Betaseron, 51% stayed off DMAs while 19% switched to Copaxone. 37% of Copaxone users switched to no DMA, and 16% switched to Avonex. **CONCLUSION:** The majority of MS patients continued treatment for three years and more. Consistent with the risk of cardiotoxicity associated with long-term use, most patients discontinued Novantrone within three years.

PND46

THE RISKS OF MULTIPLE GENERIC SUBSTITUTION OF ANTIEPILEPTIC DRUGS : THE CASE OF TOPIRAMATE

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OBJECTIVE: Generic substitution of antiepileptic drugs (AEDs) may be problematic in patients receiving multiple generics because variability in drug serum concentrations can induce breakthrough seizures. To investigate clinical consequences of generic substitution of one versus multiple generics of topiramate (Topamax®). **METHODS:** Claims data of Régie de l'assurance-maladie du Québec (RAMQ) from January 2006-October 2007 were used. Patients with epilepsy (ICD-9 345 or 780.3) treated with topiramate (Canadian patent expired January 2006) were selected. An open-cohort person-time design was used to classify the observation period into mutually exclusive periods of brand, single-generic, and multiple-generic use. One-year switching rates of brand-to-generic and switchback-to-brand were computed using Kaplan-Meier methodology. Medical resource utilization (frequency per person–year) was compared among the three periods using multivariate regressions adjusted for demographics, treatment characteristics and comorbidities. **RESULTS:** A total of 948 patients were observed during 1105 person-years (p/y) of brand use, 233 p/y of single-generic use, and 92 p/y of multiple-generic use. Approximately 38% of brand users switched to generic topiramate, of whom 14% switched back to brand. Generic users received on average 1.4 generic versions, with 23% taking two or more versions. Multiple-generic use was associated with increased utilization of both AEDs and non-AED drugs compared to brand (RR = 1.27, 95%CI = 1.24; 1.31) and single-generic use (RR = 1.10, 95%CI = 1.06; 1.13) after covariate adjustment. Multiple-generic use was associated with significantly higher hospitalization rate (0.48 vs. 0.83 visit/p/y, RR = 1.65, 95%CI = 1.28; 2.13) and hospital length of stay (2.6 vs. 3.9 days/p/y, RR = 1.43, 95%CI = 1.27; 1.60), but the effect was less pronounced in single-generic use (hospitalization: RR = 1.08, 95%CI = 0.88; 1.34, length of stay: RR = 1.12, 95%CI = 1.03; 1.23). The risk of head injury or fracture was 5 times higher (HR = 5.43, 95%CI = 4.23; 6.97) following a generic-to-generic switch compared to brand use. **CONCLUSION:** Multiple-generic substitution of topiramate was significantly associated with outcomes, such as hospitalizations, fractures and injuries.

PND47

ARE THERE GENDER AND ETHNIC DISPARITIES IN THE USE OF INSOMNIA PRESCRIPTIONS?

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OBJECTIVE: To examine if pharmacological treatment of insomnia varied with patient's gender, ethnic, or both. **METHODS:** This was a cross-sectional study using data from 2004 National Ambulatory Medical Care Survey (NAMCS) by National Center for Health Statistics. We identified visits at which at least one frequently used insomnia prescription was prescribed as defined from the American Insomnia Association. A series of population-based descriptive analyses were performed to estimate the national weighted frequency of each drug. Weighted chi-square statistics were used to compare insomnia drugs uses by patients with different gender and ethnic characteristics. To provide national estimates, all analyses incorporated sample weights and standard errors corrections to adjust for the complex sampling design employed by NAMCS. **RESULTS:** A total of 910 million outpatient visits were estimated in the US. in 2004. A total of 24.98 million visits at least one insomnia prescription was prescribed including 3.38 million visits(13.6%) with FDA approved benzodiazepine receptor agonist; 8.5 million visits(34.1%) with FDA approved non-benzodiazepine receptor agonist; and 13.1 million visits (52.4%) with antipsychotic medications which is used for insomnia treatment without FDA approved. Female received significant more insomnia prescription than male (16.4 mil. VS. 8.58 mil., P < 0.0001). Patients who are Black and Hispanics received less insomnia prescription than those who are white (P < 0.0001). **CONCLUSION:** The study found a significant gender and ethnic disparities in the use of insomnia prescriptions especially to the use of related costly non-benzodiazepine receptor agonist. The problems of access barriers to health care for the minority population are still significant. The study also provided evidence that the non-FDA approved prescription medications that were used significantly frequent to treat insomnia than currently approved agents. The issue of off-label treatment for sleep has been raised concerns about the adverse effects that develop during the insomnia treatment and limit the efficacy of these medications.

PND48

THE USE OF BOTULINUM TOXIN TYPE A FOR MIGRAINE OR HEADACHE IN THE USA

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OBJECTIVE: Since the early 1990s BoNT-A has been used as prophylaxis treatment for headaches, including migraine. Evidence suggests that this use is primarily in migraine patients who are refractory to other prophylaxis treatments. This analysis aims to evaluate the patterns of use and the characteristics of patients treated with botulinum toxin type A (BoNT-A; BOTOX®; Allergan, Inc, Irvine, CA) for migraine or headache. **METHODS:** A retrospective, database claims analysis examining pharmacy and medical claims from the Source Lx database (WoltersKluwer

Health) was conducted. SourceLX contains linked prescription and diagnosis claims for $35 million patients with insurance coverage from a variety of sources. Data were screened to identify records between December 1, 2005 and November 30, 2006 with a medical claim for BoNT-A (UB92 or CMS1500) and an ICD-9 diagnosis for headache or migraine on the same claim. **RESULTS:** In the 12-month analysis period, approximately 2.88 million people visited a physician for headache or migraine. Only 1754 patients (0.06%) received treatment with BoNT-A; the vast majority (80%) had a specific diagnosis of migraine, not a general diagnosis of headache. BoNT A recipients were between 40–59 years of age (46%) and most were female (83.1%); BoNT-A treatment was most often (84%) prescribed by a neurologist. Fewer (26%) BoNT-A treated users compared to non- BoNT-A users (52%) were using more than one medication to treat headache or migraine symptoms. In BoNT-A users, the use of combination pain medication (≥2 of the following: opioid analgesic, non-narcotic analgesic, topical anesthetic, NSAID or synthetic narcotic) was significantly reduced in the 90 days after BoNT-A treatment ($p < 0.01$). **CONCLUSION:** BoNT-A treated users are mostly migraine sufferers. BoNT A treated patients required less pain medication. Further research needs to be conducted to determine whether BoNT-A impacts overall treatment costs.

SYSTEMIC DISORDERS/CONDITIONS— Clinical Outcomes Studies

PSY1

META-ANALYSIS OF ANTICONVULSANTS, SNRIS AND TCAS IN TREATING NEUROPATHIC PAIN

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OBJECTIVE: To summarize clinical rates in treating neuropathic pain of three drug classes: tricyclic antidepressants (TCAs), serotonin-norepinephrine reuptake inhibitors (SNRIs), and anticonvulsants (ACs). **METHODS:** Patients included adults diagnosed with neuropathic pain experienced >3 months. We accepted double-blinded randomized clinical trials using any drug within these classes against placebo/active comparator. Outcomes reported were pain score changes on a visual analog scale (VAS), partial response and response (30% and 50% reduction, respectively), and ADR dropout rates. Two independent reviewers searched Medline, Embase, and Cochrane databases (inception to 2007), plus references from retrieved articles. Discrepancies were resolved by consensus (adjudication by a third reviewer). Data were extracted/verified similarly. Quality was similarly assessed using Jadad's method. Homogeneity of effects was determined using Chi-square and I-square. Data were combined using a random-effects model. **RESULTS:** From 115 articles, 84 were excluded (45 inappropriate drugs, 20 inappropriate patients, 12 unacceptable designs, five insufficient outcome data, one duplicate, and one not located), leaving 28. Thirteen studies (N = 1257) evaluated ACs (gabapentin, pregabalin), five SNRIs (N = 781), and ten TCAs (N = 249). One evaluated both ACs and TCAs. Quality was 81% ± 21% overall. Weighted mean baseline-endpoint VAS differences were: TCAs = 1.8 (95%CI = 1.2–2.4; 13 studies, N = 249), SNRIs = 2.7 (95%CI = 2.4–3.0; 10 studies, N = 781), and ACs = 2.4 2 were significant and I2 were χ (95%CI = 2.0–2.8; 20 studies, N = 1257). All 63%–90%, indicating heterogeneity. For partial response, we analyzed 17 study arms (N = 1439), nine involving ACs (n = 870), four examining SNRIs (n = 458), and four that studied TCAs (n = 111). Rates were: SNRIs = 66.0% ± 2.2%, ACs = 54.5% ± 3.7%, and TCAs = 49.2% ± 6.6%. For full response, 27 study arms were summarized: SNRIs = 45.9% ± 2.3%, ACs = 36.3% ± 3.2%, and TCAs = 32.3% ± 4.4%. ADR dropout rates were: ACs = 12.3% ± 1.8% (N = 1,259), SNRIs = 12.0% ± 2.3% (N = 732), TCAs = 11.7% ± 2.7% (N = 267). **CONCLUSION:** For all success measures, SNRIs rates were highest, then ACs, then TCAs. Dropout rates were comparable among drug classes.

PSY2

THE DEVELOPMENT OF A STANDARDIZED CLINICAL ALGORYTHMIC PREDICTOR OF WEIGHT LOSS AFTER BARIATRIC SURGERY: DATABASE ANALYSIS ENABLES EMPIRICAL AND STATISTICAL PREDICTION OF THRESHOLD WEIGHT LOSS BY END OF THIRD POST-OPERATIVE PHYSICIAN VISIT

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OBJECTIVE: To use clinician reported data pre- and post-operative in bariatric surgery patients to create an algorithm for the development of a standardized tool, for use by bariatric surgeons within a confidence interval, to determine the maximum weight loss threshold from roux en y surgery by the third physician visit. **METHODS:** Retrospective database analysis (2000–2007) of empirical clinical data, pre- and post-operative, for bariatric patients in Western New York. A multivariate model examined the relationship between % excess body weight lost (BWL) at the first three post-operative visits and % BWL at the sixth post-operative visit (V6), using SAS 9.1. Percent excess BWL was plotted vs. days elapsed from surgery. 179 obese adults (women = 155, 86.6%) received gastric bypass surgery, mean BMI = 53, (SD = 9.6), mean excess body weight at time of procedure = 185 lbs (SD = 65.3). **RESULTS:** Outcomes were available for 158 patients (women = 137, 86.7%) at V6 (mean = 707 days), mean BMI = 35.2 (SD = 7.7), women = 34.7 vs. men = 38.1. Mean % excess BWL at V6 was 60% (SD = 18%). Women had more BWL than men (61% vs. 55%). For females, BWL was maximized at 870 days post-operation, the equation fit for males did not yield an absolute maximum, leveling off at 740 days (monthly change rate < 0.5%/month). Our model included linear and non-linear components to correlate the relationship between the total % excess BWL at V6 and % excess BWL at the first three visits. All variables, except BWL at the second visit, were statistically significant. The algorithm had a predictive accuracy of 94%. **CONCLUSION:** The excess BWL at the third visit is predictive of the final excess BWL, following surgery. Gender and initial BMI displayed significant relationships with final weight loss. The algorithm derived from this sample will support the development of a standardized tool to assist physicians in their post-operative prognosis of gastric bypass patients.

PSY3

A META-ANALYSIS OF RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIALS OF THE EFFICACY OF BOTULINUM TOXIN A FOR THE PROPHYLAXIS OF CHRONIC MIGRAINE HEADACHES

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OBJECTIVE: To assess the ability of BTX-A injections to lower migraine frequency in chronic sufferers. **METHODS:** Two reviewers independently searched PubMed, Google Scholar and Cochrane Library to locate randomized, double-blind, placebo-

controlled trials of BTX-A for chronic migraines. Differences were settled via consensus. Data extraction/verification were managed similarly. The primary outcome was baseline-endpoint change in migraine frequency (number/month). Heterogeneity was assessed using χ^2 and I-squared. Two raters assessed study quality using the Downs-Black scale, with adjudication via consensus. A fixed-effects model combined study results using the standardized mean difference (Cohen's d) in monthly migraine frequency between placebo and BTX-A groups. **RESULTS:** Nine trials (N = 2114; BTX-A = 1388, placebo = 726; 2059 completed their trials) provided data in 19 study arms and 9 placebo arms. The average age was 43 +/– 3, duration of illness was 20 +/– 3 years, average number of migraines was 6.0 +/– 2.1/month, 84% were females. All χ^2 were non-significant; all I-suared were 0, suggesting combinability and confirmed using a fixed-effects model. Quality scores averaged 67% +/– 4% ("fair"; range:62%–75%). The weighted average treatment effect (Cohen's d) of BTX-A over placebo was –0.05 (CI95% = –0.13, 0.03) when measured 30 days after injection, –0.04 (CI95% = –0.12, 0.04) at 60 days, and –0.04 (CI95% = –0.12, 0.04) at 90 days post-injection. Two comparisons out of 57 were significant; one by Relja after 60 days and one by Vo after 90 days. Controlling for placebo effect and stratifying by dose stratification found no significant effect of BTX-A in reducting migraine frequency per month over saline vehicle. **CONCLUSION:** BTX-A used as prophylactic treatment of chronic migraine headaches does not decrease monthly numbers of migraines.

PSY4

THE BALANCE BETWEEN SEVERE CARDIOVASCULAR AND GASTROINTESTINAL EVENTS AMONG USERS OF SELECTIVE AND NON-SELECTIVE NON STEROIDAL ANTI-INFLAMMATORY DRUGS

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OBJECTIVE: To simultaneously assess risk of acute myocardial infarction (AMI), any cardiovascular (CV) and gastrointestinal (GI) events with traditional non-selective NSAIDs (tNSAIDs) and COX-2-inhibitors (coxibs). **METHODS:** Using the PHARMO Record Linkage System, including drug-dispensing and hospitalization data of >2 million residents of The Netherlands, subjects with a first hospitalization for AMI, any CV, and GI diagnoses were identified. NSAID and coxib use was classified into remote, recent and current use. Naproxen users were excluded. Cases were matched to controls in a 1 to 4 ratio on age and date. Multivariate analyses adjusted for gender, history of hospitalizations and medications. **RESULTS:** Compared with remote use, AMI risk was increased among current users of coxibs combined (adjusted OR 1.63, 95% confidence interval 1.24–2.16) and among current users of tNSAIDs combined (adjusted OR 1.29, 95% CI 1.08–1.55). AMI risk with current use of celecoxib (1.63, 1.09 3.54), rofecoxib (1.59, 1.15–2.19), ibuprofen (1.54, 1.13–2.09) and diclofenac (1.43, 1.13–1.82) was significantly increased. Risk of any CV event with current use of celecoxib, rofecoxib, diclofenac and tNSAIDs other than ibuprofen or diclofenac was significantly increased (adjusted OR ranged from 1.22 to 1.70) . GI risk with current use of rofecoxib (1.73, 1.27–2.35), ibuprofen (1.40, 1.00–1.95), diclofenac (4.40, 3.55–5.44) and other tNSAIDs (2.38, 1.86–3.04), but not celecoxib (1.06, 0.47–2.35) was significantly increased. Compared with current use of celecoxib, adjusted AMI and CV risk was not significantly increased with current use of individual coxibs and individual tNSAIDs ,but GI risk was increased with diclofenac (adjusted OR 4.17, 95% C.I. 1.83–9.51). **CONCLUSION:** AMI and CV risk was similarly increased with individual coxibs and tNSAIDs. Use of diclofenac strongly increased GI risk. Residual confounding and "channelling" can not be excluded.

PSY5

CROSS-CULTURAL COMPARISONS OF THE OVERWEIGHT/OBESE POPULATION IN THE US AND EUROPE

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OBJECTIVE: To provide cross-cultural comparisons of health and behavior in obese individuals. **METHODS:** We analyzed data from the 2006 National Health and Wellness Survey, a cross-sectional Internet-based survey conducted annually in the United States and EU (FR, DE, UK, SP and IT). When weighted, the sample is representative of the country's adult population in terms of key sociodemographic characteristics. The survey gathers information regarding demographics, health conditions, quality of life, and health care use. Adults were classified as overweight/obese (OWOB) based on BMI >= 25. Comparisons between groups were conducted using the Chi-square test with a significance level of $p < 0.05$. **RESULTS:** Almost 70% (144 M) of the United States population is OWOB, compared to just over half of Europeans (131 M). In both regions the OWOB populations were typically married and employed, with a mean age of 48 yrs (USA) and 51 yrs (EU) ($p < 0.05$). Both had high rates of cardiovascular co-morbidities and a family history of obesity or diabetes. The majority reported having less than very good health and "some/little/no" energy in the past four weeks. Most had seen a health care provider in the past six months (82% USA vs. 87% EU; $p < 0.05$). Although many claimed to be taking steps to lose weight (62% US vs. 50% EU; $p < 0.05$), most reported weight gain over the past 6 months (30% US vs. 28% EU, $p < 0.05$). Only a small portion reported taking a weight-loss prescription (1.9% US vs. 3.5% EU, $p < 0.05$); but most of the remainder would consider taking one (45% US vs. 36% EU, $p < 0.05$). **CONCLUSION:** The obesity problem is more evident in the United States. Americans exhibit higher rates of obesity at a younger age but have fewer provider visits and use of prescriptions, suggesting potential solutions to the problem.

PSY6

THE PREVALENCE OF PAIN SYMPTOMS AMONG UNITED STATES ADULTS AGED 65 AND OLDER

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OBJECTIVE: Pain symptoms are common among adults aged 65 and older, but prevalence rates have not been updated to reflect current national data. We assess prevalence among U.S. adults aged 65 and older with respect to pain (joint, lower back, neck, severe headaches or migraines) and describe symptoms by gender, obesity, and arthritis status. **METHODS:** Analysis of nationally representative data collected from adults aged 65 and older (n = 3810) participating in the National Health and Nutrition Examination Survey (NHANES) 1999–2004. **RESULTS:** Joint pain and lower back pain are the most frequently reported type of pain, affecting 55% and 38% of elders, respectively. Women are significantly more likely than men

to report joint pain, 59% vs. 49%, lower back pain, 42% vs. 33%, and severe headaches, 12% vs. 6% ($p < 0.0001$ for all pain differences). Knee joint pain is significantly higher in women than men (34% vs. 26%), as is finger joint pain (24% vs. 16%). Obese older adults have a higher prevalence than non-obese elders of knee pain (41% vs. 26%) and shoulder pain (21% vs. 16%). Elders with arthritis are about three times more likely than elders without arthritis to have joint pain of the knee (45% vs.14%), finger (32% vs. 9%), shoulder (26% vs. 8%), and ankle (20% vs. 8%). **CONCLUSION:** Pain symptoms are highly prevalent among older adults, particularly older women. Joint pain disproportionately affects obese and arthritic older adults. These findings call for increased recognition among providers and targeted interventions promoting symptom management and weight reduction.

PSY7

BURDEN OF OBESITY: 10-YEAR REVIEW OF PUBLISHED LITERATURE ON OBESITY PREVALENCE IN NINE COUNTRIES

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OBJECTIVE: To examine data published over the past ten years describing measured and self-reported obesity prevalence among adults in Australia, Canada, France, Germany, Italy, Spain, Sweden, the UK, and the US. **METHODS:** A review of the medical literature published from 1997 to 2007 was conducted, including MEDLINE, EMBASE, Current Contents Connect, and International Pharmaceutical Abstracts databases; ISPOR abstracts; and data published on the Internet by WHO and relevant governmental agencies. **RESULTS:** Prevalence of obesity varies significantly based on the mode of measurement. Studies based on measured weight and height report prevalence 35% to 86% higher than comparable studies based on self-reported weight and height. Obesity prevalence has increased significantly during the past two to three decades for most of the countries reviewed; prevalence in Italy, however, does not appear to have increased dramatically. Rates of increase in prevalence for most countries range from 40% to 60% over the past two decades. The US has the highest prevalence of obesity worldwide (approximately 32%). Australia, Canada, Germany, and the UK also have relatively high obesity prevalence (range: 18% to 23%). France, Italy, Spain, and Sweden have comparatively low obesity prevalence (range: 9% to 15%); however, rates of increase are similar to those of countries with higher obesity prevalence. **CONCLUSION:** Prevalence of obesity varies substantially among these countries. Given the rapid rate of increase in obesity prevalence and the variation between prevalence rates derived from measured and self-reported data, studies based on recently collected measured data are necessary to understand global obesity epidemiology.

PSY8

THE ECONOMIC BURDEN OF SYSTEMIC LUPUS ERYTHEMATOSUS AMONG PATIENTS OF THE CAROLINA LUPUS STUDY EARLY IN THE COURSE OF DISEASE

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OBJECTIVE: Our primary objective was to quantify differences in direct and indirect costs (i.e., costs of health care utilization and costs associated with job loss, respectively), and identify predictors of total cost based upon data provided at the follow-up assessment. **METHODS:** The Carolina Lupus Study is a population-based case-control study of SLE conducted in eastern and central NC and SC. Controls were identified through driver's license records and frequency matched to cases by age, sex, and state. The 2001 follow-up assessed health care utilization in the past 12 months. Health care utilization per-unit annual costs (converted to 2001 US dollars) of 198 SLE patients were compared to those of 299 controls. The natural logarithm was taken of health care services which were used in linear regression to predict factors associated with an increase or decrease in the magnitude of total annual cost for cases and controls. **RESULTS:** Annual mean direct costs for health care was $12,375 (sd $13,723) in cases compared with $3,718 (sd $6,135) in controls ($p < .0001$). The annual mean salary was $21,540 (sd 11215) among the 47 cases and $24,909 (sd 9399) among the nine controls who had stopped working due to health reasons. When averaged across the full follow-up sample (199 cases and 298 controls), the average annual cost of wages lost due to illness was $5,113 and $749 in cases and controls, respectively ($p < 0.0001$). Predictors of higher costs among cases were lower education level (less than high school), renal disease, and serositis. **CONCLUSION:** There are no published studies which compare medical expenditure costs of SLE patients to matched-controls. Health utilization costs were significantly different for nine out of the ten health services and indirect costs between cases and controls were considerable implicating a need for financial support amongst minorities and women, populations disproportionately affected by SLE.

PSY9

RISK FACTORS AND RISKS ASSOCIATED WITH HOSPITAL STAYS IN PATIENTS WITH MYALGIA

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OBJECTIVE: The risk factors for myalgia were examined along with other data associated with these risk factors involving the hospital stay of patients with myalgia. **METHODS:** Data were collected from hospitals around the United States through the NIS, and these data were narrowed down to those patients suffering from myalgia. These data were then analyzed using SAS Enterprise Guide 4. Data visualization techniques, logistic regression and linear models were used to achieve the desired results. **RESULTS:** It was determined that females are the most abundant among myalgia sufferers with a peak age around 56. The male subjects with myalgia had a broad peak of 43 to 65 years of age. This condition has occurred in most women by the age of 58. It was also determined that the Asian/Pacific Islanders demonstrated a peak age of around 70 in comparison to the average age of 58.3. Asians have the lowest probability of accumulating less than $20,000 in total charges and Caucasians, African-Americans, and Native Americans have the highest. Asians also have the highest probability among the races of accumulating between $38,000 and $58,000 in charges. Caucasians were determined to have the least probability of staying less than five days in the hospital and Asians have the highest probability of staying between 11 and 16 days. A linear model revealed that the following DX and DRG codes are significant in predicting total charges and also surround heart and blood conditions: Transfusion of packed cells, anemia (unspecified), venous catheterization (not elsewhere classified), of native coronary artery, congestive heart failure (unspecified), and atrial fibrillation. **CONCLUSION:** There is currently limited data on the risk factors of myalgia and these results will hopefully be a start to learning more about the condition.

PSY10

A NOVEL APPROACH TO ADJUST FOR THE IMPACT ON SURVIVAL RESULTING FROM PATIENT CROSS-OVER FROM CONTROL TO EXPERIMENTAL TREATMENT IN CLINICAL TRIALS

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OBJECTIVE: Clinical trials are often the best source of efficacy data for economic evaluations of medical interventions. However, their reliability can be compromised when patients cross-over from control to experimental treatment. In two trials evaluating lenalidomide (Len) plus high-dose dexamethasone (Dex) vs Dex alone (MM-009/010) in patients with multiple myeloma (MM), 47% of patients in the Dex alone group were switched to Len +/– Dex at disease progression or following study unblinding. Given the significant efficacy benefits of Len + Dex over Dex alone, the trial data will overestimate the survival with Dex alone biasing the results. **METHODS:** External data from the UK Medical Research Council (MRC) MM-IV, V, VI, and VIII trials enrolled between 1980 and 1997 were used to derive an equation reflecting survival without lenalidomide, including prognostic variables to enable adjustment for differences between the MRC and MM-009/010 trials. Applying the MRC equation to the MM-009/010 Dex patient characteristics yielded expected median survival time without cross-over to Len +/– Dex. This was used to calibrate the economic model for the Dex alone group by correcting the scale parameter of the underlying Weibull survival equation, estimated from MM-009/010, assuming the shape parameter remained the same. **RESULTS:** Of 873 MRC patients, 826 died. Exponential survival fit the data, with age, MM performance status, M-protein level, B2M level and time to progression as predictors. Applied to MM-009/010 Dex patient characteristics, this yielded a median survival of 14.9 months (95%CI: 12.3–18.0) (compared to 31 months (95%CI: 25.7–35.1) observed with cross-over in MM-009/010). Incorporating the corrected survival function into the economic model resulted in an estimated incremental 2.8 life-years and 1.9 QALYs gained per patient treated with Len + Dex vs Dex alone. **CONCLUSION:** Using external data to adjust estimation equations can mitigate the impact on economic evaluations resulting from cross-over or other distorting factors in clinical trials.

PSY11

EVALUATION OF ACETAMINOPHEN EXPOSURES REPORTED TO A REGIONAL POISON CONTROL CENTER FOR ADULT PATIENTS

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OBJECTIVE: To describe patient characteristics, doses taken, reason for exposure, time of exposure, treatment and severity of poisoning in adults with acetaminophen-related exposures reported to a regional poison control center (RPCC). **METHODS:** A retrospective review was conducted of all acetaminophen exposures that occurred between October 31, 2000 and October 31, 2003 in adults over 18 years of age who were managed by a RPCC. Data collected included patient demographics, amount ingested, severity of exposure, time since exposure, treatment, reason for exposures, exposure site, and caller site. **RESULTS:** There were 175 exposures to acetaminophen; 72% were females and 28% were males in the study population. There was no significant difference between the mean age of females (31.2 ± 14.0) and males (30.9 ±12.3) in years. The mean dose of acetaminophen taken was 18.7 ± 20.4 grams and no significant difference in the amount ingested between males and females. The majority of the callers seeking information on acetaminophen ingestion were health care professionals (68%). The mean time between the exposure and the call made to the RPCC was 11.27 ± 18.54 hours. Fifty percent of the patients received acetylcysteine therapy, 27.4% received decontamination (e.g., activated charcoal), and 22.3% received other interventions for the treatment of acetaminophen poisoning. Females (72.4%) were more likely ($p < 0.001$) to take intentional overdoses than males (27.6%). The most common acetaminophen exposure site was patient's own residence (96%). The majority of the exposures were acute (86.9%) rather than chronic poisoning. **CONCLUSION:** The main reason for acetaminophen exposure was intentional and females were more likely to ingest intentionally than males. Contacting the RPCC for advice generally occurred beyond the time for optimal acetylcysteine effectiveness. The majority of the exposures were due to acute poisoning.

SYSTEMIC DISORDERS/CONDITIONS—Cost Studies

PSY12

PROJECTED COST OF CARDIOMETABOLIC RISK FACTORS IN COMMERCIALLY INSURED NORMAL AND OVERWEIGHT PRIMARY CARE PATIENTS

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OBJECTIVE: To determine the economic impact of increased prevalence of cardiometabolic risk (CMR) factors including high blood pressure (BP), loss of glycemic control (DB), high triglycerides (TG) and decreased high density lipoproteins (HDL) in commercially insured overweight patients [Body Mass Index (BMI) > 27 kg/m2] compared to normal weight (18 ≥ BMI < 27 kg/m2). **METHODS:** Patients 18–65 years old were identified from an electronic medical record database (EMR) with CMR factors designated by prescription orders or ICD-9 codes and grouped into normal or overweight categories. Similar patients with CMR factors were identified in Medstat MarketScan® administrative claims database. Using a multivariate two-part regression model, costs from this database were estimated for CMR factors. Probabilities of being normal or overweight from the EMR database were applied to the estimated costs to obtain per patient total annual medical costs for CMR factors stratified by normal and overweight groups. **RESULTS:** A total of 75,578 patients with CMR factors were identified in the EMR. Normal [18,213 (24%)] versus overweight patients [57,365 (76%)] were distributed as follows: BP, 29% vs. 71%; DB, 19% vs. 81%; TG, 25% vs. 75%; HDL, 37% vs. 63%; any 2 CMR factors, 13% vs. 87%; any 3 CMR factors, 9% vs. 91%; and all 4 CMR factors, 6% vs. 94%. Estimated costs from the claims database were: high BP, $1630; DB, $1748; high TG's, $638; low HDL, $1474; and $2606, $2801, $3191 for 2, 3, and 4 CMR factors, respectively. Applying the probability of normal or overweight and the estimated costs to the distribution of CMR factors resulted in an

increased projected annual cost of $998 per overweight person with CMR factors. **CONCLUSION:** CMR factors are more prevalent and lead to significantly greater costs in an overweight population. Weight loss interventions of overweight patients may potentially decrease CMR factors and their associated costs.

PSY13

THE HEALTH CARE COST EFFECTS OF DIABETES AMONG OBESE AND MORBIDLY OBESE ADULTS IN THE UNITED STATES

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OBJECTIVE: To determine the extent to which diabetes among obese and morbidly obese subjects affects health care costs, and to determine whether obesity and morbid obesity remain predictors of health care costs after controlling for diabetes. **METHODS:** Data from the Medical Expenditure Panel Survey (MEPS) for 2000–2004 are examined. Multivariate models are estimated to predict the probability of incurring any health care costs and health care costs incurred. These models include obesity and morbid obesity, diabetes, age, education, occupation category and race. Models are estimated separately by gender. Estimates of out-of-pocket, insurer, and total costs are obtained. Both per capita and national aggregate cost estimates are obtained. **RESULTS:** Both out-of-pocket costs rise dramatically among obese and morbidly obese subjects who are diabetic. Relative to healthy weight individuals, out-of-pocket costs for obese diabetics increase by $1002 per annum for females and $1051 for males. The cost increases are even greater among morbidly obese diabetics—$1551 for females and $1555 for males. Insurer costs increase for obese diabetics are $3897 for females and $3651 for males. Among morbidly obese diabetics, these cost increases total $7302 for females and $8008 for males. The aggregate out-of-pocket costs of obesity total $9.7 billion, of which $8.2 billion, or 85%, are incurred by obese or morbidly obese diabetics. Aggregate costs to insurers total $56.3 billion, of which $32.2 billion, or 57%, are due to obese or morbidly obese diabetics. **CONCLUSION:** Obese and morbidly obese diabetics account for a disproportionate share of health care costs among the obese population as a whole. Efforts to prevent diabetes in this population and to reduce diabetes among obese and morbidly obese individuals will lead to very substantial cost savings to insurers and consumers.

PSY14

ECONOMIC EVALUATION OF LENOLIDOMIDE USE FOR MULTIPLE MYELOMA IN SCOTLAND IN PATIENTS WHO HAVE RECEIVED ONE PRIOR THERAPY

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OBJECTIVE: Lenalidomide in combination with high-dose dexamethasone (Len + Dex), yields improved time to progression (TTP) and survival compared to high-dose dexamethasone alone (Dex). This study aimed to estimate long-term health and cost consequences of Len + Dex versus Dex in Scottish patients with multiple myeloma (MM) who have received one prior therapy. **METHODS:** A discrete event simulation of a patient's course following initiation of Len + Dex or Dex was developed. The model uses patient's response (complete, partial, stable disease or progressive disease) and estimates corresponding TTP and subsequent survival based on Weibull functions derived from pooled data from two Phase III randomized clinical trials and long-term outcomes of UK Medical Research Council MM trials. Adverse events and disease management costs are included. Utility by response level was obtained from literature. Patients remain on treatment until relapse. Disease management costs reflect clinical practice in Scotland. Costs and health outcomes are discounted at 3.5% per annum. In the base case, events and costs are considered over two years reflecting trial follow-up (survival is modeled until death). 1000 patients are simulated per analysis. Univariate sensitivity analyses are performed around key model parameters. **RESULTS:** The modeled median TTP is conservative with Len + Dex at 13.5 months compared with 4.7 months with Dex. This translates to QALY gains: 3.19 vs 1.39. Totals costs with Len + Dex were £56,155 compared to £3819 with Dex, leading to an incremental cost-effectiveness ratio of £28,980 per QALY. Sensitivity analyses showed that outcomes remain consistent through broad changes in key parameters. **CONCLUSION:** Lenalidomide delivers significant improvements in quality-adjusted survival in a life-limiting orphan disease and yields an estimated incremental cost per QALY which falls within a cost-effective range.

PSY15

COST-EFFECTIVENESS OF ERYTHROPOIESIS STIMULATING AGENT THERAPY BY HEMOGLOBIN TARGETS IN CHRONIC KIDNEY DISEASE

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OBJECTIVE: To evaluate the cost-effectiveness of Erythropoiesis Stimulating Agent (ESA) therapy by hemoglobin (Hb) targets (Hb < 10, 10–11, 11–12, 12–13, and >13 g/dL) in Chronic Kidney Disease (CKD) considering the complication of cardiovascular diseases (CVD). **METHODS:** Two lifetime decision analyses models for hemodialysis and pre-dialysis patients using backward induction method were developed using parameter values from published literatures and 2006 United States Renal Data System. Direct costs (anemia medication (erythopoietin or darbepoetin), hemodialysis and CVD treatment) and indirect costs (patient and caregiver time cost) were measured in 2006 US Dollars. Effectiveness was measured as quality-adjusted life years (QALYs). All costs and QALYs were discounted at 3% and cost-effectiveness was measured as incremental cost per QALYs gained (ICER). Uncertainty was evaluated using one way sensitivity analyses and threshold analyses. **RESULTS:** For hemodialysis patients who initiated treatment at age 45, higher hemoglobin targets yielded favorable ICERs ($20,050, $90,387, $67,199 and $11,216 for Hb 10–11 compared to Hb < 10, Hb 11–12 compared to Hb 10–11, Hb 12–13 compared to Hb 11–12, and Hb > 13 compared to Hb 12–13, respectively). For pre-dialysis patients, Hb 11–12 and Hb 12–13 were dominant strategies compared to Hb 10–11 and Hb 11–12, and ICER for Hb 12–13 compared to Hb > 13 was $2404. The results were more favorable for older patients and darbepoetin treatment. Results were robust to sensitivity analyses in pre-dialysis model, but sensitive to the CVD probabilities and erythropoietin costs in hemodialysis model. **CONCLUSION:** Anemia treatment with ESA therapy was cost effective even in Hb > 13 for hemodialysis patients using a threshold of ICER $120,000 compared to Hb 12–13. For pre-dialysis patients, treatment to Hb 12–13 was the most cost effective. These results showed that higher treatment targets compared to current national guidelines (maintaining Hb 11–12, not exceeding 13) are associated with favorable cost-effectiveness ratios. This is consistent with Medicare's revised payment policies for ESA treatment.

PSY16

COST-EFFECTIVENESS OF TRANSDERMAL OPIOIDS REGARDING OPIOID-RELATED FRACTURES IN GERMANY—A MODEL APPROACH

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OBJECTIVE: Transdermal (TD) opioids are commonly used to treat various chronic pain conditions. A large register-based study has shown coherence between an increased fracture risk in elderly patients with osteoporosis and prior opioid administration due to side effects impacting on the central nervous system (e.g. dizziness). Thus, the objective is to investigate the cost-effectiveness of TD opioids in elderly patients with chronic pain in Germany, considering the long-term implications of opioid-related fractures. **METHODS:** A Markov model was developed to assess the consequences of hip, spine and forearm fractures related to the prior application of TD buprenorphine or generic TD fentanyl for a maximum of 89 days in patients with chronic pain. Mean costs per patient as well as incremental costs per life year gained and per quality-adjusted life year (QALY) gained were evaluated from both the perspective of the German statutory health insurance (SHI) and the German social security (GSS) over a six year time horizon. **RESULTS:** The Markov simulation predicts both a slightly better survival and higher utility score for TD buprenorphine compared to TD fentanyl (about 5.19 years with almost 4.21 QALYs versus nearly 5.17 years with about 4.19 QALYs). From the SHI perspective, the mean costs per patient after six years amount to €683.96 under TD buprenorphine and €853.55 under TD fentanyl, respectively. From the GSS perspective, the mean costs per patient after six years were €808.29 with TD buprenorphine compared to €1155.90 with TD fentanyl. The model was robust regarding probabilistic variations of all parameters in the sensitivity analyses (50,000 runs, sampling 500 times per run). **CONCLUSION:** Focusing on fractures related to the prior administration of TD opioids, buprenorphine represents a dominant treatment option in the management of patients suffering from chronic pain compared to fentanyl from both the SHI and GSS perspective in Germany.

PSY17

THE COST AND COST EFFECTIVENESS OF DASATINIB (SPRYCEL) THERAPY FOR THE MANAGEMENT OF IMATINIB RESISTANT AND INTOLERANT PATIENTS WITH CHRONIC MYELOID LEUKEMIA (CML) IN MEXICO

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OBJECTIVE: Dasatinib is indicated for the treatment of adults with CML with resistance or intolerance to Imatinib therapy. This study assessed the cost and cost-effectiveness of using Dasatinib when compared with Imatinib for the treatment of individuals with CML in México. **METHODS:** A cost effectiveness life-time Markov model was used to calculate the incremental cost per life year gained (LYG) of the compared therapies. The model follows patients with CML considering the different phases of the disease, adverse events and the resource utilization so generated. There are three different scenarios depending on the phase (chronic, accelerated or blast) patients are started in the model. The Delphi Panel technique was used to provide estimates of the use of health care resources by CML patients within the setting of the Mexican Social Security Institute (IMSS). Transition probabilities and relative risks were estimated from published international literature. The base case analysis was from a health care perspective. Costs of drugs and other health care treatments were obtained from IMSS published information and were discounted at 3%. A one-way sensitivity analysis was performed. **RESULTS:** The economic evaluation showed that in the chronic phase Dasatinib was more effective (LYG difference of .71) and less costly (–USD$35,368) than Imatinib therapy. In the accelerated phase the incremental cost effectiveness ratio (ICER) per life year gained with Dasatinib was USD$36,366 when compared with Imatinib. Finally, in the blast phase the model showed for Dasatinib costs of USD$154,900 and effectiveness of 2.13 LYG and for Imatinib costs of USD$41,927 and 1.58 LYG. These findings were robust to deterministic sensitivity analysis. **CONCLUSION:** In México, Dasatinib is a cost effective therapy for the management of Imatinib resistant patients with CML in the chronic phase. In the accelerated and blast phases Dasatinib generates incremental costs because treatment continues indefinitely due to prolonged survival.

PSY18

A COMPARATIVE COST-EFFECTIVENESS ANALYSIS ON THE USE OF FLECTOR(*r*) PATCH (DICLOFENAC EPOLAMINE TOPICAL PATCH) 1.3% VERSUS LIDODERM® (LIDOCAINE PATCH 5%) FOR THE TREATMENT OF ACUTE PAIN FOLLOWING INJURY

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OBJECTIVE: Acute pain associated with injuries (i.e., sprains, strains, contusions, and low back pain) is treated with non-steroidal anti-inflammatory drugs (NSAIDS) or topical anesthetics. These agents vary in effectiveness, may have gastrointestinal and cardio-renal side effects, and possibly interact with other systemic medications. Diclofenac epolamine topical patch (DETP) is a treatment option with minimal systemic absorption, low risk of adverse drug-drug interactions, and local anti-inflammatory properties. This analysis was designed to determine the cost-effectiveness of DETP versus lidocaine patch in the treatment of acute pain. **METHODS:** A decision analysis methodology was utilized to develop a model which served as an analytical decision support tool, where the expected values of the competing agents were calculated and compared. Published data was used to populate the efficacy and adverse event probabilities for treatment with DETP and lidocaine patch. We adjusted costs to 2007 dollars and used each drug's average daily cost (ADC), as well as overall medical care costs associated with various outcomes. The ADC in this analysis for DETP and lidocaine patch was $7.65 and $14.08, respectively. **RESULTS:** The total drug costs for a two-week duration of DETP and lidocaine patch were $107.10 and $197.12, respectively. The total health care costs (office visits and additional medical services) for therapy with DETP and lidocaine patch were $290.22 and $380.53, respectively. The 2-week course of therapy yielded a resultant cost-effectiveness of $401.42 for DETP and $556.34 for lidocaine patch. When the treatment timeframe was evaluated for 30 days, the cost-effectiveness for DETP and lidocaine patch was $551.31 and $885.69, respectively. **CONCLUSION:** Although further validation is warranted and future studies may need to be expanded to include other agents, preliminary results demonstrate that the DETP may represent a cost-effective alternative to lidocaine patch in the management of acute pain.

PSY19

PHARMACOECONOMIC EVALUATION OF TREATMENT OF HAIRY CELL LEUKEMIA

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OBJECTIVE: To determine the cost-effectiveness of standard strategy (interferon alpha) versus Cladribine (2-chlorodeoxyadenosine) and Cladribine with interferon alpha treatment for patients with hairy cell leukemia. **METHODS:** A cost-effectiveness analysis was performed. Efficacy of standard treatment strategy, Cladribine and Cladribine with interferon treatment, was estimated from a previous clinical trial held in Moscow HRC RAMS. A total of 160 patients entered the trial. Three group patients with hairy cell leukemia were assigned to receive: 1st group—interferon alpha (3 million units thrice a week), 2nd group—Cladribine (0.1 mg/kg daily as a continuous intravenous infusion over seven days), 3rd group received Cladribine with interferon alpha. Direct medical costs (cost of drug administration, resource utilization, duration of hospitalization) were estimated. Achievement of remission was used as effectiveness. Unit costs were based on detailed data from the Moscow Medical Sechenov Academy. The rate of exchange was 24.4 rubles for USD$1. **RESULTS:** direct medical costs were RUR93 477 for group 1 (C1), RUR91756 for group 2 (C2) and RUR40 436 for group 3 (C3). Achievement of remission = 70.0 % (E1), 99.0% (E2), 99.0% (E3), for each group respectively. The final calculation of cost / effectiveness ratio (CER) was: CER1 = RUR131079, CER2 = RUR94421 and CER3 = RUR40845 per one patient for group 1, 2, and 3 respectively. **CONCLUSION:** Cladribine with interferon alpha usage versus standard therapy is more cost-effective in the treatment of patients with hairy cell leukemia.

PSY20

COST-EFFECTIVENESS ANALYSIS OF IMMUNOSUPPRESSIVE TREATMENTS FOR BONE MARROW TRANSPLANTATION IN PATIENTS WITH APLASTIC ANEMIA IN MEXICO

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OBJECTIVE: Aplastic anemia is a rare disease but its presence could lead to patient's death and high expenses for hospitals and families. The purpose of this study was to model the economic and health consequences of cyclophosphamide + equine ATG vs. cyclophosphamide for the management of patients with aplastic anemia after bone marrow transplantation at the Social Security Mexican Institute (IMSS). **METHODS:** A cost-effectiveness analysis was developed based on a Bayesian decision tree model from the health care payer's perspective. Effectiveness measures were the rate of avoided acute rejected cases without complications during one-year period and total survival rate on a five-year period. Effectiveness data and transition probabilities were taken from international published literature. Comparators were cyclophosphamide (50 mg/kg) + equine-ATG (30 mg/kg) and cyclophosphamide (50 mg/kg). Resource use was obtained from a local expert panel at IMSS and direct costs were taken from official institutional databases. The model was validated and calibrated according to international pharmacoeconomics guidelines. One-way and probabilistic sensitivity analyses were performed using Monte Carlo Simulation second-order approach. **RESULTS:** Patients treated with cyclophosphamide + equine ATG experienced the highest clinical success rate with 17.37% while patients with monotherapy experienced 2.63% ($p < 0.01$). Regarding the 5-year survival rate, the combined therapy obtained 80.50% vs. cylophosphamide alone 63.40% ($p < 0.01$). Expected mean cost per patient with cyclophosphamide + equine ATG was US$104,773 and US$102,045 for cyclophosphamide. ICER estimated using the clinical success rate as effectiveness measure was US$185 and using 5-year survival rate was US$159. Within probabilistic sensitivity analyses, components analysis and acceptability curves showed that combined therapy was the most cost-effective therapy when WTP > US$10,000 ($p < 0.05$). **CONCLUSION:** In Mexico, the combined therapy is cost-effective for the treatment of aplastic anemia. These results should be taken into account by Mexican decision makers in the management of patients with aplastic anemia after bone marrow transplantation.

PSY21

THE COST-EFFECTIVENESS OF LYRICA (PREGABALIN) IN PATIENTS WITH CENTRAL NEUROPATHIC PAIN

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OBJECTIVE: Patients with chronic central neuropathic pain (CNeP) typically report considerable pain that requires frequent health care resource (HR) utilisation. The purpose of this study was to estimate the cost-effectiveness of pregabalin for the management of CNeP in a Canadian practice setting from a Ministry of Health perspective. **METHODS:** A stochastic simulation model was used to determine the effect of adding pregabalin to current treatment on daily pain and associated costs in a hypothetical cohort of 1000 patients with chronic CNeP. The model was based on data from a randomized, double blind, placebo-controlled, parallel-group, multicentre clinical trial of pregabalin, in which pain was evaluated using a 0–10 pain scale. Modeled Outcomes of interest included quality-adjusted life-years (QALYs) and mean number of days with no or mild pain (score ≤ 3) over the trial duration of 12 weeks. HR utilisation (including drug costs) was assessed from a survey conducted with a group of 149 Canadian physicians and included number of physician visits, referral to specialists and waiting times, diagnostic tests and non-pharmacological treatments. Corresponding costs were obtained from Ontario Drug Benefit, London Health Sciences Centre, and the *Régie de l'Assurance Maladie du Québec*, and are expressed in 2007 Canadian dollars. Sensitivity analyses were conducted on model's assumptions. **RESULTS:** Compared with no additional treatment, treatment with pregabalin yielded a cost-utility ratio of $9648/QALY, and a cost-effectiveness ratio of $10/day with no or mild pain. Sensitivity analyses suggested that resulting ratios were very robust to changes. The most prominent variation reported was for the extension of the time horizon up to 52 weeks, with a cost-utility ratio of $23,087/QALY. **CONCLUSION:** Model simulations demonstrate that adding pregabalin to the current pharmacotherapy received by CNeP patients, compared to no additional treatment, is a cost-effective treatment strategy.

PSY22

COST-EFFECTIVENESS OF PREGABALIN COMPARED TO GABAPENTIN IN TREATMENT OF PATIENTS WITH POSTHERPETIC NEURALGIA

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OBJECTIVE: To estimate the cost-effectiveness of pregabalin compared to gabapentin for patients with postherpetic neuralgia(PHN) in a Swedish setting. **METHODS:** This cost-

effectiveness analysis is conducted from a societal perspective (direct and indirect costs) and from a health care perspective (direct costs only). Direct costs include pharmaceuticals and physician visits. Indirect costs are calculated based on production losses (the human capital approach). The analysis uses a cost-effectiveness model which includes effect data from two clinical studies of gabapentin and one clinical study of pregabalin previously used in a Canadian cost-effectiveness analysis. In addition, the analysis and treatment doses are partly based on two clinical studies of pregabalin and gabapentin. Resource use is based on time spent in each pain state (mild, moderate, and severe). In the sensitivity analysis drug doses, costs, and quality of life weights were varied. Information regarding costs, resource use, and quality of life weights was collected from the Canadian study, Statistics Sweden, regional price lists, Pharmaceutical Specialties in Sweden, and from three burden of illness studies. Dr. Jörgen Boivie was consulted regarding Swedish treatment practice. **RESULTS:** Since patients treated with pregabalin spend less time in the more severe pain states their health in terms of QALY's is better compared to patients treated with gabapentin (0.5019 vs. 0.4596). In the societal perspective analysis, total costs of one year treatment were lower for pregabalin than for gabapentin (SEK100, 476 vs. SEK102, 103). Total costs were only slightly higher for pregabalin (SEK57,811 vs. SEK52, 645) and the cost per QALY gained was estimated to be SEK120,000 when indirect costs were excluded. **CONCLUSION:** The study shows that pregabalin is a cost-effective and, from a societal perspective, a cost-saving alternative compared to gabapentin in treatment of patients with PHN.

PSY23

COST-EFFECTIVENESS OF LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING AND LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS IN THE TREATMENT OF MORBID OBESITY

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OBJECTIVE: To assess the cost-effectiveness of laparoscopic adjustable gastric banding (LAGB) as treatment for morbid obesity compared with laparoscopic roux-en-y gastric bypass (LRGBY) and no treatment. **METHODS:** A Markov model was developed to simulate weight loss, health consequences, and costs for surgical treatment of morbid obesity. The model was used to estimate lifetime medical-care costs, quality-adjusted life years (QALYs) and incremental cost-effectiveness ratios (ICERs) in terms of cost per QALY gained. Estimates of effectiveness were derived from published results of a head-to-head randomized controlled trial comparing LAGB and LRGBY. Patients receiving no treatment were assumed to maintain their original weight. Other model parameters, including complication rates, costs of treatment and adverse events, direct medical costs attributable to obesity, mortality rates, and utilities, were estimated from published literature and publicly available databases. Base-case analyses were stratified by gender and initial body mass index (BMI). We discounted costs (2006 US dollars) and QALYs by 3% per annum. **RESULTS:** Under conservative assumptions, for a woman aged 40 years with initial BMI of 35–40, LAGB has lower average costs than LRGBY for the initial procedure ($15,470 versus $23,160) and complications ($3680 versus $11,930), but results in less weight loss. ICERs are $13,990 and $14,690 for LAGB and LRGBY versus no treatment; and $16,540 for LRGBY versus LAGB. Corresponding ICERs for women with BMIs of 40–50 are $4860, $5150, and $5780. ICERs for men are generally higher than those of women due to shorter life expectancies. Sensitivity analyses show results to be robust to reasonable variation in model parameters and overall parameter uncertainty. **CONCLUSION:** Both LAGB and LRGBY provide significant weight loss and are cost-effective versus no treatment at conventionally-accepted thresholds for medical interventions. Accordingly, choice between the two procedures can be based on other factors such as patient or provider preference.

PSY24

THE ECONOMIC CONSEQUENCES OF POST OPERATING PAIN MANAGEMENT WITH TRANSDERMAL FENTANYL (IONSYS) VERSUS INTRAVENOUS PATIENT-CONTROLLED ANALGESIA

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OBJECTIVE: To analyze the economic consequences on staff time in post-operative wards in Sweden and Denmark of two modalities for treatment of post-operative pain, the fentanyl HCL iontophoretic transdermal system (fentanyl ITS) versus patient controlled intravenous analgesia (IV-PCA). **METHODS:** Current postoperative pain management is labor intensive. Fentanyl ITS is a new modality for moderate-to-severe postoperative pain. Clinical efficacy and side effects incidence have been reported as mainly the same for fentanyl ITS and IV-PCA in several randomized clinical trials. A cost analysis was therefore performed. Staff resources in post-operative wards were calculated based on findings from a Nordic Delphi panel where the participants (nurses and anesthesiologists) from Sweden and Denmark working with post-operative patients should determine the total time required to complete all tasks involved in fentanyl ITS and IV-PCA use and assess differences in staff time between the alternatives. The panelists identified the following tasks: set up, routine patient care, dosing, routine replacement, troubleshooting, and discontinuation of post-operative pain management. Staff costs were calculated based on official wages statistics for specialists and nurses in postoperative care. Costs were calculated in 2007 prices. **RESULTS:** Based on the panel information, the total post-operative staff time requirements per patient was 70 minutes for fentanyl ITS versus 146 minutes for IV-PCA. Most staff resources were spent on set up and routine patient care for both treatment alternatives. The post-operative staff cost per patient was calculated at €27 and €57 in Sweden and €31 and €66 in Denmark, respectively. **CONCLUSION:** The staff costs of post-operative management in post-operative wards with fentanyl ITS is 53% (€30) lower per patient in Sweden and 53% (€35) lower in Denmark compared with IV-PCA. Additional health-economic analyses of total resources used for post-operative pain management, including material costs, based on clinical observations would be valuable.

PSY25

ECONOMIC IMPACT AND CONSERVATION OF INTRAVENOUS IMMUNOGLOBULIN (IVIG) THROUGH THERAPEUTIC SUBSTITUTION WITH ANTI-D IN PATIENTS WITH IDIOPATHIC THROMBOCYTOPENIA PURPURA (ITP) AT AN URBAN TEACHING HOSPITAL IN STATEN ISLAND, NY

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OBJECTIVE: Corticosteroids, IVIG and Anti-D can be used as first-line therapy for the treatment of ITP. After review of the

literature, Anti-D was selected over IVIG as the preferred agent at Staten Island University Hospital. The objectives of this study were to investigate how much IVIG was spared after implementation of this decision and determine the cost savings realized when Anti-D is used in place of IVIG. **METHODS:** Literature supporting the utilization of Anti-D in treatment of ITP was presented by each of the key clinical faculty. The oncology pharmacist screened and verified all IVIG orders for ITP patients. Substitution with Anti-D was made for all Rh+ and non-splenectomized patients. The quantity of IVIG spared was calculated by subtracting the amount dispensed before and after implementation of the program. Savings realized were calculated by determining the cost of a treatment course with IVIG and with Anti-D for a 80 kg patient. **RESULTS:** A total of 904 and 130 g of IVIG were administered during the first and the second half of 2006, respectively. Similarly, 220,000 and 376,000 units of Anti-D were used during the same time periods. A treatment course with IVIG (at 1 g/kg/day for two days) costs $8960 whereas a treatment course of Anti-D costs $4200 (at 75 ìg/kg). Since the treatment of a 80 kg patient would require 160 g of IVIG, the 774 g spared represent the amount necessary to treat 5 patients with IVIG. The sparing of 774 g of IVIG therefore helped save $23,800. Also, 3 other courses were done with Anti-D instead of IVIG yielding $14,280 in additional savings. **CONCLUSION:** In 2006, the implementation of a therapeutic substitution program at Staten Island University Hospital making Anti-D the preferred agent over IVIG in the treatment of ITP helped spare 774 grams of IVIG and saved $38,080.

PSY26

THE DIRECT MEDICAL COSTS ASSOCIATED WITH SUSPECTED (CONFIRMED AND NEGATIVE) HEPARIN-INDUCED THROMBOCYTOPENIA

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OBJECTIVE: Heparin-induced thrombocytopenia (HIT) is an important adverse reaction associated with heparin utilization. No previous studies have assessed the cost of suspected HIT or examined HIT from a Canadian perspective. Therefore, the objective of our study was to quantify the direct medical costs associated with suspected and confirmed HIT from a Canadian hospital perspective. **METHODS:** A cost of illness analysis was conducted on a population of consecutive patients with suspected HIT during 2005. Suspected HIT was defined by the performance of a HIT enzyme-linked immunosorbent assay (ELISA). Confirmed HIT was defined by one the following: 1) positive serotonin release assay (SRA), 2) positive HIT ELISA plus high clinical probability for HIT, or 3) strongly positive HIT ELISA (optical density ≥ 1.0). Negative HIT was defined as a negative HIT ELISA or SRA result. Resource utilization variables included: 1) HIT-safe anticoagulant use, 2) laboratory tests, 3) diagnostic and surgical procedures, and 4) length of stay (LOS) attributed to HIT. The average cost (2007 CAN$) per case of confirmed HIT, confirmed HIT with thrombosis (HITT), and negative HIT was calculated. Cost data was obtained from hospital and provincial sources. **RESULTS:** There were 110 suspected HIT cases (56 males: 54 females) in 2005. Two patients were excluded because their HIT status could not be determined. Average LOS was 36 ± 42 (range 3–244) days. There were 88 negative HIT cases, 8 with confirmed HIT, and 12 with confirmed HITT. Patients with confirmed HITT incurred substantially greater average costs ($25,696, range $357–$145,217) than those with confirmed HIT ($3846, range $38–$14,258). The average cost of a negative HIT case was $115 (range $38–$4119). **CONCLUSION:** This is the first study to identify the costs associated with confirmed HIT, confirmed HITT, and negative HIT. Suspected HIT increases the costs of hospital care.

PSY27

BURDEN OF OBESITY: 10-YEAR REVIEW OF PUBLISHED LITERATURE ON DIRECT AND INDIRECT COSTS IN NINE COUNTRIES

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OBJECTIVE: To examine literature published during the past ten years describing the impact of obesity and obesity-related disease on direct and indirect costs in Australia, Canada, France, Germany, Italy, Spain, Sweden, the UK, and the US. **METHODS:** A review of the medical literature published from 1997 to 2007 was conducted, including MEDLINE, EMBASE, Current Contents Connect, and International Pharmaceutical Abstracts databases; ISPOR abstracts; and data published by relevant governmental agencies. **RESULTS:** A substantial portion of direct costs related to obesity derive from treating comorbidities associated with the condition (e.g., type 2 diabetes, cardiovascular disease). Indirect costs, including those associated with reduced work productivity, increased absenteeism, and premature death, are significant, with the majority arising from comorbid conditions. Direct costs were greater for obese patients than for normal-weight patients; morbid obesity was associated with dramatic cost increases. Estimates of direct costs as a percentage of national health care expenditures were 5.7% for the US, and ranged from 2% to 2.6% for Australia, Canada, Sweden, and the UK. No estimates of indirect costs as a percentage of national health care costs were identified. No studies involving direct or indirect cost data collected since 1995 were identified for France, Italy, or Spain. **CONCLUSION:** Obesity has a substantial economic impact because of its high prevalence, association with multiple chronic diseases, and increased levels of disability and absenteeism. The lack of recent direct or indirect cost estimates in several countries highlights the need for further work to describe the global economic burden of obesity.

PSY28

A SYSTEMATIC REVIEW OF LOW BACK PAIN COST OF ILLNESS STUDIES IN THE UNITED STATES AND INTERNATIONALLY

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OBJECTIVE: Conduct a systematic review of low back pain cost of illness studies. **METHODS:** Medline was searched to uncover studies about the direct or indirect costs of low back pain published in English from 1997 to 2007. Data extracted for each eligible study included study design, population, definition of low back pain, methodology for estimating costs, year of data, and estimates of direct, indirect, or total costs. **RESULTS:** The search yielded 147 studies; 27 were deemed relevant. The studies reported on data from Australia, Belgium, Japan, Korea, The Netherlands, Sweden, the UK, and the US. Nine studies estimated direct costs only, 9 indirect costs only, and 9 both direct and indirect costs, from a societal (n = 18) or private insurer (n = 9) perspective. Methodology used to derive both direct and indirect cost estimates differed markedly among the studies. Among

studies providing a breakdown on direct costs, the largest proportion of direct medical costs for low back pain was spent on physical therapy (17%) and inpatient services (17%), followed by pharmacy (13%) and primary care (13%). Among studies providing estimates of total costs, indirect costs due to lost work productivity represented a majority of overall costs associated with low back pain. Three studies reported that estimates with the friction period approach were 56% lower than with the human capital approach. **CONCLUSION:** Estimates of the economic costs in different countries vary greatly depending on study methodology but by any standards must be considered a substantial burden on society. This review did not identify any studies estimating the total costs of low back pain in the US from a societal perspective. Such studies may be helpful in determining appropriate allocation of health care resources devoted to this condition.

PSY29

THE DIRECT AND INDIRECT COSTS OF OBESITY IN AN EMPLOYED POPULATION

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OBJECTIVE: This study quantifies the direct and indirect costs of obesity within a cohort of commercially-insured employees between 2003–2005. **METHODS:** A database of health plan claims, self-reported health risk assessments (HRAs), and productivity data (Thomson MarketScan) from 2003–2005 was used to identify individuals for analysis. The study cohort included individuals reporting a valid body mass index (BMI) value on an HRA and 12 months of continuous eligibility. Patients were divided into five groups according to the WHO classification of BMI: severely obese ($BMI \geq 35$), obese ($30 \leq BMI < 35$), overweight ($25 \leq BMI < 30$), normal weight ($18.5 \leq BMI < 25$), and underweight ($BMI < 18.5$). Mean direct medical costs and the costs associated with employee absence were calculated for each BMI group. Two-part regression models were used to estimate the incremental direct and indirect costs, conditional upon expenditure, associated with elevated BMI. **RESULTS:** Of 88,984 employees (45% female, mean age = 42.3), 9.9% were severely obese, 16.7% obese, 38.5% overweight, 34.0% normal weight, and <1% were underweight. With the exception of the underweight BMI group, univariate analysis reveals a graded pattern of expenditures for emergency room and outpatient pharmacy. As BMI increases, expenditures for these services increase. Further, compared to those with a normal BMI, the obese and severely obese have higher costs for inpatient hospital and outpatient visits and services. Regression-adjusted incremental direct medical costs associated with being overweight, obese, and severely obese were estimated to be $147.11, $712.34, and $1977.43, respectively. Regression-adjusted incremental indirect costs due to paid time off associated with being overweight, obese, and severely obese were estimated at $1403.81 $1511.24, and $1414.09, respectively. **CONCLUSION:** Overall health care costs were higher for workers who were obese or severely obese than for those of normal weight or who were overweight. Indirect costs incurred from paid time off were higher for workers in all categories of elevated BMI relative to those of normal weight.

PSY30

EVALUATION OF COST AND OUTCOMES OF WEIGHT CONTROL PROGRAM IN A REGIONAL HOSPITAL AT SOUTHERN TAIWAN

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OBJECTIVE: To evaluate the cost and outcomes of a weight control program in a regional hospital at southern Taiwan. **METHODS:** A total of 249 subjects with BMI over 24 were recruited from August 2003 to June 2004. Monthly courses providing nutritional consultation and exercise instructions for fitness were offered in three sessions per week with class size less than 25 members. Content of the course includes Physical Fitness exercise coaching, healthy diet and prescription of medication for weight control, and consultation for behavior change. Statistic analysis of data was performed with SAS software. **RESULTS:** The mean age of the 249 subjects is 38.39(±12.36) years old, with 202(81.1%) female and 47(19.9%) male. The mean of BMI is 29.98(±5.10) kg/m2, mean of body fat percentage is 38.88(±7.54). Cost for the weight control clinic service includes pharmaceutical, special formula of diet, education for healthy eating, aerobic exercise coaching, personnel and administrative expense. Analysis revealed the total cost for each person-visit of a subject is 4426 NT dollars, with 5016 NT dollars per visit for subjects accepting additional fitness training. The weight decrease in average is 4.52 + 7.52 kg, and the length of follow up in average is 68.97 + 54.36 day. In total there is 610.3 kg of weight reduction during the period of the project and the average cost for each kg weight reduction is 2212 ± 516 NT dollars. Statistic analysis with Mixed Model revealed that after adjusted by gender and age, the BMI of subjects will decrease by an estimate of 0.03757 with the increase of each day. **CONCLUSION:** The strategy of combining medication prescription, diet consultation and exercise coaching to reduce body weight in the beginning of the course is an effective enforcement to motivate the subject to establish the habit of regular exercise.

PSY31

GREATER SEVERITY OF ILLNESS, RISK OF MORTALITY, LENGTH-OF-STAY, AND HOSPITAL COSTS IN PATIENTS WITH HYPONATREMIA

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OBJECTIVE: Among hospitalized patients, hyponatremia (serum sodium <136 mmol/L) is a common problem associated with increased mortality, morbidity, and length-of-stay (LOS) in clinical trials and other studies. However, studies relating hyponatremia to costs, controlling for the other factors, are limited. The purpose of this study was to examine the relationships between hyponatremia and hospital mortality, LOS, and costs in naturalistic settings with large sample size. **METHODS:** We conducted a retrospective analysis of nationally projected adult acute care inpatient discharges from January 2003–June 2006, in the Premier Perspective clinical and economic database of >37 million actual discharges from ~600 US hospitals. We compared patients with hyponatremia (ICD-9-CM diagnosis code 276.1x) during hospitalization to a comparably sized random sample without hyponatremia, matched on age, gender, and comorbidities. Descriptive analyses including APR-DRG severity-of-illness, mortality, LOS, and costs. Chi-squared tests were used for mortality comparisons and Kruskal-Wallis for LOS

and cost comparisons, with alpha = 0.05. Multivariate regression analyses adjusted for potential cofactors influencing descriptive analyses: logistic for mortality, negative binomial for LOS, and log-linear for costs. **RESULTS:** Severity of illness was severe/extreme for 60.2% of 2,989,776 projected hyponatremia patients compared to 39.7% of 2,994,724 matched non-hyponatremia patients. Mortality among hyponatremia patients was greater than among non-hyponatremia patients (6.8% versus 5.6%; $p < 0.0001$). On average, hyponatremia was associated with 2.6 more hospital days (8.5 ± 10.5 versus 5.9 ± 7.7) and 1.5 more ICU days (6.1 ± 8.5 versus 4.6 ± 6.7) than non-hyponatremia (both $p < 0.0001$). Average total hospital costs were $3254 greater for hyponatremia patients than non-hyponatremia patients ($14,317 \pm 23,251$ versus $11,064 \pm 18,325$; $p < 0.0001$). Multivariate analyses confirmed greater mortality (Odds ratio 1.03, $p < 0.0001$) and LOS among patients with hyponatremia ($p < 0.0001$). **CONCLUSION:** Hyponatremia is associated with greater severity of illness and risk of mortality, longer LOS, and greater hospital costs. Correcting hyponatremia may be important in improving these outcomes.

PSY32

COST-UTILITY STUDY OF RECOMBINANT FACTOR VIII IN THE TREATMENT OF HEMOPHILIA A IN MEXICO

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OBJECTIVE: To determine the Hemophilia A (HA) treatment (pdFVIII or rFVIII) with the lowest cost per quality-adjusted life-year (QALY) in Mexico. **METHODS:** A cost-utility study was conducted, with an institutional perspective, in two time horizons, 30 and 50 years. The discounting rate was three percent for costs and benefits. The source of information was a meta-analysis of the international literature validated by Mexican hematologists using the Delphi technique. A decision tree with Bayesian approach and a Markov chain considering the probabilities of getting infected with Hepatitis C Virus (HCV) and Immunodeficiency Virus (HIV) because of the use of a Factor VIII concentrate and the availability of the products were performed, we also included the probabilities of HCV and HIV infections due to the use of cryoprecipitates because of the lack of the treatments analysed. The model included the states of health: HA without infection, HA+HCV, HA+HIV, HA+HIV+HCV and death. Due to lack of published information and low incidence observed, the probability of getting infected with an emergent disease (Creutzfeld-Jakob, SARS) due to the use of FVIII treatment was not included. The results were evaluated with incremental analysis and net benefits varying the incidence of HIV and HCV and the availability of the products. The sensitivity analysis was one-way, two-way and probabilistic (acceptability curves and net benefits). **RESULTS:** Patients using rFVIII get more benefits with the lowest cost per QALY when comparing to pdFVIII treatment (30 years-analysis: rFVIII = 16.45 QALY and USD$50,673/QALY, pdFVIII = 11.05 QALY and USD$51,950/QALY, ICER USD$48,066; 50 years-analysis: rFVIII = 20.79 QALY and USD$51,406/QALY, pdFVIII = 12.23 QALY and USD$60,765/QALY, ICER USD$38,042). The sensitivity analysis varying the incidence of HIV and HCV showed the robustness of the base study. **CONCLUSION:** Recombinant Factor VIII is a cost-effective option in the treatment of patients with hemophilia A in Mexico.

WITHDRAWN **PSY33**

PSY34

COST-UTILITY ANALYSIS OF SUBCUTANEOUS VERSUS INTRAVENOUS IMMUNOGLOBULIN

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OBJECTIVE: Immunoglobulin replacement is standard therapy that prevents/controls infectious complications caused by primary immunodeficiency disorders especially common variable immunodeficiency and X-linked agammaglobulinemia. In Canada, the therapy is administered intravenously (IVIg) at hospital, whereas in some European countries it is administered subcutaneously (SCIg) at home and intravenously at home/hospital. Canadian Blood Service is considering establishing SCIg as an alternative to IVIg. Concerns over increasing health care costs raise questions about its cost-effectiveness. The present study is intended to estimate cost effectiveness of SCIg against hospital-IVIg and hypothetical home-IVIg from Canada's public health care payer perspective. **METHODS:** A Markov decision-analytical model for hypothetical patients in 12-month therapy was used to estimate the incremental cost-effectiveness ratio (ICER) per quality-adjusted life year (QALY) for SCIg compared with hospital-IVIg and home-IVIg. Serious adverse events, mortality, number and severity of infections were considered. **RESULTS:** SCIg dominates (greater benefits at lesser costs) hospital-IVIg and produces an incremental cost effectiveness ratio (ICER) of CND$39,500/QALY when compared to home-IVIg. ICER is sensitive to changes in utility of infection, hospital charges, and infusion materials. **CONCLUSION:** SCIg appears to be the most cost-effective intervention if decision makers are willing to pay CND$39,500/QALY. Therefore, it could be gradually established as an alternative to patients who are willing and clinically suitable to switch. Uncertainty in the available comparative clinical effectiveness warrants a reliable comparative clinical study.

PSY35

PREVALENCE OF METABOLIC SYNDROME AND ITS IMPACT ON HEALTH CARE RESOURCE UTILIZATION

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OBJECTIVE: To assess the prevalence of metabolic syndrome in five European countries and to quantify its impact on resource utilization. **METHODS:** Data were from the 2006 European National Health and Wellness Survey (NHWS), a self-administered, Internet-based study of the health care attitudes, behaviors, disease states, and outcomes of a demographically representative sample of adults age 18+ across five European countries: France, Germany, Italy, Spain, and UK. Individuals were categorized with metabolic syndrome if they were diagnosed with diabetes and had two or more of the following: hypertension, high cholesterol, or obesity (BMI > 30). Prevalence estimates were computed using frequency weights based on gender and age distribution of each country as reported in the International Database of the U.S. Census Bureau. Linear regression models were developed using unweighted data to assess the association between metabolic syndrome and resource utilization in the past six months. Covariates included in the models included gender, age, marital status, education, and country of residence (reference=UK). **RESULTS:** There were 1092 respondents across the five European countries that were categorized as having metabolic syndrome. These respondents project to approximately 6.24 million individuals affected by metabolic syndrome. The prevalence of metabolic syndrome varied across the 5 countries

studied (France = 1.8%, 0.85 million; Germany = 3.8%, 2.55 million; Italy = 1.9%, 0.90 million; Spain = 1.2%, 0.41 million; UK = 3.3%, 1.53 million). Unadjusted results showed significant negative associations between metabolic syndrome and health care resource utilization. After adjusting for covariates these negative associations remained significant ($p < 0.001$ for all) Specifically, adults with metabolic syndrome had 0.2 more ER visits, 1.2 more days hospitalized, and 4.3 more visits to medical providers than adults without metabolic syndrome. **CONCLUSION:** Metabolic syndrome is a complex condition, potentially affected my multiple factors. It has substantial economic costs in terms of resource utilization.

PSY36

COMPLEMENTARY AND ALTERNATIVE MEDICINE AND HEALTH CARE UTILIZATION IN PATIENTS WITH NON-CANCER CHRONIC PAIN

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OBJECTIVE: Complementary and alternative medicine (CAM) represents an important group of medical treatments that are frequently excluded from health economic assessments. Chronic non-cancer pain is one area where CAM may provide significant patient benefit. The purpose of this study was to describe CAM use in outpatients with non-cancer chronic pain and to describe variables of interest in CAM users. **METHODS:** Prospective observational analysis at a tertiary care university teaching hospital conducted among outpatients with non-cancer chronic pain. We collected data using a daily log completed by patients during a one-week period. Variables included gender, ethnicity, pain source, type(s) of CAM used, health care utilization, and work hours missed. **RESULTS:** Of the 263 patients (75% female, 25% male), 95% used CAM (mean age 50.6, standard deviation 13.8). CAM was used by 94% of Caucasians, 97% of African-Americans, and 95% other (mean number of CAM 5). Frequently used CAMs included rest (77%), changing position (66%), hot/cold packs (58%), prayer (41%), exercise (39%), massage (36%), epidurals (26%), and talking to someone (25%). Mean number of CAM used by pain source was cancer (3), headache (4.1), >1 pain source (5.3), musculoskeletal (5.2), rheumatology (5.3), and sickle cell (5.7). Patients used 1–3 (low), 4–6 (medium), or >/=7 (high) therapies 32%, 38%, and 30% of the time, respectively. The mean number of doctor's appointments ($p = 0.04$) and work hours missed ($p = 0.03$) significantly increased with increasing CAM use (low, medium, or high). **CONCLUSION:** CAM utilization is common among patients with chronic non-cancer pain and should be considered in health economic assessments. Most patients used one CAM and many used more than one. Patients using more CAMs had higher health care utilization and missed more work. Future research aimed at measuring the incremental cost-effectiveness of CAM in relation to and in addition to pharmaceutical treatments would be worthwhile.

PSY37

RESOURCE USE AND COSTS ASSOCIATED WITH BACK PAIN IN GERMANY

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OBJECTIVE: This study aimed to determine the total costs of back pain and spinal disorders (ICD10: M50–M54) to German society in 2005 as well as to identify different patterns of health service utilization of a patient sub-population with recurrent back pain. In addition, potential cost savings by implementing guidelines were estimated. **METHODS:** The costs of low back pain were assessed by measuring both direct costs of providing health care to patients, and indirect costs as the value of productivity losses. Furthermore a decision tree was constructed to demonstrate different ways of managing recurrent low back pain. Data was obtained from two German health insurance funds for all identified back pain patients in 2005. The estimation of potential cost savings was based on assumptions of the Bertelsmann foundation expert-panel. **RESULTS:** In Germany, total cost of low back pain reached €6.3 billion in 2005. The indirect costs due to productivity losses accounted for 39% of the total costs. Total annual direct costs amounted €3.8 billion, with an average direct cost of €230 per patient. Nearly 42% of the direct costs were induced by outpatient treatment, 24% by physical treatment, 18% by pharmaceuticals and 14% by hospitalisation. Patients with chronic or recurrent back pain (21% of the study's population) were accountable for 43% of the direct costs. By modelling scenarios of best practice medical care, potential cost savings add up to 24% of the direct costs of the patient sub-population with recurrent back pain. **CONCLUSION:** Overall, the study confirms the high economic burden of back pain for the German society. Best practice medical care was associated with substantial cost saving opportunities. Further research is needed to establish the cost-effectiveness of treatment based on guidelines in a prospective study design.

SYSTEMIC DISORDERS/CONDITIONS— Patient-Reported Outcomes

PSY38

FACTORS ASSOCIATED WITH LOWER HEALTH-RELATED QUALITY OF LIFE (HRQOL) IN ADULTS WITH FACTOR VIII DEFICIENCY—THE HEMOPHILIA UTILIZATION GROUP STUDY-PART V (HUGS-V)

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OBJECTIVE: To examine whether predisposing, enabling and need variables in the behavioral model of health services use, described by Andersen *et al.*, are associated with lower HRQoL as measured by SF-12 in adults with hemophilia A. **METHODS:** Data were from HUGS-V, a prospective multi-center study examining hemophilia costs and impact of disease among patients at six U.S. Hemophilia Treatment Centers. Adults with hemophilia completed questionnaires and variables were selected according to the Andersen's model, including socio-demographics, self-reported co-morbidities, joint pain and motion limitation. A linear regression model was used to assess factors associated with SF-12 Physical Component Summary (PCS) and Mental Component Summary (MCS) scores. **RESULTS:** Complete data from 152 patients were analyzed. Mean age was 33.7 years (range 18–65). Sixty-four percent had severe hemophilia. 82% reported one to seven co-morbidities. Thirty-eight percent reported severe joint pain and 57% reported severe motion limitation in at least one joint. Mean PCS was 43.2 ± 10.8 and mean MCS was 50.9 ± 10.1. Adults with severe hemophilia had lower PCS scores compared to those with mild or moderate hemophilia

(41.4 versus 46.4, $p = 0.01$), while there was no difference in MCS scores. Results from the regression analysis showed one predisposing variable (unemployment), one enabling variable (income < $0000), and three need variables (increasing number of co-morbidities, severe joint pain, and severe motion limitation) were significantly associated with a lower PCS (model Adjusted $R^2 = 0.38$, $p < 0.0001$). No significant association was found between MCS scores and any variables from the model. **CONCLUSION:** Patients with hemophilia had a lower PCS, whereas MCS was comparable to the general U.S. population. Unemployment, low income, increasing number of co-morbidities, severe pain, and joint impairment negatively impacted HRQoL. Preserving joint health by preventing joint bleeding and arthropathy is important to maximize HRQoL in patients with hemophilia.

PSY39

HEALTH-RELATED QUALITY OF LIFE OF PATIENTS WITH HEMOPHILIA AND INHIBITORS

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OBJECTIVE: Health-related quality of life (HRQL) of hemophilia patients with inhibitors has not been well documented in the United States. This study aimed to measure the HRQL of hemophilia patients with inhibitors and compare findings with the HRQL of the U.S. general population. **METHODS:** Hemophilia patients with inhibitors (N = 90) who had participated in a patient forum were mailed a survey which included the SF-12, a validated generic HRQL instrument. Data were analyzed using the standard SF-12 algorithms. Scores were assessed for each of the eight HRQL domains and the two component summary scores Physical (PCS) and Mental (MCS). These were compared to those of the general population. **RESULTS:** Respondents (n = 45, response rate = 50%) were predominantly male (96.1%), and mean age was 20.7 years (SD = 18.8). The majority is hemophilia type A (88.5%) and consider their disease "serious." Mean PCS of respondents was significantly worse (i.e., lower) than that of the general U.S. public (39.9 vs. 49.6: $p < 0.01$). Four domain scores were significantly lower among respondents compared to the general U.S. public: physical functioning, role physical, bodily pain and social functioning ($p < 0.01$). Mean MCS was comparable, 49.9 vs. 49.6 ($p = 0.72$). **CONCLUSION:** These findings confirm results previously shown in Europe (Gringeri et al 2005), that hemophilia patients with inhibitors have a severely impaired physical HRQL, but maintain a normal mental score compared with the general population in the United States.

PSY40

SYSTEMATIC REVIEW OF THE PSYCHOMETRIC PROPERTIES OF THE FUNCTIONAL ASSESSMENT OF CANCER THERAPY—ANEMIA (FACT-AN) FOR ANEMIC CANCER PATIENTS

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OBJECTIVE: Anemia is a prevalent condition in patients who are under treatment for cancer. Having an instrument that can assess the impact of this potentially debilitating condition is relevant to the patient and health care provider. Our objective was to evaluate the psychometric properties of the FACT-An for anemic cancer patients. **METHODS:** A comprehensive literature review was performed to summarize the psychometric properties of the FACT-An and its subscales including the FACT-Fatigue and the FACT-General for anemic cancer patients. Published papers and abstracts were retrieved by searching Medline 1992–2007, the Cochrane Library and related websites. Relevant articles cited from these search findings were also reviewed. Key search terms included: anemia, neoplasm, quality of life and erythropoetin. **RESULTS:** Of 272 citations, thirteen articles were included for critical review. Nine papers reported satisfactory internal consistency (Cronbach's alpha = 0.79–0.96) for all subscales except for non-fatigue subscale (0.59–0.79). However, only two studies reported adequate test-retest reliability (Intraclass correlation coefficient = 0.82–0.90). There was acceptable criterion validity with significant ($p < 0.05$) correlations (r = 0.18–0.40) between the instrument and hemoglobin (Hb) levels. Each domains of the FACT-An showed acceptable convergent validity with Piper Fatigue questionnaire (r = 0.52–0.79) and Multidimensional Fatigue Symptom Inventory (r = 0.49–0.89) and showed divergent validity with Marlow-Crowne instrument, which measured the social desirability (r = 0.04–0.18). The significant ($p < 0.05$) differences in the FACT-An scores between the patients who had high Hb levels and low Hb levels showed satisfactory discriminative validity. Minimally important differences ranged 4.24–7.0 were examined using anchor based method, distribution based method and regression analysis. The acceptable responsiveness to change (effect 0.32 for the FACT-An; standardized response mean = 0.39 and Guyatt's responsiveness = 0.55 for the Fatigue subscale) were investigated. **CONCLUSION:** The FACT-An demonstrated overall acceptable psychometric performances as a discriminative and evaluative instrument for anemic patients, although evidence could be strengthened with further research.

PSY41

PATIENT- AND CAREGIVER-REPORTED PREFERENCES FOR CHARACTERISTICS OF TREATMENTS FOR HEMOPHILIA PATIENTS WITH INHIBITORS

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OBJECTIVE: Treatment preferences of patients with hemophilia and inhibitors have not been well documented. This study sought to identify treatment attributes most important from a patient/caregiver perspective in the United States. **METHODS:** A discrete choice experiment was conducted to elicit treatment preferences. Hemophilia patients with inhibitors or their caregivers completed a written survey that elicited preferences for treatment features and levels synthesized from the medical literature such as: risk of viral transmission, rise in inhibitor titer, reduction in thromboembolic events, number of infusions, preparation time, infusion time/volume, time required to stop bleeding/alleviate pain, prophylaxis use, major surgery use, and medication cost. Best-worst case scaling was used to derive preferences. Relative importance (RI) of preferences was modeled using a multinomial logit function. **RESULTS:** Most respondents were male (96.1%) with a mean age of 20.7 years (SD = 18.8). Most patients were hemophilia type A (88.5%) and the majority (88.5%) considered their disease "serious." The three most important patient-identified features were: time required to stop bleeding (RI = 19.3), possibility that the level of inhibitor may rise (RI = 14.3), and risk of contracting a virus from the product (RI = 13.5). **CONCLUSION:** Inhibitor patients and caregivers have specific treatment preferences based on product features. Overall, patient preferences were similar to physicians (Lee, 2008), although patients placed more importance on the risk of viral transmission, whereas physicians placed more on the time

to alleviate pain. In contrast, other research (Mantovani, et al., 2005) suggests greater importance of perceived viral safety among both physicians and pharmacists relative to patients.

PSY42

EFFECTIVENESS OF ONCE-DAILY EXTENDED-RELEASE (ER) TRAMADOL IN ACHIEVING CLINICALLY MEANINGFUL IMPROVEMENT IN FUNCTIONING

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OBJECTIVE: Assess the effects of tramadol ER once daily versus placebo in patients with moderate to moderately severe chronic pain due to osteoarthritis of the knee or hip. **METHODS:** Data for this post-hoc analysis were from a 12-week, randomized, double-blind, placebo-controlled, once-daily fixed dose-study of tramadol ER (100 mg–300 mg). Patients completed the WOMAC questionnaire at baseline and weeks 1, 2, 3, 6, 9 and 12. Items in each WOMAC subscale—pain (5-items), physical functioning (17-items) and stiffness (2-items) were combined and normalized from 0-to 100. The minimum clinically important difference (MCID) set at ten points improvement was determined from the literature. Mean subscale scores, percent mean change from baseline and the proportion of patients achieving a MCID at week 1 and 12 were assessed. **RESULTS:** A total of 809 patients were analyzed (604-tramadol ER; 205-placebo). Both cohorts had similar demographic and clinical characteristics at baseline. At week 1, mean change in WOMAC global and subscale scores from baseline for tramadol ER and placebo ranged from 12–16 and 7–10 points, respectively. Significantly higher proportion of tramadol ER treated patients achieved MCID versus placebo ($p < 0.05$) as early as week 1 except in the stiffness subscale. By week 12, mean change for each subscale and total WOMAC global score for tramadol ER treated patients were significantly greater versus placebo ($p < 0.01$), however, only higher doses (200–300 mg) of tramadol ER treated patients achieved MCID versus placebo ($p < 0.01$)On pain subscale, significantly higher proportion of patients treated with tramadol ER 100 mg achieved MCID versus placebo at week 1 and 12 ($p < 0.05$). **CONCLUSION:** This analysis showed that treatment with tramadol ER in patients with chronic pain extended to improvements in physical function and stiffness as demonstrated by achieving MCID in all WOMAC scores.

PSY43

DISCOVERING THE STRUCTURE OF THE POWER OF FOOD SCALE (PFS) IN OBESE PATIENTS

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OBJECTIVE: To assess the psychometric properties of the Power of Food Scale (PFS) in diverse populations of obese and non-obese individuals. **METHODS:** Data were obtained from adults in a clinical trial for a weight management drug (n = 1739; mean body mass index [BMI] [SD] = 38.6 [6.7]) and a web-based survey (n = 1275; overweight and obese [BMI 27–76 kg/m2] and non-obese [BMI 18–27 kg/m2]). Exploratory and confirmatory factor analyses were employed to discover the structure of PFS using the clinical data. The model developed was then tested using data from the web-based survey. The relationship between PFS domains and BMI was also examined. Logistic regression was used in the web-based survey to evaluate the association between obese status and PFS scores. **RESULTS:** Psychometric assessment of data from the clinical study indicated that the scale was best represented by a 3-factor, 2nd-order model—three domains and a composite domain (average of the three domains)—which was confirmed within the web-based survey (Bentler's Comparative Fit Index: 0.92 and 0.91, respectively). Cronbach's alpha for both data sets were high, ranging from 0.81–0.94 (three domains and a composite domain score). The relationships between BMI and each domain were subtle and approximately linear. An increase of one point in a PFS domain score increased the odds of being obese by 1.6–2.4 times (depending on the domain; domain scores range from 1 to 5). **CONCLUSION:** The structure of PFS is represented by a 3 factor, 2nd-order model with three domains (Food Available, Food Present, and Food Tasted) and a composite of them. This structure has high internal consistency and reliability, relates to BMI, and distinguishes between obese and non-obese subjects. The data indicate that the PFS can be used to evaluate the effects of treatment on patient perception of the power of food in trials of obese patients.

PSY44

LINGUISTIC VALIDATION OF THE HAEMO-QOL AND HAEM-A-QOL FOR USE IN INTERNATIONAL STUDIES

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OBJECTIVE: Prior to use in an international study collecting data from haemophiliacs, the Haemo-QoL and Haem-A-QoL underwent linguistic validation in 17 languages. Whilst the original Haemo-QoL was developed in British English, the Haem-A-QoL had been developed in Italian. For the purposes of linguistic validation, an English version of the latter was used as a basis for the translations. Seven distinct versions exist: an adult form (Haem-A-QoL) and child self-report and parent proxy versions (Haemo-QoL) for 3 distinct age groups (4–7, 8–12, 13–16 years). A rigorous methodology was required to ensure conceptual equivalence and cultural relevance across different languages. **METHODS:** For languages where no translation existed, the process was conducted by a specialist in each target country using the following standardized methodology: 1) two forward translations by professional translators, native speakers of the target language and fluent in English; 2) comparison and reconciliation of the translations by the specialist in the target country; 3) backward translation by a native English speaker; 4) comparison of source and backward version; 5) review by the developer for a selection of languages; creation of the different forms of the instrument; and 6) review by a clinician. Existing translations were integrated into the process as appropriate. **RESULTS:** Besides the challenge of ensuring conceptual equivalence with the original and cultural appropriateness, the translation process revealed two additional difficulties. When translating an expression, appropriate terms had to be found for each age group whilst maintaining consistency across all versions of the same language. **CONCLUSION:** The language versions of Haemo-QoL and Haem-A-QoL were established according to a rigorous translation methodology aiming to ensure conceptual equivalence across different language versions to facilitate international comparison and pooling of data. The linguistic validation process as a whole supports the advantage of integrating international feedback on concepts and wording before a questionnaire is finalized.

PSY45

EVALUATION OF THE NEUROPATHIC PAIN SYMPTOM INVENTORY: CONCEPTUAL ADEQUACY IN SIX COUNTRIES

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OBJECTIVE: The purpose of this study was to determine whether the Neuropathic Pain Symptom Inventory (NPSI) adequately assesses neuropathic pain symptoms in patients with diabetic peripheral neuropathy, post-herpetic neuralgia, trigeminal neuralgia, and sciatica across multiple cultures. **METHODS:** From data collected from 132 subjects in 6 countries, qualitative research methods identified their most important symptoms (and verbal descriptions) associated with neuropathic pain. A core set of commonly described symptoms spanning multiple cultures was also described. Moderators using a semi-structured discussion guide conducted focus groups consisting of patients in the US, Brazil, Japan, China, Finland, and Spain to elicit concepts that were most important and relevant (concept elicitation phase). Study subjects ranked the importance of each neuropathic pain symptom, completed the NPSI, and commented on its ability to capture key symptoms (face and content validation phase). **RESULTS:** Descriptive terms for sensations of neuropathic pain were similar in all countries; burning, electric shocks, and pins and needles were among the most-common sensations. Individuals with neuropathic pain experienced all sensations that were included in the NPSI. They also tended to describe pins and needles and numbness interchangeably, perhaps reflecting the relative number of DPN subjects on study. Chinese subjects tended to favor verbal descriptors and were more likely to relate extreme pain with the heart because they believe the heart is the most critical and sensitive part of the body. In Spain, the two sensations of "pins and needles" and "stabbing" were occasionally combined into one term as "stabbing pins on fire". **CONCLUSION:** This is the first study to the knowledge of the authors to confirm such a "universality" of core neuropathic pain descriptors across etiologies and cultures. Based on data from these focus groups, the NPSI is an acceptable instrument for assessing neuropathic pain worldwide.

PSY46

PSYCHOMETRIC ANALYSIS OF THE THREE-FACTOR EATING QUESTIONNAIRE: RESULTS FROM A LARGE DIVERSE SAMPLE OF OBESE AND NON-OBESE SUBJECTS

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OBJECTIVE: To assess the psychometric properties of the 21-item Three-Factor Eating Questionnaire (TFEQ-R21) in obese and non-obese subjects. **METHODS:** Data were obtained from adults at baseline from a Phase 3 trial for a weight management drug (n = 1739; mean body mass index [BMI] [SD] = 38.6 [6.7]) and a web-based survey (n = 1275; non-obese [BMI 18–27 kg/m2] and overweight and obese [BMI 27–76 kg/m2]). Confirmatory factor analyses (CFI) were undertaken to test the TFEQ-R21 structure (Cognitive Restraint [CR], 6 items; Uncontrolled Eating [UE], 9 items; Emotional Eating [EE], 6 items). Relationships between TFEQ domains and BMI were evaluated. **RESULTS:** The clinical data indicated that the original TFEQ-R21 structure needed refinement. The original 21-item model had 3 items removed from its CR domain. This resulted in an 18-item TFEQ model (Bentler's Comparative Fit Index [CFI] = 0.91) that was otherwise identical to the original factor structure (UE, CR, and EE). This modified structure was verified using data from the web-based survey (CFI = 0.96). Cronbach's alphas for the 18-item TFEQ structure for each scale were high and ranged from 0.70–0.92 and 0.78–0.94 in the clinical and web-based studies, respectively. There were no ceiling or flooring effects. Correlations with BMI were small. In the clinical study, the CR domain showed the most visibly linear relationship with BMI; a one category increase led to a 1.55 kg/m2 (95% CI: 0.79; 2.30) decrease in BMI. In the web-based survey, there was a visibly linear relationship between BMI and all domains except the CR domain. The relationship between BMI and CR depended in part on obese and diabetes status. **CONCLUSION:** The 18-item TFEQ (with 3 items removed from the TFEQ-R21 CR domain) has satisfactory psychometric properties and may be a useful tool to characterize uncontrolled eating, cognitive restraint, and emotional eating in obese patients.

PSY47

IMPACT OF NIGHTTIME PAIN ON SLEEP QUALITY IN PATIENTS WITH CHRONIC PAINFUL CONDITIONS

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OBJECTIVE: To determine the prevalence of nighttime pain among patients with chronic painful conditions and its impact on sleep quality. **METHODS:** Prospective study of 263 chronic pain outpatients with musculoskeletal problems, arthritis/rheumatism, headache, and sickle cell anemia who completed a diary. Data included demographics, pain-related diagnosis, self-reported pain scores (10-point scale), and resource utilization. Patients completed Pittsburgh Sleep Quality Index (PSQI), which includes questions about duration of sleep and sleep disturbances in previous month, and yields a sleep quality score ranging from 0 (best) to 21 (worst). Statistical tests used were Kruskal-Wallis and Pearson's correlation. **RESULTS:** Among 263 patients, the mean age was 50.6 (SD = 13.9) and 198 were female (75%). Mean PSQI score was 12.1 (SD = 4.8) for females, 11.7 (SD = 4.7) for males, and mean pain score was 5.3 (SD = 2.1). Patients disturbed by nighttime pain less than once, once to twice, or ≥3 times per week had a mean PSQI of 8.3, 9.6, and 13.7, respectively, compared to 7.2 for patients' sleep not disturbed by nighttime pain ($p < 0.0001$). Two-hundred twenty-eight patients (86.6%) had trouble sleeping because of pain at least once. Half of all patients were taking sleep medications. Patients taking sleep medication less than once, once to twice, or ≥3 times per week had mean PSQI of 10.2, 14.6, and 14.9, respectively, compared to 9.1 for patients not taking any sleep medication ($p < 0.0001$). **CONCLUSION:** Chronic pain patients may not routinely report nighttime pain to providers, but our study confirms that it is common and indeed impairs sleep quality. Also, higher pain scores and worse sleep quality were observed among those who reported taking more sleep medications. Findings underscore need to better manage pain by ensuring that patients' pain medications provide adequate analgesic coverage during sleep. Doing so may reduce the need for sleep medications in this population.

PSY48

IMPACT OF IMMUNE THROMBOCYTOPENIC PURPURA ON HEALTH CARE RESOURCE USE AND WORKPLACE PRODUCTIVITY

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OBJECTIVE: To compare patient-reported health care resource use (HCRU) and workplace productivity in patients diagnosed with ITP vs. a matched control group without ITP. Chronic Immune (Idiopathic) Thrombocytopenic Purpura (ITP) is an auto-immune disorder characterized by persistent thrombocytopenia (peripheral blood platelet count <150 × 109/L). Symptoms can range from spontaneous bleeding and bruising to intercranial bleeding. Corticosteroids are first line treatment with splenectomy in 2nd or 3rd line. **METHODS:** ITP patients were sampled from the Platelet Disorder Support Association's database of approximately 14,000 ITP patients. ITP patients were selected if diagnosed by a physician for ITP and ≥18 years. The control group was ≥18 years, never diagnosed with ITP, and matched on socioeconomic factors, age and gender. Participants completed a cross-sectional internet survey including health resource use, employment, sick leave, and workplace productivity-related questions. Ttesting was performed with t-tests for continuous variables and chi-square for categorical variables. **RESULTS:** A total of 1002 ITP patients and 1031 control subjects completed the survey between March 28 and April 3, 2006. Seventy-six percent were female and the mean age was 48; 42% of ITP patients vs. 26% of control group ($p < 0.05$) had one or more visits each month to a specialty physician. Sixty-five percent of ITP patients were employed vs. 62% of control group. Of individuals employed, 53% of ITP patients took extended sick leave (≥1 week) vs. 28% of control, 38% of ITP patients had difficulty concentrating at work vs. 29% of control, and 25% of ITP patients could not complete normal work responsibilities vs. 18% of control ($p < 0.05$ for all comparisons). **CONCLUSION:** The impact of ITP on HCRU in all ITP patients and workplace productivity in employed ITP patients is significant. ITP is burdensome to patients, impairing employed ITP patients in completing normal work responsibilities, and increasing extended time off from work and physician visits.

PSY49

THE WILLINGNESS TO PAY TO MINIMIZE CHRONIC PAIN

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OBJECTIVES: To identify chronic pain patients' willingness to pay (WTP) for completely minimizing their pain related morbidity (PRM). **METHODS:** The study was a cross sectional non-randomized design. Patients were recruited from a multidisciplinary pain centre in Edmonton, Alberta, Canada. A computer administered discrete choice experiment was used to measure WTP. Patients chose between two varying combination of treatments which differed in their level of improvement to pain intensity, level of improvement to disability and out of pocket monthly cost. Information on pain related health status, health related quality of life (EQ-5D), sociodemographic information and clinical background information was also collected. **RESULTS:** Seventy-eight patients completed the choice experiment with a consistency and transitivity rate of 100% and 94% respectively. Persons with chronic pain were WTP $92 and $361 to reduce disability to a mild severity, and between $440 and $1067 to reduce pain intensity to a mild severity translating into $453 to $1428 per month to completely minimize PRM. For every dollar an individual was WTP to improve their disability to the lowest severity (mild), he/she was WTP approximately $2 to reduce pain intensity to moderate and $3 to reduce pain intensity to mild. Persons with chronic pain are willing to allocate between 19% and 52% of their gross family income (average gross annual family income = $33,000) to minimize the morbidity caused by chronic pain. **CONCLUSION:** The economic burden associated with the chronic pain health state is $5500 to $17,000 per year per person. Persons with chronic pain are ready to allocate up to half of their total annual family income to minimize their pain and suffering. Treatment and management strategies that focus on reducing pain intensity would have the greatest impact on improving health related quality of life.

SYSTEMIC DISORDERS/CONDITIONS—Health Care Use & Policy Studies

PSY50

PHYSICIANS' INTENTIONS TO MEASURE BODY MASS INDEX IN CHILDREN AND ADOLESCENTS: A THEORY OF REASONED ACTION MODEL

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OBJECTIVE: Over the past few decades, childhood obesity has become a major public health issue in the United States. Numerous public and professional organizations recommend that physicians periodically screen for overweight in children and adolescents using the body mass index (BMI). The purpose of this study was to assess the utility of the theory of reasoned action (TRA) as the conceptual model to explain physicians' intentions to measure BMI in children and adolescents. **METHODS:** A cross-sectional mailed survey of 2590 physicians (family physicians and pediatricians) practicing in 4 states was conducted to determine the factors associated with physicians' intentions about measuring BMI in children and adolescents. A self-administered questionnaire was designed that included items related to the TRA constructs. The TRA constructs included were: intention to measure BMI, direct attitude, indirect attitude (a function of behavioral beliefs and outcome evaluations), direct subjective norm, and indirect subjective norm (a function of normative beliefs and motivation to comply). The association between the theoretical constructs was examined using correlation and regression analyses. **RESULTS:** The usable response rate was 22.8%. Less than half (44%) of the physicians' strongly intended to measure BMI in children and adolescents. Intention was significantly correlated with direct attitude ($r = 0.66$, $p < 0.01$), indirect subjective norm ($r = 0.52$, $p < 0.01$), direct subjective norm ($r = 0.50$, $p < 0.01$), and indirect attitude ($r = 0.43$, $p < 0.01$). Together, the TRA constructs attitude and subjective norm, explained up to 49.9% of the variance in intention. There were significant ($p < 0.05$) behavioral and normative belief differences between physicians who intended and those who did not intended to measure BMI. **CONCLUSION:** The TRA is a useful model in identifying the factors that are associated with physicians' intentions to measure BMI. The TRA could be used as an underlying framework in designing interventions to increase physicians' use of BMI.

PSY51

THE EFFECTS OF COMORBIDITY, PRESCRIPTION DRUG USE, AND MEDICAL UTILIZATION ON DULOXETINE INITIATION IN PATIENTS WITH FIBROMYALGIA

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OBJECTIVE: Investigate factors predicting duloxetine initiation among fibromyalgia patients. **METHODS:** Using Cox proportional hazards models, we investigated effects of baseline health characteristics among fibromyalgia patients on time to duloxetine initiation from the later of index date (duloxetine market entry (August 1, 2004)) or first fibromyalgia diagnosis. Characteristics measured in the six-month pre-index period included demographics, comorbidities, use of medications recommended by American Pain Society (APS), specialty physician services, and fibromyalgia diagnosis stage (newly-diagnosed, established). It included 7965 patients with 2+ fibromyalgia claims (ICD-9 729.1) who were continuously eligible from February 1, 2004 through December 31, 2005. A total of 495 (6.2%) had a prescription for duloxetine during the study period. Time to initiation was measured from index date to the first duloxetine prescription. Observations were right-censored if they did not initiate on duloxetine during the study period. As duloxetine initiation was strongly associated with established diagnosis, separate models were estimated for 5353 newly-diagnosed and 2612 established patients. **RESULTS:** Baseline medication use served as the strongest predictor of duloxetine initiation. Use of alpha-2-delta ligands, venlafaxine, SSRIs, TCAs, other antidepressants, opioid analgesics, and non-benzodiazepine sedatives all were strong predictors of initiation (all $p < 0.05$). Dopamine agonists and venlafaxine (hazard ratios: 2.913; 2.338) were the strongest for newly-diagnosed, and alpha-2 delta ligands and SSRIs (hazard ratios: 1.843; 1.819) for the established group. Duloxetine initiation was associated with tramadol use, female gender, later dates of diagnosis, chronic fatigue syndrome, and use of non-MD mental health providers; patients seen by chiropractors were less likely to initiate duloxetine. In the established group, those with mental health diagnoses and those visiting rheumatologists were more likely to initiate duloxetine (hazard ratios: 1.756, 1.476; both $p < 0.01$). **CONCLUSION:** Physician type and prior use of APS-recommended drugs were important predictors of duloxetine initiation. Variations in predictors exist for newly-diagnosed and established fibromyalgia patients.

PSY52

INADEQUATE GASTROPROTECTION AMONG NEW CHRONIC USERS OF TRADITIONAL NSAIDS IN THE NETHERLANDS

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OBJECTIVE: To describe the use of gastroprotective (GP) strategies among new chronic users of NSAIDs in The Netherlands by GI Risk Factor (RF) score. **METHODS:** From the PHARMO Record Linkage System, including among others linked drug-dispensing and hospital records of approximately three million individuals in The Netherlands, we selected new chronic users of Coxibs or tNSAIDs between January 1, 2000 and December 31, 2004 in The Netherlands. Eligible patients had >=1 year history before the 1st NSAID dispensing and >=1 year of follow-up afterwards. Use of GP strategies was defined as the use of PPI, Coxib or both. Baseline GI RF score was based on: history of GI drug use, high dose of NSAIDs, age >60 years, use of corticosteroids/anticoagulants/SSRI, rheumatoid arthritis, heart failure or diabetes with each condition accounting for one factor. Chronic users were >60 days on therapy during the first year of follow-up. Switching was assessed among those with >=1 GI RF during the 1st year of follow-up. **RESULTS:** Among 58,770 new chronic NSAID users at baseline, 47,234 (80.4%) used tNSAID alone, 7.9% used tNSAID +PPI, 10.2% used a Coxib alone and 1.6% used a Coxib +PPI. Mean (SD) number of GI RF among these groups was 1.6 (2.1), 3.1 (1.3), 1.5 (1.5) and 2.8 (1.3), respectively. Among 48,390 patients (82.3%) with GI RF score of >=1, 20.9% used a GP strategy, but this increased with the number of GI RF. Within the 1st year, 5.3% (n = 2067) and 4.8% (n = 1843) of tNSAIDs users with >=1 GI RF switched to tNSAIDs+PPI and Coxib alone respectively. **CONCLUSION:** Gastroprotection in users of tNSAIDs was inadequate. Over 80% of tNSAIDs with >=1 GI RF did not receive any GPA and <5% start one within a year. More research should show if GPA was used for preventive reasons.

PSY53

HOSPITAL CHARGES AND COMORBIDITIES AMONG OBESE AND MORBIDLY OBESE PATIENTS

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OBJECTIVE: Despite accumulated evidence that obesity is significantly associated with elevated risk for many chronic conditions; its prevalence has reached epidemic levels not only in the general population but also among patients with established heart disease. Rising obesity and its associated comorbidities will increase significant health and economic burdens. In-dept analyses of obese patients admitted in Florida hospitals have not been reported. The purposes of the study are: 1) to compare the adjusted total hospital charges among patients who are normal weight or non-obese, obese and morbidly obese, and 2) to describe the frequencies of comorbidities between these groups. **METHODS:** A retrospective analysis of 2005 data from the Florida Agency for Health Care Administration (AHCA) was utilized. From the de-identified hospital discharge file, records with primary or secondary diagnosis of obese and morbidly obese using the International Classification of Diseases, Ninth Edition (ICD 9) code were extracted. Chi-square statistics and general linear models were used to compare differences between three groups. **RESULTS:** Of all discharges in Florida (N = 2,534,641) in 2005, 44,552 (1.8%), 83,718 (3.3%), and 2,406,371 (94.9%) records were morbidly obese, obese, and non-obese, respectively. Age, gender, ethnicity, type of admission, discharge status, length of hospital stay, health insurance status, and total hospital charges differed significantly in three groups. Additionally, age-, length of stay-, and health insurance-adjusted total hospital charges (US$) were significantly different among non-obese (27,689), obese (30,676), and morbidly obese (31,461) ($p < 0.01$). The most common comorbidity was unspecified essential hypertension in all three groups. **CONCLUSION:** Because obesity is a major cause of human essential hypertension, rising blood pressure and its associated comorbidities will continue to impart their health and economic consequences in Florida. Thus, consistent and timely medical care to evaluate health risks among obese patients is imperative.

PSY54

DEVELOPMENT OF AN OPIOID ROTATION MODEL

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OBJECTIVE: To develop a model characterizing the phenomena of opioid rotation for chronic non-cancer pain. **METHODS:** Literature review, supplemented by a panel of two pain specialists and one oncologist completed a questionnaire to provide guidance on the typical treatment pathway of care for patients requiring chronic long acting opioids for chronic non-cancer pain. Guidance included management of commonly reported side effects, frequency of follow up, dose adjustment and switch criteria. **RESULTS:** A model reflecting three treatment arms was constructed based on feedback from the panel: 1) MS Contin ER switch to OPANA ER; 2) MS Contin ER switch to OxyContin ER; 3) and OPANA ER switch to OxyContin ER for patients where morphine is not an appropriate first line treatment option. Clinicians will evaluate the effectiveness and safety within 7–14 days to determine the need for drug switch or dose adjustment. If a dose adjustment or medication switch is required, further follow up within 7–14 days will take place. Most patients' pain is likely to be controlled with tolerable side effects within the first 28–42 days of initiation of therapy. For patients not controlled, dose adjustment, switching or consultation with a pain specialist may be required. Over the course of one year, up to 50 different pathways were possible for each treatment arm which may include two or more different opioids and up to five dose adjustments. **CONCLUSION:** Opioid rotation is not well characterized. Switching medications, adjusting dose and frequent follow-up, contribute to incremental costs. Appropriate selection of second or third line therapy should include consideration for patient tolerability. Further analysis from a long-term registry currently underway may provide further guidance for validating the proposed model in order to better evaluate the cost impact of switching, frequency of physician contacts, and dose adjustments associated with opioid rotation.

PSY55

DIAGNOSIS AND TREATMENT FLOWS FOR MORBIDLY OBESE PATIENTS VISITING PHYSICIAN OFFICES IN THE US

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OBJECTIVE: To understand the relationship between morbidly obese patients' reasons for office visits, physicians' diagnoses of obesity, and obesity treatments, using a patient flow model. **METHODS:** We used the 2005 National Ambulatory Medical Care Survey, a nationally representative survey of visits to non-federal office-based physicians, including specialists. Patients with body mass index (BMI) >=40 were categorized as morbidly obese, based on office-recorded height and weight. We created a patient flow model to study obesity diagnosis rates based on patients' stated reasons for visit, and obesity treatment rates based on type of diagnosis. Reported percentages are based on weighted frequency counts. **RESULTS:** In 2005, there were 962.7 million office visits by non-pregnant adults (>=18 yrs) of which 38.7% had both height and weight recorded. Of these, 24.1 million (6.5%) visits were made by morbidly obese patients. Less than 5% stated weight gain as a reason for visit. The rate of physician diagnosis of obesity was 12.0%, with an additional 38.6% noted (but not diagnosed) as obese, leaving 49.4% neither diagnosed nor noted as obese. Obesity diagnosis rates greatly improved when patients stated weight gain as a reason for visit (81.5%). Overall only 2.1% received an obesity prescription, 38.7% received health education for weight reduction, diet/nutrition or exercise, and 59.2% received none of the above. Treatment rates improved significantly with an obesity diagnosis, with 4.2% receiving an obesity prescription and 80.1% receiving health education. **CONCLUSION:** Among morbidly obese patients, the rate of physician diagnosis and treatment is very low. However, rates improve when patients state weight gain as a concern. These patient flows clearly demonstrate that both the patient and physician have a shared responsibility in addressing the condition and efforts are needed to further involve both stakeholders in tackling the obesity epidemic.

POSTER SESSION II

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Clinical Outcomes Studies

PMC1

SEARCH STRATEGIES AND RESULTS OF SYSTEMATIC REVIEWS

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OBJECTIVE: A systematic review is the preferred approach for assembling clinical evidence. The gold standard for literature searching comprises sensitive search strategies applied to multiple literature databases and hand-searching of journals and conference abstracts. As a follow-up to a previous ISPOR poster, we sought to evaluate the impact of different search approaches on the pooled statistical results from systematic reviews, rather than simply numbers of studies included. **METHODS:** Previously, we selected a series of published Cochrane systematic reviews and compared the effect of more limited search strategies (a search of multiple literature databases without grey literature, and a Medline keyword search) on the number of included studies. We extended this work to compare the pooled effect sizes resulting from meta-analyses of key outcomes from the studies included in each search strategy. The reviews covered five different areas: smoking cessation, non-small cell lung cancer, neuropathic pain, acupuncture and Crohn's disease. All meta-analyses where studies were missed by lower level searches were re-run including only the studies retrieved by these searches. This allowed the impact of missing studies on the meta-analysis result to be assessed. **RESULTS:** Differences between meta-analysis results were generally fairly minimal, although in some cases missing studies changed the result of a meta-analysis from a significant to a non-significant result. In several cases lower level searches resulted in there being no studies at all looking at particular outcomes. For example, in a review of neuropathic pain treatments, which showed a significant effect of antidepressants versus placebo on atypical facial pain relief (RR = 1.67), both studies included in the meta-analysis were absent when searching with a Medline keyword search only. **CONCLUSIONS:** A comprehensive search strategy is needed to retrieve all relevant studies in a systematic review. Less comprehensive searches impact results of meta-analyses and can distort the evidence base.

PMC2

WHEN ARE INDIRECT AND MIXED TREATMENT COMPARISONS BIASED? A GRAPHICAL EXPLANATION WITH DAGS

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In the absence of head-to-head randomized studies, often indirect treatment comparisons are performed for reimbursement sub-

missions. Often it is mentioned that in order to obtain unbiased estimates based on indirect comparisons the distribution of characteristics of the patients included in the different trials needs to be similar, as well as the study design. By means of directed acyclic graphs (DAGs), which are often used in epidemiology for inferences, it is explained that indirect and mixed treatment comparisons are biased when differences in patient characteristics and trial design do act as an effect modifier of the treatment effect. Furthermore, the graphs can be used to differentiate between heterogeneity, selection, and confounding bias. DAGs for indirect comparisons of RCTs are compared with DAGs for head-to-head randomized designs and meta-analysis of RCTs.

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Cost Studies

PMC3

METHODS FOR ESTIMATING CONFIDENCE INTERVALS OF PER MEMBER PER MONTH (PMPM) UTILIZATION RATES

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OBJECTIVES: Per member per month (PMPM) utilization rates are commonly reported in the medical literature to compare differences in costs and other outcomes across various health care technologies and interventions. A limitation of PMPM estimates is that a confidence limit around the point estimate is not obvious or available from standard statistical software. Our objective is to demonstrate various methods of calculating confidence intervals for PMPM utilization rates. **METHODS:** Several methods were used to estimate confidence intervals surrounding PMPM estimates including Fieller's method and Monte-Carlo (MC) simulation. Women with at least one prescription fill for alendronate, risedronate, or ibandronate during 2006 in a large managed care data set were used as a sample to generate PMPM estimates and 95% confidence intervals for bisphosphonate drug cost, all hospitalization cost, hospital days, and number of hospital admissions during the calendar year of 2006. **RESULTS:** There were 34,675 women in our sample. The PMPM estimate of bisphosphonate drug cost was $23.48. The 95% confidence intervals generated by the Fieller and MC methods were ($23.21, $23.75) and ($23.45, $23.87), respectively. The PMPM hospitalization cost was $242.28: Fieller and MC 95% confidence intervals were ($221.53, $263.03) and ($227.74, $259.99), respectively. The PMPM estimate of hospital days was 0.108 days: Fieller and MC 95% confidence intervals were (0.098, 0.118) and (0.100, 0.116), respectively. The PMPM point estimate for number of hospital admissions was 0.0137: Fieller and MC 95% confidence intervals were (0.0131, 0.0142) and (0.0133, 0.0142), respectively. **CONCLUSION**: The Fieller and MC simulation methods produced similar confidence intervals for PMPM estimates for each of the outcomes of interest. Use of these methods would improve the utility of PMPM point estimates in comparing health care technologies.

PMC4

THE ADOPTION AND DIFFUSION OF COST-EFFECTIVENESS ACCEPTABILITY CURVES IN PUBLISHED ECONOMIC EVALUATIONS

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Cost-effectiveness acceptability curves (CEACs) plot the probability that one treatment is more cost-effective than another, as a function of a societal threshold willingness to pay for additional units of efficacy (e.g., life-year or QALY gained). **OBJECTIVES:** To assess the adoption and diffusion rates of CEACs within the field of economic evaluations. **METHODS:** We used the Tufts-New England Medical Center registry of 620 published cost-effectiveness analyses (CEA), presenting an original cost/QALY ratio from 2002–2005 (http://www.tufts-nemc.org/cearegistry/). For each CEA we recorded the year of publication, journal's name, study origin (country), and a subjective assessment of overall study quality ranging from 1 (low) to 7 (high). We used univariate analyses (chi-square and t-test), to assess differences in CEAC use by year of publication, study origin and quality. We also compared practices in journals publishing a high-volume ($n \geq 10$) versus low-volume ($n < 10$) of CEAs during the study period. We used multivariable logistic regression to identify factors predicting CEAC use. **RESULTS:** Approximately one fifth (20.2%) of CEAs presented a CEAC. The adoption of CEACs has increased over time from 5.3% (2002) to 30.4% (2005) ($p < 0.0001$). Studies using CEAC were of higher quality (4.6 ± 1.0 vs.4.1 ± 0.9; $p < 0.0001$) and more prevalent in high-volume journals (30.7% vs. 16.4%; $p < 0.0001$). CEACs were more frequently used in UK studies (48.8%) versus studies from Sweden (24.1%), The Netherlands (17.9%), United States (11.7%), and Canada (9.1%). Significant predictors for using CEACs were study quality (OR 1.96; 95% CI-1.53–2.51), publication in a high-volume journal (OR 1.85; 95% CI-1.18–2.89), and year of publication. **CONCLUSIONS**: CEACs have been rapidly adopted, especially among UK-based investigators. If CEACs turn out to be a useful tool to decision makers, this trend is encouraging, but means to achieve more rapid deployment should be identified.

PMC5

AN ANATOMY OF PHARMACEUTICAL COST-UTILITY ANALYSES, 1976–2005

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OBJECTIVE: To review and critically evaluate published cost-utility analysis (CUA) research on pharmaceuticals for the past three decades. **METHODS:** We examined data from the Tufts-NEMC Cost-Effectiveness Analysis Registry www.tufts-nemc.org/cearegistry), which contains detailed information on over 1100 CUAs and 3000 cost-utility ratios (in $US2005) published from 1976–2005. **RESULTS:** Of 1164 CUAs published through 2005, 518 (44.5%) pertain to pharmaceuticals. The proportion of all CUAs that focus on pharmaceuticals increased from 32% prior to 1990 to 48% from 1990–2005. U.S.-based investigators account for 53.6% of the total (47.5% of pharmaceutical studies), though the relative proportion of US-based studies has decreased over time. The U.K.'s share of total published CUAs increased from 7% in 1990 to 18% in 2005. The quality of study (as measured by a subjective 1–7 scale) did not differ by type of sponsorship (4.4 for industry vs. 4.55 for non-industry, $p = 0.44$). The leading journals for publishing pharmaceutical CUAs were Pharmacoeconomics (58 CUAs), Ann Intern Med (47), Int J Technol Assess Health Care (37), JAMA (34) and Am J Med (25). About 38% of pharmaceutical CUAs were sponsored by pharmaceutical companies, 27% by non-industry sources (and in 35% the source of funding could not be determined). Pfizer (26), Norvatis (25), Schering Plough (23), GSK (21) and Roche (19) have funded the most pharmaceutical CUAs. The median of 1055 pharmaceutical CE ratios is $26,000/QALY and is lower for industry vs. non-industry funded studies ($p = 0.004$). In multivariate analysis adjusting for factors such as sponsor type, pharmaceutical CE ratios are similar to others—

odds ratio for exceeding the overall median was 1.0 (95% CI: 0.64–1.55). **CONCLUSION:** Pharmaceutical CUAs account for almost half of all published CUAs. The quality of studies does not appear to differ according to study sponsor. In the published literature, the cost-effectiveness of pharmaceuticals is similar to that of other interventions.

PMC6

THE $50,000/QALY THRESHOLD RECONSIDERED: A RETROSPECTIVE ON KLARMAN'S ORIGINAL PAPER WITH AN EYE TO THE FUTURE

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It has been 40 years (1968) since Herbert Klarman and colleagues published their paper in Medical Care establishing that the cost-effectiveness of kidney dialysis is $50,000/QALY. This served as the basis for expanding the United States Medicare program to provide universal coverage for end stage renal disease and subsequently the basis upon which all new health technology has been compared. This standard has not changed throughout the health technology assessment community despite years of inflation and structural changes in health care systems since this time. This paper will first re-examine Klarman's work and show how he quality-adjusted the life years in the wrong direction—producing ill-year rather than healthy-year equivalent years; therefore, he grossly underestimates the cost-effectiveness ratio associated with kidney dialysis. The implication of this mistake for health technology assessment and some suggestions for new CE threshold standards will be discussed. Current conditions in health technology assessment require that these new standards be both dynamic—allowing for change over time—and flexible to allow adjustment based on mitigating factors like budget impact. Several examples and evidence from Australia, the UK and the United States will be presented to indicate how these standards might be developed.

PMC7

TOTAL DIRECT MEDICAL EXPENDITURE OF CHRONIC DISEASES UNDER DIFFERENT ECONOMETRIC MODELS

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OBJECTIVE: Quantify effect of alternative econometric models, in estimating total direct medical expenditure in diabetes, arthritis, cardiac diseases, asthma, hypertension, stroke, and emphysema. **METHODS:** Data from the MEPS's Household Component (2004), a nationally representative survey of the U.S. civilian noninstitutionalized population, was used. Accounting for the survey's clusters, strata and sampling weights; total direct medical expenditure was estimated under 11 different econometric models to assess their sensitivity to the zero mass, non-negative values and skewed distribution. Models compared were, OLS on raw-expenditure (OLSraw); OLS on log-expenditure (LnHom) and homoskedastic-retransformation; OLS on log-expenditure (LnHet) and heteroskedastic-retransformation; GLM with log-link and Gamma-family (GLMGam); GLM with log-link and Poisson-family (GLMPoi); Extended Estimating Equations (EEE); and 2-part models of OLSraw (2POLSraw); LnHom (2PLnHom); LnHet (2PLnHet); GLMGam (2PGLMGam); and GLMPoi (2PGLMPoi). Incremental expenditure from the method of recycled predictions summed over diseased population gave total expenditure. Box-Cox test confirmed log-link for GLM models while Modified Park's test determined a distribution between the Poisson and the Gamma for the family. LINK, RESET and Hosmer-Lemeshow test determined model fit, while COPAS test was employed for over-fitting and cross validation. Covariates included age, gender, race, ethnicity, marital status, education, insurance status, and comorbidity. **RESULTS:** Total expenditure in billions (b) of dollars, for diabetes ranged from $48.5b(2POLSraw) to $127b(LnHet). Similarly, expenditure of arthritis ranged from $73b(2POLSraw) to $196b(LnHet); cardiac diseases ranged from $99.2b(2POLSraw) to $194b(LnHet); asthma ranged from $27.8b(2POLSraw) to $64.2b(GLMGam); emphysema ranged from $2.1b(2PLnHom) to $18.4b(LnHet); hypertension ranged from $69.9b(2POLSraw) to $241b(LnHet) and stroke ranged from $13.1b(2PLnHom) to $39.3b(LnHet). LnHet model was consistently associated with the highest total expenditure estimate, while 2POLSraw model typically predicted the lowest estimate. **CONCLUSION:** The strong influence of model choice on the total medical expenditure estimate, underscores importance of understanding the data generation procedure before selection of the appropriate estimator.

PMC8

A CONCEPTUAL FRAMEWORK TO ANALYZE A DISEASE'S WORKPLACE IMPACT ON AN EMPLOYER

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OBJECTIVES: A disease's workplace impact on an employer is often highly sought but rarely available information that an employer can use to understand the value of a health intervention and to influence health insurance coverage of that intervention. This document presents a conceptual framework to analyze a disease's workplace impact on an employer. **METHODS:** The conceptual framework presented here was developed on the basis of a comprehensive literature review, extensive consultation process, analytical mapping of concepts, objects, behaviors, domains, functions, and relationships, as well as real case analyses. **RESULTS:** A four-component conceptual framework of workplace impact of a disease is proposed to guide researchers to quantify disease-workplace-impact from an employer perspective. These four components are work interruption costs, work care costs, worker turnover costs and productivity reduction costs. The examples of work interruption costs include employer-paid medical leaves, absence, short-term disability, and other forms of work interruption resulted from a disease. The examples of work care costs include disease related work adaptation costs, and a disease related insurance premium increase. The examples of worker turnover costs include worker separation costs, new worker recruitment costs, and new worker training costs. The productivity reduction costs are mainly the costs of productivity decrease resulted from presenteeism. Both predisposing factors and intervening factors of workplace impact are discussed in this conceptual framework. Based on this conceptual framework, we conducted a real world case analysis, which suggests not only significant workplace impact of a debilitating disease, but also some methodological challenges in estimating workplace impact of a disease from an employer's perspective. **CONCLUSIONS:** Our four-component conceptual framework can guide researchers to quantify workplace impact of a disease from an employer's perspective. The real case analysis suggests a debilitating disease not only affect patients, but also exert significant workplace impact on an employer.

PMC9

30 YEARS OF COST-EFFECTIVENESS ANALYSES: A BIBLIOMETRIC REVIEW OF ARTICLES PUBLISHED IN THE ECONOMIC AND MEDICAL LITERATURE: 1976–2005

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Cost-effectiveness analysis (CEA) presenting a cost/QALY ratio is considered the gold standard for economic evaluations in health care. Despite the proliferation of CEA research, there has been no detailed study focusing on the bibliometric properties of this literature. To describe and analyze trends in publications and co-authorship in the CEA literature from 1976–2005. We used the Tufts-New England Medical Center registry of original CEAs published through 2005 http://www.tufts-nemc.org/cearegistry/). For each article we recorded the year of publication, journal's name, the number of contributing authors and their names. Authors were assigned a credit based on their perceived contribution to the study (1 credit point for the first and last authors, $^1/_2$ point for the second author, and 1/n credit points for all other authors). We calculated the Author's Contribution Index (ACI), by dividing the total credit points by the number of studies published by the same author. Approximately 1150 studies have been published in 360 journals over the past 30 years, with an increase in the number published annually from 18(±26) in 1976–2000 to 138(±46) in 2001–2005, $p < 0.0001$. The mean number of contributing authors was 4.6(±2.4) and increased from 4.3(±2.3) to 4.8(±2.5), $p < 0.0001$ over that same time interval. Medical journals were characterized by a higher number of co-authors, as compared with the economic and health policy literature: 4.7(±2.4) vs. 4.2(±2.1), $p = 0.004$. The lowest number of co-authors (3.6) was in Value in Health and Medical Decision Making, and the highest in Circulation (7.7). The most prolific authors were affiliated with Harvard and Tufts Universities. **CONCLUSIONS:** The CEA literature continues to proliferate. Co-authorship trends seem to follow the rapid increase in the mean number of authors found in the health economics and medical literature. Further research is needed to examine journals' and authors' concentration trends, and dissemination of CEA results.

PMC10

THE DEVELOPMENT OF COST-EFFECTIVENESS INDICES WITH EQUITY IMPLICATIONS FOR THE ECONOMIC EVALUATION OF HEALTH CARE

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The incremental cost-effectiveness ratio (ICER) with number of dollars per quality-adjusted life year (QALY) has been extensively used in cost-effectiveness analysis (CEA) for improving efficiency in health care, but there is a lack of simple CEA indicators to take the equity issue in health into consideration. In this paper, by adjusting the ordinary ICERs with the quality-adjusted life expectancy (QALE) of the age- and gender-matched general population, we developed the CEA indicators based on and/or weighted by relative health gap to improve the distributive justice. If we collect the quality of life and survival data to estimate the QALY gained by a certain intervention for a specific disease, then the CEA indicators based on and/or weighted by relative health gain can also be developed to reduce the unintended inequity. The proposed six new CEA indicators with equity implications were empirically calculated for comparisons among the diseases of end stage renal disease, acquired immune deficiency syndrome, liver cancer, and breast cancer to demonstrate their applicability.

PMC11

ACCOUNTING FOR THE PLACEBO RESPONSE IN COST-EFFECTIVENESS ANALYSIS

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Defined as the psychophysiologic response associated with placebos, the placebo effect is of considerable interest to researchers and clinicians. To ensure that study participants remain blinded to treatment, a placebo must resemble the investigational product in all aspects except for physiological activity: it should have the same shape, colour, delivery mode, smell and taste. To produce a placebo with all of these qualities, the development cost and, thus, the daily cost of providing them to patients in a clinical trial, can be significant. Cost-effectiveness analyses (CEAs) typically use efficacy and safety data from RCTs. In fact, phase 3 RCT data are often considered the most robust data source in CEAs. By subtracting the clinical effect in the placebo arm from the clinical effect in the active arm, CEAs remove the placebo response from the effectiveness side of the equation. However, the same method is not applied to the cost side: instead of subtracting from the cost of active treatment, the cost of placebo is ignored. This leads to an inaccurate estimation of the incremental cost of treatment relative to the incremental effects and, consequently, of the incremental cost-effectiveness ratio (ICER). We propose a method whereby both the costs and effects of placebo are incorporated into CEA. A CEA of Sativex in oncology pain will be used to illustrate the proposed approach. Results will be presented. In recognition of the clinical benefit that can be effected via the placebo response, RCTs have been designed to measure this response and to deduce the true effect of an active therapy. CEAs, which typically use data from these RCTs, should adopt a similar approach. Economic analyses should not only consider the effect but also the costs of placebo to achieve a more accurate prediction of the ICER for an active therapy.

PMC12

MEASURING ECONOMIC AND CLINICAL OUTCOMES ASSOCIATED WITH TELE-ICU MONITORING

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OBJECTIVE: Patients in adult intensive care units (ICUs) require multidisciplinary care that frequently result in substantial morbidity, mortality, and costs. Telemedicine has been used to provide remote intensivist monitoring for ICUs. We measured the economic and clinical outcomes associated with Tele-ICU monitoring in 6 ICUs (5 hospitals) across the Houston metropolitan area. **METHODS:** We assessed the cost and effectiveness of Tele-ICU by comparing the economic and clinical outcomes in the period after the full implementation of the Tele-ICU (post period) with the economic and clinical outcomes in the baseline period before the introduction of the Tele-ICU (pre period). The cost analysis in this study adopts a hospital perspective because the decision to implement a Tele-ICU is made at the hospital or health system level. Costs were measured using hospital costs and the cost of operating the Tele-ICU. Hospital costs were computed using average daily ICU costs and floor costs for patients in each ICU during the two study periods using individual patient data (4390 patients). ICU and hospital length of stay (LOS) and ICU and hospital mortality were obtained from chart reviews. **RESULTS:** Average

daily per patient ICU costs across the six ICUs was $3060 and $3663 in the pre and the post period respectively and the average daily per patient floor costs was $1439 and $1551 in the pre and the post period respectively. The average LOS across the 6 ICUs increased from 4.5 to 5.3 days. There was no significant difference ($p > 0.05$) in the average mortality rate in the pre and the post period across the 6 ICUs. **CONCLUSION:** Unlike in previous studies, Tele-ICU monitoring increased hospital costs and length of stay.

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Database Studies & Management

PMC13

USE OF POTENTIALLY INAPPROPRIATE PSYCHOACTIVE MEDICATIONS AND FALLS IN U.S. NURSING HOME RESIDENTS

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Use of Potentially Inappropriate Psychoactive Medications (PIPM) poses a serious threat of falls among elderly nursing home residents. With this objective, the study was conducted to identify the effects of PIPMs on falls among nursing home residents. The 2004 National Nursing Home Survey (NNHS) was used as the data source. Logistic regression was performed to ascertain the relationship between residents' falls in the past 180 days and use of PIPM as per Beers' criteria in the presence of other risk factors. The data analysis was performed using SAS 9.1. The 2004 NNHS includes 1174 facilities consisting of 3868 males and 9639 females. The mean age of the residents was 80.5 ± 12.97 years. The residents who fell were older than the residents who did not fall (82.46 vs. 79.5 years, $p < 0.0001$). Residents on PIPMs were at an increased risk of falling compared to those who did not take PIPMs (odds = 1.295, $p < 0.0001$). Residents suffering from mental disorders fell more compared to the other group (odds = 1.316, $p < 0.0001$). Residents' fall-risk increased with an increase in the number of impaired ADLs (odds = 1.158, $p < 0.0001$). The fall-risk also increased with advance of age (odds = 1.017, $p < 0.0001$). Use of bedrails had a protective effect on residents fall-risk (odds = 0.652, $p < 0.0001$). In addition to these factors, male gender (odds = 1.247, $p < 0.0001$) and white race (odds = 1.485, $p < 0.0001$) were also significant risk factors. Among facility factors, being a non-profit facility ($n = 467$) was associated with a higher risk of falls (odds = 1.133, $p < 0.0001$). Prevention of falls in elderly nursing home residents remains a challenge. PIPMs are still prescribed to the elderly nursing home residents. Access to appropriate psychoactive medications should be ensured. Residents with the identified risk factors should be closely monitored. Further research should be pursued to evaluate the impact of medications in other therapeutic categories and facility factors on falls.

PMC14

EXPLORING CANDIDATE DIFFERENCES BETWEEN DRUG COHORTS PRIOR TO EXPOSURE: A SYSTEMATIC APPROACH USING MULTIPLE OBSERVATIONAL DATABASES

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OBJECTIVES: To develop a systematic approach using disparate observational databases for identifying pre-exposure differences in condition incidence across drug cohorts. A case study to examine the utility of the method was conducted, comparing dutasteride with finasteride. **METHODS:** Two disparate databases an electronic health record (EHR) and an administrative claims database were used for analysis. We applied an unmatched cohort design to each source, capturing all persons within the two exposed populations. For all conditions, we calculate unadjusted incidence rates prior to exposure for each cohort and the associated incidence rate ratios (IRR) between cohorts. Three different IRR estimates were calculated using unique definitions of person-time: '6 months' prior to exposure, any time 'before' exposure, and 'variable' time based on length of exposure. Each method used statistical significance of the IRR as the threshold for identifying 'candidate differences' (CD). A composite threshold requiring significance across both sources was also used. **RESULTS:** Using the '6 months' metric, 194 CDs within the EHR and 469 within the claims database were identified, with 108 conditions occurring in both sources. Expert review found the combined list contained all concepts previously hypothesized as important to consider when designing a dutasteride-finasteride study, as well as 10 conditions not hypothesized but deemed important for any evaluation, 40 unexpected pre-exposure conditions that warranted further consideration, and 10 terms that added no value. There was good concordance across metrics, with 70 of 129 'before' CDs and 95 of 161 'variable' CDs matching the '6 months' results. **CONCLUSIONS:** Exploratory analysis of pre-exposure cohort differences can enhance design of observational evaluation studies, guiding researchers to develop their conceptual model to assess the relationship between treatment and outcome by identifying potential sources of sample selection bias. Using multiple data sources allows independent verification of exploratory findings, raising confidence that CDs identified bear consideration.

PMC15

DETERMINING THE MECHANISM OF MISSING DATA IN INCOMPLETE DATASETS

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OBJECTIVES: In any study involving individual level data, the problems associated with incomplete observations are an obstacle to analysis. For this reason methods have been developed to complete these datasets. Multiple imputation is considered the most robust method of handling missing data, however it is also the most complex and computationally intensive. Whether multiple imputation is needed depends on the mechanism of the missing data. For example, if data is missing completely at random simpler methods can be used. For this reason, we conduct an analysis to inform the appropriate imputation method by identifying the mechanism of missing data. **METHODS:** To determine the mechanism of missing data we fit a probit model to a dataset from a study comparing the use of Endovascular Repair (EVAR) versus the use of Open Surgical Repair (OSR) in repairing Abdominal Aortic Aneurisms. From this we determined the appropriate method to complete the dataset. We then ran a sensitivity analysis on the different methods to determine the potential consequence of utilizing the inappropriate method. **RESULTS:** The results of the probit model indicated that the dataset had data which was missing at random and thus the missingness is predictable by observables in the dataset. This implied that the most appropriate method is imputation by stochastic regression or multiple imputation(the stronger of the two methods). The sensitivity analysis, however, showed no statistically significant difference between the two methods in terms of QALYs—total QALY difference between EVAR and OSR: –0.09952(–0.13202,–0.0670) for SR and –0.0866(–0.12344,–0.04977) with significant deviations from other methods. **CONCLUSIONS:** This study demonstrates the

importance of appropriate imputation and how determining the mechanism of missing data informs the appropriate imputation method. A probit model using missing data dummies can effectively identify the mechanism of missing data and inform the appropriate method for imputation.

PMC16

CREATING NATIONAL WEIGHTS FOR A LARGE-SCALE, PATIENT LONGITUDINAL DATABASE

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Project a large-scale, patient longitudinal database to the U.S. insured population. The AHRQ Medical Expenditures Panel Survey (MEPS) was used as the basis for the adjustment methodology. MEPS are a source of data representing the cost and use of health insurance coverage, and are comprised of several large scale surveys of families, individuals, employers, and health care providers. First, we subset the data source to the study population, then used multivariate logistic regression to construct demographics and case-mix based weights that were applied to make the data similar to the national sample. The weight is derived using inverse of probability of existing in the database. To validate the weights, we randomly divided MEPS data into two parts; training set, and validating set. We used the training set to estimate the weights, then validated weights comparing standardized differences in terms of demographics and health status between the weighted and validating data sets. The following variables were used in the logistic regression: age group, gender, race, location, income levels and health status (Charlson Comorbidity Index and Chronic Conditions). i3 data were more likely to be male, older, chronic, and white ($p = 0.0000$). Adjusted weight values for the Commercial group ranged from 1 to 51 with median 1.63, Medicaid 1 to 104 with median 1.03, and Medicare 1 to 61 with median 1.07. After applying adjusted weights, standardized differences in all confounders were less than 105. National projection of a large-scale, patient longitudinal database requires adjustment from not only demographic factors but also case-mix differences related to health status. The created weights successfully balanced the population in terms of co-morbid conditions and chronic conditions as well as demographic factors.

PMC17

A METHOD FOR CONVERTING NATIONAL DRUG CODES (NDCS) TO GENERIC AND THERAPEUTIC CATEGORY CODES FOR USE IN LARGE DATABASE STUDIES OF PRESCRIPTION DRUG CLAIMS

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OBJECTIVES: Prescription drug studies using large administrative databases usually require that NDCs be converted to generic or therapeutic categories for analysis because NDCs are structured with this information. Commercial crosswalk solutions for assigning generic and therapeutic codes to NDCs are available, but they are generally designed for applications other just converting NDCs. The cost of these comprehensive systems can be prohibitive for academic researchers conducting small to medium size projects; thus limiting research possibilities. A new system for making this conversion has been devised. **METHODS:** Because this system is designed solely for the purpose of converting NDCs to generic and therapeutic categories, it does not have many of the features found in commercially available systems (e.g., counseling notes, drug-drug interactions, patient information, etc.). However, advantages of the new system for academic researchers are its ease of use, method of delivery, simplicity, logical structure, comprehensive coverage, and free distribution. **RESULTS:** The new system provides a crosswalk from NDCs to generic entity and therapeutic category codes. Other selection criteria include dosage form, strength, and route of administration. This SQL-based system is accessible by a point-and-click user interface to select and download records of interest. Users then match the selected codes by NDC to a claims database to obtain the desired drug claims. Currently, the system includes coding for over 25,000 NDCs at the nine digit level (11 digit NDC without package size code). Additional NDCs will be added as they are identified. **CONCLUSION:** Two capabilities of this system, ability to aggregate drugs generically and therapeutically, are not found in the FDA database. In addition, the new system is retrospective whereas the FDA system is not. Academic researchers have a new tool for research using large databases of prescription claims.

PMC18

COMPARISONS OF DATA MINING ALGORITHMS FOR ADVERSE DRUG REACTIONS: AN EMPIRICAL STUDY BASED ON THE ADVERSE EVENT REPORTING SYSTEM OF THE FOOD AND DRUG ADMINISTRATION

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OBJECTIVE: To compare the sensitivity and timing of ADRs signal early detection across the four DMAs based on the Adverse Events Reporting System (AERS) of the Food and Drug Administration. **METHODS:** The four DMAs,including the Reporting Odds Ratio (ROR), the Proportional Reporting Ratio (PRR), the Information Component (IC), and the Gamma Poisson Shrinker (GPS), are applied to retrospectively detect ten confirmed drug events combinations (DECs). The sensitivity to detect adverse events is defined as the percentage of DECs that are detected by the DMA as positive signals. The sensitivity of each DMA given different number of reports per DEC is measured as well. The timing of ADRs signal early detection is measured by comparing the index date of withdrawal (IDW) with the index date of detection (IDD). The IDW is defined as the date on which the drug was removed from the market, while the IDD is defined as a date on which the signal is significantly detected by DMAs. **RESULTS:** The estimated sensitivity to detect adverse drug event is 100% for the ROR, 90% for the PRR and the IC, and 70% for the GPS. The difference is not statistically significant. The sensitivity increases while increasing the number of reports per DEC. The average period of interval between the IDD and the IDW per DEC are approximately 10.1 quarters for the ROR, 9 quarters for the PRR, 9.9 quarters for the IC, and 4.7 quarters for the GPS, indicating the ROR is associated with the earliest signal detection among four DMAs. **CONCLUSION:** Given the overall consideration of the sensitivity and the timing of signal detection, ROR may be considered as the first choice when selecting DMAs to conduct ADRs signal detection. The findings need to be further validated in a prospective context.

PMC19

ESTIMATING SOCIODEMOGRAPHIC VARIABLES IN A PHARMACY DATASET: APPLYING DATA FROM US CENSUS 2000

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OBJECTIVE: Pharmacy datasets are useful for evaluating drug costs, patient utilization, and patient adherence. Few have information on sociodemographic variables including race, education, income, and urban/rural designation of the patients' neighborhoods. We undertook to estimate those variables by linking USA census 2000 data with one such database. **METHODS:** We obtained census data tables for race, median income, education, and percentage of urban/rural residences by Zone Improvement Plan (ZIP) codes. Linking to the RxAmerica pharmacy claims database by 5-digit ZIP, we estimated sociodemographic variables for a cohort of adult new users of lipid-lowering therapy with ≥18-months continuous eligibility. For patients without a ZIP, pharmacy ZIP was used as a proxy. Four variables were generated to estimate race, median income, education level, and urban/rural designation of the patients' neighborhoods. **RESULTS:** A total of 29,667 patients met the inclusion criteria. Of these, 28,293 (95.4%) had a valid 5-digit ZIP that linked with one in the census tables; 97.0% of the ZIPs were derived from the patients' addresses. Among a sample of 19,458 patients, there were 4662 unique ZIPs; number of patients within each ZIP ranged from 1–125 (SD 11.9). The mean observation for income based on the median income variable reported in the census table was $45,924 (SD $15,965). The median observation for education was at least a high-school diploma; 25% of subjects had an observation corresponding to at least some college. Most of the patients had observations for race indicating they were from predominantly white neighborhoods (63.5% from neighborhoods that were ≥75% white). Most of the patients also had observations indicating they were from highly urbanized areas (74.0% from neighborhoods that were ≥75% urban). **CONCLUSION:** Census tables may be useful for estimating sociodemographic variables for pharmacy claims analyses. Future work should focus on the validity of these variables for estimating sociodemographic variables.

PMC20

METHODS TO SUMMARIZE COMPLICATED DATASETS CONTAINING STRUCTURED, NOMINAL DATA USING SAS

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Objective: The purpose of this study is to show the methodology for preprocessing and analyzing large health care databases. We consider working with large databases of clinical information such as National Inpatient Sample (NIS), and Thomson MedStat MarketScan data containing all patient claims in 40 million observations. **METHODS:** We can define a group of procedures and treat them as one episode to investigate the frequency of occurrence. In many studies, only the primary procedure and diagnosis are considered when there are more than one procedure and diagnosis columns, but important information could be in those other columns. In our database used for the study, there are fifteen procedure and fifteen diagnosis columns that we use to find episodes of patient care. We also combine information from multiple datasets: inpatient, outpatient, pharmacy information. Another approach is to consider a sequence of treatments on patients and to study the effectiveness of treatment by looking at this sequence for each patient. Studying the physician decisions and the results of them is interesting to many health care organizations. **RESULTS:** Powerful statistical software is required to work with large data files. We used SAS Enterprise Guide and the RXMATCH function to summarize codes defining a specific diagnosis, using multiple information sources. An alternative approach is to use SAS Text Miner. We combine columns using the CATX function. Then we use SAS Text Miner on the defined text string; the terms window in the output gives the frequency and number of documents. We use Text Miner features such as "Treating as equivalent terms", "Sorting" and "Filtering" to get summaries of different diagnosis or procedures. We successfully defined episodes of care. **CONCLUSIONS:** Preprocessing is an essential aspect of outcomes research. Dealing with multiple data sources is essential.

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Modeling Studies

PMC21

COST-EFFECTIVENESS SENSITIVITY TO COST-EFFECTIVENESS CORRELATION: A SIMULATION STUDY

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Incremental costs and effectiveness may be correlated if patients receiving the most health benefit from an intervention tend to be those who incur greater (or lesser) incremental cost. Such correlation has the potential to bias the synthesis of cost-effectiveness evidence, yet is infrequently reported. The objective of this study was to assess the sensitivity of an incremental cost-effectiveness ratio (ICER) for interventions A vs C, estimated indirectly from studies of A vs B and B vs C, to correlations between incremental cost and effect. Incremental costs and effects of interventions A vs B and B vs C were simulated from lognormal and Normal distributions respectively of given mean, standard deviation (SD) and cost-effectiveness correlation. The distribution of the ICER for interventions A vs C was calculated. Results from various parameter choices were compared. One parameter set choice was that the mean (SD) incremental cost of A vs B was $100,000 ($40,000) for a health benefit of ten(2) and that the incremental cost of B vs C was $200,000 ($50,000) for a health benefit of 12(2). For the parameter set described, the mean (SD) ICER of intervention A vs C assuming no correlation between incremental costs and health effects was $13,760 ($2637). Varying the two correlation parameters between −1 and +1 altered the mean ICER by up to $200 and the ICER's SD by up to $1679. The ICER's mean was fairly insensitive to the two correlation parameters but its SD was more sensitive. Correlations between cost and effectiveness can therefore be expected to be more important in questions of decision uncertainty rather than in the estimation with best existing knowledge of relative cost-effectiveness. More generally, sensitivity was greater when distributional variance and skewness of incremental cost and health benefit were greater.

PMC22

A MODEL TO EXAMINE THE EFFECT OF GUIDELINES ON OUTCOMES RESEARCH

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OBJECTIVE: This paper introduces a method that combines the propensity score matching and interrupted (segmented) time series models to measure the effect of guidelines on outcomes measures. **MODEL:** Propensity score matching is used to balanced the groups before the trend is analyzed. The Kitchen sink approach is used for propensity score matching. Interrupted time series models applied over the matched sample. The time series

model contained two predictor variables, the binary intervention variable, and an interval coding for time. This model controlled for the confounding influence of any underlying trend and ensures that any estimated change in the mean level of the series after intervention is not simply due to the fact that the series was already decreasing or increasing. **RESULTS:** To illustrate the model, changes in the utilization of two hypothetical drugs were analyzed after the issue of the guidelines. Patients who used these two drugs were different at the baseline in terms of observable characteristics such as age, gender, co-morbidities. ($p = 0.000$). Samples were balanced with nearest neighbor matching. Then, segmented time series models were applied. There was a significant association between the onset of intervention and the level of utilization of these drugs. **CONCLUSION:** To isolate the effect of guidelines we needed to control for three different factors: 1) Base line differences between the two groups; 2) Stepwise differences at the intervention point; and 3) Trend differences after the intervention. We showed that propensity score matching can be used for the first one, and the later two can be controlled with interrupted time series model.

PMC23

PREDICTION MODELS FOR TRANSITIONS IN THE ELDERLY USING ADMINISTRATIVE CLAIMS

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OBJECTIVES: We developed and validated claims-based prediction models for transitions from the community to nursing home in an elderly population without dementia. We sought to compare three models: model 1 included prescription drug class and disease conditions variables, model 2 excluded prescription drug class variables, and model 3 excluded disease condition variables. **METHODS:** The study sample was a retrospective cohort of 454,656 elderly Medicare beneficiaries with employer-sponsored supplemental health insurance. We developed models for predicting the probability of nursing home admission within six months after a baseline year of no nursing home admissions or diagnosis of dementia, using a combination of literature-based risk factors for transitions, stepwise logistic regression, and Akaike's information criteria. A split-sample approach was used to assess reliability of final models. Model discrimination was evaluated using the C-statistic. Model calibration was measured by using the Hosmer and Lemeshow test to assess Chi-square goodness-of-fit of the model and then inspecting residuals and checking the existence of influential data points. **RESULTS:** In addition to age, sex, geographic region, insurance type, prior hospitalization and number of prescriptions, the final prediction model 1 for beneficiaries without dementia contained 36 co-morbidities and 16 drug categories. The C-statistics of model 1, model 2, and model 3 were 0.83, 0.81, and 0.82, respectively. The Hosmer and Lemeshow goodness-of-fit tests for the models were not significant except for the model 3. In each case, less than 5% of standardized residuals had a value outside the range [−1.96; 1.96]. No influential points were found in any of the models. **CONCLUSION:** Prediction models using administrative claims can be a valuable screening tool for identifying beneficiaries who are at high risk of nursing home admission. Reliable prediction models for nursing home admission can be based on data that include or exclude drugs/disease information.

PMC24

INVERSE PROBABILITY WEIGHTED RANDOM EFFECT MODELS FOR ESTIMATION OF CENSORED OUTCOMES VARIABLES

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OBJECTIVE: Most of the claims file fit naturally in to a panel format since there are data on cost and utilization at multiple intervals such as months or years. In this paper we describe a method that can apply to longitudinal data when the outcome variable is censored. **METHOD:** It has been proved that inverse probability weighted random effect models produce consistent estimators with censored outcome variable. We briefly summarize how this consistency is achieved and how we can calculate the standard errors. Moreover, we described how to write the commands in statistical software programs to estimate relatively complicated and advanced formulas to achieve consistency. **RESULTS:** We calculated two standard errors: unadjusted to censoring bias and adjusted to censoring bias for inverse probability weighted random effect models. We showed that adjusted standard errors always equal or less than unadjusted standard errors. **Conclusion:** One of the main difficulties to apply inverse probability of weighted random effect models is to estimate adjusted standard errors. Due to complications, in outcomes research, these models are not widely used. This paper shows that most of the times unadjusted standard errors would be enough to make strong conclusions about the effect of our variables.

PMC25

SENSITIVITY ANALYSIS FOR PROPENSITY SCORE MATCHING

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Matching has become a popular approach to estimate average treatment effect. However, matching cannot control for unobserved bias. Using Rosenbaum bounding approach, we aim to show how strongly unmeasured variables must influence the selection process to undermine the implication of matching analysis. The Surveillance, Epidemiology, and End Results (SEER) Data is used for the analysis. The SEER-Medicare Database is created by linking Medicare identifiers to SEER patients aged 65+ and all claims collected including hospital, physician and clinic. For each patient, their hospital of care and associated hospital volume is computed. Patients in the high and low volume hospitals are matched in terms of demographic and clinical characteristics. Treatment costs are compared, Rosenbaum bonds estimated and Mantel and Haenszel test statistics is calculated to provide evidence on the degree to which any significance results hinge on unconfoundedness assumption. A volume cohort was constructed consisting of 19,375 female SEER-Medicare patients, aged 65+, suffering an in situ and/or invasive breast cancer during 2003–2005 with surgical treatment performed at 567 hospitals. After the matching, samples were similar in terms of race, comorbidity and adjuvant therapies. Under the assumption of no hidden bias, costs were lower of the high volume hospitals ($p = 0.000$). Results were insensitive to a bias that would double the odds of being treated at high volume hospitals but sensitive to a bias that would triple the odds. Rosenbaum bonds provide evidence on sensitivity of the estimated results with respect to deviations from propensity score matching assumptions.

PMC26

APPLICATION OF THE FRAMEWORK FOR EVALUATING COMPLEX INTERVENTIONS TO CLUSTER RANDOMIZED TRIALS FOR THE EVALUATION OF DISEASE MANAGEMENT PROGRAMS

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Trials of disease management programs pose several methodological challenges. Our objective is to assess the extent to which the various development steps of a cluster randomized trial to evaluate disease management are represented in the framework for the design and evaluation of complex interventions. The framework for evaluating complex interventions developed by Campbell and colleagues is composed by five phases: theoretical, identification of components of the intervention, definition of trial and intervention design, methodological issues for main trial, and promoting effective implementation. Using these phases the corresponding stages in the development of the cluster randomized trial to evaluate the effectiveness of disease management programs are identified and described. Synthesis of evidence needed to construct the program, survey and qualitative research used to define components of the program, a pilot study to assess the feasibility of delivering the care, methodological issues in the main trial including choice of design, allocation concealment, outcomes, sample size calculation and analysis are adequately represented using the stages of the framework for evaluating complex interventions. Even though is difficult to define precisely what exactly the "active ingredients" of a program of disease management and how they relate to each other, we think that the applied framework is a powerful resource for researchers planning a randomized clinical trial to evaluate the effectiveness of such programs.

WITHDRAWN **PMC27**

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Patient-Reported Outcomes Studies

PMC28

RASCH PARTIAL CREDIT ANALYSIS OF THE SF-12V2 USING THE 2003 MEDICAL EXPENDITURE PANEL SURVEY (MEPS)

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This study assesses the Rasch measurement properties of the SF-12 version 2 (SF-12v2) physical and mental health (PH and MH) items in respondents with most prevalent chronic conditions. Medical Expenditures Panel Survey (MEPS) respondents' age $\geq$ 18 with complete SF-12v2s from 2003 were extracted (n = 19,906). Eleven subgroups were identified using the primary ICD-9-CM code for the top 10 chronic conditions (hypertension, diabetes, depression, back disorder, arthropathy, cholesterol, asthma, sinusitis, anxiety and joint disorder) and healthy persons (n = 8324). Respondents with perfect scores demonstrating ceiling (n = 303) and floor effects (n = 12) were removed to ensure uncertainty in the responses. Coding reflected that higher scores represent healthier respondents. The Rasch partial credit model was used to exam the item category properties and fit statistics. Residual factor analysis was conducted to assess the factor loadings on the items. Item misfit took place mostly among MH items (infit/outfit z-score >2.0). Particularly, MH item "Have you felt calm and peaceful?" showed misfit across all subgroups. Rasch residual analysis identified 75.2% to 86.9% of the shared variance within clusters of all items. Further, PH items had positive factor loadings while MH items had negative factor loadings, with few exceptions (3/11). Some item category steps had poor step properties. Mental health items are more likely to be noisy. The patterns of the factor loadings of the PH and MH items were as expected in most of the groups suggesting that the SF-12v2 has two distinct factors measuring the overall health. Poor item category performance suggests that collapsing of these categories might improve the quality of the instrument.

PMC29

INTERNATIONAL VALUATION SET FOR EQ-5D HEALTH STATES

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OBJECTIVE: Health states defined by classification systems like the EQ-5D can be valued using techniques that aim to elicit cardinal measures directly, such as the time trade-off (TTO) and visual analogue scale (VAS), but also by ranking the health states. In this study, we estimate international value sets for the 243 EQ-5D states based on rank, TTO and VAS responses and test their equivalence. **METHODS:** We estimated the coefficients scale is recommended in Sweden [in Swedish] of a conditional logit and a linear probability model of rank responses as well as the coefficients of two linear models of TTO and VAS responses using pooled data from eight countries: Slovenia, Argentina, Denmark, Japan, Netherlands, Spain, UK and US, which gave us 179,431 responses from 11,483 subjects. The main difference between the two rank models is that one models utility in ln(odds), as suggested by McFadden, and the second in probability. The regression specifications have previous models estimated in the United States and UK nested within its framework. Furthermore, we compare rescaled predicted values for the 242 EQ-5D states, excluding 11,111, across techniques in terms of correlation and concordance. **RESULTS:** The non-optimal gap reduces when utilities are linearly modeled in probability instead of log-odds, as suggested by McFadden. The rank-based values are highly correlated with both TTO and VAS values. Compared to the log-odds model, the linear probability model produces rank-based values with greater concordance to TTO/VAS values. **CONCLUSION:** In former investigations we tested if ranking in the large pool of data produce values of health states comparable with direct measures as TTO and VAS. In this investigation we provide further evidence by showing convergent validity between TTO/VAS and alternative rank-based models for the whole valuation space. This evidence emphasizes the promise of a valuation technique that incorporates ordinal responses. Overall, rank-based values merits closer investigation.

PMC30

A REVIEW AND CRITIQUE OF METHODS FOR MEASURING TEMPORARY HEALTH STATES IN COST-UTILITY ANALYSES

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OBJECTIVES: Temporary health states (states with a duration of less than one year) are common and include many infectious diseases, short-term treatments, and diagnostic procedures. Valuation of these states requires special consideration because the health state is transitory and standard methods ignore the influence of duration on preferences. Inaccurate assessments could introduce bias into cost-utility ratios. There is no "gold stan-

dard" valuation method. The aim of this study is to review and critique temporary health state valuation methods and identify areas for future research. **METHODS:** We reviewed the literature and evaluated preference-based temporary health state valuation methods according to five criteria: (1) Consistency with quality-adjusted life year theory; (2) Ease of use; (3) Relevance to temporary health state-specific domains; (4) Sensitivity to health state duration; and (5) Extent of bias. Our goal was to provide a critical assessment of methods that could be used to obtain values for use in cost-utility analyses. **RESULTS:** We identified six temporary health state valuation methods. Methods modified standard approaches by prorating utilities, using a chained approach, or trading-off waiting time or sleep instead of death in a time trade-off. These modifications capture the effect of duration better than standard methods. The strength of methods varied. No method was well tested for validity and reliability with respect to temporary health states. **CONCLUSION:** The literature on temporary health state valuation methods is sparse and inadequate. Our critique did not identify a method that is appropriate for valuation of all temporary health states. Selection of the most appropriate method should depend on the duration of and type of temporary health state being considered. Further research should focus on the validity, reliability and feasibility of valuation under different circumstances. Utility values obtained using temporary health state methods should be compared to those using standard methods to quantify biases.

PMC31

CONTROLLING MEASUREMENT ERROR OF PATIENT-REPORTED-OUTCOMES DURING THE IMPLEMENTATION STAGE OF CLINICAL TRIALS

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OBJECTIVE: Measurement errors may be introduced in the development, cultural adaptation, implementation, and analysis of PRO assessments. Recent publications provide guidance to minimize measurement errors during the development and cultural adaptation stages. Very little guidance is available to control errors, especially in multinational studies, introduced during the implementation of PRO assessments. The objective of this abstract is to highlight errors that may be introduced during the implementation stage, specifically during the production of data capture modules (e.g. Case Report Forms)for multi-national studies. **METHODS:** A rigorous process was put in place to monitor errors introduced during the CRF development process with the aim of having a library of PRO instruments readily available for use in clinical trials. After typesetting, CRF pages were proof read by three independent reviewers including a native speaker. Suspected errors including poor grammar and typographical errors found in original PRO instruments were reconciled with author's permission and documented. **RESULTS:** A total of 40 PRO instruments were used in 39 Phase III multinational studies involving 69 languages in 2006–2007. Three instruments had multiple versions for the same language and the author of another instrument did not have a list of available translations. Two types of errors were found at the final stage of proof reading by native speakers. The first, ambiguous or outdated terminology. The second, typesetting errors which may have altered the meaning of the phrase or question. **CONCLUSION:** An adequate process must be in place to monitor, document and minimize errors that may be introduced during the implementation stage of PRO assessments. Failure to do so, especially in multi-national studies, may invalidate the resources spent during the development and translation stages and increase the Company Risk.

PMC32

PREDICTING SF-6D PREFERENCE-BASED UTILITIES USING MEAN SF-36 HEALTH DIMENSION SCORES WHEN PATIENT LEVEL DATA ARE NOT AVAILABLE

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OBJECTIVES: The objective of the study is to derive an algorithm to predict a cohort preference-based SF-6D index using the eight mean health dimension scores when patient level data is not available. **METHODS:** Health related quality of life data (n = 6890) collected from patients with a wide range of health conditions was used to explore the relationship between the SF-6D and the eight dimension scores. Ordinary least square regressions were derived using the eight dimension scores and first order interactions. Models were assessed for goodness of fit and predictive abilities using standard statistics such as variance explained; residuals and the proportion of predicted values within the minimal important difference. The models were also compared on their abilities to predict mean cohort SF-6D scores using mean dimension scores using both within-sample and out-of sample published datasets. **RESULTS:** The OLS equations obtained explained over 83% of the variance in the individual SF-6D scores. While the models over-predict the lower health states and under-predict the higher SF-6D scores on the individual level, the mean absolute errors are in the region of 0.040. When using mean dimension scores from within-sample subgroups and out-of sample published datasets, the majority of predicted scores were well within the minimal important difference (0.041) for the SF-6D. The models are reasonably accurate at predicting incremental values between study arms (mean error 0.012; mean absolute error 0.017) and when predicting incremental changes over time (mean error 0.004; mean absolute error 0.024). **CONCLUSION:** This paper presents a mechanism to estimate a mean cohort preference-based SF-6D score from published mean dimension scores. This study is unique in that it uses published mean statistics to validate the results. The out-of sample validation demonstrates the algorithms can be used to inform both clinical and economic research. Further research is required in different health conditions.

PMC33

PREDICTING A MEAN EQ-5D PREFERENCE-BASED SCORE FROM THE 8 MEAN SF-36 DIMENSION SCORES WHEN INDIVIDUAL DATA IS NOT AVAILABLE

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OBJECTIVES: The objective of the study is to derive a method to predict a cohort EQ-5D preference-based index score using published statistics of the eight dimension scores describing the SF-36 health profile. **METHODS:** Ordinary least square regressions are used to obtain models from patient level data covering a wide range of health conditions. The eight dimension scores, the squares age and gender are used to derive a relationship with the EQ-5D index. Models obtained are compared for goodness of fit using standard techniques such as descriptive statistics, variance explained, the residuals and the proportion of values within the minimal important difference. Predictive abilities are also compared when using summary statistics from both within-sample subgroups and datasets published studies. **RESULTS:** The models obtained explain more than 56% of the variance in the EQ-5D scores. For the individual predicted values, the mean predicted EQ-5D score is correct to two decimal places and the mean absolute error is approximately 0.13. Using summary statistics to

predict within-sample subgroup mean EQ-5D scores, the mean errors (mean absolute errors) range from 0.021 to 0.077 (0.045 to 0.083). When predicting baseline cohort EQ-5D scores using published mean dimension scores the models produce mean errors ranging from 0.048 to 0.099 with 76% of values correct to within the minimal important difference. When predicting out-of sample incremental differences between study arms and incremental changes over time, over 71% of values are within the minimal important difference. **CONCLUSIONS:** The models provide researchers with a mechanism to estimate EQ-5D utility data from published mean dimension scores. This research is unique in that it uses mean statistics from published studies to validate the results. While further research is required to validate the results in additional health conditions, the algorithms can be used to derive additional preference-based measures for use in economic analyses.

PMC34

INTERNATIONAL SURVEY ON WTP FOR ONE ADDITIONAL QALY GAIN—HOW MUCH IS THE THRESHOLD OF COST-EFFECTIVENESS ANALYSIS

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OBJECTIVE: Threshold of cost-effective analysis is thought to be £20,000–£30,000 in UK and $50,000–$100,000 in the US, however it is known that these values are not based on explicit scientific evidence. We measured WTP for one additional QALY gain to determine the threshold of cost-effectiveness analysis. **METHODS:** We measured willingness to pay (WTP) for additional one year survival in perfect health status to determine threshold of incremental cost-effectiveness ratio (ICER) by the internet. The number of subjects is 1000 (500 male and 500 female in their 20 s to 50 s) in Japan, Republic of Korea (ROK), Australia and UK. We asked them four kinds of WTP, i.e., 1) WTP for their own additional QALY: (WTPsel); 2) WTP for their own additional QALY 5 years later: (WTP5sel); 3) WTP for their family's additional one QALY: (WTPfam); and 4) the amount they think society should pay for someone's additional one QALY: (WTPsoc). The double bound dichotomous choice was applied to this research analyzed by nonparametric Turnbull method. **RESULTS:** The value of WTPsel is ¥5 million (Japan), ROK70 million Won, AUS$64,000 (Australia) and GBP23,000 (UK). Discount rate of outcome was calculated by comparing WTPsel with WTP5sel, and it is estimated to be 6.8% (Japan), 3.7% (ROK), 1.9% (Australia) and 2.8% (UK). The order of four kinds of WTP is WTP5sel < WTPsel < WTPsoc < WTPfam in Japan and ROK, and WTP5sel < WTPsel < WTPfam < WTPsoc in Australia and UK. **CONCLUSION:** Considering the value of WTPfam (¥6.4 million), we think the threshold of ICER should be determined to be ¥5 million to ¥6 million per QALY in Japan. This result also shows the threshold and discount rate adapted by NICE is reasonable. The difference of four WTP's order may represent cultural gap between Asia and Western world.

PMC35

A SYSTEMATIC REVIEW OF APPLICATIONS OF CONJOINT ANALYSIS IN MEDICINE

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OBJECTIVE: To conduct a systematic review of studies that employ conjoint analysis methodology in outcomes research in medicine published between 1985 and 2006 in order to document: i. clinical areas of focus; ii. sample size; iii. method of design; iv. method of analysis and other quality parameters. **METHODS:** Papers published between 1985 and 2006 were identified on Medline, using the search terms conjoint analysis/analyses, stated preference(s), discrete choice analysis/analyses, and discrete choice modeling/experiments(s). All papers were then reviewed for content by three reviewers, with papers not actually related to conjoint analysis being deleted. Remaining papers were then classified as: i. a clinical application; ii. an application focusing on heath systems; or iii) papers focusing on methods. We classified all clinical applications by ICD-9 codes and identified key methodological characteristics such as sample size, design methodology and type of analysis when available. **RESULTS:** We began our review in 1985 due to the limited number of publications between 1970 and 1985 (n = 4). Post 1985, 27% (n = 48) discussed the methodology of conjoint analysis with no application, 25% (n = 45) focused on health systems in medicine and 48% (n = 86) were clinical and therapeutic applications of conjoint analysis. There is a steady increase in the use of conjoint in medicine between 1985 and 1999, most common clinical areas being HIV, cancer and STI. The average sample size is 267. Use of orthogonal arrays was the most common design, 74% (n = 50) followed by adaptive conjoint analysis, 16% (n = 11). Primary analysis techniques were probit and logistic regression, 39% (n = 27) and 30% (n = 21) respectively. **CONCLUSIONS:** We find insufficient information on the methods used in a significant proportion of manuscripts reviewed. Given the importance of preference elicitation in medicine, we need to focus on developing standardized research practices for the application of conjoint analysis in outcomes research.

PMC36

THE USE OF A MOBILE PHONE FOR ASSESSING MOOD AND PERFORMANCE IN EVERYDAY LIFE

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OBJECTIVE: Handheld computers and mobile phones allow assessments of a variety of aspects of behaviour, experience and performance in an everyday life setting. We have evaluated the use of a mobile (cell) phone to collect data on alcohol consumption, subjective state, and psychomotor performance and to assess the relationships between these variables. **METHODS:** Thirty eight healthy volunteers (20 male) aged 18–54 years (mean 22.8) took part. The study program ran on any phone supporting downloadable Java® applications. Text (SMS) messages were sent twice a day for 14 days according to a randomised schedule, and volunteers completed their entries as soon as possible after receiving the text. They recorded alcohol consumption and mood, and completed performance tasks. **RESULTS:** Compliance was good, with responses being made to over 80% of text messages. Subjective drowsiness (% of visual analogue scale length) ranged from 35.7–42.9 between 09:00 and 19:00 and from 51.5–57.7 between 21:00 and 01:00. Mean ratings of drunkenness assessed between 21:00 and 01:00 were 5.5% (S.D. 12.2) where no alcohol consumption was recorded and 53.1% (S.D. 21.0) where five or more drinks had been consumed in the last six hours (ANOVA $p < 0.001$). Mean errors on a memory scanning task were 6.6 (S.D. 4.7) with no alcohol and 10.5 (S.D. 6.8) after 6 or more drinks (ANOVA $p < 0.01$). **CONCLUSION:** Both objective and subjective measures showed the expected relationship with reported alcohol consumption. The widespread use of mobile phones means that this type of study can be carried out economically and with reasonable train-

ing requirements. Mobile phones provide a very effective method of collecting data in an unsupervised, naturalistic setting.

PMC37

ACCESS TO PATIENT-REPORTED OUTCOME (PRO) INSTRUMENTS AND THEIR TRANSLATIONS IN THE LIGHT OF FDA RECOMMENDATIONS

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Following the FDA recommendations of having exhaustive, reliable and documented information on an instrument and its translations when using these in an international study (draft PRO guidance in 2006), the accessibility of this information for instrument users has become increasingly important. The quality of this information is however directly impacted by how a developer chooses to release the latter into the scientific community and the way he decides to protect his instrument. It is thus necessary to review current ways in which this is done, to determine if FDA recommendations can actually be met or not and explore ways in which to facilitate this. Methods included to conduct a review of existing ways in which developers release information into the scientific community; 2) to comment on the pros and cons for each identified system with concrete examples; and 3) to make recommendations for instrument developers. Out of the 50 different cases identified and reviewed, two trends emerge with all possible variations between the following two extremes: on the one hand, the uncontrolled, de-centralised, free access to non-updated information without developer input and on the other controlled, copyright-protected, centralized, fee-paying access to reliable and updated information with input of the developer. Whilst both extremes have advantages and disadvantages, results demonstrate that the latter extreme seems to be more compliant with FDA recommendations. Concrete examples will be discussed in the presentation. Findings indicate that the way in which a developer organises (or not) the release of information on his instrument and its translations is directly related to whether a user can comply or not with FDA recommendations. Promoting a controlled, centralized system with input from the developers will facilitate access to reliable and updated information on instruments and their translations.

PMC38

USE OF A MOBILE PHONE TO ADMINISTER VISUAL ANALOGUE SCALES (VAS)

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OBJECTIVE: Handheld computer systems are increasingly being used to administer performance tasks and mood assessments in an everyday life setting. Mobile phones (cell) phones can be used in a similar way, and are highly portable and widely used. We evaluated a mobile phone implementation of a VAS scale using alcohol as a means of producing changes in subjective state. **METHODS:** Sixty-five volunteers (30 male) aged 19–54 years (mean 23) consumed a drink containing either vodka or water and orange juice in 10 minutes. Mean breath alcohol concentration 60 minutes later was 45–170 mg/100 ml (mean 94). Subjective drunkenness was rated on the mobile phone and on paper in randomised order before the drink and at 60 minutes after the drink with other test procedures in between. **RESULTS:** Changes in sober–drunk ratings (% of scale length) due to alcohol were comparable between the two testing modes (Alcohol—Placebo: 29.3 for phone, 25.3 for paper) and the agreement was excellent (Intra-Class Correlation = 0.96). The sensitivity to changes in scores between alcohol and placebo was similar for the two modes. **CONCLUSION:** We have shown that ratings made on a 2.1 cm VAS on a mobile phone screen are very similar to those on a conventional 10 cm scale on paper. Taken together with work on handheld devices, these data suggest that VAS scores are unaffected by scale length over a rather wide range, and support the use of mobile phone and handheld implementations of VAS for assessing subjective states.

PMC39

A COMPREHENSIVE PARADIGM TO ESTIMATE MINIMAL CLINICALLY IMPORTANT DIFFERENCES (MCID)

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OBJECTIVE: Due to the existence of many methods for estimating MCID and a lack of consensus on choosing among the potential estimates, an integrated approach for generating a MCID change score on Patient Reported Outcomes (PRO) measures is proposed. When incorporating PRO in clinical trials, clinicians and researchers face the challenge of determining whether a mean difference on a measure is clinically important. Currently available methods for interpreting the scores on PRO measures are often classified as being either anchor-based or distribution-based. These methods may yield a variety of candidates as potential MCID estimates. However, there is no agreed method of choosing among these candidates. **METHODS:** A strategy is proposed that integrates these two methods of MCID estimation and extends to selection among the candidate values by incorporating their natural variability and distinctions as well as the critical role of clinical judgment. The strategy consists of three steps: 1) generating multiple estimates of a MCID and corresponding confidence intervals (CIs) and range of variability; 2) integrating across the estimates from Step 1 by applying adopted normative descriptive criteria for MCID; 3) incorporating clinical judgment. An illustration of the proposed strategy is provided. **RESULTS:** Across the candidate MCID values, the maximum, minimum, mean of the estimates, minimum and mean of the 80% CI lower bounds, as well as the range of variability, were selected with consideration given to clinical insight. The comprehensive paradigm resulted in a MCID estimate that integrates normative, descriptive criteria. **CONCLUSION:** The proposed paradigm serves as a unifying approach that integrates available methods for estimating a MCID for a PRO.

PMC40

PHARMACY STUDENTS' PERCEPTIONS OF HEALTH-RELATED QUALITY OF LIFE FOR MULTIPLE CHRONIC HEALTH STATES MEASURED VIA ALTERNATIVE METHODS FOR UTILITY ASSESSMENT

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OBJECTIVES: To measure and analyze utility value assignment by professional pharmacy students to each of four chronic health states (Depression, Type 1 Diabetes, Rheumatoid Arthritis, and Hypertension) through utilization of one of the following utility assessment techniques: visual analog scale (VAS), feeling thermometer (FT), standard gamble (SG), and time-trade off (TTO). **METHODS:** Each Doctor of Pharmacy student (n = 195) was provided with a detailed patient vignette for each health state under evaluation. These cases contained information including the patient's drug therapy, overall health state and the impact of the latter on activities of daily living. Much care was given to

ensure that each patient vignette was written in a manner that accurately reflected and depicted the health state being examined. Students were randomly assigned to evaluate each case using one of the four different utility assessment techniques. **RESULTS:** The utility values (Mean +/– SD) for each of the health states under consideration were as follows: Depression (0.66 +/– 0.16), Type 1 Diabetes (0.73 +/– 0.17), Rheumatoid Arthritis (0.48 +/– 0.17), and Hypertension (0.83 +/– 0.12). A consistent trend emerged for all four health states being evaluated where the student assigned average utility score was highest when using the SG technique, second highest using TTO, third highest when adopting the FT and lowest when using an untransformed VAS score. A statistically significant difference ($p < 0.05$) between utility scores as measured by the SG technique and the VAS was found for each of the four health states under investigation. There was no significant difference in health state utility value assignment based on either a students' gender or age. **CONCLUSION:** Student assessment of health-related quality of life varied considerably as a function of the type of health state being evaluated and/or the utility assessment technique which was adopted.

PMC41

MAPPING SF-12 TO EUROQOL EQ-5D PREFERENCE SCORES IN THE SPANISH-SPEAKING HISPANIC COMMUNITY IN THE UNITED STATES

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OBJECTIVE: To generate an algorithm to map SF-12 scores to the Euroqol EQ-$5D_{INDEX}$ based on responses of the U.S. Spanish-speaking Hispanics ($_{SP}$Hispanics). **METHOD:** Responses from 2386 $_{SP}$Hispanics who were eligible to answer the self-administered questionnaire included in the 2003 Medical Expenditure Panel Survey were used in the analyses. EQ-$5D_{INDEX}$ was estimated using a recently developed set of social preferences for the U.S. Hispanics. Several ordinary least square (OLS) regression models of the EQ-$5D_{INDEX}$ onto the physical and mental $SF\text{-}12_{V2}$ scores were developed based on 2/3 of the $_{SP}$Hispanics sample. Modelling was performed excluding (basic model) and including sociodemographic characteristics, and also exploring possible compound terms between $SF\text{-}12_{V2}$ scores. Validation of the model was performed on 1/3 of the $_{SP}$Hispanics sample comparing observed and estimated EQ-$5D_{INDEX}$ in terms of correlation and mean absolute error (MAE). **RESULTS:** Based on goodness of fit, the best basic regression model considered both $SF\text{-}12_{V2}$ scores plus the squared term of the mental score ($R^2 = 0.59$). When sociodemographic characteristic were taken into account, only age significantly contributed to the previously described model (p value < 0.001), but its effect on improving R^2 was only marginal. Pearson correlation coefficient between observed and predicted EQ-$5D_{INDEX}$ was 0.77 for the best basic model in both the modelling and validating samples. MAE between observed and estimated EQ-$5D_{INDEX}$ was 0.076 in the validating sample. **CONCLUSION**: Findings confirm that reasonable estimates of the $_{SP}$Hispanic EQ-$5D_{INDEX}$ can be obtained from $SF\text{-}12_{V2}$ based on a simple OLS model. This algorithm may provide researchers in Latin America with a useful method to obtained preferences-based scores when only SF-12 data is available. Given the significant amount of variance that is usually left unexplained in these types of models it would be highly recommendable to incorporate this uncertainty in sensitivity analyses.

PMC42

METHODOLOGICAL ISSUES WITH THE ANALYSIS OF PREFERENCE-BASED EQ-5D INDEX SCORE

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The EQ-5D index is widely used to assess the preference-based health status. In this paper, we examine the analytical issues of regression models for the U.S. preference-based EQ-5D index score. We propose a two-part approach to model the special features of the EQ-5D index, particularly, a large proportion of subjects having the maximum score at 1.0. The first part is a logistic model for the probability of reaching the maximum score. The second part is a model for the rest of the scores that are less than 1.0, which can be either a least squares regression with robust standard errors for the conditional mean, or a quantile regression for conditional quantiles such as the median. We show that the two-part model has some desirable features that are not available in the previously published regression methods for the EQ-5D index score, including the ordinary least squares, Tobit model, and the censored least absolute deviations (CLAD) model. We illustrate the proposed approach with data from the Medical Expenditure Panel Survey (MEPS), which has a U.S. nationally representative sample. The proposed method may be used for other utility or health related quality of life scores of similar features.

PMC43

USE OF BACK TRANSLATION REVIEW IN THE TRANSLATION OF PRO INSTRUMENTS—SOME EXAMPLES

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OBJECTIVE: Back translation is considered a vital step in the generally accepted methodology for the translation of PRO measures (Wild et al. 2005). However, critics question its use (e.g. McKenna et al. 2005). There is agreement that more research is needed. Before embarking on more detailed research, it would be helpful to consider how back translation is currently being used as a step in the methodology for the translation of PRO measures. **METHODS:** A review was undertaken of 50 back translation reports from 4 past projects at Oxford Outcomes. Examples of how back translation contributed to the translation process were gathered. Statistics were also gathered on how many items were questioned by the reviewer, and on how many of those items questioned were changed as a result. **RESULTS:** Reviewers use back translation review as an opportunity to question what is in the translation, but do not force changes on the investigator. Review of the back translations can catch important misunderstandings/errors in the translation. The back translations can show investigators that their translation may be open to misinterpretation. Fourteen percent of items within the sample were changed as a result of back translation review. Although there are differences of style with different reviewers (e.g. questioning more items), the rate of changed items is around 15%, suggesting that the differing styles do not unduly influence the outcome of the reviews. The structure of the translated language can cause reviewers to question items that are not incorrect. Reviewers question more items in languages that are from cultures that differ widely from their own (e.g. Indic languages). **CONCLUSION:** Whilst back translation undoubtedly has its weaknesses and strengths, its users are aware of them and can consequently use it as tool to improve the quality of the translations of PRO instruments.

PMC44

IS A LITERAL BACK TRANSLATION IN PRO DOCUMENTS ALWAYS THE BEST OPTION?

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OBJECTIVE: Back translation is considered by many to be an integral part of the translation methodology for PRO documents. But while the ISPOR Task Force paper (2005) describes it as a critical component in the translation process without which final translations risk containing undetected different content from the source document, it is criticised by McKenna et. al. (2005) for having "no clear scientific basis" and for leading to potentially misleading impressions of the translation. In contrast to the more conceptual forward translation, using back translations as a tool in the translation of PRO documents usually requires a more literal translation to provide an accurate "window" into the translation. This research compares literal with non-literal back translations in PRO documents and aims to ascertain the circumstances in which each type of back translation would be most appropriate. **METHODS:** A selection of PRO translation projects has been reviewed based on the extent to which the back translation was literal or not. **RESULTS:** Some literal translations can be confusing and un-natural sounding while others suggest the forward translation is incorrect where this is not necessarily the case. Examples of both types of back translation include the literal back translation of a Turkish phrase as "did your head turn . . . over the last 24 hours?" This makes little sense because the forward translation was idiomatic. Back translations of the Ukrainian for "please tick one box" resulted in "please tick one answer" (conceptual) and "please tick one square" (literal)—here the literal translation is closer. The literal back translation of the Czech for "seizure" shows an error in the Czech where the conceptual back translation does not highlight this. **CONCLUSION:** Literal back translations can be misleading in idiomatic phrases but are usually more beneficial for symptoms and health states.

PMC45

EQ-5D + VAS = PRO

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OBJECTIVE: Conflicting requirements are made for health outcome measures reported in the USA and in Europe. Draft guidance issued by the FDA takes the narrow prescriptive view that a PRO is *a measurement of any aspect of a patient's health status that comes directly from the patient (i.e. without the interpretation of the patient's responses by a physician or anyone else)*. This runs counter to the requirement stipulated by NICE that health benefits should be weighted using population preference values. The absolute need for hypothetical health state valuations is questionable and this paper reports on a novel scoring system for EQ-5D based entirely on self-assessments obtained from "real" people. **METHODS:** Data were pooled from several different UK sources, including national population surveys conducted by post and patients self-assessment in clinical studies. A total of 23,679 respondents contributed EQ-5D data that included the health state defined by respondent's reported problem level on the 5 dimensions (OSTATE) and the 0–100 VAS rating of their own health status (EQ-$5D_{VAS}$). A total of 139 EQ-5D health states were identified. The mean EQ-$5D_{VAS}$ was computed for the 73 OSTATEs for which more than 5 observations were available. OLS regression analysis was performed on the micro-level data taking the OSTATE problem levels as independent variable and the self-rated VAS rating as the dependent variable. **RESULTS:** The model fit proved to be very good ($r^2 = 0.985$) when forced through the origin. Level decrements within dimension were monotonic and consistent. A value for the state dead of 12.0 obtained from similar UK national survey data enabled these "real" VAS-based scores to be converted into the 0–1 format required in economic evaluation. **CONCLUSION:** Values for EQ-5D based on own-health ("real") ratings are preferred to hypothetical values by some decision-makers. This simple methodology contrasts markedly with the more complex requirements of utility estimation techniques.

PMC46

DEVELOPMENT OF A STANDARDIZED CLASSIFICATION SYSTEM FOR THE TRANSLATIONS OF PRO INSTRUMENTS

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OBJECTIVE: To facilitate the understanding of and the communication about the status of a translation of a Patient Reported Outcome (PRO) instrument with instrument developers, users and regulatory agencies, there is a need to develop a standardized, universally recognized classification system for translations. This will help to summarize the methodology followed to develop a specific language version, define which regulatory requirements are met and describe possible outstanding work to meet a required standard. **METHODS:** Based on the existing classification used for translations of the St George's Respiratory Questionnaire (SGRQ) established in collaboration with the developer, we propose to revise, complete and extend this system to the some 2000 translations officially distributed for the 70 developers collaborating with our information centre in the following manner: a comparison of the existing classification with other possible classification systems identified during a literature search, a revision and finalization of the present classification integrating developer, user and regulatory input. **RESULTS:** The present classification system based on 61 translations of the SGRQ is divided into four categories ranging from grade A (official translation) to grade D (used when low standard translations require further work). The literature search is currently on-going as well as the gathering of information from developers, users and regulatory agencies. Results will be illustrated in the presentation. **CONCLUSION:** The revised translation classification will integrate existing classifications, developer, user and regulatory input. It will be based on the recognition that a standardized translation methodology is key to ensure conceptual equivalence and cultural relevance across languages and ultimately international comparison and pooling of data. The revised classification might then be extended to all translations in the PRO field and indeed may be used to define quality standards for translations in particular settings (such as phase II or III trials, international or national clinical trials).

RESEARCH ON METHODS & CONCEPTUAL PAPERS—Study Design Studies

PMC47

EFFICIENCY OF HYBRID APPLICATIONS OF EXACT COVARIATE MATCHING AND PROPENSITY SCORE

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OBJECTIVES: This study examines trade-offs between the high dimensionality of covariate matching and high computational efficiency from propensity score applications by comparing effi-

ciency among six distinct hybrid algorithms used with health care data. **METHODS:** Six matching algorithms were examined. Each combined covariate matching with a different propensity scoring function: continuous factor, weighting factor, caliper, parenting factor, nesting factor or partner. The algorithms were compared in terms of 1:1 matching rate, computing time, bias balancing and standardized difference. The influence of sample size variation on stability and efficiency was considered. Paired T-test, Pearson Chi-Square and Standardized Difference were adopted for assessment. **RESULTS:** The superiority of some hybrid algorithms over pure covariate matching was observed. In terms of matching rate, the partner function reported the highest rate (99.7%), followed by its function as a caliper (88.4%), while the parenting function produced the lowest rate (59.5%). All others performed at a similar level. Computing time varied, the most efficient using the propensity score as a parenting factor (00:25:10). The longest reported times were seen when used as a weighting factor (00:37:56) or caliper function (00:37:52). Differences are more profound in large samples. In bias balancing tests, all algorithms were balanced on categorical covariates except when the propensity score was used as a partner or a caliper where each displayed the lowest capability of producing p-values above 0.05. Significant reduction in standardized difference below 10% was indicative of higher efficiency of the hybrid algorithms. Categorical covariates produced values near zero despite the lower performance for the partner approach. With increasing sample size, all investigations performed as expected. **CONCLUSION:** Overall, these hybrid applications exhibited greater efficiency in simultaneously overcoming high dimensionality on covariate matching and reducing variation in propensity score matching. Depending on data characteristics and research profiles, each application has specific merits in certain circumstances.

PMC48

SETTING THE OPTIMAL SCREENING TOOL THRESHOLD FOR A CHRONIC UNDERDIAGNOSED ILLNESS: WHOSE BURDEN MATTERS MOST?

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Ankylosing spondylitis (AS) is a chronic disease with approximately 0.5% prevalence in the general population and 5% among chronic back pain (CBP) sufferers. The disease typically remains undiagnosed for over a decade which is problematic since new treatments may alter the natural history. An AS screening instrument based upon patient reported data was developed but selecting the optimal screening tool threshold is a critical issue for discussion. Question items were identified from a literature review, patient focus groups, and an advisory board of rheumatologists. A case-control study was conducted to test the screening instrument among subjects with confirmed AS (cases) or CBP for ≥3 months (controls). Question items were examined in a multivariate logistic framework using best subsets modeling. Receiver-operator characteristic analysis was conducted to determine optimal sensitivity (SE), specificity (SP), positive predictive value (PPV), and negative predictive value (NPV) of the instrument: AS prevalence set equal to 0.5% in the general population and 5% among CBP sufferers. Responses from 102 cases and 214 controls were analyzed to develop a twelve-variable model. Sensitivities ranging from 69.6% to 90.2% were associated with specificities of 99.1% to 79.9%, respectively. Lowering sensitivities reduced the portion of false positives seen by the provider from 95% to 20.3% (78.6% reduction) and 99.5% to 72.8% (26.8% reduction) for the CBP and general populations, respectively (SE = 69.6%, SP = 99.1%). Selecting the optimal screening tool threshold depends on whose burden matters the most: increasing sensitivity of the instrument would increase the probability of identifying patients with disease earlier and the ability to improve AS patient well-being. However, this approach would increase the economic burden (additional medical evaluations) from the payer perspective, raise the patient care burden from the rheumatologist perspective, and reduce quality of life for those with false positives. We will discuss the trade-offs in this real world example.

PMC49

TRANSLATING HETEROGENEITY BIAS FROM HEALTH STATUS IN OUTCOMES STUDIES—USING LATENT CLASS CLUSTER ANALYSIS AND LONGITUDINAL DATA

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Ignoring heterogeneity in health may bias measurement of intervention outcomes through confounding with intervention of interest. If repeated observations on each subject are available, heterogeneity may be usefully included in outcomes studies. We assume heterogeneous health status as a latent index and multiple health proxies (and their correlations) are used to estimate heterogeneous health grouping from the latent index. For example, in a treatment effect study with longitudinal data: 1) estimate K, the number of heterogeneous groups, by latent class cluster analysis (LCCA) using health proxies of each subject at each period, such as comorbidity indices, length of hospitalization, total health care cost and so on; 2) if $K > 1$ (heterogeneity), estimate a treatment effect for each group and compare the results across the groups; 3) if the effects vary over the groups, heterogeneity can be translated by each group's health profile (e.g. higher effectiveness found in sick but less hospitalized group). This approach is relatively conservative and combines multiple proxies objectively. Estimating K implies a near consensus of model selection criteria such as Bayesian Information Criteria (BIC), adjusted BIC, Akaike Information Criteria (AIC), and consistent AIC; and bootstrap likelihood ratio test (BLRT). Furthermore, it is difficult to find a practically useful K (say <5) because K tends to diverge to N (i.e. each subject is a group), for a large enough sample size N. Applying heterogeneity estimation to a claims data of 3260 subjects for two years found two heterogeneous groups (BIC, adjusted BIC, consistent AIC, and BLRT all supported $K = 2$ except AIC). One group ($N = 2841$) was significantly sicker than the other group ($N = 419$) in Year 1 (and in Year 2) at 5%: Charlson Comorbidity Index 3.91 vs 0.11 (4.49 vs 0.14); length of stay 0.87 vs 0.03 (1.04 vs 0); total cost $10690 vs $245 ($11149 vs $184).

PMC50

EVIDENCE AND VALUE: IMPACT ON DECISION MAKING—THE EVIDEM FRAMEWORK AND POTENTIAL APPLICATIONS

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Develop a quantitative and practical methodology to structure, objectify and facilitate health care decisionmaking. A conceptual framework was developed that segregated components of decision-making into three categories: 1) quality of evidence available; 2) intrinsic value of the health care intervention; and 3) extrinsic or system related value, usually not directly quantifiable. Using this framework, practical tools to assess health care interventions were designed drawing on an extensive review of the literature and of current decisionmaking processes for drug reimbursement around the world. A matrix to quantify the quality of evidence available for a health care intervention was

designed including 5 elements defining quality, clustered into three criteria, and 12 components covering types of evidence required by decision-making bodies worldwide. A scoring process was developed based on international scientific standards in each field of research covered. To quantify the intrinsic value of an intervention, a multi-criteria decision analysis (MCDA) matrix was designed encompassing 15 value components. Scoring, which depends on the value system of the evaluator, was designed to allow inclusion of perspectives of a representative group of health care stakeholders. An integrated process to apply matrices was established. The EVIDEM methodology can be applied retrospectively to explore the contribution of quality of evidence and intrinsic value to past coverage decisions. Prospectively, matrices can be adapted to specific needs of decision-makers and applied to evaluate new health care interventions. The matrices also provide a practical collaborative framework for those who generate data and those who need data to make decisions, ultimately facilitating future health care decision-making.

PMC51

MEDICATION ADHERENCE: A CONCEPTUAL REVIEW

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Adherence is an important element in the medical field since it is thought to be the link between treatment and outcomes. Adherence to medications has been extensively researched and it is evident that non-adherence is common across most disease states. These studies vary by the conceptual definitions of adherence behavior and by the research paradigms. The objectives of this presentation are to review the conceptual definitions used in adherence research and to review the theoretical frameworks used to explain mediation adherence behavior. Compliance, adherence, and concordance are used interchangeably in the medical, health behavior, and pharmacy literature. It is important to compare and contrast these terms to study specific health behavior. These terms reflect different philosophies of medicine with respect to the provider-patient relationship. Conceptually, adherence, compliance and concordance differ in the amount of patient involvement and participation, that may be depicted along a continuum of patient involvement- with compliance depicting no patient involvement, concordance depicting patients as being equal partners in their treatment and adherence lying somewhere in between. Consistent use of these concepts will move the science toward understanding specific patient behavior and its antecedents.

Much of the adherence research published in the medical and pharmacy journals does not include a theoretical framework. The non-theoretical approach to adherence research is partly to blame for the lack conceptual clarity and underscores the need to incorporate a theoretical basis in adherence research. Prominent theories in adherence research include expectancy-values models like the health belief model, the transtheoretical model, and the self-regulation theory. Other promising models include the medication adherence model, the interaction model of client behavior and the therapeutic decision model. The strengths and weaknesses of each are presented. Finally, recommendations for researchers of medication adherence include using a theoretical framework and conducting longitudinal studies are provided.

PMC52

THE DEVELOPMENT OF THE PROGNOSTIC PROPENSITY SCORE: UTILIZED TO PROVIDE PHYSICIANS WITH DETAILED EVIDENCE TO ALLOW FOR OPTIMAL PRESCRIBING

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OBJECTIVE: Clinical evidence is often reported as an average treatment effect across a large population. This is appropriate if all patients experience the same effect from a given treatment. However, more often, different patients experience different outcomes on the same medication. If this is true, then averaging the effects of treatment obscures the outcomes received by most patients. It also makes it difficult for physicians to utilize this evidence to select the most appropriate treatment for individual patients. This interpretation of average outcomes by physicians leads to geographic variation, inappropriate care, and increased health care costs. An essential step towards optimizing therapy is to provide evidence that recognizes inter-individual differences in drug response. **METHODS:** The PPS is defined as the expected outcome (on control) given the individual's covariates. To calculate the PPS, the outcome of interest is regressed on the covariates for those patients treated with the control(Drug A). Using the coefficients from this model, in conjunction with patient characteristics, the PPS is computed for all patients; as if every patient was a member of the control group. Variations in treatment effect are then identified across subgroups by partitioning patients, according to PPS, into strata and calculating the treatment effect within each stratum. This analysis is repeated using the alternative treatment (Drug B) as the control. By identifying and comparing the stratum that receives the optimal benefit from each treatment, the patient characteristics that are uniquely associated with success on Drug A and Drug B can be determined. **RESULTS:** To demonstrate the use of the PPS, a convenient sample of California Medicaid beneficiaries diagnosed with schizophrenia will be used. **CONCLUSIONS:** The outlined approach will allow physicians to more accurately prescribe the most beneficial treatment for each and every patient, by linking patient characteristics to treatment success.

PMC53

PREVALENCE OF RESEARCH FOCUSED ON GENETICALLY-LINKED DISORDERS: WHERE HAVE WE BEEN AND WHERE ARE WE GOING?

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OBJECTIVES: The completion of the human genome project has not provided the answer to genetic disease that was expected and a large amount of research is still being conducted into the treatment of genetically-linked disorders. The rationale of this review was to investigate the proportion of research conducted within eight genetically-linked disorders across time (Alzheimer's disease [AD], Crohn's disease [CD], cystic fibrosis [CF], haemophilia, Huntington's disease [HD], muscular dystrophy [MD], Obesity, Sickle cell anaemia [SCA]) and to predict likely areas of growth within the selected disorders. **METHODS:** A citation search was conducted in Medline on December 12, 2007. A filter for RCTs was implemented to provide an estimate of clinical interest in a given disease for the years 1951–2005 (5-yearly time periods). **RESULTS:** A total of 706,660 probable RCT citations were retrieved, with 20,787 relating to the selected disorders. Over time, the rate of increase of probable RCTs relating to these genetically-linked disorders is not significantly different from the general increase in RCTs

($t = -0.09$, $p = 0.93$). Probable RCTs in these areas now account for 4% of all RCTs compared to 1.6% in 1956–60. Advances in mono-factorial disorders such as CF, Haemophilia, HD, MD and SCA, have tended to remain relatively constant across 50 years, whilst multi-factorial diseases such as AD and CD, continue to attract significant interest. Obesity has attracted an ever increasing number of RCTs. **CONCLUSIONS:** Trials of new treatments within the selected diseases were expected to increase; however, results reported no evidence of increased research (within the selected disorders) following the identification of the causative gene(s). A greater interest appeared to be directed towards diseases with gene-environment interaction i.e. obesity. Further development of this analysis may assist identification of genetic research investments which can translate most effectively to improved clinical practice.

WITHDRAWN **PMC54**

PMC55

MATRIX MODEL FOR DETERMINING A DRUG'S HEALTH ECONOMIC FOCUS TO OPTIMIZE ITS ECONOMIC VIABILITY

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Discovering and developing drugs is a risky process that requires a great deal of both time and money. To gain competitive advantage, companies must establish the health economic viability of the product and adapt development plans effectively to meet market access requirements. To present a conceptual model that optimizes the economic viability of potential new drugs by identifying useful properties and obtaining clinical, economic, and quality-of-life data as early as possible in the product development cycle. The matrix is formed by two drug characteristics of primary importance: indication and mechanism of action (MOA). Four scenarios arise from this matrix: I = New Market Entry (drugs having both novel MOA and indication), II = Product Development (new MOAs for existing indications), III = Market Expansion (existing MOA but new indication), and IV = Market Penetration (existing MOA and existing indication). Economic viability incorporates the following six parameters: efficacy, tolerability/safety, QOL, pricing, effectiveness, and formulation. To optimize a product's economic viability, sponsors should evaluate, based on type of scenario and its requirements for these six parameters, the health economic challenges ahead to be overcome in order to achieve successful reimbursement. Drugs in Scenario I fulfill an unmet therapeutic need and are therefore highly desired. Economic viability for these products is high. Those with novel MOAs are also highly valued, as they could treat wider ranges of patients or those who fail other regimens. Compounds in Scenario IV pose the greatest challenges for health economic viability. The product is considered a 'me too' and, therefore, there is an increased focus on added value relative to existing products. Using this matrix can identify early the optimal position of a new drug, the data required, and when the data should be collected and verified. Consequently, development can be made efficient, with reduced waste of resources and funds.

CARDIOVASCULAR DISORDERS— Clinical Outcomes Studies

PCV1

A MODIFIED RXRISK-V COMORBIDITY INDEX PREDICTS ADHERENCE WITH LIPID LOWERING THERAPY (LLT)

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OBJECTIVE: Studies have shown that increased co-morbidity is associated with poor pharmacological adherence. We undertook to determine the feasibility of using the modified RxRisk-V co-morbidity index to predict adherence to lipid lowering therapy (LLT). **METHODS:** Using RxAmerica data, patients ≥18 years and with ≥18 months of continuous health plan enrollment from 2001–2005 were included in the analysis if they were 'new starts' with any class of LLT, defined as no prior treatment in the class for six months. Adherence ratios (defined as proportions of drug-available days during the follow-up period) were calculated and patients with adherence ratios ≥0.80 were considered adherent to LLT. Using a modified RxRisk-V, co-morbid conditions (CCs) were identified based on one-year of prescription claims prior to the index LLT prescription. Multivariable logistic regression was used to estimate the age- and sex-adjusted odds for adherence associated with various levels of disease co-morbidity. **RESULTS:** A total of 19,458 patients were identified as new starts with an LLT class. The mean age of patients was 55 years (SD 12.1), 48% were females, and 43% had ≥3 CCs. Results of the regression analysis showed that patients with 1–2 CCs were less likely to be adherent (OR: 0.90; CI: 0.83–0.99) compared to patients with no CCs. Patients with ≥3 CCs were more likely to be adherent (OR: 1.10; CI: 1.01–1.18). The OR for adherence was significantly decreased for individuals with anxiety and tension, pain disorders, and tuberculosis. The OR was significantly increased for patients with cardiovascular diseases, psychiatric disorders, gastric acid disorders, and others. **CONCLUSION:** These results show that the relationship between adherence and degree of co-morbidity takes a U-shaped distribution; patients with lower levels of co-morbidity are less adherent compared to patients with no co-morbidity, and patients with higher levels of co-morbidity are more adherent.

PCV2

STROKE EVENTS IN MANAGED CARE PATIENTS MANAGED ACCORDING TO NATIONAL LIPID TREATMENT GUIDELINES

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OBJECTIVE: The objective of the analysis was to evaluate impact of adherence to lipid treatment guidelines [National Cholesterol Education Program's Third Report on Detection, Evaluation, and Treatment of High Blood Cholesterol and Adult Treatment Panel's (NCEP-ATP III)] on stroke events in managed care patients. **METHODS:** Patients with laboratory values for low-density lipoprotein-cholesterol (LDL-C), high-density lipoprotein-cholesterol (HDL-C), & triglycerides (TG) between January 1, 2003-December 31, 2005 [index date], no lipid therapy 6-months pre-index date, and minimum 12 months health plan eligibility pre- and post-index date were analyzed using a large integrated United States managed care database. Patients were classified as appropriately (AM) or inappropriately managed (IAM) using baseline lipid levels and the first post-index follow-up lipid panel (goal attainment irrespective of therapy), and risk stratification per NCEP-ATP III guidelines. Post-index,

stroke event incidence between groups was analyzed descriptively and through a multivariate logistic regression analysis after controlling for differences in baseline clinical and demographic variables. **RESULTS:** Among 8176 study patients (3493 AM; 4683 IAM), AM patients were significantly older [51.4 ± 9.1 and 50.0 ± 9.6 years, $p < 0.01$] and comprised of fewer males (43.2% vs. 56.2%; $p < 0.01$). AM patients were more likely to be at lower risk status at index date versus IAM patients (63% vs. 28%; $p < 0.01$), and had a significantly lower Deyo-Charlson comorbidity score (0.32 ± 0.56 vs. 0.20 ± 0.44; $p < 0.01$). During follow-up, fewer AM patients experienced a stroke event versus IAM patients (0.7% vs. 1.1%; $p = 0.03$) and thereby were 36% less likely to have a stroke event (OR: 0.64, 95% CI: 0.44–0.93; $p < 0.01$). **CONCLUSION:** Adhering to clinical guideline treatment recommendations was likely to be associated with subsequent stroke reductions and possible long-term cost savings in this managed care population.

PCV3

SYSTEMATIC REVIEW OF NICARDIPINE IN NEUROVASCULAR CONDITIONS

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OBJECTIVE: Injectable nicardipine is increasingly used in managing neurovascular conditions. To understand its place in therapy, we conducted an evidenced-based literature review. **METHODS:** The English-language literature in OVID and Cochrane databases was searched using combinations of these terms: intracerebral hemorrhage (ICH), neurology, neurosurgery, nicardipine, stroke, subarachnoid hemorrhage (SAH). Two-hundred and twenty-three abstracts were identified; after independent review by two individuals, four clinical guidelines, two meta-analyses, and four randomized controlled trials (RCT) were deemed relevant. **RESULTS:** In clinical guidelines, based on expert opinion, nicardipine was recommended to manage hypertension in 1) ischemic stroke patients eligible for acute reperfusion therapy (alternatives: labetalol, nitropaste, and nitroprusside); and 2) ICH (alternatives: enalapril, esmolol, hydralazine, labetalol, nitroprusside, nitroglycerin). In a meta-analysis, nicardipine had no effect on death or dependency in patients with aneurysmal SAH [RR:0.97 (95%CI:0.78–1.20)]; adverse events were higher versus placebo [hypotension:34% vs. 5%; phlebitis:22% vs. 5%; pulmonary edema + azotemia: 6% vs. 2%]. In acute traumatic brain injury, nicardipine had no impact on death and severe disability [RR:0.25 (95%CI:0.05–1.27)]. Nicardipine's effect on cerebral blood flow was comparable to labetalol (+0.19 ± 3.9 ml/100 g/min vs. −1.55 ± 3.2 ml/100 g/min; $p = 0.39$) in ICH, while it increased from baseline in SAH patients (42.1 ± 12.3 ml/100 g/min vs. 47 ± 10.7 ml/100 g/min; $p < 0.05$). In a craniotomy RCT, nicardipine was less effective than labetalol in preventing emergent hypertension (50% vs. 82%; $p = 0.05$) and was associated with more tachycardia (20% vs. 0%; $p = 0.11$), hypotension (15% vs. 0%; $p = 0.23$) and higher cost ($23.65 ± 6.62 vs. $5.23 ± 2.0; $p < 0.05$). Mean arterial pressure remained depressed 20 minutes post-infusion compared to nitroprusside, despite lack of cumulative nicardipine plasma levels [60 ± 2 mmHg vs. 73 ± 4 mmHg; $p < 0.05$] in spinal surgery patients. **CONCLUSION:** While nicardipine has a role in select neurovascular indications, recommendations are based on expert opinion. Moreover, a lack of benefit has been demonstrated in meta-analyses and RCT in other neurovascular indications, including aneurysmal SAH and acute traumatic brain injury.

PCV4

APPROPRIATE UTILIZATION AND COST-ANALYSIS OF ADD-ON EZETIMBE LIPID-LOWERING THERAPY AT THE VETERANS AFFAIRS SAN DIEGO HEALTH CARE SYSTEM (VASDHS)

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OBJECTIVE: The current study evaluated the appropriate utilization of ezetimibe add-on therapy to simvastatin and the cost-consequences based upon the following outcomes: ezetimibe response, LDL-C goal achievement, and switch to rosuvastatin. **METHODS:** This was a retrospective review of VASDHS medical records to identify patients with active prescriptions for ezetimibe and simvastatin between January 1, 2004 and August 31, 2007. Base-case response was defined as ≥10% LDL-C reduction from baseline at study endpoint. Additional efficacy parameters included LDL-C goal achievement and switch to rosuvastatin if LDL-C goal not met. Pre-post analyses for continuous and binomial data were performed using Wilcoxon-ranked sum and McNemar's tests, respectively. Cost analyses were conducted from the payer perspective, utilizing total direct costs. Average cost-effectiveness ratios (CER) were calculated for (1) ezetimibe response, (2) LDL-C goal achievement, and (3) switch to rosuvastatin. Sensitivity analyses were performed varying the base-case response definition. **RESULTS:** Overall, 121 patients met inclusion. Baseline characteristics were as follows: male 97.5%; Caucasian 78.5%; CHD 67.8%; diabetes 63.6%; symptomatic CAD 15.7%; PAD 18.2%; AAA 7.4%; >20% 10-year risk-score 95.9%; LDL-C goal <100 mg/dL 95.9%; LDL-C goal <70 mg/dL 57.9%; and smoker 28.1%. Pre-post comparisons showed significant differences from baseline LDL-C and cholesterol for both responders ($p < 0.001$, $p < 0.001$) and non-responders ($p = 0.028$, $p = 0.028$). Overall, 88.4% of patients responded to ezetimibe, while 36% of non-responders had their antilipemic regimen modified. In addition, 53% of patients reached LDL-C goal. Average CERs over a 9-month period using base-case response definition were: $1705.64 per ezetimibe response, $2054.26 per LDL-C goal achieved, and $2997.56 per switch to rosuvastatin. Sensitivity analyses showed no change in trend for ezetimibe response, but changes were observed for the latter parameters. **CONCLUSION:** There is benefit in assessing both response rates as well as LDL-C goal attainment when determining a cost-analysis of ezetimibe add-on therapy to simvastatin.

PCV5

THE IMPACT OF PHARMACISTS' INTERVENTIONS: SENSITIVITY ON PATIENT OUTCOMES IN HYPERLIPIDEMIA MANAGEMENT

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OBJECTIVE: Hyperlipidemia increases the risk for cardiovascular disease and control is pivotal for preventing subsequent complications. Multidisciplinary interventions, including pharmacists, are important for improving patients' outcomes. Our objective was to quantify the impact of pharmacist interventions in enhancing patients' clinical and humanistic outcomes. **METHODS:** Two reviewers searched International Pharmaceutical Abstracts, Medline, Embase, The Cochrane Central Register of Controlled Trials, 3rd Quarter and CINAHL for pharmacist interventions in hyperlipidemia. Quality was assessed using Downs-Black scale. Data extracted included patients enrolled, study characteristics, intervention type and pre- and post-

intervention measures for LDL, HDL, triglycerides, total cholesterol, adherence and quality-of-life. A random-effects meta-analysis combined data between pharmacist-intervention and standard-care groups. Chi-square tested heterogeneity of effects. Publication bias was assessed using funnel plots and Begg-Mazumdar statistic. **RESULTS:** Fifty-one studies were found; 22 met inclusion/exclusion criteria. Study settings included medical clinic/center (n = 11), community pharmacy (n = 8), hospital (n = 2) and patient homes (n = 1). Patient education (77%) and medication management (73%) were most common interventions. The average patient follow-up period was 9.8 ± 6.4 months. Quality of pharmacist-intervention studies was considered "fair" (65%, SD = 6.6%). Total cholesterol was significantly reduced from baseline (34.3 ± 10.3 mg/dL, $p < 0.001$) and also significantly above control groups (22.0 ± 10.4 mg/dL, $p = 0.034$). LDL was reduced significantly from baseline (38.6 ± 12.4 mg/dL, $p = 0.002$); but not significantly more than controls (22.1 ± 12.0 mg/dL, $p = 0.065$). A clinically relevant but not statistically significant reduction in triglycerides was found. Patients' adherence to pharmacotherapeutic regimens (3/9 studies reported significant results after pharmacists' interventions) and quality of life (2/2 significant) were considered possibly not sensitive and possibly sensitive to pharmacist interventions, respectively. **CONCLUSION:** Total cholesterol is sensitive to pharmacist's interventions while LDL and triglycerides levels are possibly sensitive to those interventions. Further research should evaluate specific determinants of pharmacist-sensitive outcomes.

PCV6

ROLE OF OSTEOPROTEGERIN AND RANKL IN BONE AND VASCULAR CALCIFICATION

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OBJECTIVE: New members of the TNF-signaling superfamily, osteoprotegerin (OPG) and receptor activator of nuclear factor-κB ligand (RANKL), are thought to play an important role in vascular calcification and bone remodeling and might represent the molecular link between arterial calcification and bone resorption. The purpose of this study was to determine whether OPG and/or RANKL mediate the observed association between coronary and bone calcification in postmenopausal women. **METHODS:** Among the members of the Rancho Bernardo longitudinal study, 92 postmenopausal women (aged 58–81 years) taking estrogen therapy (ET) who underwent assessment of bone mineral density (BMD) and coronary artery calcification (CAC) and had serum OPG and RANKL levels measured between 1998–2002 are the basis of this report. **RESULTS:** Neither OPG nor RANKL levels varied among subjects with and without CAC in multivariate analysis. Increase in BMD at the hip was associated with decrease in CAC (OR = 0.52; 95% CI: 0.29–0.93) independent of age, fat-free mass, HDL cholesterol, current smoking, and use of cholesterol-lowering medications. Other skeletal sites demonstrated a similar pattern. Addition of RANKL and/or OPG in the model had minimal effect on the magnitude or statistical significance of the BMD-CAC association. Additionally, a test of interaction indicated that RANKL and OPG are not significant effect modifiers of the association. **CONCLUSION:** Serum OPG and RANKL do not account for the observed association between bone and coronary artery calcification among postmenopausal women using ET.

PCV7

RISK OF HOSPITALIZATION ASSOCIATED WITH BETA-BLOCKER THERAPY IN PATIENTS OF CHRONIC HEART FAILURE AND DIABETES: A MEDICAID STUDY

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OBJECTIVE: Beta-blocker therapy, well established in the treatment of CHF, is considered contraindicated in patients with concomitant diabetes by many physicians due to concerns of increased incidence of hypoglycemia, worsening dyslipidemia, and decreased insulin sensitivity. Purpose of this study is to determine the association between beta-blocker therapy and hospitalization in patients with chronic heart failure (CHF) and diabetes. **METHODS:** The study was a retrospective analysis utilizing the pharmacy, inpatient and outpatient claims linked with eligibility files for persons enrolled in the Georgia Medicaid benefits through the year 2001. Patients who received both diagnosis of chronic heart failure and diabetes were identified. The study cohort was further categorized into treatment and comparison groups according to their exposure to Beta-blocker. A stepwise logistic regression analysis was employed to assess the association between taking beta-blocker and hospitalization among CHF patients with diabetes. **RESULTS:** Three hundred ninety patients with beta-blocker exposure and 642 not-exposed patients were identified. Two hundred thirty eight patients were hospitalized and 799 had no hospitalization. Majority of the cohort was female 788 (76.36%), black 531 (51.45%) and in the age group of 40–65 years 966 (93.60%). Metoprolol was the most commonly used beta-blocker with 12,149 claims (51.83%) followed by Carvedilol 6169 (26.32%). The most common co-morbid conditions among patients were found to be Hypertension, Ischemic Heart Disease and Chronic Obstructive Pulmonary Disease. Diuretics, ACE inhibitors and Digoxin use were found to be the common concurrent therapy taken by the patients. After controlling for factors like age, race, gender, common co-medications and co-morbid conditions, there was no significant association between hospitalization and beta-blockers use in patients with Chronic Heart Failure and Diabetes. **CONCLUSION:** Despite the potential contraindication, the utilization of beta-blocker does not lead to a higher rate of hospitalization among CHF patients with diabetes.

PCV8

BLOOD PRESSURE SUCCESS ZONE LONGITUDINAL STUDY OF SUCCESS (BPSZ-BLISS). AN OBSERVATIONAL, MULTI-CENTER STUDY OF THE IMPACT OF THE BPSZ EDUCATIONAL PROGRAM ON BLOOD PRESSURE CONTROL, PERSISTENCE, COMPLIANCE, AND TREATMENT SATISFACTION. ENROLLMENT METRICS AND BASELINE COHORT CHARACTERISTICS

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OBJECTIVE: The Blood Pressure Success Zone (BPSZ) Program is a nationwide initiative which provides blood pressure management education to hypertensive patients and a complimentary trial of antihypertensive medications. The BPSZ-BLISS (Longitudinal Observational Study of Success) is an observational study to evaluate BPSZ program effectiveness on blood pressure (BP) control, compliance, persistence and treatment satisfaction.

BPSZ-BLISS is naturalistic and designed to obtain outcomes data with minimum impact on BPSZ and clinical processees. **METHODS:** Data are entered, using an Interactive Voice Response System (IVRS), by MDs at baseline and at usual care visits up to 12 +/– 2 months; subjects report self-measured BPs, persistence, compliance, and treatment satisfaction at 3, 6, and 12 months. Final cohort characteristics are reported. **RESULTS:** After 18 months, 10,067 eligible US subjects have been enrolled by 734 IRB approved MDs. Subjects are 48% male, mean aged 56 (SD = 13) years, and 27% newly diagnosed with hypertension. Most are Caucasian (70%), or African-American (22%); only 5% are Hispanic, or other (3%) ethnicity. Median diastolic and systolic BPs qualifying subjects (without diabetes or kidney disease) for study enrollment were 98 mmHg and 154 mmHg respectively. In chronic hypertensives, most common antihypertension medications prior to baseline were angiotensin receptor blockers (ARB) or ARB combination (38%), calcium channel blockers (CCB) or CCB combination (32%), beta blockers (BB) or BB combination (27%), or angiotensin converting enzyme inhibitors (ACE I) or ACE I combination (24%), and diuretics (18%). Automated IVRS validations have maintained data quality (≤5% error on key variables). Completion of patient follow-up is scheduled for June 2008. **CONCLUSION:** An innovative design and automated data management and quality control methodologies have been shown to be feasible to collect MD and patient data in a nationwide health education program. Baseline study data are available for comparison with other real-world datasets.

PCV9

TRENDS IN MORTALITY, LENGTH OF STAY AND READMISSIONS AMONG PATIENTS WITH ACUTE STROKE AT THE NATIONAL HEALTHCARE GROUP, SINGAPORE, 2000–2006

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OBJECTIVE: To describe the trends of intra-hospital mortality, length of stay (LOS) and readmissions of patients with acute stroke at the National Healthcare Group (NHG), Singapore, 2000–2006. **METHODS:** All patients aged 21+ years discharged with a primary diagnosis of stroke (ICD9CM 430-435) from the three public hospitals in NHG from January 2000 to December 2006 were studied. Data extracted from computerized datamart included demographic characteristics; co-morbid conditions; and outcomes of interest; i.e. LOS, intra-hospital mortality, and readmissions within one, three, and six months of discharge. Patients were stratified into hemorrhagic stroke (HS), ischemic stroke (IS) and transient ischaemic attack (TIA). Data were analysed by one-way ANOVA, logistic regression and chi-square test using SPSSv15. **RESULTS:** During the period 2000–2006, there was a total of 22,428 deaths and discharges of patients with acute stroke. Prevalence of hypertension was highest in HS (>60%), with the rate decreasing significantly from 2000–2006 ($p = 0.001$). However, the prevalence of dyslipidaemia was highest among in IS, with a significant increase in rate in all during the period in all types of stroke ($p < 0.001$). Overall, HS was associated with highest intra-hospital mortality rate (95%CI: 22.3%–24.3%) and longest average LOS (95%CI: 17.1–18.7 days). A significant increasing trend in average LOS ($p < 0.001$) was noted in both HS and IS. Readmissions within the 1-month, 3-month, and 6-month all decreased significantly over the period ($p < 0.001$). The readmission rates within 1-month for HS and IS were higher than that of TIA, while there were no difference in readmission rates within three (5%) and six (6%) months for all stroke types. **CONCLUSION:** More studies into the causes of increased LOS should be carried out. Targeted primary interventions are needed to address the high rates of hypertension among those with IS and the increasing trend in dyslipidaemia among all types of stroke.

PCV10

EFFECTS OF INTENSIFYING LIPID-ALTERING THERAPY ON CHD EVENTS IN A SECONDARY PREVENTION POPULATION WITH HIGH NON-HDL CHOLESTEROL

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OBJECTIVE: Many patients with dyslipidemia fail to reach treatment goals on the lowest dose of a single drug. We assessed the effects of intensified lipid-modifying therapies on the expected rates of coronary events among a cohort of 10,000 people aged 50+ years with established CHD and high non-HDL-cholesterol levels. **METHODS:** This model-based analysis used data from the recent SEACOAST clinical trial and a published equation for secondary prevention of CHD from the Framingham Heart Study (FHS), based on the total-cholesterol/HDL-C ratio, to calculate the expected number of CHD events over five years. Findings from the SEACOAST trial showed that patients treated with a fixed-dose extended release niacin/simvastatin (ERN/S) combination had significant improvements in non-HDL-C, HDL-C, and triglyceride levels when compared to patients treated with simvastatin therapy alone. Age, sex, and coronary risk-factor data for patients with CHD and non-HDL-C cholesterol >130 mg/dL were obtained from 1999–2002 NHANES. The drugs of interest included simvastatin alone and ERN/S. The scenarios of interest reflected increasing the dose of simvastatin or adding ERN to simvastatin. **RESULTS:** We estimated that 1741 CHD events would occur over five years among 10,000 patients treated with 20 mg of simvastatin. The number of CHD events would decrease by 8.9% with 1000/20 mg of ERN/S. Relative to a maximum dose of 80 mg of simvastatin, intermediate (1000/40 mg) and maximum doses (2000/40 mg) of ERN/S would reduce CHD events by 4.9 and 11.1 percentage points, respectively. **CONCLUSION:** Based on this FHS risk model for a secondary prevention population with elevated non-HDL cholesterol, intensifying lipid-modifying therapy with selected fixed-dose ERN/S combinations may reduce the number of CHD events relative to the use of simvastatin monotherapy. Confirmation of the predicted clinical events of the fixed-dose combination in a secondary prevention patient population would be useful.

PCV11

ASSESSMENT AND QUANTIFICATION OF THE BENEFIT RISK RATIO OF ROSUVASTATIN AND ATORVASTATIN FROM A META-ANALYSIS OF HEAD TO HEAD RANDOMISED CONTROLLED TRIALS

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OBJECTIVE: Statin therapy is fundamental in cardiovascular disease prevention. Benefit of statin therapy is proportional to low-density lipoprotein cholesterol reduction and no threshold has been identified as a limitation below which benefit is reduced. Serious side-effects are infrequent, but the adverse experience with the agent Cerivastatin justifies scrutiny of the relationship between therapeutic effect and the risk of side-

effects. Meta-analysis of head-to-head comparisons represents a robust method for anticipating the benefit and risk of an emergent statin, such as rosuvastatin, in comparison to an extensively studied agent such as atorvastatin. **METHODS:** A systematic literature search to identify head to head clinical studies of R and A was conducted. Data were available for 30 comparisons of 1:1 dose ratios (R10mg vs. A10mg etc), 24 comparisons of 1:2 dose ratios (R5mg vs. A10mg etc) and six comparisons of 1:4 dose ratios (R5mg vs. A20mg etc). Treatment difference in benefit (% Low Density Lipoprotein-cholesterol [LDL-c] reduction) and risk (odds ratios for myalgia, serious adverse events and withdrawals due to adverse events, elevated Alaninaminotransferase [ALT] (3xULN), and Creatine Kinase [CK] (>10xULN), were estimated by meta-analysis (random effects) and presented in benefit risk planes. **RESULTS:** Analysis of 25 studies (~24,000 pts) demonstrated rosuvastatin to be significantly more efficacious than atorvastatin, for LDL-c reduction, at 1:1 and 1:2 dosage ratios. There were no significant differences between rosuvastatin and atorvastatin, at any dose ratio, for i) withdrawals due to adverse events, ii) myalgia, iii) serious adverse events, iv) death, v) ALT > 3x upper limit of normal (ULN), and vi) creatine kinase (CK) >10xULN. **CONCLUSION:** At 1:1 and 1:2 dose ratios, significant additional reductions in LDL-c are obtained by rosuvastatin at a comparable risk of the adverse events presented.

PCV12

METHODS FOR INDIVIDUALIZING THE BENEFIT AND HARM OF WARFARIN

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OBJECTIVE: To extend beyond the current approach of predicting warfarin benefit and harm independently in new atrial fibrillation (AF) patients by refining methods to identify predictors of the four combined benefit/harm outcome groups—i) no stroke/no bleed; ii) no stroke/bleed; iii) stroke/bleed; iv) no stroke/no bleed. **METHODS:** We analyzed patient-level data from the Atrial Fibrillation Investigators RCT database (n = 9155) and an observational database of AF patients managed by Kaiser Permanente Colorado (n = 5475). We classified patients based on the four benefit/harm outcome groups and applied decision tree modeling (CART) and polytomous logistic regression (PLR) to identify patient factors predicting each outcome group. Statistical significance was set at alpha = 0.05. **RESULTS:** CART and PLR consistently identified age and warfarin use as predictors for all outcome groups. Both techniques identified predictors of stroke/no bleed and no stroke/bleed not previously included in AF stroke and bleed risk-assessment tools that predict these outcomes independently (e.g., $CHADS_2$ and $HEMORR_2HAGES$). Methodology strengths and limitations were evident. CART provides a visual algorithm approach to risk. However, there is a lack of quantitative measurement (e.g., odds ratios [OR], confidence intervals) for predictors. While PLR results were thorough and predictor parameter estimates could be converted to ORs to indicate strength of association, the result of PLR is number-intensive. To calculate a patient's probability for each of the four outcome groups, the patient's data must be inputted into three separate equations. While both techniques can be used to calculate an individual patient's probability for each outcome group, PLR likely has more scope for application in a clinical setting. Once refined, a clinical prediction rule could be created based on identified predictors and their ORs. **CONCLUSION:** While methods under study need further refinement, these individual patient data analyses provide a useful step forward in the movement towards evidence-based individualization of drug therapy.

PCV13

ANGINA FOLLOWING REVASCULARIZATION—FREQUENCY, PATIENT CHARACTERISTICS AND TIMING

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OBJECTIVE: Angina is relieved by CABG, PCI and stenting procedures but reoccurs over time in a percentage of patients. Little is known about the frequency of recurrent angina following percutaneous and surgical procedures, the characteristics which put a patient at risk for recurrent angina and the timing of angina recurrence. **METHODS:** Patients enrolled in a large national managed care plan with a claim for a CABG, PCI or stent from January 1, 2003 to Decemeber 31, 2004 were selected if they were 35 or older, and enrolled one year prior and one year following their procedure. Patients were followed for one year after their index procedure for medication use, angina diagnosis by ICD-9 code and additional revascularization procedures. **RESULTS:** Following selection criteria 18,240 patients were eligible for analysis. The average age was 59 years, with 25% age 65 years and older. Most patients were male (78%). Of the 18,240 patients, 46% (8420) experienced angina (identified by angina diagnosis and/or two or more nitrate prescriptions) within a year following their index procedure. Of those patients experiencing angina, approximately a third (30%/2904) had another revascularization procedure following the angina diagnosis. The average time from initial procedure to second procedure, after angina diagnosis, was 73 days, although there is a wide range among patients (SD = 103 days). Risk factors for having angina following a revascularization procedure were younger age, female gender and having a PCI without a stent. **CONCLUSION:** Angina reoccurs in a considerable percentage of patients in the year following a percutaneous or surgical coronary procedure. A third of patients experiencing angina have a second procedure after experiencing recurrent angina.

PCV14

EVALUATION OF RESISTANT HYPERTENSION IN A USUAL-CARE SETTING

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OBJECTIVE: Resistant hypertension is defined as the failure to reach blood pressure (BP) goals while treated at adequate doses with three or more antihypertensive agents (AHYs) where one is a diuretic. Clinical trials have found that 2–15% of treated patients have resistant hypertension. The exact prevalence of resistant hypertension in clinical practice is unknown. This analysis evaluates the prevalence of resistant hypertension in a real-world setting. **METHODS:** Hypertensive patients aged 18 and older were identified from the General Electric Electronic Medical Records (EMR) database during the period of November 1, 2002 to November 30, 2005. Resistant hypertension was defined as a blood pressure reading over 140/90 mmHg (130/80 mmHg for patients with diabetes or kidney disease) within one year after the last AHY agent was prescribed during a treatment observation window of November 1, 2003 to November, 2004. **RESULTS:** A total of 29,474 hypertensive patients were identified with an average age of 63.3 years (SD ± 13.3)

and 60.9% were female. Of these 21,460 (72.8%) were treated with at least one AHY and 3584 (12.2%) were treated with three or more AHYs including a diuretic. Overall, 19,202 (65.6%) of the population had uncontrolled hypertension, and 2670 (9.1% overall or 12.4% of the treated population) had resistant hypertension. Resistant hypertension occurred in 70.9% of those treated with three AHYs including a diuretic and in 82.3% of those treated with four or more AHYs including a diuretic. The prevalence of diabetes and/or kidney disease was higher in patients with resistant hypertension (37.8% vs. 22.9%; $p < 0.001$). **CONCLUSION:** This study provides real-world evidence that resistant hypertension is a common treatment concern in the management of hypertension. Additional research to better understand patient characteristics, long term outcomes, and optimal treatment options in the management of resistant hypertension is warranted.

PCV15

SEASONAL VARIATION OF HEART ATTACKS IN WOMEN

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OBJECTIVE: The onset of cardiovascular diseases, such as an acute myocardial infarction (AMI) shows certain circadian and seasonal variation. The development of vascular diseases may also be influenced by age and sex. The purpose of our study was to find out whether a weekly variation or a seasonal variation could be found in the occurrence of a heart attack in the group of women. **METHODS:** We have carried out a retrospective analysis among women with the diagnosis of AMI (n = 32,345) admitted to hospitals between 2000 and 2004 in Hungary, grouped in age groups below and above the age of 50. Data was collected from the data base of the National Health Insurance Fund Administration according to the International Classification of Diseases (ICD I21, I22). **RESULTS:** With consideration to seasonal variation, the peak period of AMI was during Spring, with the lowest number of events during Summer months. There was significant difference between numbers of events in each season ($p < 0.01$). The weekly peak period of AMI morbidity was found on the first day of the week, Monday; showing a gradually decreasing tendency until the last day of the week, Sunday ($p < 0.01$). No significant difference was found between the two age-groups regarding seasonal or weekly variation. **CONCLUSION:** In summary, the results of our study suggest that AMI incidence in women shows a characteristic variation regarding seasons and the days of the week, which should be taken into consideration in the development of prophylaxis strategies.

PCV16

PERMANENT STRESS MAY BE THE TRIGGER OF A HEART ATTACK ON THE FIRST WORK-DAY OF THE WEEK

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OBJECTIVE: Numerous studies have reported the weekly variation of an acute myocardial infarction. The Monday peek has been connected with higher rate of physical and mental, work-related stress. We wish to study the weekly variation of an acute heart attack in the group of workers and pensioners, and find out whether National Holidays on the first day of the week influence the weekly rhythm of a heart attack. **METHODS:** We have carried out the retrospective analysis of patients received at Hungarian hospitals with the diagnose of an acute heart attack (n = 88,687) between 2000 and 2005. Data were retrieved from the data-base of the National Health Insurance Fund in accordance with the International Classification of Diseases (ICD). **RESULTS:** According to the morbidity data of a heart attack, the weekly peek is on the first work-day of the week, showing a gradually decreasing tendency until the end of the week. Morbidity rates on Mondays being National Holidays are similar to the number of events on Saturdays and Sundays ($Z = -25{,}337$; $p < 0.001$). There was a significant difference between number of events on work-days and weekends ($Z = -26{,}638$; $p < 0.001$). No marked difference has been found between workers under the age of 65 and pensioners above the age of 65, or between the two sexes. **CONCLUSION:** The results of our study reveal that the occurrence of an AMI shows characteristic changes through the days of the week, and the first work-days of the week may be related with higher incidence of a heart attack. Such results urge finding the potential new methods of forecast and prevention.

PCV17

PREDICTING CLINICAL OUTCOMES IN MIXED DYSLIPIDEMIA PATIENTS USING THE FRAMINGHAM RISK AND A NEW RISK EQUATION BASED ON A MANAGED CARE DATABASE: A VALIDATION APPROACH

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OBJECTIVES: To compare predicted coronary heart disease (CHD) events and lipid goal attainment under the Framingham and a managed care database risk equation in a managed care patient cohort with established CHD. **METHODS:** Independent outcomes models were developed from the Framingham-based risk equation (FR model) and from a risk equation using a large Integrated Research Database (IRD model). Prior CHD patients ≥50 years (distribution based on NHANES data) with combined sub-optimal LDL-C (≥100 mg/dL), HDL-C (≤40 mg/dL, males; ≤50 mg/dL, females), and TG levels (≥150 mg/dL) at baseline were modeled to predict CHD events and lipid goals attained over five years. IRD model covariates included age, gender, follow-up time, combined lipid goal achievement, and Deyo-Charlson co-morbidity index. CHD events included acute coronary syndrome, sudden coronary artery disease death, and cardiac catheterization (PCI). Patient therapy was based on a formulary with all major branded and generic lipid drugs. **RESULTS:** Using a hypothetical 1,000,000 member plan, 35,059 patients aged ≥50 years were identified with prior CHD. The percent of patients achieving LDL-C and TG goals over five years was higher in the IRD model versus FR model (68.9% vs. 62.7% and 69.9% vs. 49.2%, respectively), while HDL-C goal achievement percent was comparable (53.4% vs. 54.5%). The number of patients experiencing a CHD event over five years was higher in the IRD versus FR model (17,194 vs. 6387), reflecting the inclusion of actual practice CHD intervention (i.e., PCI) in unstable angina (14,430 vs. 1461). **CONCLUSIONS:** The established FR model appears to conservatively underestimate both lipid response and theoretical CHD events, nor does it account for CHD clinical intervention. The IRD model may better reflect the real world lipid response and CHD events, also accounting for actual event indicators of CHD intervention, being developed from a treatment population.

PCV18

FACTORS ASSOCIATED WITH RISK OF METABOLIC SYNDROME FOR US FIRST GENERATION ADOLESCENTS (AGES 12–17)

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OBJECTIVE: To contrast the factors that are associated with metabolic syndrome risk for first generation adolescents and US non-immigrant adolescents. **METHODS:** At risk is defined as having one or more of the following: elevated fasting glucose, elevated SBP, elevated BMI, 75th percentile waist circumference, or low HDL. Logistic regression and NHANES 2005–2006 data were used to examine the impact on metabolic syndrome risks; gender, ethnicity, length of residence, income, and number of meals eaten outside the home per week. First generation Hispanic and non-Hispanic adolescents are compared with adolescent non-immigrants. A significance level of 0.05 was used. Sample sizes for Hispanic first generation adolescents, non-Hispanic first generation adolescents, and non-immigrant adolescents are 1,076,059, 674,536, and 22,091,170 respectively. **RESULTS:** About 71% of first generation adolescent Hispanics, 67% for non-Hispanic other first generation adolescents, and 67% of non-immigrant adolescents are at risk for metabolic syndrome. Significant predictors for risk among Hispanics are female gender, longer time of residence in the United States, and low familial income. For every one meal eaten outside the home risk increases by 11%. For other non-Hispanics, the male gender is a negative predictor along with low and middle familial income levels. Length of residence in the United States and meals eaten outside the home were not significant predictors. Among the non-immigrants, male gender is a negative predictor, while low and middle income increase risk by 60% and 47% respectively. Each meal eaten outside the home increases their risk by 3%. **CONCLUSION:** These adolescents are at risk for acute cardiovascular endpoints, higher medical utilization and expenditure, and lower quality of life. Interventions should focus on education regarding healthy eating outside the home with limited resources. A surprising result of this analysis is the high price of acculturation for Hispanic first generation adolescents in particular.

PCV19

RESIDUAL DYSLIPIDEMIA ON SIMVASTATIN: POPULATION MODELING OF OPTIMAL LIPID VALUE ACHIEVEMENT WITH ADDED EXTENDED-RELEASE NIACIN VERSUS EZETIMIBE

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OBJECTIVE: To compare the population modeling effects of simvastatin alone, simvastatin plus ezetimibe and simvastatin plus extended-release niacin (ERN) on achievement of individual and combined optimal lipid values in untreated managed care patients with coronary heart disease (CHD) or risk equivalent (CHD/RE). **METHODS:** Patients with a baseline lipid panel between January 1, 2000-December 31, 2001, no concomitant dyslipidemia therapy, continuous eligibility for 24 months, and CHD or CHD/RE by diagnosis or procedure were analyzed from a 2.1 million record managed care database (HealthCore, Inc. Research Integrated Dataset). Patient-level lipids were assessed for achievement of guideline-defined optimal lipid values for LDL-C (<100 mg/dL), HDL-C (>40 mg/dL men; >50 mg/dL women), triglycerides (TG; <150 mg/dL), non-HDL-C (<130 mg/dL), and combined LDL-C + HDL-C + TG at untreated baseline, after simvastatin 40 mg, after simvastatin + ezetimibe 10 mg, and after simvastatin + ERN 1 g and 2 g. Treatment effects were modeled based on product labeling, assuming additivity for simvastatin and ERN. Primary outcome measure was percentage of patients with nonoptimal values. **RESULTS:** Analysis included 20,948 patients: 49% female, mean (±SD) age 65 ± 14 years, hypertension 62%, diabetes 34%. At untreated baseline, nonoptimal values occurred in 79% for LDL-C, 43% HDL-C, 42% TG, 77% nonHDL-C, and 92% for combined lipids. After modeled therapy, nonoptimal value frequencies were: simvastatin LDL-C 34%, HDL-C 14%, TG 34%, nonHDL-C 36%, and combined 69% ($p < 0.05$ vs baseline); simvastatin + ezetimibe LDL-C 21%, HDL-C 23%, TG 32%, nonHDL-C 31%, and combined 53% ($p < 0.05$ vs baseline, simvastatin); simvastatin + ERN 1 g and 2 g LDL-C 25% and 18%, HDL-C 0.2% and 0%, TG 30% and 22%, nonHDL-C 20% and 10%, and combined 46% and 36% [$p < 0.05$ vs baseline, simvastatin, simvastatin + ezetimibe (p = NS for TG at 1 g dose)]. **CONCLUSION:** In this high-risk population, nonoptimal lipid values were very prevalent and persisted after modeled simvastatin 40 mg. Modeled simvastatin + ERN 1–2 g diminished residual dyslipidemia and nonoptimal lipid values more than simvastatin + ezetimibe.

PCV20

UPDATING THE RXRISK-V: CREATING A CROSSWALK BETWEEN VA AND FIRSTDATABANK THERAPEUTIC CATEGORIES

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OBJECTIVE: Co-morbidity indices based on drug utilization have been used to predict costs of care. The original RxRisk co-morbid disease index was based on United States (US) National Drug Code (NDC) numbers, and as such, needed to be updated at the NDC level for any change in manufacturer, repackager, or generic status, or with the introduction of each new molecular entity to the US market. The RxRisk-V was a modification of the original that used Veteran Affairs (VA) drug codes rather than NDC numbers to assign co-morbidity status for a set of diseases. Use of VA drug codes rather than NDCs simplifies the process of updating the tool. We undertook to create a crosswalk between VA drug codes and FirstDataBank (FDB) categories so the tool could be used with non-VA pharmacy data. **METHODS:** We obtained SAS code and disease category tables for the RxRisk-V. Clinical pharmacists reviewed the RxRisk-V disease categories and created an algorithm for mapping VA therapeutic categories to FDB specific drug therapeutic class categories. Pharmacists also updated disease categories to include drugs that would not have been updated in the RxRisk-V due to new therapeutic categories introduced since 1999. Generic name, brand name, and route of administration fields were used to specify which agents within each FDB therapeutic class were predictive of each RxRisk-V disease category. The SAS code for the RxRisk-V was modified to crosswalk between VA codes and non-VA pharmacy data. **RESULTS:** We successfully applied the crosswalk to a cohort of 19,458 patients from the RxAmerica database and generated co-morbidity scores. **CONCLUSION:** Using the RxRisk-V enables investigators to apply an updated co-morbid disease severity index to VA pharmacy data. We created a crosswalk to enable use with non-VA pharmacy data. Future work is needed to validate the tool with the crosswalk incorporated.

PCV21

PREVALENCE, AWARENESS AND MANAGEMENT OF HYPERTENSION, DYSLIPIDEMIA, AND DIABETES AMONG UNITED STATES ADULTS AGED 65 AND OLDER

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OBJECTIVE: Hypertension, dyslipidemia, and diabetes, which are established risk factors for cardiovascular disease (CVD), have been previously described among adults aged 65 and older, but have not been updated to reflect current national data. We assess prevalence, awareness, treatment and control rates among U.S. adults aged 65 and older with respect to hypertension, dyslipidemia, and diabetes, and describe predictors associated with awareness and management of these factors. **METHODS:** Analysis of nationally representative data collected from adults aged 65 and older (n = 3810) participating in the National Health and Nutrition Examination Survey (NHANES) 1999–2004. **RESULTS:** Women have a significantly higher prevalence of hypertension than men (76.6% vs 63.0%) and a significantly lower rate of control when treated pharmacologically (42.9% vs 57.9%). Dyslipidemia prevalence is 60.3% overall, and women are significantly more likely to be aware of their condition than men (71.1% vs 59.1%). Diabetes affects 21.2% of older adults, and 50.9% of prevalent cases are treated pharmacologically. Goal attainment among those treated is problematic for all three conditions–hypertension (48.8%), dyslipidemia (64.9%), and diabetes (50.4%). Having two or more doctor visits annually is associated with goal attainment for dyslipidemia. **CONCLUSION:** Knowledge of cardiovascular health in older adults and understanding gender gaps in awareness can help physicians and policymakers improve disease management and patient education programs.

PCV22

SIGMOID MAXIMUM EFFECT MODELING OF CORONARY HEART DISEASE DEATH AND MYOCARDIAL INFARCTION RATE VERSUS LOW-DENSITY LIPOPROTEIN CHOLESTEROL IN STATIN SECONDARY PREVENTION TRIALS

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OBJECTIVE: Guidelines and expert opinion regard the relationship between low-density lipoprotein cholesterol (LDL-C) and coronary heart disease (CHD) event rates from prevention trials as linear or log-linear. However, these relationships require key assumptions that are typically invalid in biological systems, and may be more fully described by a sigmoidal maximum effect function. **METHODS:** Data were extracted from statin secondary prevention trials of at least 4-years duration (CARE, LIPID, 4S, HPS, TNT, IDEAL; N = 57,042; average duration 5.2 yrs, range 4.8–6.1 yrs). Linear and modified nonlinear sigmoid maximum effect (sEmax) models were constructed using WinNONLIN (v.1.5, Pharsight Corporation, Mountain View, CA) to evaluate the relationship of annualized absolute rates of CHD death plus nonfatal myocardial infarction (NFMI) versus average on-treatment LDL-C. Model output included E0 (CHD death + NFMI %/yr at LDL-C = 0 mg/dL) and fit parameters [r2 and Akaike's Information Criteria (AIC)]. The model-dependent number needed to treat (NNT) for one year to prevent one CHD death + NFMI event with LDL-C reduction from 100 mg/dL to 70 mg/dL was also calculated. **RESULTS:** Fit parameters indicated that the sEmax was the more correct model (r2 = 0.906, AIC = 8.40; linear r2 = 0.876, AIC = 15.99). The sEmax model yielded an E0 of 1.37%/yr, whereas the linear model E0 was biologically implausible at –0.76%/yr. The CHD death + NFMI rate at LDL-C = 100 mg/dL (sEmax 1.91%/yr; linear 2.13%/yr) and LDL-C = 70 mg/dL (sEmax 1.58%/yr; linear 1.14%/yr) resulted in NNT of 303 and 101 based on sEmax and linear models, respectively. **CONCLUSION:** The relationship between LDL-C and annualized rate of CHD death + NFMI is sigmoidal and best described by a nonlinear maximum effect model (sEmax). This model demonstrates a marked diminishing rate of return with aggressive LDL-C lowering, strongly suggesting alternative risk modification measures be explored at LDL-C <100 mg/dL. These findings have clinical trial design, treatment guideline, managed care, economic, and public health implications.

PCV23

MEDICAL CLAIMS FOR GASTROINTESTINAL ADVERSE EVENTS ARE COMMON IN PATIENTS PRESCRIBED CLOPIDOGREL

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OBJECTIVE: Clopidogrel is commonly co-prescribed with aspirin in patients with heart disease, and therefore the associated risk of gastrointestinal adverse events may be high. We sought to determine the incidence of medical claims for potential gastrointestinal adverse events among clopidogrel users in an administrative database. **METHODS:** Clopidogrel users were identified in a large US database (representing a network of over 70 managed care plans) based on the following criteria: an initial clopidogrel prescription between between October 2003 and January 2004, a clopidogrel-free window in the prior 6 months, and at least 24 months of continuous eligibility over the study time-frame. ICD9 codes were used to identify new peptic ulcer and gastrointestinal bleeding events in the 12 months after the first clopidogrel prescription. **RESULTS:** There were 368,061 subjects identified who met the selection criteria. Of these subjects, 58% were male and 72% were greater than or equal to 60 years of age. The average duration of clopidogrel use was 200 days. The proportion having a medical claim for peptic ulcer or gastrointestinal bleeding was 6.2%. Higher incidences were seen in women compared to men (7.4% vs. 5.4%; $p < 0.000001$) and those who were greater than or equal to 60 years of age compared to those under 60 (6.9% vs. 4.3%; $p < 0.000001$). **CONCLUSION:** There is a high incidence of medical claims for peptic ulcer or upper gastrointestinal bleeding among patients who receive clopidogrel, especially in women and those who are greater than or equal to 60 years of age.

PCV24

ASSESSMENT OF SAFETY FOR BROMOCRIPTINE: COMPARISONS OF REPORTING SYSTEMS AND A RETROSPECTIVE COHORT STUDY

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OBJECTIVE: Because of recent attention to public adverse event reporting systems, we assessed findings from published case reports and adverse drug reactions reported to the World Health Organization (WHO) Programme for International Drug Monitoring and findings from an analysis of patients in the General Practice Research Database (GPRD) regarding bromocriptine and risk of myocardial infarction and stroke (CVD). **METHODS:** We tallied reports of adverse CVD events related to bromocriptine in the medical literature using PubMed (years

1950–2007) and from the WHO (years 1997–2006). Global person-year exposure to bromocriptine was estimated using data from IMS. Next, we conducted a retrospective matched cohort study using data from the GPRD (years 1990–2006). Age- and multivariate-adjusted Cox proportional hazard models were constructed to calculate a hazard ratio (HR) and 95% confidence interval (CI) of CVD events among bromocriptine users compared to controls. **RESULTS:** We identified 24 CVD events published in the worldwide medical literature and 56 CVD events reported to the WHO over an estimated 19.3 million person-years of bromocriptine exposure. At least 92% of reported CVD events were among women in either data set. In our GPRD cohort, 88% of patients exposed to bromocriptine for any specified indication were women. After multivariate adjustment, patients exposed to bromocriptine appeared to have lower risk of a CVD event, although not statistically significant, HR 0.82 (95% CI 0.29 to 2.31). Gender was not a significant confounder in the multivariate model. **CONCLUSION:** Using public reporting systems, CVD events appear to occur infrequently among patients taking bromocriptine but predominately among women. Results from our GPRD analysis are not consistent with an increased risk of CVD events among patients taking bromocriptine; rather, they suggest a decreased risk. These findings highlight the need for careful epidemiologic study to consider the potential risks associated with bromocriptine specifically and medications in general.

PCV25

IMPROVEMENTS IN CARDIOVASCULAR DISEASE OUTCOMES IN MANAGED CARE PATIENTS MANAGED ACCORDING TO NATIONAL LIPID TREATMENT GUIDELINES

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OBJECTIVE: Evaluate cardiovascular disease (CVD) outcomes in managed care patients upon adherence to lipid treatment guidelines [National Cholesterol Education Program's Third Report on Detection, Evaluation, and Treatment of High Blood Cholesterol and Adult Treatment Panel's (NCEP-ATP III)]. **METHODS:** Patients with laboratory values for low-density lipoprotein-cholesterol (LDL-C), high-density lipoprotein-cholesterol (HDL-C), & triglycerides (TG) between January 1, 2003-December 31, 2005 [index date], no lipid therapy 6-months pre-index date, and minimum 12 months health plan eligibility pre- and post-index date were analyzed using the HealthCore integrated managed care database. Patients were classified as appropriately (AM) or inappropriately managed (IAM) using baseline lipid levels and the first post-index follow-up lipid panel (goal attainment), and risk stratification per NCEP-ATP III guidelines. Impacts on lipid parameters between groups were descriptively analyzed, while multivariate logistic regression was performed to estimate risk of CVD events (ischemic heart disease, peripheral vascular disease, stroke and related occurrences and interventions). **RESULTS:** Among 8176 study patients (3493 AM; 4683 IAM), AM patients were significantly older [51.4 ± 9.1 and 50.0 ± 9.6 years, $p < 0.01$] and comprised of fewer males (43.2% vs. 56.2%; $p < 0.01$). Mean LDL-C, HDL-C, and TG baseline levels were significantly different among AM patients (127 ± 35, 55 ± 15, and 131 ± 66 vs. 132 ± 37, 45 ± 13, and 181 ± 81 respectively; $p < 0.01$). During follow-up, AM patients had greater decreases in LDL-C and TG levels versus IAM patients (–12% vs. –3% and –8% vs. +5%; $p < 0.01$), while HDL-C levels showed greater increases (5% vs. 2%; $p < 0.01$). AM patients were 38% less likely to experience a CVD event versus IAM patients [Odds Ratio = 0.62; 95% CI, 0.48–0.80; $p < 0.01$]. **CONCLUSION:** Greater improvement in all three lipid parameters and reduction in CVD event risk occurred among dyslipidemia patients managed in accordance with clinical guideline treatment recommendations in this managed care population.

CARDIOVASCULAR DISORDERS—Cost Studies

PCV26

BELGIAN BUDGET IMPACT ANALYSES OF ALISKIREN (TEKTURNA/RASILEZ) IN HYPERTENSION

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OBJECTIVE: To assess the budget impact of reimbursing aliskiren (Tekturna/Rasilez), the first drug from a new class of antihypertensive drugs (direct renin inhibitors), for the management of essential hypertension, from the health care payer (RIZIV/INAMI), patient, and societal perspectives in Belgium. **METHODS:** Following ISPOR's budget impact guidelines, the pharmacy costs of the current therapy distribution of patients treated for essential hypertension in Belgium was compared to an alternative scenario, where aliskiren gains market share from conventional ARB therapy over a 3-year time horizon. IMS databases and literature data were used to estimate the total number of treated hypertensive patients and to derive market shares of the different antihypertensive medication classes (Beta-blocker, CCB, Diuretic, ACEi, ARB) and all possible dual and triple combinations thereof. The antihypertensive market share uptake of aliskiren was assumed to be identical to that observed previously for telmisartan in Belgium (0.16% year 1; 0.24% year 2; and 0.28% year 3). Only drug acquisition costs (obtained from official Tariffs) were considered in this analysis. Univariate sensitivity analyses were performed as well as sub-populations analyses. **RESULTS:** The predicted Belgian populations treated for hypertension in 2008, 2009, and 2010 were estimated at 1,398,446 patients; 1,426,137 patients; and 1,525,827 patients, respectively. Over 3 years, it was estimated that RIZIV/INAMI hypertension drug budget following aliskiren reimbursement would increase by 0.02% (i.e. €148,395), from €755,522,606 to €755,671,001. Patients' co-payments would decrease by €20,613, resulting in societal incremental costs of €127,782. Sensitivity analyses confirmed that the net budget impact would remain of the same magnitude. **CONCLUSION:** Our analyses suggest that, under current assumptions, reimbursing aliskiren in Belgium would only slightly increase costs from the RIZIV/INAMI and societal perspectives, while generating savings for patients. Moreover, this budget impact does not consider aliskiren potential savings due to end organ protection.

PCV27

COST EFFECTIVENESS STUDIES IN HEART FAILURE: AN UPDATE OF THE LITERATURE

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OBJECTIVE: Heart failure (HF) is a major public health burden in terms of mortality, morbidity and costs. Economic analyses of clinical trials and real-world studies have assessed the cost-effectiveness of drugs used to treat HF. Although a few papers have summarized the results of the earlier economic studies, new evidence has emerged necessitating an update of the cost-

effectiveness literature. **METHODS:** A literature search was conducted in MEDLINE to identify the published articles on HF from 1993 to 2007 with a focus on economic evaluations and resource use. Six review articles were found which summarized 31 economic studies for ACE inhibitors, beta-blockers and digoxin through 2004. None of the review articles had summarized the studies for ARBs, aldosterone receptor blockers, or evidence from real-world studies. **RESULTS:** After excluding studies summarized in the previous review papers, we found 29 new economic analyses for drugs used to treat HF. Among these, 22 studies were based on data available from clinical trials. These included 14 cost-effectiveness analyses (CEA), 1 CEA/cost-utility analysis, 1 CEA/cost-consequence analysis, 4 CEA/cost-benefit analyses (CBA), 1 CBA and 1 budget impact analysis. The remaining analyses were studies conducted using real-world data. Five studies compared ARBs to placebos or ACE inhibitors, out of which four suggested cost-savings or cost-effectiveness for ARBs, and one showed higher costs for ARBs. For the remaining drugs, evidence that treatment was cost-saving was observed in 16 studies and that the treatment had favorable cost-effectiveness ratio was observed in 7 studies. Finally, one study comparing costs among beta-blockers found bisoprolol to be the most cost-effective drug. **CONCLUSION:** Economic studies analyzing drugs used to treat HF can help in making rational decisions regarding provision of care. However, there is need of more comparative economic studies between same class drugs to inform prescription drug decisions.

PCV28

CARDIOVASCULAR EVENT DRIVEN ECONOMIC ANALYSIS OF ROSUVASTATIN VERSUS SIMVASTATIN USING PRAGMATIC HEAD-TO-HEAD RCTS WITH SURROGATE END-POINT MEASURES

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OBJECTIVE: Evidence demonstrates a strong association between reductions in LDL-C achieved with statin therapy and reductions in cardiovascular events. Several cost-effectiveness analyses have incorporated LDL-C reduction, which is a "surrogate endpoint", as indicator for effectiveness of interventions in their models. Interpretations of cost-effectiveness analyses with surrogate endpoints may confuse decision-makers. Therefore, clinically important endpoints (hard endpoints) such as cardiovascular events may be a better alternative to comprehend the magnitude of the cost-effectiveness of therapeutics. The objective is to estimate cost savings through cardiovascular event reduction correlated with LDL-C reduction in patients with hypercholesterolemia on statin therapy using pragmatic head-to-head RCTs from a Canadian perspective. **METHODS:** Reducing LDL-C was incorporated into an economic analysis through a reduction in cardiovascular (cardiac and cerebrovascular) events. Data for LDL-C reduction from a head-to-head RCT [Am Heart J 2002;144:1036–43]; rosuvastatin (starting 5 mg) versus simvastatin (starting 20 mg) with up-titration doses; and distribution of cardiovascular risk for users [N = 100,000, 5 years] in Canadian population [Clin Invest Med 2007;30:E63–E69]. Medical costs are from the perspective of the Canadian health care system. **RESULTS:** It is estimated that approximate acquisition costs for simvastatin is more than $14 million less than acquisition costs for rosuvastatin. Health care cost-savings through cardiovascular events prevention related to statin therapy are estimated as follows: Non-fatal myocardial infarction, rosuvastatin ($97,488,572) and simvastatin ($88,086,070); ischemic stroke, rosuvastatin ($63,178,674)and simvastatin ($57,085,510). Rosuvastatin saves almost $15.5 (95%CI: $14.8, $16.2) million compared to simvastatin due to cardiovascular events reduction. Rosuvastatin and simvastatin can prevent 3161 and 2857 deaths, respectively. **CONCLUSION:** Although the acquisition cost for simvastatin is much less than that for rosuvastatin, the economic benefits of dyslipidemia management with rosuvastatin in the Canadian population is estimated to be significantly superior to simvastatin therapy through a reduction in costs associated with the management of cardiovascular events and sequelae.

PCV29

A COST-EFFECTIVENESS ANALYSIS OF TREATMENT TO LOW-DENSITY LIPOPROTEIN (LDL) CHOLESTEROL GOAL IN HIGH-RISK PATIENTS BASED UPON THE 2004 NATIONAL CHOLESTEROL EDUCATION PROGRAM (NCEP) GUIDELINE UPDATE

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OBJECTIVE: To assess the cost-effectiveness of LDL cholesterol reduction based upon the 2004 NCEP guideline update for atorvastatin, lovastatin, rosuvastatin, simvastatin, atorvastatin plus ezetimibe, lovastatin plus extended-release niacin, and simvastatin plus ezetimibe from a third-party payer's perspective. **METHODS:** Literature-based decision analyses were conducted to evaluate direct costs, treatment outcomes defined as LDL goals of <70 and <100 mg/dl, and clinically-significant adverse events. Each of the decision trees consisted of four initial monotherapy treatment arms and also considered combination therapy versus dose titration if treatment goals were not achieved. Base cases were defined according to NCEP high-risk patient classifications and five categories of baseline LDL levels from the 1999–2002 National Health and Nutrition Examination Survey (NHANES). Meta-analyses were performed to estimate percent LDL reductions for each agent and for each dose. Monte Carlo simulations and probabilistic sensitivity analyses were used to yield incremental cost-effectiveness ratios, confidence intervals, and graphical representations of findings. One-way sensitivity analyses were conducted on key variables of uncertainty and costs. **RESULTS:** Overall, costs were observed to higher and effectiveness lower among patients seeking a <70 mg/dl goal. Simvastatin was found to be the most cost-effective treatment option for both <70 mg/dL and <100 mg/dl goals and for each baseline LDL cholesterol strata. Combination therapy was more cost-effective compared to dose titration among the <70 mg/dl goal and in those requiring LDL reductions above 45%. Analyses indicated that the recent generic pricing of simvastatin substantially impacted results. **CONCLUSION:** From a third-party payer perspective and among high-risk patients, simvastatin (including monotherapy and combination with ezetimibe), was observed to be the most cost-effective treatment option for LDL treatment goals of <70 and <100 mg/dl. Further research is warranted concerning combination therapies and in evaluating additional surrogate outcomes such as high-density lipoprotein (HDL).

PCV30

CLOPIDOGREL IS COST-EFFECTIVE COMPARED WITH ASPIRIN IN UNITED KINGDOM PATIENTS WITH A MYOCARDIAL INFARCTION WHO SUBSEQUENTLY SUSTAIN AN ISCHAEMIC STROKE OR PERIPHERAL ARTERIAL DISEASE EVENT

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OBJECTIVE: The REACH Registry shows that the rate of death, myocardial infarctions (MI) and ischaemic strokes (IS) increase

as the number of symptomatic arterial disease locations increases. A cost-utility analysis was undertaken comparing two years of clopidogrel treatment with aspirin treatment for patients with a previous history of MI, who then sustain an IS or a peripheral arterial disease (PAD) event. These patients are referred to as 'high-risk'. **METHODS:** A model was constructed to simulate hypothetical 'high-risk' patients. The time horizon was that of patient lifetime with only direct medical costs considered. Health states included were vascular death, non-fatal IS events and non-fatal MI events. The risk of future events in the 'high-risk' group compared with patients who had sustained a single event (MI, IS or PAD) was calculated from the CAPRIE trial and showed an 81% increase. This ratio was applied to previously published risks of vascular death, non-fatal IS and non-fatal MI for UK patients with a single event to calculate the event rates for 'high-risk' patients. The relative risks (and 95% confidence intervals) of clopidogrel compared with aspirin in 'high-risk' patients in the CAPRIE trial were 0.87 (0.63–1.19), 0.83 (0.60–1.15) and 0.53 (0.32–0.86) for vascular death, non-fatal IS and non-fatal MI events respectively. Costs and utilities associated with events were taken from literature reviews and were discounted at 3.5% per annum. Probabilistic sensitivity analyses were undertaken. **RESULTS:** The mean cost per QALY for clopidogrel compared with aspirin was ≤5443 (95% confidence interval ≤2332 to dominated). The probability of the cost per QALY being below ≤20,000, a significant threshold for cost-effectiveness in the UK, was 79%. **CONCLUSION:** The model suggests that, in patients with a previous MI event and a subsequent IS or PAD event, clopidogrel can be considered cost-effective compared with aspirin in terms of current UK thresholds.

PCV31

COST-EFFECTIVENESS OF DIFFERENT STRATEGIES FOR DIAGNOSIS OF DEEP VEIN THROMBOSIS

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OBJECTIVE: Proper diagnosis of Deep Vein Thrombosis (DVT) at the earliest time is very important so that appropriate therapy can be initiated. Various diagnostic tests have been developed for DVT, but most of them have poor sensitivity and specificity. Due to the above issues, it is very important that diagnosis strategies be developed which are cost-effective. **METHODS:** Cost-effectiveness was analyzed using a decision model from TreeAge Pro Suite 2007 software. Outcomes considered were costs, adverse events and quality adjusted life years (QALYs). Probabilities were calculated using Bayes' revision method that utilized sensitivity and specificity of the diagnostic tests along with the pretest probability of developing the disease. Quality of life and costs data were pooled from literature reviews. QALYs were calculated using life expectancy tables. Costs in pounds were converted to US dollars and adjusted through use of Consumer Price Index data from Bureau of Labor Statistics. **RESULTS:** With a cost-effectiveness ratio of $32.4995 per QALY, the following strategy dominated other alternate strategies—Perform venography if D-dimer test is positive. Otherwise, if D-dimer test is negative then no treatment is given. If venography shows abnormal results, treatment is given otherwise for normal results, no treatment is given. Sensitivity analysis showed that this strategy remained cost-effective even when all costs were varied by 25%. The model results were affected by the sensitivity of the diagnostic tests. **CONCLUSION:** Based on this analysis, it would be cost-effective if symptomatic patients are diagnosed with the strategy after classifying them according to Wells score. Further research needs to be done to see if cost of venography is offset by decrease in hospitalization of those who later develop severe form of DVT. Health care providers should consider patient population distribution among the risk groups defined by Wells score before generalizing the finding.

PCV32

COST-EFFECTIVENESS OF CLINICAL PHARMACY SERVICES ON HYPERLIPIDAEMIC MANAGEMENT IN A PUBLIC HOSPITAL OF HONG KONG

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OBJECTIVE: This study was aimed to evaluate the economic benefits of clinical pharmacy service in hyperlipidaemic management in accordance to the ATP III guidelines. **METHODS:** A clinical pharmacy service was developed at the lipid clinic of Prince of Wales Hospital (PWH) between October 2005 and October 2007. In the intervention group, patients attended educational visits conducted by a clinical pharmacist. Medication compliance and the proper use of drugs were assessed. Monthly telephone follow-ups were made to check on the progress of patients. The time spent by the pharmacist was recorded. In the control group, patients received usual medical care with no pharmacist intervention. **RESULTS:** A total of 300 patients were recruited (150 in the intervention group and 150 in the control group). Intervention group achieved 23.6%, 15.3%, and 22.3% mean reduction in LDL-C, total cholesterol and triglyceride levels, respectively, compared with 3.7%, 5.2%, and 2.7% in the control group. A sustained reduction in total cholesterol of 1% is associated with a 2–3% reduction in CHD risk. Pharmacist conducted mean of 3.34 + 0.7 educational visits and 16.3 + 3.3 telephone follow-up calls. The overall time spent was 3.08 minutes per patient per week. The average monthly salary of a hospital pharmacist was HK$30,000 (HK$7.8 = USD$1). In previously published data, 0.39 patients per year at the PWH lipid clinic experienced acute myocardial infarction (AMI) and required HK$28,800 medical cost annually. Clinical pharmacy service reduced the CHD risk of these patients and prevented the development of an AMI, providing a potential cost saving of HK$28,600 (which was 99% cost reduction) per patient per year at PWH. (Estimated cost of pharmacist to manage 0.39 patients per year is HK$182.18). **CONCLUSION:** Clinical pharmacy service is potentially a cost-effective way to improve the management of hyperlipidaemia alongside with routine physician care.

PCV33

LONG-TERM REDUCTION OF CARDIOVASCULAR EVENTS AND COST-EFFECTIVENESS OF DIFFERENT STATINS AND DOSES IN MEXICO

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OBJECTIVE: To assess long-term reduction of cardiovascular (CV) events and cost-effectiveness of the use of rosuvastatin (RSV), atorvastatin (ATV), simvastatin (SIM) and pravastatin (PRA) in Mexican patients over 55 years old. **METHODS:** Efficacy data from STELLAR clinical trial (total cholesterol -TC-, LDL-C; HDL-C, triglycerides -TG-) was used as input to the model. Based on Framingham risk equations, 4 gender/risk

cohorts were traced for 20 years (4-year Markov cycles) with 55–76 year old patients in order to predict primary and secondary CV events. Quarterly titration in year one was set up to a maximum dose of 20 mg RSV, 80 mg ATV, 80 mg SIM and 40 mg PRA based on TC target, whereas risk was calculated using average TC : HDL-C ratio of the 1000 simulated patients, with adjustment for Framingham's hypothesized over-prediction of Mexican risk. The economic analysis was done under private sector perspective with a 5% and 1.5% discount rate for costs and benefits, respectively. Unitary costs were obtained from NADRO (local wholesaler). Mexican Institute of Social Security costs and data from a Delphi Panel were used to estimate CV diseases' private costs. Disability-adjusted life years gained (DALYs) for each treatment regimen were estimated. Results are shown in natural units, while costs are expressed in US dollars. Sensitivity analysis included threshold, one-way scenarios and probabilistic analysis. **RESULTS:** RSV 10 mg for the 20-year horizon resulted in less primary and secondary events (197) and deaths (42), per 1000 patients, more DALYs (14.97) and lower per-patient treatment costs ($8134.57) than other statins on equivalent doses. Hence, RSV 10 mg is highly cost-effective with a cost per DALYs gained of $16,802.15 than comparators. Sensitivity analysis showed the robustness of results. **CONCLUSION:** RSV is a cost-effective strategy: it yields fewer CV events, resulting in fewer deaths and significant economic saving for both patients and institutions.

PCV34

THE COST-EFFECTIVENESS OF ALISKIREN AS ADD ON TO LOSARTAN AND OPTIMAL ANTIHYPERTENSIVE THERAPY IN PATIENTS WITH TYPE 2 DIABETES, HYPERTENSION AND NEPHROPATHY IN THE UNITED KINGDOM SETTING

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OBJECTIVE: AVOID (Aliskiren in the Evaluation of Proteinuria in Diabetes) was a multicentre, randomised, double-blind, six-month study designed to assess the effect of adding aliskiren, an oral direct renin inhibitor, to losartan and optimal antihypertensive therapy (excluding ACE inhibitors), on the reduction in urinary albumin to creatinine ratio (UACR) in patients with hypertension, type 2 diabetes, and nephropathy. A cost-effectiveness model was developed aiming to estimate the progression to end-stage renal disease (ESRD) and to project the associated costs and clinical outcomes of aliskiren in the UK setting. **METHODS:** A previously published Markov model of diabetic nephropathy and ESRD was adapted to incorporate treatment effects from AVOID, where aliskiren reduced mean UACR versus placebo by 20% ($p = 0.0009$). Transition probabilities from AVOID were used until patients reached UACR >1,900 μg/g, with probabilities from the Irbesartan in Diabetic Nephropathy Trial used thereafter. Direct medical costs were based on UK pharmacy costs and published sources. Annual discount rates of 3.5% were applied over the 20-year time horizon. **RESULTS:** Short-term therapy benefits associated with aliskiren were projected to increase life expectancy by 0.0983 years (7.9175 ± 0.0434 versus 7.8192 ± 0.0369 years), improve quality-adjusted life expectancy by 0.0878 quality-adjusted life years (QALYs) (5.3038 ± 0.0444 versus 5.2160 ± 0.0391 QALYs) and reduce the cumulative incidence of ESRD by 2.51 percent (19.52% versus 22.03%) compared to placebo. An incremental cost-effectiveness ratio of £12,073 per QALY gained was calculated for aliskiren, which is well below the willingness-to-pay threshold of the UK of £30,000 per QALY gained. Sensitivity analysis where the clinical benefit of aliskiren was extended beyond UACR >1900 μg/g, proved to be a cost saving strategy. **CONCLUSION:** Aliskiren would be considered cost-effective in the UK setting when added to losartan therapy due to the additional renal protection provided and a reduced incidence of ESRD.

PCV35

GADOFOSVESET IN THE MANAGEMENT OF PERIPHERAL ARTERIAL OCCLUSIVE DISEASE IN CANADA—A MODEL APPROACH FOCUSING ON DIAGNOSTIC CONFIDENCE

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OBJECTIVE: To investigate the cost-effectiveness of a diagnostic imaging strategy starting with magnetic resonance angiography (MRA) enhanced with a blood pool agent versus strategies starting with either MRA enhanced with conventional extracellular agents or standard-DSA in severe peripheral arterial occlusive disease (PAOD) in Canada. **METHODS:** A microsimulation model focusing on "diagnostic confidence" instead of "diagnostic accuracy", built by Kienbaum et al. (submitted for publication) for the European perspective was adapted to compare a strategy with initial MRA with Gadofosveset to strategies with either initial MRA with conventional extracellular contrast media (standard-MRA) or a standard digital subtraction angiography (standard-DSA) in the work-up of severe PAOD (critical limb ischemia) in the Canadian setting. The model allows evaluating aggregated mean costs per initial diagnostic modality as well as incremental costs per quality-adjusted life year (QALY) gained. Both efficacy and utility data were derived from the European analysis. Cost data were calculated from the payer perspective and estimated by the 'Program for the Assessment of Technology in Health' (PATH) at McMaster University. **RESULTS:** The model simulation predicts an equivalent utility score for all alternatives considered. From the payer perspective, the mean overall cost of the Gadofosveset-MRA strategy amount to $7814. In contrast, aggregated costs with either standard-MRA or -DSA reach $8637 and $9842, respectively. Thus, an imaging strategy with initial Gadofosveset-MRA is less costly than strategies initially using standard-MRA or -DSA. With regard to cost-effectiveness the additional costs per QALY gained by standard-MRA versus Gadofosveset-MRA amount to about $117,000 and about $178,000 for standard-DSA. The model was robust regarding probabilistic variations of all parameters. **CONCLUSION:** From the payer perspective in Canada, an imaging strategy starting with Gadofosveset-MRA represents a cost-effective option for the diagnostic work-up of severe PAOD (critical limb ischemia) compared to strategies with either standard-MRA or -DSA.

PCV36

SYSTEMATIC REVIEW OF COST-EFFECTIVENESS STUDIES ON DIABETES MEDICATION

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OBJECTIVE: Some new antidiabetic drugs such as insulin glargine, insulin detemir, exenatide, and rosiglitazone have been widely used in the clinical practice. Very few pharmacoeconomics studies on diabetes medications are focused on these drugs. To compare and contrast the cost-effectiveness of the various diabetes medications, we conducted the systematic review of drug-

related cost-effectiveness studies on diabetes. **METHODS:** A literature search using PubMed and OhioLINK websites was conducted for cost-effectiveness studies. The key terms used for literature search were "diabetes", and "cost, cost-effectiveness, cost-benefit, economics, or treatment outcome". Eligible studies were randomized controlled trials focusing cost-effectiveness of diabetes drug therapies, published in English between July 2005 and October 2007. Review articles were excluded. **RESULTS:** Initial search resulted in 911 abstracts. After applying the inclusion/exclusion criteria, 11 studies were selected from Canada, UK, USA, Austria, Germany and Asian regions. The median sample size was 638 patients; the median duration of trials was 39 weeks. Most studies demonstrated overall positive effects in economic outcomes and found that interventions improved the cost-effectiveness and health care utilization over the control groups from their individual perspectives. Four studies focused on insulin glargine, which together with other new drugs including insulin detemir, exenatide and rosiglitazone can be more cost-effective. With regard to diabetes-related complications such as renal disease, hypertension and diabetic peripheral neuropathic pain, these studies suggest that the earlier introduction of preventive measures such as therapeutic drugs would lead to longer delays in the onset of its complications and the overall savings in health care resource utilization. **CONCLUSION:** There is growing evidence that these drug interventions may promote diabetic health with better economic outcomes. The review complemented our previous study of cost on diabetes till July 2005. Future research should include extensive database search including databases such as Cochran and manual search for the journals' Diabetes, and Diabetes Care.

PCV37

BIATRIAL VERSUS RIGHT ATRIAL APPENDAGE PACING IN BRADYCARDIA TACHYCARDIA SYNDROME

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OBJECTIVE: Bradycardia-tachycardia syndrome (BTS) management includes bradycardia and tachyarrhythmia therapy. Right atrial appendage pacing (RAA), a typical pacing site, manages bradycardia but have poor AF preventive properties. Biatrial pacing (BiA) is a modality of pacing to prevent AF in BRT patients with interatrial conduction disturbances. It is a cost-effectiveness analysis of BiA versus RAA pacing in AF prevention, in BTS patients. **METHODS:** Follow-up study: 125 pts (51 males, mean age = 67.9) with BTS, P-wave >120 ms and paroxysmal, recurrent AF; 50 pts had BiA and 75 RAA pacing system implanted. Observation window was one year before pacemaker implantation to three years after. Costs were calculated from the public health care payer perspective. Primary clinical endpoints: chronic AF occurrence and patient reported outcome reflecting symptomatic AF episodes frequency at four point scale. AF episodes were defined very frequent in case of AF episodes >1 per week (rank 3), recurrent AF = 1 episode per week to 1 episode per month (rank 2), occasional = if occurred <1 per month (rank 1), no recurrences = rank 0. Confidence intervals for CER by bootstrap method. **RESULTS:** The frequency of symptomatic AF episodes decreased in BiA group as measured on the scale (2.54 vs 1.28; $p < 0.001$) and not in the RAA group (1.33 vs 1.55; NS). There was 71.2% reduction of annual number of hospitalizations in BiA group; no change in RAA group as compared to pre-implantation period. In BiA group 12.0% of patients developed chronic AF; 17.3% in the RAA group (NS). Incremental cost-effectiveness ratio for decrease of AF frequency episodes (BiA vs RAA) was 499.97 USD PPP (95%CI—272.5–1353.6) for one point on the scale. **CONCLUSION:** Biatrial pacing in contrast to RAA pacing decreases symptomatic AF episodes frequency and hospitalizations. BiA compared to RAA pacing is a cost-effective method of AF prevention in BTS patients with pacing indications.

PCV38

BOSENTAN IS A COST-EFFECTIVE TREATMENT FOR UNITED KINGDOM PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION OF WHO CLASS III

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OBJECTIVE: To assess whether bosentan is a cost-effective first-line treatment option compared with epoprostenol and with no active intervention, all added to palliative care, for patients with pulmonary arterial hypertension (PAH) of WHO functional class (FC) III in the UK. **METHODS:** A cost-utility model was constructed to simulate hypothetical patients with PAH. Patients were assumed either to remain in FC III until death or to deteriorate to FC IV where epoprostenol and palliative care would be prescribed until death. It was further assumed that the choice of first-line treatment would not affect the time to death, but instead would affect the duration patients spend in FC IV. The time to deterioration in FC was approximated by time to clinical worsening (TTCW), a composite measure of death or worsening of PAH leading to a change in treatment. Data on TTCW was estimated from over three years of observational data for bosentan and from published epidemiological literature for palliative care alone. For epoprostenol, TTCW was assumed equal to that of bosentan—in accordance with published literature. The time horizon was that of patient lifetime with only direct medical costs considered. The utility associated with each FC was taken from published literature. Costs and benefits were discounted at 3.5% per annum. Probabilistic sensitivity analyses were undertaken. **RESULTS:** Bosentan dominated epoprostenol, as it provided the same number of QALYs at a reduced cost. Bosentan dominated no active intervention, as it had lower costs and greater QALYs, due to the reduced time, per patient, spent in FC IV. **CONCLUSION:** Bosentan is a more cost-effective first-line therapy for patients with PAH FC III in the UK than either epoprostenol or no active intervention. It can be inferred that bosentan would also dominate any other intervention with a TTCW not proven to be better than palliative care alone.

PCV39

INDIRECT COMPARISONS OF RIVAROXABAN VS ALTERNATIVE PROPHYLAXES FOR THE PREVENTION OF VENOUS THROMBOEMBOLISM IN PATIENTS UNDERGOING TOTAL HIP OR TOTAL KNEE REPLACEMENT

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OBJECTIVE: To estimate differences in the efficacy and safety of rivaroxaban versus fondaparinux, warfarin and dabigatran in prevention of venous thromboembolism (VTE). Such differences may influence the cost-effectiveness of thromboprophylaxis following total hip replacement (THR) or total knee replacement (TKR). **METHODS:** Three large, randomized controlled trials (RCTs; RECORD1–3) demonstrated relative risk reductions

(RRRs) in VTE events with rivaroxaban against enoxaparin of 70–79% ($p < 0.001$) following THR and 49% following TKR ($p < 0.001$). However, the effect of rivaroxaban relative to alternative prophylaxes is also important, including those presently in development. A systematic literature review identified RCTs comparing enoxaparin with warfarin, fondaparinux or dabigatran in THR or TKR. Indirect comparisons of rivaroxaban to each were conducted, using enoxaparin as common comparator. Whenever the comparison included more than three studies, a meta-regression was performed. Results presented are RRRs from those analyses. **RESULTS:** Rivaroxaban showed statistically significant reductions in the incidence of key endpoints. In THR, when compared with fondaparinux, rivaroxaban was associated with RRRs of 56% in total VTE ($p = 0.015$) and 89% ($p = 0.015$) in symptomatic VTE. When compared with dabigatran, RRRs with rivaroxaban were 86% ($p = 0.0018$) in symptomatic VTE and 77% ($p < 0.001$) in total VTE. Similarly, when compared with warfarin, the RRR in symptomatic VTE with rivaroxaban was 92% ($p = 0.003$). In TKR, rivaroxaban produced 67% ($p < 0.001$) and 66% ($p < 0.001$) reductions in total VTE and deep vein thrombosis (DVT) respectively, versus warfarin, and 50% ($p < 0.001$) reductions in total VTE and DVT versus dabigatran. No other statistically significant differences were found. Importantly for a new anticoagulant, there were no increases in major bleeding so safety endpoints are unlikely to influence cost-effectiveness. **CONCLUSION:** Rivaroxaban reduced the incidence of overall or symptomatic VTE events relative to alternative prophylaxes without increased major bleeding, reflecting a better clinical profile. These risk reductions may have implications for cost-effectiveness analyses.

PCV40

COST-EFFECTIVENESS ANALYSIS OF DRUG-ELUTING STENT VS BARE METAL STENT IN PATIENTS WITH ISCHAEMIC HEART DISEASE IN SOCIAL SECURITY MEXICAN INSTITUTE.

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OBJECTIVE: To estimate the cost-effectiveness of the use of drug-eluting stent compared to bare-metal stent in a cohort of patients with coronary disease in the Social Security Mexican Institute (IMSS). **METHODS:** Cost-effectiveness in a cohort of patients with ischemic disease with indication of PCI (Percutaneous Coronary Intervention). The measure of effectiveness was the rate of clinical success without major cardiovascular adverse events. The cost and effectiveness of the treatment were obtained from clinical follow-up of the cohort from 104 patients in the Cardiology Hospital of IMSS. The micro-costing technique was used, and the costs come from bases institutional costs. The results are expressed in US dollars (US$) in 2007. Given the time horizon of the study (12 months), the discount rate was not applie. We performed a sensitivity analysis probabilistic, and I think the curve of acceptability. **RESULTS:** The 61.5% of patients in the cohort used bare-metal stent and 38.5% drug-eluting stent, drug-eluting stent showed the highest average cost per patient US$15,452.9 ± 12,996.8 compared with bare-metal stent US$14,254.4 ± 10,826.5. However, the effectiveness drug-eluting stent found were 97.44% (95% 92.48–100) regarding a bare-metal stent 81.67% (95% CI 71.88–91.46). The RCE was US$17,453.5 in the case of drug-eluting stent and US$15,829.6 with bare-metal stent, the RCEI was US$7419. The acceptability curve shows that the treatment of drug-eluting stent becomes the dominant cost-effectiveness alternative from WTP US$15,109.9. The probabilistic analysis shows that drug-eluting stent is more cost effective when it exceeds US$21,153.8 WTP per patient. **CONCLUSION:** Drug-eluting stent is an alternative treatment interventional revascularization with better outcomes in health, and depending from the availability to pay can be a cost-effectiveness alternative to the institution.

PCV41

COMPARISON OF COST-EFFECTIVENESS OF POM (PRESCRIPTION ONLY) STATINS; OTC (OVER THE COUNTER) STATIN AND PLANT STEROL / STANOL PRODUCTS FOR PRIMARY CVD (CARDIOVASCULAR DISEASE) PREVENTION IN THE UNITED KINGDOM FROM THE PATIENT'S PERSPECTIVE

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OBJECTIVE: To consider the cost-effectiveness of POM statins, OTC statin and plant sterol/stanol products from the perspective of middle aged males when used according to current UK guidance for the primary prevention of CVD. **METHODS:** We used a Markov-Model to obtain the outcomes for an illustrative cohort up to 100 years old or death, whichever come sooner. For the base-case we assumed that all would receive POM statins from 70 years old and all had to pay for their prescription charge up to 59 years. The main outcomes for effects were QALYs (quality-adjusted life-years) and LYG (Life Years Gained). The main costs included were prescription charges, product costs, travel costs and gross weekly incomes. The NICE technology assessment report "Statins for the Prevention of Coronary Events" published in 2005 was used for transition probabilities and utility values. Updated costs for 2007 values extracted from NHS and "HM Revenue & Customs" databases, and average retail prices of the UK market. **RESULTS:** Estimated discounted incremental cost/QALYs were ≤2970.63, ≤8026.37 and ≤16,536.84 for POM statins, OTC statin and plant stanol/sterol products, respectively. Estimated discounted incremental cost/LYGs were ≤5339.02, ≤14,458.69 and ≤30,076.96, respectively. Cost/QALYs ranged from ≤1318.03 to ≤7854.44, ≤4289.46 to ≤11,763.28 and ≤3961.10 to ≤29,112.59 for POM statins, OTC statin and plant sterol/stanol products, respectively in the univariate sensitivity analyses. **CONCLUSION:** From the patient's viewpoint, the most cost-effective intervention is a POM statin (≤2970.63/QALY). There are considerable differences between the most (POM statins) and the least (plant sterol/stanol products) cost-effective interventions. However, for individual patients non-eligibility for free prescription or a strong desire to avoid medicalising disease prevention may overturn the main results.

PCV42

COST-EFFECTIVENESS ANALYSIS OF EDUCATIONAL PREVENTIVE TECHNOLOGIES FOR PATIENTS WITH CARDIOVASCULAR DISEASES IN RUSSIA

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OBJECTIVE: To study preventive technologies economic efficiency for patients with cardiovascular diseases in Russia. **METHODS:** The study consisted of two parts. The first part involved 303 hypertensive patients without serious s complications. The second part involved 100 patients with coronary heart disease (CHD). In both substudies, patients were randomized to treatment and control groups. Patients of the treatment group participated in a structured education program for hypertensive

patients or for patients with CHD, and patients of control group were in routine clinical practice. All patients were observed during 12 months. Economic efficiency in both cases was evaluated on the basis of "cost of illness" and "cost-effectiveness" analysis. **RESULTS:** In hypertensive patients we received the following results. The cost-efficiency ratio for decreasing blood pressure on 1% was $216.6 in the treatment group and $1179 in the control group. The results of patients' education in CHD patient were the following: The cost-efficiency ratio for decreasing angina attacks frequency on 1% was S974 in treatment group and 2838$ in control group. The cost-efficiency ratio for decreasing cholesterol on 1% was $2857 in the treatment group and S4365 in the control group. The cost-efficiency ratio for decreasing blood pressure on 1% was $1606 in the treatment group and $9316 in the control group. **CONCLUSION:** Educational preventive technologies for patients with cardiovascular diseases are cost-effective over a one-year period.

PCV43

OPTIMIZATION OF DIAGNOSIS AND TREATMENT OF CORONARY ARTERY DISEASE IN CHINA WITH USE OF CORONARY CT ANGIOGRAPHY

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OBJECTIVE: Diagnosis of coronary artery disease (CAD) in China using coronary angiography (CA) is challenging due to high disease prevalence and limited resources. It has been estimated that up to 50% of Chinese patients are negative for CAD upon CA. Coronary CT Angiography (CTA) may provide an opportunity to minimize unnecessary invasive diagnostic procedures and increase patient access to diagnosis of CAD in a cost-effective manner. This study was conducted to evaluate the potential costs and efficiency of utilizing CTA in combination with CA to optimize diagnosis and care of patients with suspected CAD in China. **METHODS:** We conducted a cost-consequences analysis from the perspective of Fuwai Hospital in Beijing. We developed a decision-analytic model comparing a diagnostic strategy of CA only with a strategy of CTA in combination with CA for patients with low to moderate pre-test probability (based on Duke Clinical Score) of significant disease. All CA-positive patients were assumed to receive percutaneous coronary intervention (PCI). CTA diagnostic accuracy data and cost estimates were obtained from Fuwai Hospital and other inputs were derived from the published literature. **RESULTS:** In the base-case analysis, assuming a CAD prevalence of 39% (range 18–64%) in the low to moderate risk patient population, utilization of CTA in combination with CA lead to a cost savings of $559 (USD) per patient (range $680–$416) compared to the CA only diagnosis strategy. The hospital cost per diagnosis of CAD was $12,483 (CTA + CA) (range $14,197–$11,900) and $13,418 (CA only) (range $17,406–$12,100), and the proportion of catheter lab diagnoses leading to PCI increased from 39% (range 18–64%) to 73% (range 48–88%). **CONCLUSION:** Our study suggests that CTA implementation in China could optimize the patient population that undergoes invasive CA procedures and provide cost-savings for Chinese hospitals.

PCV44

RELATIONSHIP BETWEEN THE OBESITY PARADOX AND HEALTH CARE EXPENDITURES IN SUBJECTS WITH CARDIOVASCULAR DISEASE USING THE MEDICAL EXPENDITURE PANEL SURVEY

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OBJECTIVE: To examine how found 'obesity paradox'—a paradoxical decrease in morbidity and mortality with increasing BMI in subjects with cardiovascular disease (CVD)—relates to health care-expenditures using Medical Expenditure Panel Survey (MEPS). **METHODS:** We performed cross-sectional analyses of 11,385 adults from the 2005 MEPS, a national survey of noninstitutionalized civilian population in the United States. Subjects with CVD (coronary heart disease, myocardial infarction, stroke, and hypertension) were determined from self-reports. Mean expenditures per capita were estimated for NIH BMI categories (under, normal, overweight, obese I, II, and III) using a two-part exponential conditional model (ECM) adjusted for age, race, wage, occupation, type of health insurance, degree level, and smoking status. The first part of the model was logistic regression to predict the probability of incurring any expenditures. For the second part, we used ECM since the log-scale expenditure data was not leptokurtotic and was heteroscedastic. We performed Box-Cox test and Park test to find the link function and distribution family. Average expenditures in 2005 U.S. dollars were calculated by multiplying each person's probability of incurring any expense and expenditures. **RESULTS:** About 67% of subjects with CVD (N = 2596) and 65% of subjects without CVD (N = 8789) were overweight or obese. Using gamma distribution with log link function, mean expenditures in CVD-group by BMI categories were $3247, $3040, $3098, $2966, $3500, and $3375 (p = non-significant). Those in subjects without CVD were $1857, $2327, $2389, $2534, $3179, and $3783 ($p < 0.001$). Age, smoking status, and Medicare were associated with expenditures in CVD-group. **CONCLUSION:** Health care-expenditures did not significantly differ among BMI categories in subjects with CVD whereas health care-expenditures were increasing with BMI in subjects without CVD. This could be due to the influence of CVD-care costs across weight categories in CVD-group. We did not find a obesity paradox in health care-expenditures in subjects with CVD.

PCV45

ECONOMIC IMPACT OF STROKE-RELATED COMORBID CONDITIONS ON THE TREATMENT OF STROKE: AN ANALYSIS OF MEDICARE BENEFICIARIES IN THE UNITED STATES

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OBJECTIVE: Few cost-of-illness studies in stroke have examined the incremental impact of comorbid condition(s). The aim of this study was to assess the costs of stroke management attributable to stroke and comorbid conditions using data from the Medicare program in the United States (U.S.). **METHODS:** Medicare beneficiaries diagnosed with hemorrhagic (HS) and ischemic (IS) stroke from 2002–2005 were identified from a 5% random sample of Medicare outcomes and care database. Direct costs were assessed from the perspective of the Medicare program. Descriptive and multivariate analyses were performed. Data were analyzed from one year prior to the index event through four

years following that event. **RESULTS:** A total of 10,335 patients were identified; 8444 with IS and 1891 with HS. Increases in medical costs during the four year post index period were as follows for HS patients: without co-morbidities, $14,745; with hypertension, $22,667; with hypertension plus type 2 diabetes (T2D), $29,662; with hypertension plus congestive heart failure (CHF), $26,768; with hypertension plus T2D plus CHF, $34,302. For IS patients, these costs were $17,000 for IS-only patients, but ranged from $21,344–$30,987 for IS patients with other comorbidities. Results from multivariate analyses supported the validity of the descriptive statistics. **CONCLUSION:** Comorbidities/risk factors contribute substantial incremental costs to the already high economic burden of both HS and IS stroke.

PCV46

COSTS OF ACUTE MYOCARDIAL INFARCTION IN HUNGARY; 2003–2005

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OBJECTIVE: The morbidity of acute myocardial infarction (AMI) is remarkable in Hungary, therefore it is inevitable to understand the disease burden more accurately. Our aim was to assess the burden of AMI in Hungary between 2003 and 2005. We studied how much burden AMI patients impose on the financer (National Health Insurer Fund Administration—NHIFA) in the inpatient and outpatient care and we estimated the size of indirect social costs, too. **METHODS:** We extracted the data of 'new' AMI patients (ICD-10: I21 main diagnosis but not treated with the same diagnosis in the previous 24 months) hospitalized in May 2003 from the database of the financer. We analyzed inpatient treatment costs of these patients in the period of 12 months before the AMI and in the following first and second 12 months. Data were distributed by sex and age (age groups: 25–44, 45–64, over 65). Other costs were estimated after expert consultations. **RESULTS:** Average health insurance costs of AMI's active hospital care in the first 12 months are generally higher in females as in males; €1905.2 vs. €1564.4 (65 and over), €1716.4 vs. €1557.6 (45–64) and €918.0 vs. €962.4 (25–44). The burden in the chronic care is €60–160 per patient in the first year, which is similar to the active care costs in the 23rd to 24th months after the AMI (€88–216). **CONCLUSION:** NHIFA was estimated to spend 17.6 million Euros on direct health care on behalf of the nearly 12,000 annual AMI patients in the first 12 months. Avoiding one AMI could save €1380–2260 (depending on gender and age) direct health care cost in the first 12 months. According to our estimate, the annual indirect costs of AMI exceed €3.36 million (€711.3/patient) in the working age group.

PCV47

MEDICARE OUTLIER PAYMENTS FOR CORONARY ARTERY BYPASS GRAFTING

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OBJECTIVE: To examine variation in outlier payments across U.S. hospitals and the extent which variation is explained by patient and hospital factors, including quality of care. **METHODS:** Using the national Medicare claims database for 2002, we examined outlier payments in patients undergoing coronary artery bypass grafting (CABG) (n = 165,226). We then categorized hospitals performing these procedures according to their outlier payment rates. Using multiple logistic regression, we explored the relationships between hospital outlier payment rates, patient case mix and hospital quality, as reflected by risk-adjusted mortality rates. **RESULTS:** The proportion of patients associated with outlier payments was 14% (CABG). Average outlier payments were considerable: $24,000 per patient, costing Medicare more than half a billion dollars. Risk factors for outlier payments were race and admission acuity. Higher hospital and surgeon volumes and teaching status were associated with lower rates of outlier payments. There was a negative correlation between risk-adjusted mortality rates and outlier payments. The proportion of outlier payments was greater than 20 percent. Measurable patient and hospital factors explained a small proportion of variation across hospitals. **CONCLUSION:** Outlier payments in CABG are an important component of medical costs with inpatient surgery. Although explained in part by quality, reasons for wide variation in outlier payments across hospitals remain to be clarified.

PCV48

LIKELIHOOD AND COST OF ADVERSE EVENTS IN ATRIAL FIBRILLATION ARE ASSOCIATED WITH CHOICE OF ACUTE CONVERSION THERAPY

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OBJECTIVE: We evaluated the likelihood and cost of adverse events (AE) by choice of acute conversion therapy for atrial fibrillation (AF) in hospitalized patients. **METHODS:** We extracted Premier Perspective(tm) 2004–2005 discharges with primary AF diagnosis and treatment with electric conversion (EC) or IV anti-arrhythmic agent (AA; either amiodarone, ibutilide or procainamide). We estimated odds ratios and inpatient costs attributable to any AE, hypotension AE, or dysrhythmia AE based on treatment, adjusting for comorbid, demographic and hospital-specific factors. **RESULTS:** Out of 74,072 discharges initially treated with EC (32%), amiodarone (49%), ibutilide (11%) or procainamide (8%), approximately 28% (20,808) had a treatment-related AE. Of these, 24% had hypotension and 37% experienced dysrhythmia. Odds ratios for any AE were significantly higher when initial treatment was amiodarone vs. EC (OR; 95% CI) (1.24; 1.20–1.29), amiodarone vs. procainamide (1.36; 1.27–1.46) and amiodarone vs. ibutilide (1.58; 1.48–1.68). A similar pattern was observed for hypotension AE. Initial treatment with EC increased the likelihood of dysrhythmia AE vs. amiodarone (1.23; 1.16–1.30), ibutilide (1.21; 1.11–1.33) and procainamide (1.29; 1.16–1.44). Adjusted costs for discharges with any AE were significantly higher vs. discharges without AE ($P < 0.0001$). AE among patients receiving an AA had the highest cost impact, contributing an average of $2702 in additional adjusted costs. Hypotension and dysrhythmia AE among patients receiving AA were associated with $1232 and $1054 in additional adjusted costs, respectively ($P < 0.0001$). Among patients receiving EC, any AE, dysrhythmia and hypotension AE were associated with $2128 ($P < 0.0001$), $1655 ($P < 0.0001$) and no significant ($P = 0.21$) increase in costs, respectively. **CONCLUSION:** The likelihood of AE is associated with choice of initial AF therapy. Patients initially treated with amiodarone have the highest likelihood of AE, particularly hypotension AE; those treated initially with EC have a higher likelihood of dysrhythmia AE. Incremental costs attributable to AE are substantial in this population.

PCV49

ECONOMIC BURDEN OF VENOUS THROMBOEMBOLISM IN THE GENERAL POPULATION AND AFTER MAJOR ORTHOPAEDIC SURGERY—RESULTS OF A SYSTEMATIC LITERATURE REVIEW

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OBJECTIVE: The estimated annual incidence of venous thromboembolism (VTE) is 5–12 per 10,000 and ~10% of hospital deaths are attributable to pulmonary embolism (PE). Despite prophylaxis, 1–3% of patients undergoing major orthopaedic surgery (MOS) develop symptomatic deep vein thrombosis (DVT). The incidence of recurrent VTE (DVT and PE) is ~20% and 33–50% of patients develop post-thrombotic syndrome (PTS). Despite the extensive health care burden of VTE, there is no systematic review of the associated costs. The objective of this study was to estimate the costs of VTE in the general population, and in patients undergoing MOS. **METHODS:** A systematic literature review was performed, which focused on "all-cause" VTE and VTE following MOS. Included studies had to identify and measure, in clinical practice, health care utilization and the economic consequences of VTE and associated complications, including recurrent VTE, PTS and bleeding events. **RESULTS:** Annual costs per patient for all-cause VTE were $10,804–33,200 in the US and ~€4000 in Europe. Following MOS, annual treatment costs per patient for VTE were €8265 in Europe. In the US, charges for the surgical admission were $52,037 for patients with VTE compared to $34,485 for those without. Complications associated with VTE and its treatment, described above, were frequent. Following MOS, the 1-year cumulative incidence of recurrent DVT was ~24%, ~6.5% for PE, with additional annual treatment costs in the US of up to $6400. European studies suggest that, despite the low cost of prophylaxis, the overall costs of VTE are approximately half the costs associated with MOS. The main cost drivers were inpatient care and hospitalization for recurrent events. **CONCLUSION:** VTE occurs frequently and is a major cost and resource burden for health care systems, particularly after MOS. Prophylaxis regimens that can reduce the incidence of VTE might enable significant cost savings to be achieved.

PCV50

UP-TITRATION OF STATIN THERAPY TO MEET CANADIAN TARGET LIPID GOALS: ECONOMIC IMPACT OF TITRATION ASSOCIATED WITH COMPARATIVE EFFICACY OF ROSUVASTATIN, ATORVASTATIN, SIMVASTATIN AND PRAVASTATIN

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OBJECTIVE: To evaluate and compare the relative medical costs associated with up-titration of statin therapy (Rosuvastatin, Atorvastatin, Simvastatin, Pravastatin) in order to reach Canadian Lipid Goals. **METHODS:** Efficacy measures and Canadian LDL-C goal attainment rates on the studied statins were derived from a head to head RCT (McKenney JM et al. 2003). The need for up-titration was modeled during 3-month intervals for a period of one year based on the goal attainment rates for each statin and dose. The total number of physician visits and up-titration from the initial start dose to target lipid goals was captured and associated medical costs were calculated. Medical costs consisting of the physician visits and lab costs were derived from the Ontario Health Insurance (OHIP) Schedule of Benefits and Fees. **RESULTS:** After initiation on 10 mg for each statin, out of a cohort of 100 patients for each treatment arm, 15 patients required dose up-titration to target lipid goals with Rosuvastatin, 32 with Atorvastatin, 34 with Simvastatin, and 56 with Pravastatin. Additional up-titration to higher doses was further required for 1 patient on Rosuvastatin, 8 on Atorvastatin, 13 on Simvastatin and 20 patients on Pravastatin. Over one year, 16% of patients treated with Rosuvastatin need to be titrated compared with 40% on Atorvastatin, 47% on Simvastatin and 76% on Pravastatin. Total costs for general physician visits and up-titration was estimated to be $6516 for Rosuvastatin, $7849 for Atorvastatin, $8244 for Simvastatin, and $9834 for Pravastatin. **CONCLUSION:** Statins differ in efficacy at getting patients to target lipid goals. Differences in efficacy can translate for a need of dose titration, and potential increased costs in direct medical expense. This analysis shows that Rosuvastatin may offer increased savings in physician visits and lab costs since fewer patients need to be up-titrated to meet target lipid goals.

PCV51

A FLEXIBLE TOOL TO ESTIMATE MEDICAL-CARE COSTS FOR STUDY EVENTS IN CARDIOVASCULAR ENDPOINT TRIALS

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OBJECTIVE: Cardiovascular endpoint trials are increasingly being performed in phase IV evaluations of antihypertensive, cholesterol-lowering, and glucose-lowering medications. To facilitate the conduct of economic evaluations in such studies, we developed a flexible tool to permit researchers to assign medical-care costs to events commonly included in cardiovascular endpoint trials. **METHODS:** We used econometric techniques to fit generalized linear models to administrative data (Ingenix) on longitudinal costs of care for patients experiencing various cardiovascular events, including myocardial infarction, cardiac arrest, stroke (hemorrhagic & ischemic), transient ischemic event (TIA), revascularization procedures (CABG, PTCA, stenting), and various cardiovascular-related hospitalizations. Separate regression equations were estimated for patients who had these events as well as for their propensity-score matched controls. Costs of care (net of controls) were estimated on a monthly basis for the first 36 months following each event and then annually thereafter, with differences in survival between cases and controls factored into the longitudinal cost calculations. The regression models included covariates for age, sex, cardiovascular disease history, and comorbidity profile to permit differential estimation of event costs for patients of varying characteristics, as would be observed in cardiovascular endpoint trials. **RESULTS:** Mean costs of care (2006 US$) for fatal events were $18,970 for MI, $12,630 for cardiac arrest, $19,830 for hemorrhagic stroke, and $11,930 for ischemic stroke. Mean costs over 36 months for nonfatal events were $36,370 for MI, $36,020 for resuscitated cardiac arrest, $59,270 for hemorrhagic stroke, $30,150 for ischemic stroke, $8190 for TIA, $30,650 for CABG, and $27,780 for PTCA with stenting. Results differ by age, sex, and patient characteristics. **CONCLUSION:** The costing tool permits rapid assignment of medical-care costs to events occurring in cardiovascular endpoint trials. Widespread use of this tool will permit standardization of event costing in piggyback economic evaluations in endpoint trials as well as in cardiovascular modeling studies.

PCV52

ECONOMIC IMPACT OF A PHYSICIAN-PHARMACIST COLLABORATIVE CARE INTERVENTION IN PRIMARY CARE FOR PATIENTS WITH DYSLIPIDEMIA: A CLUSTER-RANDOMISED CONTROLLED TRIAL (TEAM STUDY)

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OBJECTIVE: To evaluate the health care costs of a physician-pharmacist collaborative care (PPCC) over usual care (UC) for patients at moderate (MR) or high risk (HR) of coronary heart disease with dyslipidemia. Trained community pharmacists provided advance care including monitoring of laboratory tests and lipid-lowering medication dosage adjustments. **METHODS:** Annual direct health care costs and incremental costs were estimated from an interim analysis of a 3-year cluster randomised controlled trial (TEAM study) evaluating the efficacy of a PPCC versus UC for patients on a statin but not at lipid targets. The mean annual costs of pharmacists' follow-up (pharmacists' training, pharmacist visits, laboratory tests), physicians' follow-up (physician visits, laboratory tests), lipid-lowering treatment (medication, pharmacists' fee), and total cost (pharmacists' follow-up, physicians' follow-up, lipid-lowering treatment) were compared between groups by t-tests. **RESULTS:** Geographical clusters of general practitioners (GP) and pharmacists were randomised to PPCC (GP = 41; pharmacists = 58) or UC (GP = 36; pharmacists = 46) and followed 167 patients (PPCC = 67; UC = 100). Costs for the pharmacists' follow-up per patient were CND$390.80 and CND$410.53 for MR and HR, respectively, including CND$320.67 per patient for the pharmacists' training. Total costs per PPCC patient were significantly higher than for UC patient (MR: 9CND$25.84 vs. CND$529.39; HR: CND$1065.39 vs. CND$591.48). Incremental costs per patient for the physicians' follow-up were: CND$33.38 ($p = 0.004$) for MR and CND$16.17 ($p = 0.07$) for HR, and for the lipid-lowering treatment, CND$39.04 ($p = 0.6$) for MR and CND$79.69 ($p = 0.06$) for HR. Incremental total costs per patient were CND$396.45 ($p < 0.0001$) for MR and, CND$473.91 ($p < 0.0001$) for HR. Assuming an incremental efficacy of 10% LDL reduction between groups, ICERs per patient (95% CI) would be CND$39.65 (2CND$1.35 to CND$57.94) for MR and CND$47.39 (CND$38.54 to CND$56.24) for HR per % LDL reduction. **CONCLUSION:** Community pharmacists can provide advance care to patients with dyslipidemia at a reasonable cost and contribute to reduce the GP workload.

PCV53

DRUG-ELUTING STENTS FROM A MEDICARE PAYER PERSPECTIVE: COST-UTILITY ANALYSIS WITH 4-YEAR CLINICAL META-ANALYSIS DATA

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OBJECTIVE: After several years of use, the cost-effectiveness question of drug-eluting stents (DES) has not been answered satisfactorily due to a limited time horizon in previous analyses. Using four year follow-up clinical data from a large meta-analysis we examined the cost-effectiveness of Cypher and Taxus stents compared to bare-metal stents with a decision analytic cost-utility model from a Medicare payer perspective. **METHODS:** We developed a five state Markov cost-utility decision analytic model. The model included the events MI, CABG and the need for a repeated percutaneous coronary intervention. Transition probabilities were directly extracted from the meta-analysis. Quality of life data was derived from the ARTS trial. Costs for the resource use (including stenting with DES and BMS) were obtained from Medicare diagnosis related groups for ten leading cardiology hospitals and a random sample of ten United States hospitals offering stenting procedures. All costs are in USD$ of the financial year 2007. Probabilistic sensitivity analysis was performed with 10,000 Monte Carlo simulations. **RESULTS:** Cypher stents are slightly more effective than bare metal stents with an incremental effect of 0.001 QALYs (95% CI –0.042 to 0.012 QALYs), while the Taxus stents provide –0.004 incremental QALYs (95% CI –0.064 to 0.012). DES are more costly than BMS. At a willingness to pay of $100,000/QALY, the incremental net monetary benefit (INMB) for Cypher stents is $–940 and $–1612 for Taxus stents, respecively, for the leading hospitals. Using the random sample of hospitals Cypher and Taxus stents yield an INMB of $–1146 and $–1751, respectively. The probability that DES are cost-effective ranges from 34% for Taxus stents in the random sample to 43% for Cypher stents in the leading hospitals. **CONCLUSION:** From a Medicare perspective, the use of drug-eluting as compared to bare metal stents is not cost-effective when implanted in unselected patients with symptomatic ischemic coronary artery disease.

PCV54

THE COST-UTILITY OF ALISKIREN IN THE TREATMENT OF MILD TO MODERATE HYPERTENSION. A CANADIAN HEALTH CARE SYSTEM PERSPECTIVE

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OBJECTIVE: To determine the cost-utility of aliskiren in combination or monotherapy vs. usual care for patients with mild to moderate hypertension from the Canadian health care system perspective. **METHODS:** A Markov model was programmed to simulate patient flow between 17 health states (including death), different treatment lines and allowing for non-persistence. Cardiovascular disease (CVD) related outcomes were projected for over 40 years from systolic blood pressure (SBP) reductions observed in several randomized trials using risk equations from landmark studies, including the Framingham Heart Study. Patients were at low risk of CVD, based on their demographic and clinical history at baseline. The following comparisons were analyzed: aliskiren + thiazide-diuretic vs. ACEI + thiazide-diuretic, ARB + thiazide-diuretic, and CCB + thiazide-diuretic, aliskiren + CCB vs. thiazide-diuretic + CCB, and aliskiren vs. ARB. Direct costs for health states and events were taken from published literature. Weighted average unit prices were obtained for each antihypertensive drug class. All costs are in 2007 CAD. The primary outcome was incremental cost per additional quality-adjusted life-year QALY. Additional outcomes included life expectancy and number of CVD-related deaths. **RESULTS:** Aliskiren + thiazide-diuretic was shown to be dominant vs. CCB + thiazide-diuretic, cost-effective in monotherapy vs. ARB ($1011/QALY) and cost-effective when in combination therapy with CCB vs. thiazide-diuretic + CCB ($29,813/QALY). More variability occurred when comparing aliskiren + thiazide-diuretic to ARB + thiazide-diuretic (ranging from dominance to being dominated). Based on pooled data of aliskiren vs. ARBs showing similar SBP-lowering effect, the cost impact of aliskiren is

expected to be neutral, given equivalent unit prices with ARBs. Most results were robust to changes in underlying model settings and parameters, and in the range of acceptable values for health care interventions. **CONCLUSION:** Compared to several standard antihypertensives, aliskiren provides good value for money, and in some cases, results in cost savings and better outcomes.

PCV55

THIRY-DAY RESOURCE USE DIARY DATA FROM THE BURST STUDY

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OBJECTIVE: This study identifies 30-day post discharge direct medical and nonmedical resources of ischemic stroke patients who are participants from The *BUR*den of Ischemic *ST*roke (BURST) Study. **METHODS:** The BURST Study is a prospective, observational study with a cohort (N = 200) of ischemic stroke patients recruited in a consecutive manner at stroke sites (N = 10) across Canada. In addition to four questionnaires, study participants were asked to complete a 30-day diary after discharge evaluating physician and health professional visits (direct medical) as well as paid services and purchase of stroke-related items (direct nonmedical). **RESULTS:** A total of 61 diaries were analyzed. Demographics included mean age 62.7 ± 15.5 (27–93) years, 52.4% male and 72.1% discharged as outpatients. On average, 4.8 ± 5.9 (0–28) doctor visits were reported. Inpatients at rehabilitation and long term care facilities had a mean 10.2 ± 8.4 (1–28) visits compared to 2.9 ± 3.0 (0–12) by outpatients. Nurses, therapists (physiotherapy, occupational and speech), social workers and dieticians were the most visited health professionals by all patients with a mean 20.1 ± 29.3 (0–98) visits. Inpatients reported more visits with a mean 59.2 ± 25.8 (3–98) visits compared to 4.9 ± 10.4 (0–52) by outpatients. Seventeen patients reported an average 10.5 ± 10.1 (1–30) paid service visits while 19 patients purchased at least one stroke-related item under $499. **CONCLUSION:** Patients reported an average 5 doctor visits and 20 health professional visits, 30 days following their first ischemic stroke. The average number of visits increased if patients were discharged to an inpatient facility. Approximately 30% patients paid for services (e.g. housekeeping or transportation) and also purchased stroke- related items (e.g. cane or home renovations). The next step will be to apply unit costs to this data for cost calculations.

PCV56

VOLUME AND MIX OF CARDIAC X-RAY PROCEDURES ACROSS U.S. HOSPITALS: UTILIZATION DATA TO SUPPORT FINANCIAL DECISIONS

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OBJECTIVE: Cardiovascular x-ray imaging machines have advanced patient care by providing the latest in imaging technology for diagnostic and interventional purposes. Hospitals are faced with the financial dilemma of whether the benefits of purchasing such a machine outweigh the costs. One important economic driver to help them make the decision is current and potential procedural mix and utilization data. However, limited research exists in this area and hospitals may not have access to this type of information. Therefore the objective of this analysis was to assess the volume and mix of cardiac x-ray procedures across U.S. hospitals so hospitals can utilize this data to make informed financial decisions. **METHODS:** A cross-sectional retrospective analysis of hospital claims for the 2005 calendar year was conducted using the Premier's Comparative Database(tm). Procedures of interest were identified via primary and secondary ICD-9 procedure codes. Average volume per hospital was calculated as the total number of procedures of interest divided by the number of hospitals that conducted at least one procedure of interest. Procedure volume data was then rolled up into three specific categories: coronary/cardiac, peripheral and electrophysiology. **RESULTS:** In one year, a hospital on average conducted 3144 cardiac x-ray imaging procedures. A majority (48.1%) of the procedures were coronary/cardiac (N = 1512), followed by peripheral procedures at 36.9% (N = 1161) and the final 15.0% were electrophysiology procedures (N = 471). **CONCLUSION:** Results of this analysis could help hospitals develop cost-benefit models which can assist them in making financial decisions regarding purchasing a cardiology x-ray imaging machine.

CARDIOVASCULAR DISORDERS—
Patient-Reported Outcomes

PCV57

PREVALENCE OF UNDERUTILIZATION OF INITIATED STATIN THERAPY AND RENIN-ANGIOTENSIN SYSTEM BLOCKADE

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OBJECTIVE: To estimate the proportion of a population underutilizing previously initiated therapy with statins and/or angiotensin converting enzyme inhibitors or angiotensin-II receptor blockers (ACEi/A2RB) and, of these, percent with high cardiovascular risk and how well they are identified by a strategy that targets new users. **METHODS:** The study sample consists of a geographically defined subset of a commercially insured population who were age 25 to 84 on October 31, 2007 and continuously enrolled from January 2002 through November 2007. For all patients with any history of filling a prescription in the respective drug category January 2002 to June 2006, the proportion of days covered (PDC) July 2006 to June 2007 is deduced from dispensed dates and days supplied. Underutilization is defined as PDC 0% or >0%–<80%. Claims January 2002–June 2006 are assessed for high cardiovascular risk criteria including: acute myocardial infarction, coronary revascularization, coronary atherosclerosis, acute ischemic stroke, diabetes, peripheral arterial disease, abdominal aortic aneurysm, nitrates, platelet aggregation inhibitors, diabetes therapy, cilastazol or pentoxyphylline. **RESULTS:** Of 294,734 in the sample, 70,814 (24.0%) filled >=1 prescription for a statin and 65361 (22.2%) for an ACEi/A2RB between 2002 and June 2006. During the subsequent 12 months, PDC was 0% and >0–<80%, respectively, for: 19.1% and 34.5% of all patients with previous statin history, 16.2% and 33.1% of those satisfying risk criteria; 26.7% and 26.7% of all with previous ACEi/A2RB history, 25.6% and 26.7% of those satisfying risk criteria. Patients who were new users in preceding 12 months (July 2005–June 2006) comprised 10.9% of high risk patients underutilizing previously started statin therapy and 7.6% of those underutilizing previously started ACEi/A2RB therapy. **CONCLUSION:** Underutilization of cardiovascular risk-lowering medications is an important problem that requires strategies beyond targeting new users.

PCV58

MODELING CARDIOVASCULAR HEALTH OUTCOMES IN MEDICAID HYPERTENSIVE PATIENTS—EFFECT OF PATIENT ADHERENCE

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OBJECTIVES: The extent to which adherence to anti-hypertensive medications may affect risk of having new cardiovascular events remains unclear, in part due to the methodological complexity in measuring adherence. We sought to determine the relationship between anti-hypertensive drug adherence and cardiovascular health outcomes in a Medicaid, high risk population. **METHODS:** The study is composed of continuously enrolled patients in a Mid-Atlantic Medicaid Managed Care program between July 1, 2002 and June 30, 2005, with at least three prescriptions of anti-hypertensive medications and no such prescription during the preceding six months. Adherence to anti-hypertensive medications was first measured as a time weighted average of Cumulative Medication Acquisition (CMA) and then as Medication Possession Ratio (MPR), with weight being the length of therapeutic period of each drug class. We used Cox proportional hazard models to assess the impact of adherence on events of interest, adjusting for sociodemographic and clinical characteristics. **RESULTS:** A total of 7939 patients qualified for the study and 140 cardiovascular events were observed after six months post index date. For the CMA model, we found every 10% increase in CMA score decreased the hazard of having cardiovascular events by approximately 14% and similar trend was observed in the MPR model. Both of the effects were significant at P = 0.05 level. We also conducted sensitivity analyses by altering washout-out period to three months and similar results were observed. To disentangle the possible "healthy adherer" effect, we investigated the relationship between CMA and risk of hospitalization for Lung Cancer, HIV/AIDS, or Peptic Ulcer and found no association between adherence and specified health outcomes. **CONCLUSIONS:** In this Medicaid population, a lower risk of cardiovascular events associated with improved drug adherence was observed. Adherence outcome benefits are likely to be mediated by drug effects and do not merely reflect a "healthy adherer" behavior attributes.

PCV59

THE COST AND EFFECTIVENESS OF ADHERENCE-IMPROVING INTERVENTIONS FOR LIPID-LOWERING AND ANTIHYPERTENSIVE DRUGS

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OBJECTIVE: Adherence to cardiovascular (CV) medications is poor. Studies that investigate interventions to improve adherence rarely consider the costs of these programs. We assessed the effectiveness and costs of different adherence-improving interventions for CV drugs. **METHODS:** We reviewed MEDLINE to update a published literature review of interventions to improve adherence to lipid-lowering and/or antihypertensive therapy. The prior review covered January 1972–June 2002; this review covered July 2002–October 2007. Search terms included hypertension, hyperlipidemia, antihypertensive agents, antilipidemic agents, patient compliance, intervention studies and reminder system. Eligible studies evaluated at least one adherence intervention, compared an intervention to control, used an adherence measure other than self-report, and followed patients for >=6 months. Interventions were classified as dosing modifications, patient education, case management, reminders, other interventions, or combinations. Effectiveness was calculated as the ratio of adherence in the intervention group to the control group. Costs were based on those reported in the analysis, where available, or estimated based on resource use described in the article. All costs were standardized to 6 months and adjusted to 2006 dollars using the medical component of the CPI. **RESULTS:** We identified 755 new articles, 5 of which met all eligibility criteria; when combined with the prior review, there were a total of 23 interventions from 14 studies. Relative improvement (RI) in adherence ranged from 1.11 to 4.65. Six month intervention costs ranged from $9.59 to $142.22 per patient. Reminders tended to have the lowest effectiveness (RI: 1.11–1.14), but were the least costly ($9.59/6 months). Case management was the most effective (RI: 1.23–4.65), but more costly than other interventions ($89.90–$129.78/6 months). **CONCLUSION:** In general, there was a positive association between the cost of the intervention and its effectiveness at improving adherence. Understanding the costs and benefits of adherence interventions may guide design and implementation of efficient adherence-improving programs.

PCV60

USING A LONGITUDINAL MODEL TO ANALYZE DRUG COMPLIANCE

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To describe a measure of drug compliance on each patient at multiple time points, and illustrate an approach for quantifying the impact of covariates on these longitudinal compliance measurements. Nine thousand hypertensive patients from MEDSTAT's Marketscan database were identified who filled an antihypertensive drug 5 times in 2006. At each fill, days since expiration of previous fill's days supply (gap) was measured, a smaller gap suggesting better compliance. Also measured were covariates such as demographics, co-medication, and co-pay. A random effect model was used to describe the dependence of the five gap compliance measurements on each patient, with a random intercept reflecting the impact of both measured and unmeasured covariates. Patient specific slopes were used to reflect relationships between gap and covariates. The average gap was 5 days and the fraction of total gap variance due to heterogeneity across patients was 27%. The gap within patients increased on average over time (0.5 day increase in gap size per month) but this varied considerably between patients (SD = 0.8). The gap was larger for diuretic than for non-diuretic drug users, decreased slightly with age, and was not associated with co-pay. Unlike single measures of compliance, longitudinal measures provide opportunity to describe patterns over time within patients, and permit impact of changing covariates within patients to be estimated.

PCV61

IMPACT OF PRESCRIPTION COPAY ON ADHERENCE WITH RENIN-ANGIOTENSIN SYSTEM AGENTS IN HEART FAILURE PATIENTS

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OBJECTIVE: The purpose of the study was to investigate the relationship between prescription copay and adherence with renin-angiotensin system (RAS) therapy in heart failure patients. **METHODS:** Data for this study came from a large national pharmacy benefit manager's clients. A retrospective data analysis was used to identify patients who had a diagnosis of heart failure (ICD-9 code 428) between July 1, 2003 and June 30, 2006. The discharge date of the first hospitalization after the 6-month base-

line was designated as the index date. Patients' pharmacy claims were followed for one year after their index dates. Adherence with RAS therapy was measured by medication possession ratio (MPR). Prescription copay was measured by a flat dollar amount paid for RAS therapy, normalized at days of supply level. Regression analyses were adopted to analyze the effects of copay on adherence with RAS therapy. Other control variables included age, gender, comorbidities, concomitant medications (b-blockers, statins, calcium channel blockers), and the step-therapy care program. **RESULTS:** The results show that of the 799 heart failure patients, 457 (57%) received RAS therapy. 48% of the 457 patients were adherent (MPR $\geq$ 0.8), 22% were partially adherent ($0.5 \leq$ MPR < 0.8) and 30% were non-adherent (MPR < 0.5). Prescription copay had a significant negative effect on adherence, which meant higher copayment led to lower adherence rates such that for every $1 increase in prescription copay, adherence decreased by 9%. Of the controlling variables, only age had a positive impact on adherence where older individuals were more compliant with RAS therapy than younger people. **CONCLUSION:** Approximately 4 out of 10 patients did not receive recommended pharmacotherapy with RAS agents after a heart failure event. Furthermore, only half of those patients who received RAS therapy were considered adherent. Higher prescription copay was associated with lower adherence to RAS therapy.

WITHDRAWN **PCV62**

PCV63

BARRIERS AND MOTIVATORS ASSOCIATED WITH ADHERENCE TO ANTIHYPERTENSIVE MEDICATIONS AND BLOOD PRESSURE CONTROL AMONG AFRICAN AMERICANS FROM ALABAMA

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OBJECTIVE: African Americans (AAs) have higher prevalence of hypertension and worse cardiovascular and renal outcomes than Caucasians. Previous studies have shown that adherence to antihypertensive medications is lower in African Americans than Caucasians. Limited information is available on behavioral factors associated with medication adherence in African Americans. Therefore, our objective was to determine the barriers and motivators associated with adherence to antihypertensive medications and blood pressure control among African Americans living in Alabama. **METHODS:** A cross-sectional study sampled adult AAs outpatients with a diagnosis of hypertension that were receiving at least one antihypertensive medication, were residents of Jefferson County and had signed the informed consent. A face to face interview was conducted by three previously trained and certified interviewers that administered a computer-assisted structured questionnaire to collect survey data on demographics, medical history and behavioral measures (medication adherence, self-efficacy, and barriers and motivators). **RESULTS:** Seven hundred and forty eight AAs participated: 71% women, 85% older than 45 years of age, 59% finished high school, and 87% had annual family income <$5000. Forty percent of participants adhered to antihypertensive medications. There were statistically significant differences in diastolic blood pressure between adherent (80 ± 14) and non-adherent patients (83 ± 15, $p = 0.03$). Compared to non-adherent patients, more adherent patients took their medications as directed because they felt they were doing something to reduce their blood pressure ($p = 0.030$), felt their disease was under control ($p = 0.001$) and felt more responsible ($p = 0.033$). A higher proportion of adherent patients overcome barriers such as taking medications when they were busy at home ($p = 0.0001$), when they were working ($p = 0.001$), or when they were in public places ($p = 0.001$). **CONCLUSION:** Adherent patients were able to overcome barriers for medication adherence. Interventions focused on motivators have the potential for improving blood pressure control in high-risk populations.

PCV64

IMPACT OF STATIN STEP CARE PROGRAM ON PATIENT COMPLIANCE

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OBJECTIVE: The main purpose of this study was to evaluate the impact of Statin Step Care (SC) Program on patient compliance. **METHODS:** Using a pre-post self case-control approach, prescription records were obtained from de-identified pharmacy claims database maintained by a large pharmacy benefit manager (PBM). To be included in the analysis, SC program enrollees were defined as having at least one generic statin prescription on or after May 1, 2007 (index date) and any brand name statin prescription history before the index date. The case group was comprised of statin prescription records of enrollees four months before and after the index date. All eligible patients were also checked for their continuous enrollment during the study period. Statin prescription records of the same enrollees group in a similar timeframes of 2006 were obtained as a control group. Compliance was assessed in terms of medication possession ratio (MPR), defined as sum of days that patient possessed any statin medication divided by the total number of days in the follow-up period. MPR was calculated for the pre and post periods and compared using paired t-test. **RESULTS:** A total of 4122 claims and 451 eligible enrollees were included in the analysis. For the study group, mean MPR increased from 0.8347 to 0.8571 (p-value = 0.0304) from the pre-period to the post-period. However, in the control group, the mean MPR increased slightly from 0.8540 to 0.8554 (p-value = 0.8709), and the difference was not found to be statistically significant. **CONCLUSION:** A significant increase in the MPR was observed in the study group patients after the statin step care program implementation. The study suggests that the statin SC program could have improved the patient compliance. However, further prospective studies are needed to establish the cause-effect relationship between SC program and patient compliance.

PCV65

CHANGE IN HEALTH-RELATED QUALITY OF LIFE FOLLOWING NON-FATAL CARDIOVASCULAR EVENTS IN POST-MYOCARDIAL INFARCTION PATIENTS

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OBJECTIVE: To determine the impact of subsequent cardiovascular (CV) events on change in preference-based measures of HRQL in patients who previously experienced an acute myocardial infarction using data from the VAlsartan IN Acute Myocardial iNfarcTion (VALIANT) trial. **METHODS:** Patients in the VALIANT HRQL sub-study completed the EQ-5D, including the visual analogue scale (VAS) rescaled to 0–1, at baseline, and 6, 12, 20, and 24 months. All EQ-5D assessments from baseline

through the first assessment following a CV event were retained. Patients who experienced multiple events or died prior to the next EQ-5D assessment were excluded from the main analysis. Random-effects regression models, specified with random intercepts and slopes, were used to model linear trajectories of utility weights and VAS scores across time. To evaluate the impact of a CV event (hospitalization for heart failure, recurrent acute myocardial infarction, stroke, and resuscitated sudden death/cardiac arrest), the mean trajectory change between the observed HRQL scores following the CV event and the expected HRQL scores based on the patients' pre-event trajectories were estimated. **RESULTS:** Among 14,703 adult patients enrolled in VALIANT, 2,556 patients were eligible for HRQL sub-study and completed baseline EQ5D. Among the 504 patients who experienced a nonfatal CV event, the trajectory-adjusted mean change following the event was –0.07 (95%CI: –0.1 to –0.03; P = 0.0007) based on UK utility weights, –0.05 (95%CI: –0.08 to –0.01; P = 0.0082) based on US utility weights, and –0.06 (95%CI: –0.08 to –0.03; P < 0.0001) based on VAS scores. Differences between results using utility weights and VAS scores were most notable for patients suffering a non-fatal stroke with trajectory adjusted mean change scores of –0.26 with UK utility weights, –0.22 with US utility weights, and –0.06 with VAS. **CONCLUSION:** Post-MI patients who suffered a subsequent cardiovascular event experienced a significant decrease in HRQL.

WITHDRAWN **PCV66**

PCV67

RESPONSIVENESS OF PROXY-RATED PREFERENCE-BASED MEASURES OF HEALTH-RELATED QUALITY OF LIFE

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OBJECTIVE: Our aims were: 1) to determine whether proxy responses to generic health related quality of life (HRQL) measures are responsive to meaningful patient improvement in the six months following ischemic stroke; 2) to compare the responsiveness of generic measures by proxy assessment; and 3) to compare proxy to patient responsiveness. **METHODS:** This secondary analysis of a longitudinal cohort study of ischemic stroke patients and caregivers (n = 124 at baseline; n = 98 at 6 months) included the following HRQL measures: EQ-5D Index, EQ-5D VAS, HUI2, HUI3, and SF-6D. Patients were categorized as improved from baseline to 6 months based on improvement in Barthel Index (BI) categories (mild: ≤85; moderate: ≤60 to <85; severe: <60). Responsiveness was compared on the basis of effect size (ES) statistics for the baseline to 6 month interval. **RESULTS:** Stroke patients were primarily male (52%), average 67 (SD 15) years, and had primarily severe stroke (59% categorized as severe by BI). Proxies tended to be female (67%) and either a spouse (48%) or child (32%) of the stroke patient. Among patients who improved according to the BI, all proxy-assessed measures demonstrated large magnitudes of change (ES > 0.80). The SF-6D was the most responsive measure (ES = 1.36; bootstrapped 95% CI: 0.95–1.89), while the HUI3 was least responsive (ES = 0.99, bootstrapped 95% CI: 0.69–1.40), although bootstrapped 95% CIs overlapped for all measures. ES estimates were not significantly different for proxy raters compared to patient self-report (all bootstrapped CIs overlapped). However, the ES for proxy-rated VAS scores was 50% greater than patient report while indirect utility measures tended to produce comparable levels of responsiveness or were larger according to patient self-report. **CONCLUSION:** Proxy assessments of stroke patients were responsive to meaningful change using the VAS, EQ-5D, SF-6D, HUI2, and HUI3 during the initial post-stroke recovery process, capturing large magnitudes of changes similar to patient assessments.

PCV68

CLINICAL DETERMINANTS OF SATISFACTION AND HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH CARDIAC DISEASE AND DYSLIPIDEMIA

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OBJECTIVE: To study clinical determinants of satisfaction and health-related quality of life (HRQoL) in patients with cardiac disease and dyslipidemia. **METHODS:** A prospective, cross sectional study was conducted using a questionnaire. The questionnaire containing SF-12v1 general health survey (range 0–100), the MacNew Heart disease health-related quality of life instrument (range 1–7), and questions regarding satisfaction with care (range 1–7) and demographics were administered to randomly selected patients seeking care in a secondary prevention lipid clinic. A unique de-identified patient code was matched with medical charts to obtain clinical information. Descriptive analyses and stepwise regression analyses were conducted to assess study objectives. **RESULTS:** A total of 124 participants (65.7% male) completed the survey; response rate was 72.9%. Physical (PCS) and mental (MCS) component summary scores of the SF-12v1 scale were 37.3 (± 9.2) and 49.1 (± 9.7), respectively. The scores of the MacNew scale domains were physical (5.2 ± 1.3), emotional (5.2 ± 0.9), social (5.5 ± 1.3), and global (5.2 ± 1.0), respectively. In general, the participants in the study were satisfied with the care provided (4.28 ± 0.62). Multivariate analysis indicated that LDL levels (β = –0.37) and triglycerides levels (β = –0.26) significantly ($p < 0.05$) predicted the MCS scores, while drug type (β = –0.51) and gender (β = –0.32) significantly ($p < 0.05$) predicted PCS scores. With respect to the MacNew scale, LDL levels (β = –0.29), triglycerides (β = –0.22), and diastolic blood pressure (β = 0.28) significantly ($p < 0.05$) predicted emotional scores, while drug type (β = –0.26) significantly ($p < 0.05$) predicted physical scores. Further, LDL goals achieved (β = 0.22) and BMI (β = –0.27) significantly ($p < 0.05$) predicted satisfaction with care. **CONCLUSION:** Results suggest that LDL levels, triglycerides levels, and drug type used significantly affected HRQoL as measured by both scales and LDL goals achieved BMI significantly affected satisfaction with care. This information is valuable for future interventional studies aiming to improve HRQoL and satisfaction with care provided after cardiac disease and may aid physicians' decisions while providing care.

PCV69

CONVENIENCE OF THE NEW LONG-ACTING ANTICOAGULANT IDRAPARINUX VERSUS VITAMIN K ANTAGONIST IN PATIENTS WITH ATRIAL FIBRILLATION

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OBJECTIVE: A major goal of a new anticoagulant therapy is to alleviate the burden associated with treatment by Vitamin K Antagonist (VKA). However, advantages such as simplified administration and monitoring or reduced lifestyle constraints

cannot be assessed by usual efficacy and safety clinical endpoints. Hence, the aim of the current evaluation was to compare the perceived convenience of the once-weekly injection regimen of Idraparinux (IDRA), with no need for monitoring, to usual VKA treatment. **METHODS:** A total of 2556 patients with Atrial Fibrillation, enrolled in an international randomized open-label Phase III trial comparing IDRA to VKA, completed a self-administered questionnaire assessing treatment convenience and their satisfaction with it. The Perception AntiCoagulant Treatment Questionnaire (PACT-Q) previously validated, measured expectations (7 items) at baseline, treatment Convenience (13 items) and Satisfaction (7 items) both at 3 and 6 months (M3, M6). Convenience and Satisfaction scores ranged from 0 (worst) to 100 (best). Primarily IDRA was compared to VKA Convenience scores at M3. Treatment comparisons (ANOVA) were also performed on Satisfaction score, at M6 and with covariates adjustment. **RESULTS:** Baseline expectations were comparable between treatment groups. Mean Convenience scores at M3 were significantly higher in IDRA than VKA (90.3 vs. 85.6, $p < 0.001$). This result was maintained when adjusted for country, age, gender, prior medication, and baseline expectations. The better convenience of IDRA over VKA was confirmed at M6. Similar findings were shown on Satisfaction scores. **CONCLUSION:** Idraparinux was perceived as more convenient and satisfactory than current standard VKA management by patients with Atrial Fibrillation.

PCV70

PATIENT ADHERENCE TO CHOLESTEROL TREATMENT (PACT): CANADIAN PHYSICIAN AND PATIENT PERSPECTIVES

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OBJECTIVE: Evaluate the opinions of Canadian physicians and patients towards adherence with cholesterol treatment. **METHODS:** A convenience sample of 362 general practitioners recruited across Canada completed a physician questionnaire. A minimum of 20 statin patients per physician completed questionnaires during normally scheduled visits. An independent third party collected and analyzed the data. Each physician received aggregate practice level and entire patient cohort data. **RESULTS:** A total of 13,508 patients participated; 42% of cohort was 65 years or older. Reported medical conditions: 55% high BP, 59% high LDL, 27% heart problems, 29% diabetes, 18% obesity, 6% stroke. Patient reasons for stopping statins: 26% don't like taking medication, 20% needed more information on side effects, 14% improved their diet or lost weight, 10% needed more information on benefits of statins. Physician opinions on why patients have poor compliance to statins: 80% resistance to taking medications, 68% side effects of medication, 64% lack understanding of the benefits of statin therapy, 25% achieved weight loss or diet improvements. Patient reported factors that would motivate them to stay on therapy: 36% seeing a printout of my levels, 32% knowing more about risks of high cholesterol, 31% having the doctor discuss cholesterol in more detail, 25% knowing more about my medication. Physician opinions on key patient compliance motivators: 83% discussing cholesterol issues with patients, 79% follow up discussion on levels, 72% discussing medications, 61% diet and lifestyle support program. Medication change preference if not reaching LDL target–patient vs. physician: Increase dose 51% vs. 75%, change statin 40% vs. 7%, add another drug 9% vs. 19%. **CONCLUSION:** Differences exist in physician and patient reported reasons for adherence to statin therapy. Understanding these differences may assist physicians to counsel their patients more effectively and possibly improve adherence.

PCV71

PSYCHOLOGICAL FACTORS AS PREDICTORS OF CARDIOVASCULAR RISK IN A PROSPECTIVE STUDY COHORT IN THE UNITED KINGDOM

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OBJECTIVE: To construct risk models linking psychological risk factors with the risk of myocardial infarction (MI) and stroke. **METHODS:** The Caerphilly Prospective Study (CaPS) comprises a general population sample of 2959 men aged 45–59, followed up for 20 years. Psychological Distress Indicator (PDI) was constructed based on GHQ30; anxiety was measured with State Trait Anxiety Questionnaire; type A behaviour with Jenkins Activity Survey and Health Attitude Inventory; and anger with four Framingham anger scales. Logistic, fractional polynomial and Cox's proportional hazards models were used to analyse the data. A multivariate analysis that included standard and psychological risk factors was carried out. Composite indices based on the sum of the main effects for the individual psychological risk factors and main effects with interactions were developed. **RESULTS:** In univariate analyses, no significance was found for psychological distress, anxiety, type A behaviour and anger measured on three scales for both MI and stroke. In men with low anger-out scores, the odds ratio and hazard ratio of MI were OR = 1.75 [95% CI: 1.25–2.43] and HR = 1.75 [95% CI: 1.28–2.40], respectively, relative to men with high anger-out scores. Cardiovascular risk explained by psychological factors increased by up to 21.5% when adjusted for the regression dilution bias. When adjusted for standard risk factors, the hazard ratio of MI in men with high anger-out score was 1.64 ($p = 0.007$). When psychological risk factors were combined, the risks were HR = 2.26 [1.26, 4.06] and HR = 2.72 [1.23, 6.01] for alternative indices. The risk of stroke was not associated with any psychological risk factors. **CONCLUSION:** Individual psychological risk factors were found to be of limited significance in cardiovascular risk prediction. Composite indices of psychological outcomes were significantly associated with the increased risk of MI; such measures of psychological risk could be considered in risk equations.

PCV72

ENHANCING THE EFFECTIVENESS OF COMMUNITY STROKE RISK SCREENING: A RANDOMIZED CONTROL TRIAL

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OBJECTIVE: Major risk factors for Stroke are well known and are relatively easy to assess in community screens. However, less than one-third of all persons found to have modifiable risk factors follow–up with a primary care physician up to six months post screening. This study tested the effectiveness of a patient counselor intervention to enhance motivation and reduce barriers in seeking medical advice regarding screen-detected sroke risk. **METHODS:** A total of 227 patients identified as having risk of Stroke were randomly allocated either to an experimental group that received a telephonic intervention (patient counselor) or a telephonic intervention plus physician notification of study results or were assigned to a control group that received usual care (advice only) and were followed for six months. Follow-up data was collected at three months post screening visit. **RESULTS:** MD visits after screening date had increased significantly in intervention group compared to control group from baseline levels (70.1% versus 52.9%, p-value < 0.05). We further

stratified our analysis among patients with 2 or more risk factors, and found that 72% returned to see the physician within the intervention group compared to 59 % of the control group (p-value < 0.05). The intervention also produced a significant increase in the percentage of patients who reported they were confident about lowering stroke risk with the physician assistance (69% versus 52%, p-value < 0.05). After confounder adjustment, patients in the intervention group were still 1.8 times more likely to visit their physicians than patients in the control group, in multivariate analyses (p < 0.05). **CONCLUSION:** This randomized controlled trial illustrates that provision of telephonic intervention is effective in increasing patient visits to the physician after stroke screening. These results can be used to maximize the clinical utility of risk factor identification in high risk communities.

PCV73

VALIDATION OF AN ABBREVIATED TREATMENT SATISFACTION QUESTIONNAIRE FOR MEDICATION (TSQM-9) AMONG PATIENTS ON ANTIHYPERTENSIVE MEDICATIONS

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OBJECTIVE: The 14-item Treatment Satisfaction Questionnaire for Medication Version I (TSQM) is a reliable and valid instrument to assess patients' satisfaction with medication, providing scores on four scales—side effects, effectiveness, convenience and global satisfaction. In naturalistic studies, using the TSQM with the side effects domain has a potential to interfere with routine medical care. In this study, an interactive voice response system (IVRS)-administered abbreviated 9-item TSQM without the five items of the side effects domain (TSQM-9) was psychometrically evaluated among patients taking antihypertensive medication. **METHODS:** A total of 396 subjects who self-reported taking a prescribed antihypertensive medication were recruited from an online panel. The subjects were asked to complete the TSQM-9 at the start of the study, along with the modified Morisky scale, and then again within 7 to 14 days. Psychometric analyses including confirmatory factor analysis (CFA), Cronbach's alpha and intraclass correlation coefficients were conducted. **RESULTS:** There was evidence of construct validity of the TSQM-9 based on the CFA findings of the observed data fitting the Decision Balance Model of Treatment Satisfaction even without the side effects domain (Non-normed Fit Index = 0.9791; Bentler's Comparative Fit Index = 0.9860). TSQM-9 domains had good internal consistency as evident from Cronbach's alpha values of 0.84 and greater. TSQM-9 domains also demonstrated good test-retest reliability with high intraclass correlation coefficients exceeding 0.70. As expected, the TSQM-9 domains were able to differentiate between individuals who were high compliers with medication use and those that were low compliers, with a moderate-to-high effect size (Cohen's d ranging from 0.6 to 0.8). There was evidence of convergent validity with significant correlations with the medication adherence scale. **CONCLUSION:** The IVRS-administered TSQM-9 was found to be a reliable and valid measure to assess treatment satisfaction in naturalistic study designs, in which there is potential for the TSQM's side effects domain to interfere with routine clinical care.

PCV74

THE IMPACT OF TARGETED MEMBER EDUCATION ON CHOICE OF PREFERRED STATIN THERAPY AFTER A FORMULARY CHANGE

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OBJECTIVE: To measure the impact of patient targeted education designed to inform atorvastatin users of lower cost antihyperlipidemic alternatives after atorvastatin was removed from their formulary. **METHODS:** A retrospective case-control research design was used with case and control groups composed of clients that implemented the formulary change on January 1, 2006 and had flat 3-tier copayments. Case group members were enrolled in clients that implemented a targeted communication strategy and control group members did not. Success was measured as switching to a formulary antihyperlipidemic on or after June 30, 2006. Logistic regression models, estimated separately for retail and home delivery (HD) channels, was used to estimate the impact of education on the likelihood of switching controlling for age, gender, high dose (40 or 80 MG), prior switching, household median income, non-preferred and generic copayment differential, and other client-level trend programs (i.e., step therapy). **RESULTS:** A total of 201,223 patients in the control group and 165,758 patients in the case group met the study inclusion criteria. Controlling for patient and plan covariates, patients in the case group in retail were 3.48 times more likely to switch to a preferred statin (95% Confidence Interval (CI) = 3.38–3.59) compared to control group members. In HD, the likelihood of switching was 9.82 (95% CI = 9.46–10.20). This translates into an absolute increase in the switch rates of 14.3 and 29.8 percentage points for patients in retail and HD, respectively. **CONCLUSION:** In the context of a formulary change, targeted member communication and assistance is an effective means of promoting lower cost formulary alternatives. Greater conversion in HD may be related to a higher degree of assistance and outreach within this channel.

CARDIOVASCULAR DISORDERS—Health Care Use & Policy Studies

PCV75

LOW-DENSITY LIPOPROTEIN APHERESIS FOR THE TREATMENT OF FAMILIAL HYPERCHOLESTEROLEMIA

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OBJECTIVE: To assess the clinical effectiveness and cost-effectiveness of low-density-lipoprotein (LDL) apheresis for treatment of patients with homozygous (HMZ) and heterozygous (HTZ) familial hypercholesterolemia (FH). **METHODS:** Seven case series and one retrospective review with heparin-induced extracorporeal LDL precipitation (HELP) for the treatment of refractory HMZ and HTZ FH published between January 1998 and May 2007 were included in the analysis. **RESULTS:** The mean acute decrease in LDL-C ranged from 53–77% with HELP. The mean chronic decrease in LDL-C ranged from 9–46% and the increase in HDL-C ranged from 12–27%. The LDL:HDL ratio exceeded target values. There was a beneficial impact on coronary outcomes demonstrated by a decrease in Agatston scores and a regression in atherosclerotic lesions. Adverse events, ranging 2.9–5.1%, were typically mild and related to vascular access problems. Studies were generally of low quality however performing controlled studies is not feasible

given that HELP represents a last therapeutic option for these patients. The annual budget impact was $1.0 and $61.0 million (CAD) for HMZ and HTZ FH patients respectively. Costs were halved with biweekly treatment. The cost per CHD death avoided comparing HELP with Plasma Exchange (PE), current treatment, and with no intervention in HTZ FH was estimated to be $37.5 million and $18.7 million for weekly and biweekly treatment respectively. Although HELP costs twice as much as PE, it avoided 12 deaths versus PE and 22 deaths versus no intervention over a 10-year period. **CONCLUSION:** There is evidence of overall clinical benefit of LDL apheresis for HMZ and HTZ FH. The diffusion of LDL apheresis for refractory HTZ FH should factor affordability and potential capital and human resource constraints.

PCV76

LONGITUDINAL ASSESSMENT OF THE CLINICAL UTILITY OF POINT-OF-CARE MEASUREMENT DEVICES FOR DETERMINING THE INTERNATIONAL NORMALIZED RATIO

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OBJECTIVE: Point-of-Care (POC) devices that measure the International Normalized Ratio (INR) may be associated with enough measurement error to influence warfarin dosing decisions. The purpose of this trial was to determine if there were differences between any of five FDA-approved POC testing devices in terms of the proportion of time patients spend in the target INR range (TR). **METHODS:** In this longitudinal clinical trial, patients were randomized to one of five POC devices that measure the INR (International Normalized Ratio). Patients were followed over time according to usual anticoagulation clinic practice. Clinicians used measurements from the POC device to make all clinical decisions, including warfarin dose changes. At each visit, a venous blood sample was also collected to serve as an accepted standard measure to calculate time in the target range (TR). A Bayesian hierarchical model with a parametric variance component for estimating coagulation times between observed blood draws was used to estimate the mean proportion of time each patient's INR was within his or her TR. The analysis assessed the probability that each device resulted in patients' INR values within the TR over time, as measured by the accepted standard laboratory measure. **RESULTS:** A total of 287 patients were enrolled, completed ≥3 visits, and were monitored for an average of 87 days. There was significant differences in the time patients' INR values were in the target range, based on POC device: Coaguchek S (52.2%), Coaguchek ProDM (51.5%) Hemochron Jr. (48.3%), ProTime (45.5%), and Rapidpoint (41.2%). The posterior probabilities that the Coaguchek S and Coaguchek ProDM were the superior devices were 0.58 and 0.31, respectively. **CONCLUSION:** Five FDA-approved POC INR devices resulted in significantly different time in the TR. This suggests that there are clinically significant differences amongst FDA-approved devices. Measurement of clinical outcomes may improve the regulatory approval process.

PCV77

ASSESSMENT OF CONTROL AND TREATMENT PATTERNS IN AN ELDERLY POPULATION WITH COMORBID DIABETES AND HYPERTENSION

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OBJECTIVE: Evaluate treatment patterns and levels of blood pressure (BP) and glycemic control in elderly patients with comorbid hypertension and type 2 diabetes. **METHODS:** Retrospective review of 2 consecutive years (August 1, 2005–July 31, 2007) of medical claims, pharmacy claims, and medical charts from a physician group, comprised of more than 200 physicians, located in the Ohio Valley region. Patients 65 years-of-age and older with an ICD-9 diagnosis code for both hypertension and type 2 diabetes were identified for inclusion between August 1, 2005–July 31, 2006, and evaluated from August 1, 2006–July 31, 2007. Administrative claims databases were utilized to analyze treatment patterns. Medical charts was reviewed to confirm diagnoses and collect clinical indicators of control, including BP and hemoglobin A1C measurements. **RESULTS:** This study included 505 patients with hypertension and type 2 diabetes. The mean age was 75.7 years, and 57% were females. Approximately 35% (n = 177) achieved BP goal of <130/80 mmHg, while 58% (n = 293) achieved glycemic control, defined as A1C <7%. Only 26% (n = 133) attained both goal BP and A1C levels. The most prescribed antihypertensive and antihyperglycemic classes were beta-blockers (50%) and sulfonylureas (44%), respectively. Forty-seven percent of the patients were on an angiotensin converting enzyme inhibitor, and 14% were on an angiotensin receptor blocker. Antihypertensive monotherapy was the least prevalent (21%) mode of therapy, followed by therapy with two agents (29%), and >3 agents (50%). In contrast, antthyperglycemic monotherapy was the most prevalent (55%) mode of therapy, followed by dual therapy (30%), and >3 agents (15%). **CONCLUSION:** Elderly patients with comorbid hypertension and type 2 diabetes did not achieve goal BP, and over 40% did not achieve goal A1C. Further opportunities to educate both health care providers and patients are necessary in order to prevent complications associated with the poor management of these two common conditions.

PCV78

INTERNATIONAL COMPARISON OF HEALTH CARE RESOURCES AND QUALITY OF LIFE IN ACUTE CORONARY SYNDROME PATIENTS IN 2007: RESULTS FROM THE ANTIPLATELET TREATMENT OBSERVATIONAL STUDY (APTOR)

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OBJECTIVE: To explore variation in practice and its impact on QoL in management of acute coronary syndromes (ACS), the commonest cardiac cause of hospital admission. **METHODS:** A prospective, international, observational study recruited ACS patients undergoing percutaneous coronary intervention (PCI), January–August 2007, capturing practice patterns, resource use and QoL. **RESULTS:** A total of 1525 ACS-PCI patients (Spain-

538, UK-504, France-483), under 122 cardiologists, mean age 62 (SD 12), mean weight 80 kg (SD 15), 22% female were recruited with co-morbidities of hypertension-53%, dyslipidemia-52%, diabetes-20% and prior MI-23%. Index diagnosis was: non ST-elevation ACS-62% and ST-elevation MI (STEMI)-38%. Admission and discharge use of medications were: aspirin-36 & 95%, clopidogrel-21 & 94%, statins-37 & 84%, beta-blockers-30 & 76% and ACE inhibitors/ARBs-34 & 67%. 2349 stents were used (DES-52%; France-33%, Spain-64%, UK-55%) with 58% of patients receiving only one. A total of 51% of patients were transferred at least once between study and another hospital, France-54%, Spain-46%, UK-54%. Admission to PCI at study hospital was: median 2 days (IQR 1–5 days) for non-ST ACS patients, (65% 3 days or less; France-87%, Spain-72%, UK-38%); and median 0 days (IQR 0–2 days) for STEMI patients, (73% 1 day or less; France-82%, Spain-74%, UK-58%). Total stay was median 6 days (IQR 4–9) for both cohorts. QoL at hospital discharge using EQ-5D health state index was: median 0.85 (IQR 0.71–1.00) with 1 representing perfect health, (France-0.85 (0.73–1.00), Spain-0.85 (0.73–1.00), UK-0.81 (0.68–1.00)). **CONCLUSION:** These data indicate geographic and case mix variation in management of ACS patients, including use of DES, but with uniform early QoL findings. Use of pharmacotherapies is high. Long term QoL will assess the impact of variations, but these early findings are useful benchmarks to guide service provision, focus treatment guidelines and validate clinical trials.

PCV79

PHYSICIAN CHARACTERISTICS ASSOCIATED WITH STROKE RELATED OUTPATIENT CARE UTILIZATION: ANALYSIS OF THE NATIONAL AMBULATORY MEDICAL CARE SURVEY DATA 2000–2005

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OBJECTIVE: To assess trends in utilization of stroke-related outpatient physician services by physician specialty over the past 6 years. **METHODS:** This study was a retrospective analysis of the National Ambulatory Medical Care Survey (NAMCS) from 2000–2005. Ischemic stroke related visits in persons aged ≥45 years were identified using diagnosis codes (ICD9CM) 433.1x, 434.xx, and 436.xx. Visits per/1000 persons were calculated using United States population estimates. With logistic regression, we adjusted associations between stroke-related visits and physician type (Neurology, Primary Care, and Cardiovascular Medicine), for age, race, and region (Northeast, Midwest, West, and South), sex, diabetes, hypertension, insurance type, and survey year. **RESULTS:** From 2000 to 2005, stroke related outpatient physician office visits ambulatory care visits increased significantly from 4.7/1000 persons to 6.3/1000 (P Trend =< 0.0001) persons, a 131% increase. During the study period, the proportion of ambulatory stroke-related visits that were to a neurologist increased significantly from 15.5% in 2000 to 26.3% in 2005 (P Trend =< 0.0001). However, during the same period, visits to primary care (2000: 74.4% vs. 2005: 67.8%), and cardiovascular medicine (2000: 10.0% vs. 2005: 5.9%) decreased. After adjustment, greater odds of stroke-related visits to neurologist (OR = 10.6 95% CI: 7.9–14.1) whereas no significant differences were observed for cardiovascular medicine (OR = 1.5 95% CI: 0.9–2.2) (Reference Category: Primary Care). **CONCLUSION:** From 2000 to 2005, stroke-related ambulatory physician visits increased significantly overall but particularly to neurologists. Secondary stroke prevention, historically performed by primary care physicians in the US, may be increasingly performed by neurologists. Given predictions for large rises in stroke prevalence due to the aging population and improved stroke survival, US demand for neurologists may be insufficient.

PCV80

NATIONAL ESTIMATES OF ENROLLMENT IN DISEASE STATE MANAGEMENT PROGRAMS IN THE UNITED STATES

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OBJECTIVE: Disease state management (DSM) programs are recommended for patients with conditions such as diabetes, hypertension, and hyperlipidemia. However, the level of adoption of these programs is not known. The objective of this study is to determine the level of utilization of DSM programs in the United States. **METHODS:** Data from the National Ambulatory Medical Care Survey (NAMCS), which includes a nationally representative sample of outpatient physician office visits, was used to meet the study objectives. In year 2005, NAMCS included an additional item regarding enrollment in DSM programs. Patients with diabetes, hypertension, or hyperlipidemia were identified and estimates for enrollment in DSM programs were computed. Logistic regression analysis was used to identify predictors of enrollment in such programs. Sample weights and the complex sampling design of the NAMCS were accounted in all the analyses. **RESULTS:** The final study sample included 3,884 patient visits. Patients with diabetes had the highest rate of enrollment (24.6%), followed by patients with hyperlipidemia (20.4%) and hypertension (19.5%). Insurance status was an important predictor of enrollment status with patients enrolled in Medicare [Odds Ratio (OR) = 1.68; p = 0.021] and Medicaid (OR = 2.13; p = 0.008) significantly more likely to be enrolled in a DSM program as compared to those without insurance. Patients of Hispanic ethnicity were 67% less likely to be enrolled in a DSM program (OR = 0.33; p < 0.001). The only co-morbid condition that was a significant predictor of enrollment status was depression. Patients with co-morbid depression were 1.87 times more likely to be enrolled as compared to those without depression (OR = 1.87; p = 0.004). **CONCLUSION:** Although the benefits of DSM programs have been documented, their adoption rate remains extremely low. This study indicates that Hispanic ethnicity, insurance status and co-morbid depression were predictors of enrollment status. Additional studies are needed to identify other predictors and to tailor interventions to increase the adoption of such programs.

PCV81

ASSESSING THE IMPACT OF INCORPORATING PATIENT KNOWLEDGE AND BELIEFS INTO ANTICOAGULATION THERAPY MANAGEMENT SERVICES

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OBJECTIVE: The primary aim was to determine the impact on INR control resulting from the integration of information on patient health literacy and numeracy, health knowledge and health beliefs regarding warfarin therapy into the clinical information provided to the pharmacist. **METHODS:** A single-blinded randomized controlled study was conducted to test the hypothesis that including information on patient's health literacy, numeracy, and anticoagulation knowledge and beliefs improves patient INR control. Patients were recruited from anticoagulation management services at the University of Maryland Medical Center and the Baltimore VA Medical Center.

Enrolled patients completed a series of questionnaires assessing individual anticoagulation knowledge and beliefs, literacy and numeracy skills. Only patients in the intervention arm had the information incorporated into the clinical chart used by the pharmacist to manage warfarin therapy. **RESULTS:** A total of 160 patients consented and were randomized into the study, representing a 69.2% enrollment rate. Variation in INR readings did not improve as a result of the inclusion of patient information sheets in the charts of the intervention group as compared to patients receiving standard of care (difference = 0.037; p = 0.58). Patient knowledge of anticoagulation therapy significantly improved in the intervention group as compared to patients receiving standard of care (difference = 0.8 points (measured on a 20-point scale); p = 0.04). **CONCLUSION:** Systematic inclusion of information regarding patient knowledge and beliefs of oral anticoagulation therapy, literacy and numeracy skills did not improve INR control but improved patient knowledge of anticoagulation therapy. While patient knowledge can be improved by providing opportunities to individualize educational interventions, further studies are needed to identify effective interventions to improve INR control and patient outcomes.

PCV82

EVALUATION OF THE EFFECT OF ACUTE DECOMPENSATED HEART FAILURE GUIDELINES IN COMMUNITY HOSPITALS

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OBJECTIVE: To evaluate the effect of the voluntary implementation of heart failure guidelines on clinical outcomes, utilization and quality measures among group purchasing organization member hospitals. **METHODS:** Member hospitals were invited to participate in this guideline implementation study. Patients at each hospital presenting to the emergency department and hospitalized with the primary diagnosis of heart failure between October and November 2007 were randomly selected for inclusion. Data from five hospitals (67 patients) who implemented the guidelines (cases) were compared to seven hospitals (96 patients) that did not implement the guidelines (controls). **RESULTS:** There was no difference between male gender (51% vs. 43%, p = 0.34), age (74 vs. 74.7 yrs, p = 0.67) or past medical histories including heart failure (81% vs. 82%, p = 0.89), hypertension(76% vs. 84%, p = 0.25), coronary artery disease (54% vs. 61% p = 0.37), and diabetes (47% vs. 54%, p = 0.39) in controls compared to cases except for history of ejection fraction less than 40%(28% vs. 13%, p = 0.03). Clinical presentation was consistent with volume overload in most patients with no differences between groups except for fatigue (18% vs. 33%, p = 0.03) and congestion on first chest x-ray (52% vs. 28%, p = 0.003) on admission. Time spent in the emergency department was significantly lower in the cases (4.3 ± 1.7 vs. 3.5 ± 1.4, p = 0.002), while hospitalization length of stay (LOS) (4.9 ± 3.1 vs. 4.3 ± 2.3, p = 0.09) and ICU LOS (2.9 ± 3.2 vs. 1.8 ± 1, p = 0.48) were not different. Use of IV vasoactive drugs was higher in the cases (11% vs. 27%, p = 0.003). Prescription for mortality-reducing oral medications were higher in the cases (p > 0.05). Joint Commission core measures for documentation of discharge instructions (86% vs. 91%, p = 0.10), prescribing of ACE inhibitor or angiotensin receptor blocker upon discharge (63% vs. 66%, p = 0.29) and smoking cessation education (58% vs. 64%, p = 0.41) was more common among cases. **CONCLUSION:** There was a trend for improvement in utilization and compliance with quality measures in hospitals where guidelines were implemented.

PCV83

GENDER DISPARITIES IN THE UTILIZATION OF MYOCARDIAL PERFUSION IMAGING

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OBJECTIVE: Myocardial perfusion imaging (MPI) is recommended by the American Heart Association/American College of Cardiology for the evaluation/diagnosis of patients with coronary artery disease. Disparities have been found in the use of exercise stress testing based on gender and other sociodemographic factors. Our goal was to specifically assess these disparities in MPI. We hypothesized that women are less likely to receive MPI procedures than men after controlling for other sociodemographic factors. **METHODS:** Patients undergoing MPI were identified using data from the 2004 National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) using the International Classification of Diseases, 9th Revision procedure code 89.44. Utilization rates (tests/100,000) by gender were calculated at a national level. Multiple logistic regression analyses (with sample weights applied) were conducted controlling for age, race, ethnicity, and payment type. **RESULTS:** In the United States in 2004, 2.9 million and 228,000 MPI procedures were ordered by office-based physicians and hospital outpatient departments, respectively. The utilization rates differed by gender (NAMCS: men 420, women 250; NHAMCS: men 415, women 175). Logistic regression analyses revealed that for office visits and hospital outpatient visits, women were less likely than men to have MPI orders (NAMCS: OR 0.63, 95%CI 0.41–0.97; NHAMCS: OR 0.54, 95%CI 0.32–0.91) after controlling for other sociodemographic factors. For office visits, age and race were also associated with the MPI orders (both p < 0.05). Subgroup analyses among women showed that for office visits, age had significant impact (p < 0.001) on the use of MPI in women; while for hospital outpatient visits none of the sociodemographic factors studied were significantly associated with the use of MPI in women. **CONCLUSION:** MPI was ordered less frequently for women regardless of age, race, ethnicity, and payment type. Understanding why the gender disparities exist requires further research into clinical and social factors.

PCV84

HEALTH CARE UTILIZATION ASSOCIATED WITH DEPRESSION FOLLOWING THROMBOTIC CARDIOVASCULAR EVENTS IN ELDERLY MEDICARE BENEFICIARIES

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OBJECTIVE: To measure the impact of depression following a thrombotic cardiovascular event (TCE) on health care services utilization in elderly Medicare beneficiaries and to determine whether antidepressant use affects this relationship. **METHODS:** A cohort of 7051 community-dwelling non-HMO elderly beneficiaries who experienced a TCE were pooled from the 1997 to 2002 Medicare Current Beneficiary Survey. Baseline characteristics and antidepressant utilization were ascertained through the self-reported survey. TCEs (410, 411, 413, 414, 415, 433–438, 452, or 453) and depression (296.2, 296.3, 296.5, 296.6, 298.0, 300.4, 308.0, 309.0, 309.1, 309.4, or 311) were identified by ICD-9 codes on Medicare claims. Depression was identified by a depression claim within six months after the TCE. Antidepressant utilization by class was measured through at least one drug mention. Time to first emergency department visit, inpatient

hospitalization and outpatient hospital visit were assessed using Cox-proportional hazard models. Counts of office visits were assessed using negative binomial regression models. **RESULTS:** Elders with a claim for depression had a higher frequency of inpatient hospitalizations (52.4%) and emergency department visits (29.7%) than elders without a depression claim (36.4% and 19.1%). Elders with a depression claim were admitted to the hospital 51% sooner (95% CI = 1.31, 1.76), visited an emergency department 56% sooner (95% CI = 1.29, 1.90), and had an outpatient hospital visit 19% sooner (95% CI = 1.03, 1.38) than elders without a depression claim. A depression claim had no effect on the number of physician office visits. Antidepressant use by elders with a depression claim was not significantly associated with health care utilization. **CONCLUSION:** Elders with a claim for depression after a TCE use more acute health care services and sooner than those without a depression claim. Antidepressant use does not affect this relationship.

PCV85

IMPACT OF MEDICARE PART D IMPLEMENTATION ON STATIN UTILIZATION AND MARKET SHARE IN STATE MEDICAID PROGRAMS

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OBJECTIVE: Upon implementation of Medicare Part D in 2006, Medicaid and Medicare dual-eligibles were shifted to Part D for their prescription drug coverage. This shift affected the utilization and market share of medications under Medicaid. This study focuses on statins which are widely prescribed. The objectives were: 1) to describe the number of units dispensed, the number of prescriptions, and total expenditures for statins in 2005 and 2006, nationally and for each state, and 2) to assess the shift in market share for these drugs between 2005 and 2006. **METHODS:** Summary claims data for 11 commonly prescribed statins were obtained from the Centers for Medicare and Medicaid Services website for all US states for 2005 and 2006. Total units of statins reimbursed, total number of prescriptions, total reimbursement amount, and percent market share were calculated for each of the statins and for each of the 50 states. **RESULTS:** The total units of statins reimbursed decreased from 573.5 million in 2005 to 201.0 million in 2006, as did the total number of prescriptions (17.5 million in 2005 vs. 6.2 million in 2006), and the total reimbursement amount ($1.8 billion in 2005 vs. $0.66 billion in 2006). The percentage market share of Lipitor® units decreased from 48.7% in 2005 to 42.8% in 2006. Similar trends were observed for percentages of prescriptions and reimbursement amounts. Zocor® also showed the same trend while Vytorin® and generic statin use increased. State wise comparisons show variability among states with CA and NY having the highest statin use. **CONCLUSION:** Overall, the findings of the study indicate a substantial decrease in statin prescriptions covered by Medicaid for the year 2006. This decrease in utilization along with the shift to generic statins affects the rebates received by Medicaid.

PCV86

PATTERNS OF DIURETIC USE IN MULTI-DRUG ANTI-HYPERTENSIVE REGIMENS IN THE POST ALLHAT ERA

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OBJECTIVE: Our study goal was to determine if the proportion of "diuretic eligible" patients receiving diuretics, including thiazides, for hypertension control in multi-drug antihypertensive regimens has increased since the publication of ALLHAT and JNC7. **METHODS:** We used an electronic medical records repository of a tertiary care VA Medical Center to determine medication use in 8286 non-diabetic hypertensives in March 2005. Patients selected did not have contraindications for thiazides (gout, heart failure, creatinine >=2 mg/dL) and were categorized as receiving one, two, three, or four or more drugs. Diuretic use overall, for the elderly (age ≥60 years) and African-American subgroups was compared to March 2001 levels. **RESULTS:** Rates of any diuretic use were 27.6%, 56.7%, 78.2% and 90.5% in people on single, two, three and four or more drugs respectively. Thiazide use rates were 26.7%, 52.6%, 69.7%, and 77.8% in those groups, respectively. Comparable rates of thiazide diuretics utilization from 2001 were 11.6%, 39%, 59%, and 72.5%, respectively ($p < 0.05$ for all comparisons). The proportion of African-American patients on 2, 3, or 4 or more drugs was 67.5%, 84.6% and 91.6% respectively ($p < 0.05$ for all comparisons except 4 or more drugs; $p = 0.102$). Overall, 49% of the elderly received diuretics: 22.6% on monotherapy ($p < 0.05$), and 49.6%, 75.2% and 91.6% on 2, 3, or 4 or more drugs ($p > 0.05$). **CONCLUSION:** Use of thiazides to treat multidrug hypertension has increased since release of JNC-7 and ALLHAT, indicating evidence-based provision of care in the VA. However, there is still room for improvement and need for additional study of factors affecting thiazide use in hypertensive patients, especially the elderly.

PCV87

PHYSICIAN AND PATIENT FACTORS PREDICTING THE PRESCRIBING OF STATINS IN HYPERTENSION AND DIABETES

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OBJECTIVE: To determine the rate of off-label prescribing of statins for patients diagnosed with hypertension and/or diabetes and to identify the patient and physician characteristics affecting the prescribing of statins. **METHODS:** Data from the National Ambulatory Medical Care Survey (NAMCS) for the year 2005 was used. Hypertension and diabetes visits were identified based on the ICD-9-CM diagnoses code, reason-for-visit codes, and an affirmative answer to a question asking whether the patient is currently suffering from hypertension/diabetes. Statin visits were identified using the NAMCS generic drug codes. "On-label" statin visits defined as visits having ICD-9-CM diagnoses code, reason-for-visit code for hyperlipidemia, Acute Myocardial Infarction, Ischemic Heart Disease, Angina, & Atherosclerosis, a CPT-4 code for revascularization, or a lipid lab test were excluded. Multivariate logistic regression models were applied using Stata 9 to take into account the complex survey design. **RESULTS:** In 2005, 23.1 million diabetes visits (95% CI = 18.3–28.0 million), and 50.1 million hypertension visits (95%

CI = 40.7–59.5 million), resulted in a statin prescription representing 24%, and 22%, of the total visits for the two conditions respectively. Patients aged 41–60 years (OR = 3.49, 95% CI = 1.43–8.47) or 61–80 years (OR = 3.98, 95% CI = 1.40–11.31), or those from metropolitan areas (OR: 2.23, 95% CI: 1.11–4.48) were more likely to receive a statin prescription compared to the respective baseline groups. Whereas residing in the northeast (OR = 0.44, 95% CI = 0.26–0.75) or midwest (OR = 0.40, 95% CI = 0.21–0.77) regions or being black (OR = 0.50, 95% CI = 0.29–0.87) predict significantly lower odds of receiving statin prescription compared with the south region and nonhispanic whites or other race groups. **CONCLUSION:** As expected, age was the most important factor determining the prescribing of statins in hypertension and/or diabetes. It is not clear if these rates of statin prescribing reflect aggressive off-label prescribing or undercoding of on-label diagnoses. Data on more years needs to be analyzed to confirm the findings.

PCV88

OLD HABITS DIE HARD: A NATIONWIDE UTILIZATION STUDY OF CALCIUM CHANNEL BLOCKERS IN TAIWAN

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OBJECTIVE: To investigate the trend of ambulatory calcium channel blockers (CCBs) utilization in Taiwan according to the national health insurance claims over an eight-year period. Special attention would be paid to the extent and situations of prescribing first-line (short-acting) CCBs on a PRN (pro re nata) order. **METHODS:** The visit-based sampling claims datasets of ambulatory care visits from 1997 to 2004, offered by the National Health Insurance Research Database, were analyzed. The datasets represented 0.2% of total ambulatory care visits within the National Health Insurance in Taiwan. The utilization of CCBs was stratified by ingredient and formulation, and the prescriptions of CCBs on a PRN order by the patient's age, the prescribing physician's specialty, and the setting of health care facility. **RESULTS:** During the study period, the CCBs had remained as the most popular antihypertensive agents in Taiwan. The number of defined daily doses (DDDs) of all CCBs per 1000 inhabitants per day increased from 15.3 in 1997 to 36.4 in 2004. The growth of CCBs was attributed to second- and third-generation CCBs, especially amlodipine. While the first-line CCBs, mainly short-acting nifedipine, became less popular with time (from 6.0 DDDs per 1000 inhabitants per day in 1997 to 3.5 in 2004), their PRN use did not have a diminishing trend. In 2004, the short-acting nifedipine on a PRN order still existed in 1.5% of prescriptions containing antihypertensive agents and 3.4% of prescriptions containing CCBs. More than one half of these PRN orders were prescribed by the internists and to the elderly patients; almost four-fifths of these PRN orders were prescribed during normal consultations. **CONCLUSION:** The physicians in Taiwan still had the habit of prescribing short-acting CCBs both on regular use and on PRN use. The reason for such practices and the impact on patients' health deserve attention.

PCV89

PRE AND POST STROKE STATIN USE AND ASSOCIATED HEALTH CARE COSTS AMONG ELDERLY STROKE SURVIVORS

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OBJECTIVE: This study examined associations between pre and post stroke statin use with health care costs among elderly stroke survivors enrolled in a Medicare Health Maintenance Organization (HMO). **METHODS:** This was a retrospective analysis of Medicare HMO in the southeastern region of United States. Stroke survivors were identified using primary inpatient discharge codes of 434.xx or 436.xx during the 'enrollment period' from January 1, 2000 to December 31, 2002. Patients were required to have at least 2 prescription fills for HMG-CoA reductase inhibitors (statin) and continuous eligibility to the HMO benefits during index period. Medication adherence was calculated using prescription refills. Multivariate log-linear regression analyses were used to determine predictors of health care costs. **RESULTS:** A total 181 stroke patients with mean age of 74.3 years (SD = 7.6) and over 60% were studied. Over 55.2% patients were on atorvastatin, followed by simvastatin with 24.3%. The average medication possession ratio for statins was 49.6%. Patients reported poor health status and significant comorbidity. In multivariate log-linear regression analyses factors, we found that statin use in the year prior to stroke (27% of the patients) was significantly associated with decreased health care costs ($p < 0.05$). The only other factor significantly associated with increased health care costs in the post-stroke year was increased comorbidity severity ($p < 0.001$). **CONCLUSION:** Statin use in elderly HMO enrolled elderly patients in the pre-stroke period was significantly associated with significant reductions in health care utilization and costs in the post-stroke year. Prophylactic statin use in elderly patients at risk for stroke may be warranted to decrease post-stroke morbidity resulting in significant health care costs.

PCV90

DISPARITIES IN MEDICAL EXPENDITURES AND UTILIZATION AMONG HYPERTENSIVE MEN AND WOMEN IN THE UNITED STATES

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OBJECTIVE: To estimate and compare annual medical expenditures and utilization attributed to hypertension in men and women of the U.S. And to investigate predisposing, enabling and need predictors of gender differences in hypertension attributable medical expenditures and utilization. **METHODS:** Procedural equity was assessed by applying the theoretical framework developed by Aday et.al. We used the 2001–2004 Medical Expenditure Panel Survey (MEPS) and regression models to estimate medical expenditures and utilization. A cross-sectional study design was used and unit of analysis was person-year. The interaction between hypertension and gender was used to study gender differences. We estimated incremental health care utilizations attributed to hypertension as difference in utilization and expenditures between hypertensive and non-hypertensive individuals. Percentage changes in total and attributable utilization and expenditures of hypertensive men relative to hypertensive women were also estimated. **RESULTS:** Weighted mean total medical expenditure for hypertensive women and men was $5512 and $5266 respectively. However, total expenditure attributable to hypertension for hypertensive women and men was $3272 and $3910 respectively. Therefore, hypertensive men had 19.5% more attributable expenditures relative to hypertensive women. Hypertensive women had significantly more office visits, prescription drug and outpatient visits. However, similar to total expenditure, hypertensive men had 27.3% more office visits, 2.9% more prescription drug, and 10.9% more outpatient visits that is attributable to hypertension than hypertensive women. **CONCLUSION:** Gender remained significant predictor of resource use even after controlling for predisposing, enabling and need factors. Hypertensive women had more utilization and

expenditures than hypertensive men. However, hypertensive men had more utilization and expenditures attributed to hypertension than hypertensive women. Hypertensive men and women with similar health status and comorbid conditions did not have similar utilization and expenditures regardless of their age, income or insurance status. Thus, according to procedural equity, hypertensive men and women were not being treated equally.

PCV91

PATIENT INSURANCE AND MEDICATION CHOICE FOR HYPERCHOLESTEROLEMIA

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OBJECTIVE: To assess the influence of prescription drug coverage on physician recommendations for hypercholesterolemia treatment, specifically comparing coverage types that employ patient copayments and formulary restrictions with unrestricted coverage. **METHODS:** Respondents from an ongoing web-based survey of 2200 randomly-selected primary care physicians in Florida, Massachusetts, North Carolina and Texas viewed a clinical vignette of a patient with hypercholesterolemia and provided a treatment recommendation. Insurance was randomly assigned as commercial, Medicare Part D, Medicaid, or Medicare-Medicaid dual eligible. Commercial insurance patients had no copayments or formulary restrictions; other patients' copayment and formulary information depended on insurance type. We compared drug choices across insurance groups using chi-square tests and root mean squared deviations (RMSDs). **RESULTS:** Data from 229 respondents (1942 eligible, 11.8% response rate) were available at time of submission; 53 respondents were randomized to patients with commercial insurance, 59 to Part D, 59 to Medicaid, and 58 to dual eligible. Nearly all physicians (98%) recommended a statin. Respondents were more likely to select a brand drug for commercial insurance patients (66%) than for Medicare 22%), Medicaid (37%), or dual eligible (29%, overall $P < 0.001$) patients. The most-prescribed brand agent (atorvastatin) was recommended more often and the most-prescribed generic agent (simvastatin) was recommended less often for commercial insurance patients (47%, 30% respectively) than for Medicare (8%, 61%), Medicaid (17%, 51%), and dual eligible (21%, 64%) patients (overall $P < 0.001$). Drug choices for the Medicaid group (RMSD 13.2) most closely approximated the commercial insurance group's distribution, followed by the dual-eligible (RMSD 15.8) and the Medicare (RMSD 17.8) groups. **CONCLUSION:** These preliminary data indicate that physicians' drug recommendations for hypercholesterolemia treatment differ by patients' insurance type. In particular, physicians recommended generic drugs more often than brand drugs for patients with drug coverage that uses copayments and formulary restrictions than for patients with unrestricted drug coverage.

PCV92

THE HEALTH AND ECONOMIC IMPACT OF SWITCHING FROM ATORVASTATIN TO SIMVASTATIN IN THE US

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OBJECTIVES: One recent analysis of brand to generic switching patterns in a large, nationally representative pharmacy claims database from January 2005 to June 2006 suggested that 3% of patients taking atorvastatin were switched to simvastatin. However, 38% of these switches were to less potent doses. This analysis sought to assess the long-term impact of this switching pattern in the US. **METHODS:** A Markov model simulated the future cardiovascular health of Americans aged 35–74 years who were initially free of cardiovascular disease (CVD), but who met NCEP-ATPIII criteria for lipid-lowering treatment. Follow-up occurred until age 75 years. Decision analysis was used to compare the effects of prescribing all subjects atorvastatin versus prescribing 97% atorvastatin and 3% simvastatin. Subjects were profiled on participants of the 1999–2004 NHANES. The risks of CVD and death were estimated from application of a Framingham risk equation and derived from US mortality statistics, respectively. The costs of CVD and statins were derived from administrative health care claims data. A uniform 3% annual discount rate was applied. **RESULTS:** The analysis estimated a cohort of 24,037,997 Americans. If all were to be prescribed atorvastatin, 24.0% would be expected to suffer a cardiovascular event and 24.2% to die by age 75. If 3% were to be prescribed simvastatin at the observed pattern, the equivalent figures would be 24.1% and 24.3%, representing an excess of 2317 cardiovascular events and 9987 deaths, respectively. There would be a net cost saving associated with the switch, but at $42,400 per year of life lost and $27,700 per QALY lost. **CONCLUSIONS:** In the US, many patients are being inappropriately switched from atorvastatin to generic simvastatin, which might lead to an increase in cardiovascular events and overall mortality for little health-economic gain.

PCV93

LIFETIME MEDICAL EXPENDITURES AMONG HYPERTENSIVE MEN AND WOMEN IN THE UNITED STATES

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OBJECTIVE: To estimate and compare lifetime (LT) medical expenditure of hypertension among men and women of the United States. **METHODS:** We estimated medical expenditures with cross-sectional data and survival with prospective data, to estimate lifetime expenditures from ages 20 to 85+. The 2001–2004 Medical Expenditure Panel Survey (MEPS) were used to estimate average annual medical expenditures. Total medical expenditure was defined as sum of inpatient stay, emergency room visits, outpatient visits, office based visits, and prescription drugs expenditures. The 1986–2000 National Health Interview Surveys (NHIS) were linked to mortality in the National Death Index through 2002, to estimate survival with discrete time hazard models. A discount rate of 3% was used to estimate the LT medical expenditures. We controlled for hypertension status, gender, age and race and ethnicity while estimating regression models. In addition, interactions between hypertension and other independent variables were controlled to differentiate different levels of medical expenditures and mortality between hypertensive and non-hypertensive individuals. Both total and hypertension attributable expenditures were estimated. **RESULTS:** Expected total LT expenditure for individuals at age 20, was $244,303 for hypertensive men and $259,499 for hypertensive women. But the LT expenditure that could be attributed to hypertension was $133,933 for men and $74,088 for women. Therefore, hypertensive men had about 81% more attributable LT expenditure relative to hypertensive women. Similarly, hypertensive men of age 40 had about 88% more attributable LT expenditure than hypertensive women, and hypertensive men of age 60 had about 93% more attributable LT expenditure relative to hypertensive women. **CONCLUSION:** Although hypertensive women have more expected LT total expenditure than men, hypertensive men had relatively more expected LT attributable expenditure than women at different ages and the gap widened with age.

PCV94

PREDICTING HIGH COSTS IN MEDICARE BENEFICIARIES WITH HEART FAILURE

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OBJECTIVE: The cost-effectiveness of heart failure (HF) disease management depends on avoiding future high costs. Prospectively identifying HF patients who are likely to incur high costs would be beneficial. **METHODS:** We used a 100% sample of 1,363,977 Medicare beneficiaries hospitalized with a primary diagnosis of HF (ICD-9-CM codes 428.x, 402.x1, 404.x1, 404.x3) between 2001 and 2004. The earliest HF hospitalization for each beneficiary was considered the index. We summed Medicare payments for rehospitalizations in the year following the index hospitalization, adjusted costs to 2001 dollars, and created a binary variable, with patients in the 4th quartile (>$16,500) defined as "high cost." Comorbidities and risks were obtained from the index claim and from inpatient claims in the prior year. Logistic regression was used to predict high cost status in a 75% random derivation sample; the model was validated in the remaining 25%. We evaluated the calibration and discrimination of the model in both samples and refit the model on the entire sample. **RESULTS:** Average Medicare payments in the year following index hospitalization were $38,300 (SD $29,146) among high cost patients and $4272 (SD $4857) among patients in the lower 3 quartiles. Inpatient cost in the prior year was the strongest predictor of inpatient cost in the subsequent year (OR 2.31, 95% CI: 2.27–2.35 for prior year inpatient costs >$16,500 vs. no inpatient costs in the prior year.) In both the derivation and validation cohorts, 11% of patients in the lowest decile and 45% of patients in the highest decile were high cost. The model was well-calibrated. The c-statistic was 0.65 for both the derivation and validation cohorts. **CONCLUSION:** There is limited ability to predict high cost HF patients using claims data alone. Future studies should assess the value of incorporating clinical variables.

PCV95

IMPACT OF ADOPTION OF NEW ANTIHYPERTENSIVE DRUGS ON THE HEALTH CARE UTILIZATION IN HYPERTENSIVE PATIENTS

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OBJECTIVE: This study aims to analyze the hypothesis that utilization of newer medications is associated with decreased health care utilization and increased quality of life in patients with hypertension. **METHODS:** This is a retrospective follow up study of patients identified as hypertensive (ICD-9-CM codes 401–405) and prescribed at least one antihypertensive medication during round one of 1999 MEPS database. Antihypertensive drugs approved by FDA during the years 1996, 1997 and 1998 were defined as 'new antihypertensive drugs'. New drug adopters (NDA) were those hypertensive patients who were prescribed atleast one new antihypertensive medication. The total health care expenditure and the non-prescription health care expenditure were taken as markers for health care utilization and the number of ER visits was a marker for quality of life of a patient. **RESULTS:** Fourteen new antihypertensive drugs were approved by FDA during the year 1996 (3), 1997 (7) and 1998 (4). A total of 1149 (un-weighed) patients were identified as the study population of which 63 (5.88%) patients were identified as NDA's. Females comprised 66.67% (42) in NDA's and 49.82% (534) in non-NDA's. The New drug adopters were found to spend $637 & $675 more on total health care expenditure and on non-prescriptions expenses respectively as compared to non-NDA's. Also NDA's had 0.124 more ER visits as compared to non-NDA's. These results were statistically insignificant at 0.05 level when adjusted for age, gender, income, race, ethnicity, number of co-morbid conditions and insurance status. **CONCLUSION:** No relation was found between the total health care utilization and adoption of newer antihypertensive medications on aggregate level. This signifies the need to scrutinize the pharmacoeconomic evaluation of each new drug before acceptance by physicians and pharmacy managers.

PCV96

THE EFFECT OF MEASUREMENT ERROR FROM POINT-OF-CARE INR DEVICES ON WARFARIN DOSING DECISIONS

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OBJECTIVES: Assessment of point of care devices (POCs) that measure INR does not typically include the impact of measurement error on clinical decision-making. This study determined the effect of POC measurement error on warfarin dosing decisions, and how this effect varies over the INR scale. **METHODS:** For each patient, INR was simultaneously measured using two different POC devices and standard laboratory techniques. Clinicians blinded to INR measurement technique were asked to state a warfarin dosing decision for each INR value. The difference between each POC-derived INR and the laboratory standard measure were recorded for each patient, as were differences in warfarin dosing decisions based on the POC devices versus laboratory standard measures. **RESULTS:** A total of 202 patients on warfarin therapy were enrolled. Overall, the POC devices resulted in different warfarin dosing decisions compared to the laboratory standard in 114 of 404 instances (28%, 95% CI: 24–33%). Discordant dosing decisions resulting from POC and laboratory measures were most common when the laboratory INR was between 1.5–1.99 (40/92, 43%, 95% CI: 33–55%) and 3–3.49 (15/36, 42%, 95% CI: 26–59%). Relatively small amounts of measurement error from the POC devices resulted in different warfarin dosing decisions between the laboratory and POCs at specific intervals in the INR scale. For example, overestimation of INR by the POC by 0.2–0.39 INR units resulted in discordant warfarin dosing decisions in 44% of instances when the laboratory INR was between 1.5–1.99. **CONCLUSIONS:** Measurement error in POC devices leads to different warfarin doses in a high proportion of cases. A relatively small amount of measurement error can result in different warfarin dosing decisions if it occurs at specific intervals on the INR scale. Investigators and regulators should consider the varying effect of measurement error along the INR scale and its impact on clinical decision-making when evaluating POCs.

PCV97

IS THERE A LEARNING CURVE ASSOCIATED WITH EXERCISE TRAINING IN PATIENTS WITH HEART FAILURE?

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OBJECTIVE: Estimating the cost-effectiveness of disease management programs requires a comprehensive assessment of per-

sonnel and patient time. Assessments at a single time point may under- or overestimate the time required to perform related activities. In this study, we use data from a large clinical trial of exercise therapy in patients with heart failure to evaluate whether there is evidence of a learning curve with regard to time spent on non-exercise activities across 36 supervised exercise training sessions across 12 weeks. **METHODS:** As part of the economic evaluation planned alongside the NIH-sponsored HF-ACTION trial, a Provider and Patient Time Assessment Survey was administered across 9 study sites representing a subset of 56 patients. The survey was designed to assess provider time with and without the patient, pre- and post-exercise, to account for a variety of related tasks (e.g. pulling charts, patient education, scheduling, etc.). Linear growth models were used to model the trajectory change of time spent on 'non-exercise' activities across 36 visits. **RESULTS:** Data were available for 39 (69.6%) patients who completed all 36 exercise sessions, 7 (12.5%) patients who were still enrolled in ongoing exercise training, and 10 (17.9%) patients who discontinued exercise training. The average non-exercise time associated with supervised training was 30.3 (SD = 19.8) minutes, comprised of 20.6 minutes spent with patients and 9.5 minutes without patients. After adjusting for whether warm-up/cool-down activities were included, the total time spent on non-exercise activities decreased significantly (parameter estimate: −1.04 minutes/week; $p = 0.007$), with approximately equal reductions in time with patients (−0.57 minutes/week; $p = 0.038$), and without patients (−0.65 minutes/week; $p = 0.058$) over 12 weeks. **CONCLUSION:** Our analysis suggests that providers and patients experienced efficiency gains in regard to time spent on activities associated with supervised exercise training. These results demonstrate the potential importance of comprehensive time assessment when evaluating disease management programs.

PCV98

THE EFFECTS OF STEP THERAPY: LOOKING BEYOND IMPACTS ON PRESCRIBING RATES AND COSTS

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OBJECTIVE: The goal of the study was to test the effects of step therapy on pharmaceutical and medical utilization and costs. This study examined the effect of step therapy for antidepressant and antihypertensive medications. **METHODS:** The data was extracted from the MarketScan database, representing the health care experience of enrollees in employer-sponsored, commercial health plans. The sample consisted of employees and dependents of 4 employers (2-step therapy and 2 controls) who were continuously enrolled in the MarketScan database from 2003 through the third quarter of 2006 and who used antidepressants (N = 15,552 step therapy; N = 45,244 control) or antihypertensives (N = 11,851 step therapy; N = 30,822 control) at least once during the study period. An analytic file was created using a panel data framework, yielding 15 observations or quarters of data per patient. Chi-square and Student's t-tests were computed to compare demographic and clinical characteristics as well as outcome variables between the step therapy and comparison groups after step therapy had been implemented for plans with step therapy. Multivariate generalized estimating equation (GEE) models were used to estimate the effects of step therapy on spending and utilization while controlling for important covariates and adjusting for clustering by patient. **RESULTS:** Step therapy had the intended effect of increasing generic prescribing and lowering brand prescribing. Overall, medication costs were reduced in the step therapy plans in the initial period following implementation. However, inpatient, outpatient, and emergency room utilization and costs were higher in the step therapy plans after step therapy was implemented relative to the comparison groups. Medication discontinuation rates for the targeted drugs increased in step therapy plans. **CONCLUSION:** Implementation of step therapy produces intended and unintended results. The intended results of reducing drug costs are found to co-occur with unintended results that may adversely affect patients as evidenced by higher ER and inpatient utilization.

PCV99

THE FIRST MOVER STRIKES AGAIN. COST-EFFECTIVENESS OF STATINS AND PRESCRIBING BEHAVIOR IN PORTUGAL

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OBJECTIVE: In this study, cost-effectiveness of different doses of Atorvastatin, Pravastatin, Rosuvastatin and Simvastatin are compared. The results are used to evaluate if prescription decisions follow willingness to pay. **METHODS:** Incremental cost-effectiveness ratios (ICERs) were calculated using a model to be published in Value in Health. However, for this analysis, we used efficacy estimates from a meta-analysis that compared several statins across dose ranges. Furthermore, we considered two scenarios. In scenario 1, doses are doubled after 12 weeks of treatment if the LDL level is over 115 mg/dL; in scenario 2, the dose is fixed. For the analysis of prescription patterns and costs per dose, we used official data. **RESULTS:** Results show that, in both scenarios, Pravastatin 10 mg and 20 mg and Atorvastatin 10 mg are dominated. Taking Simvastatin 10 mg as reference, the ICER of Simvastatin 20 mg in scenario 1 is €203,780 and the ICER of Rosuvastatin 10 mg is €108,293, while the ICER of Rosuvastatin 10 mg compared to Simvastatin 20 mg is €61,670. In scenario 2, the ICERs of Simvastatin 20 mg and Rosuvastatin 10 mg are €199.933 and €61.238, respectively, while Rosuvastatin 10 mg dominates Simvastatin 20 mg. In both cases the Simvastatin 20 mg ICER is well above the €50.000 per life year gained threshold. However, Simvastatin 20 mg is the most prescribed alternative in Portugal. In fact, during 2006 its market share was around 66%, while Simvastatin 10 mg accounted just for 2% and Rosuvastatin 10 mg for 12%. Future research will show how results change with the market launch of Rosuvastatin 5 mg. **CONCLUSION:** Doctors are not influenced by economic evaluation when prescribing statins. Results show that Simvastatin 10 mg should be used as first line and Rosuvastatin 10 mg as second line strategies. Most probably, the high market share of Simvastatin 20 mg reflects the "first mover" advantage in the market.

PCV100

THE EFFECTIVENESS OF A PATIENT AND PHYSICIAN EDUCATIONAL PROGRAM IN INITIATING STATIN THERAPY AMONG DIABETICS

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OBJECTIVE: To evaluate the effectiveness of a patient- and physician-directed communication program to consider initiation of statin therapy among diabetics. **METHODS:** Educational letters were sent to physicians and patients from a large commercial health plan. Physician- and patient-directed letters were sent to 593 and 579 patients respectively. Letters to the

physicians were sent prior to the patient letters. Diabetic patients absent of statin treatment in a prior 120-day period were identified. Continuous eligibility was required for the evaluation and only patients over 17 years of age were included. Patients were observed for adding a statin during a 120-day follow-up period. Controls were identified from four other plans with similar characteristics. One-to-one case-control matching and t-test were performed to evaluate the effect of the interventions. Regression analyses were performed to determine the predictors of intervention responsiveness. **RESULTS:** Mean age for patients in the program was approximately 55 years. There were 760 unique patients in both the patient and physician intervention components. Overall, 170 (22.4%) and 112 (11.0%) patients added a statin in the case versus control group (difference 11.4%, $p < 0.0001$). Specifically, among the physician intervention component there were 17.8% and 11.6% of cases versus controls who added a statin (difference = 6.22%, $p < 0.05$). Among the patient intervention component there were 12.3% and 8.6% cases versus controls who added a statin (difference 3.84%, $p < 0.05$). Significant positive predictors of adding a statin include presence of cardiovascular disease, females, and higher comorbidities. **CONCLUSION:** Educational letter-based programs that are directed to physicians and patients are effective in promoting the use of statin therapy among diabetics.

WITHDRAWN **PCV101**

PCV102

THE ASSESSING CARDIOVASCULAR TARGETS (ACT '07) PROGRAM: PRELIMINARY RESULTS FROM A PRACTICE REFLECTIVE ASSESSMENT ACROSS CANADA

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OBJECTIVE: To examine patients' level of cardiovascular risk in community based clinical practice and assess whether treatment targets as specified in Canadian clinical guidelines (hypertension—2007, dyslipidemia—2006, diabetes—2003, metabolic syndrome—2006) are met. **METHODS:** A convenience sample of more than 375 general practitioners recruited from across Canada participated between September and December 2007. Case report forms were completed for at least 20 patients during normally scheduled office visits. Current survey results were compared to a similar survey of 450 general practitioners and 17,188 patients conducted in January to April 2006 that used the 2003 dyslipidemia, 2003 diabetes, & 2005 hypertension guideline targets to assess whether treatment targets were met. **RESULTS:** A total of 1722 patients analyzed to date of which 98% were taking lipid-lowering drugs. Approximately 14,000 patients' data will be available upon study completion. Demographics: 57% male, 40% 65 years or older, 53% 45–64 years. CV risk factors identified: 68% hypertension, 38% diabetes, 26% family history premature CAD, 24% previous history of MI, stroke, or PAD, 25% current or recent smoker, 9% evidence of hyperdyslipidemia. Fifty-four percent of cohort had three or more risk factors. Physician assessed CV risk level: 59% high, 24% moderate, 18% low. Forty percent of patients met the criteria for metabolic syndrome. Patients NOT at guideline targets 2007 survey vs. 2006 survey: hypertension 22% vs. 26%, LDL-C 47% vs. 34%, TC : HDL-C 35% vs. 31%, triglycerides 42% vs. 51%, FBG > 6.2 mmol. 34% vs. 44%, waist circumference 55% vs. 55%. **CONCLUSION:** Preliminary aggregate data shows that despite drug treatment many patients are still not at lipid or blood pressure target levels. Community practice physicians in this survey prescribe lipid-lowering drugs to predominantly high (59%) and moderate (24%) CV risk patients.

PCV103

THE PATIENT SAFETY STANDARDS OF ACUTE STROKE MANAGEMENT IN HUNGARY

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OBJECTIVE: The environment of caring for acute stroke patients impacts the outcome of the process. The aim of the study was to explore the present institutional conditions of acute stroke units and to compare these to the Hungarian national standards. **METHODS:** A cross sectional study design was used to explore the present conditions for acute stroke nursing (nurse staffing, skill mix, shift patterns, physical environment, etc.) in 11 institutions representing all regions of Hungary. The collected data were compared to the professional standards lied in the government decree. The data were collected in the beginning of 2005. The data analysis was done with Chi-square and ANOVA method using SPSS 11.0. **RESULTS:** The examined institutions represent 19% (658) of active neurological beds in Hungary. The nursing posts were not filled in 13% of the 11 units, furthermore the total number of nursing posts were under the minimum recommended standards with 17%. A total of 81% (219) of the filled nursing posts are staffed with qualified registered nurses, out of them 5% has a degree. In three institutions degree nurses are not available at al. 80% of the nurses are between 21–45 years. The average nurse-patient ratio: 2.4:1 (lowest: 1.8, the more: 3.6). In 10 out of 11 institutions have ISO 9001 QA accreditation. The tools for helping nurses' work are not enough and correlating with lower qualification levels significantly ($p < 0.01$). **CONCLUSION:** The nursing shortage is a serious problem in stroke units (30%). Therefore, nursing can not meet the criteria lied in the government decree and in the ISO 9001 system. Although the majority of the nursing staff are qualified not all department employs degree nurses who could develop the professional nursing.

PCV104

RELATIONSHIP BETWEEN QUALITY OF CARE AND EXCESSIVE COST FOR MEDICARE PATIENTS UNDERGOING LOWER EXTREMITY BYPASS SURGERY

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OBJECTIVE: To examine the relationship between the excessive cost and quality of care across US hospitals for Medicare patients undergoing lower extremity by pass surgery. **METHODS:** We examined outlier payments in patients undergoing lower extremity bypass surgery (n = 43,886) using National Medicare claims database. Using multiple logistic regression we explored the relationship between hospital outlier payments and hospital quality as reflected by risk-adjusted mortality rates. **RESULTS:** The proportion of patient associated with outlier payments was 10%. Total Medicare outlier payments for lower-extremity bypass graft was $78,921,669 averaging $18,214 per patient. There was a negative correlation between risk-adjusted mortality rates and outlier payments. Proportion of systematic variation in hospital outlier payment rates explained by hospital factors explained 7.8% of in-between variation of outlier rates in lower extremity bypass. **CONCLUSION:** There exist negative relationship between quality and excessive cost across the hospitals. However,

only small variation of the excessive cost distribution can be explained by quality.

PCV105

IMPACT OF GUIDELINES FOR TREATMENT AND PROPHYLAXIS OF VENOUS THROMBOEMBOLISM IN COMMUNITY HOSPITALS

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OBJECTIVE: To evaluate the impact of guidelines for treatment and prophylaxis of VTE on appropriateness of anticoagulant therapy, JCAHO performance measures, adverse drug outcomes, and total cost of therapy. **METHODS:** We conducted a multi-hospital 'pre-post' guideline intervention study. Guidelines for VTE treatment and prophylaxis were developed and implemented in the participating hospitals. Retrospective chart review was used to collect patient data during the pre and post periods. **RESULTS:** The number of participating hospitals and total patient cases submitted by the hospitals were 23 and 617, respectively in the pre-guideline (PRG) phase and 13 and 338, respectively in the post-guideline phase (POG). The appropriateness of prescribing (as measured by the dose, duration, and the type of anticoagulant used) increased by 7% (PRG 77%, POG 84%). JCAHO performance measures for 1) percentage of VTE patients receiving education; 2) percentage of patients with reduced LMWH dosage in compromised renal failure; 3) percentage of patients with normal INR; 4) percentage of patients with objective confirmation of clinically suspected VTE; 5) percentage of unfractionated heparin (UFH) managed by nomogram/protocol; and 6) percentage of patients with anticoagulation overlap of parenteral and warfarin therapy, increased by 20%,17%, 13%, 9%, 6%, and 1%, respectively. JCAHO measures for 1) VTE treatment for discharged patients with active cancer, and 2) platelet count monitoring for patients with VTE receiving UFH, decreased by 2% and 11%, respectively. The proportion of patients experiencing at least one anticoagulant related adverse drug outcome decreased by 0.5% and rates of major bleeding decreased by 1% in POG. On average, the total cost of therapy (cost of major/minor bleeding, DVT, PE and drugs costs) decreased by $105 per patient in POG.

CONCLUSION: Implementation of VTE treatment and prophylaxis guidelines improved appropriateness of anticoagulant therapy in the participating hospitals resulting in improved outcomes, reduced costs, and improved quality performance.

DIABETES/ENDOCRINE DISORDERS—
Clinical Outcomes Studies

PDB1

EXENATIDE UTILIZATION AND EFFECTIVENESS IN A HEALTH PLAN POPULATION

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OBJECTIVE: Numerous clinical outcomes trials have demonstrated the benefits of achieving glycemic goals in patients with type 2 diabetes (T2D). In controlled clinical trials, the incretin mimetic exenatide improved glycemic control in patients with T2D; 34% to 46% of patients achieved A1C ≤7% and mean A1C change from baseline was –0.8% to –0.9% (baseline A1Cs: 8.2% to 8.7%). To investigate the effects of exenatide in clinical practice, this retrospective cohort study used a large, US commercial health plan claims database to describe baseline characteristics, comorbidities, concomitant therapies, and clinical effectiveness in patients initiated on exenatide. **METHODS:** A total of 4936 patients were identified having a new prescription claim for exenatide between May 1, 2005 and June 30, 2006 (first claim = index date), with ≥12 months of pre- and post-index eligibility, and ≥18 years old. **RESULTS:** Mean (±SD) age was 53.7 ± 10.2 years (11.7% ≥65 y; 52% female). The 12-month mean (SE) medication possession ratio (MPR = days of supply/365 days) in patients with >1 prescription claim was 66 ± 30%. Most patients analyzed (94%) were treated with at least one other antidiabetic medication at initiation (100 d pre-index to 15 d post-index); 25% with one drug, 35% with two drugs, and 34% with ≥3 drugs. The mean number of antidiabetic drugs (including exenatide) per patient was similar at initiation (3.08) and post-index (3.05). Clinical effectiveness was measured in all patients with an A1C >7.0% at baseline (≤100 d pre-index) and having both baseline and post-index (60–365 d) A1C data available (n = 201; mean baseline A1C = 8.9 ± 1.5%). In this cohort, 31% achieved A1C ≤7% in the post-index period and mean A1C change from baseline was –0.8%. **CONCLUSION:** The mean change in A1C and percentage of patients achieving A1C ≤7% in this real-world analysis mirrored results of controlled clinical trials. Furthermore, glycemic improvement was achieved without a further increase in concomitant antidiabetic drugs.

PDB2

HBA1C GOAL ATTAINMENT IN RELATION TO DOSE AMONG DIABETES PATIENTS USING METFORMIN

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OBJECTIVE: To study dosing frequency of metformin in relation to HbA1c-goal attainment in daily practice. **METHODS:** Data for this nested case-control study were obtained from the PHARMO Record Linkage System, including among others linked drug-dispensing and clinical-laboratory records of approximately three million individuals in defined areas of The Netherlands. The study cohort included new users of oral glucose-lowering drugs (OGLD) between 1999–2005, with a baseline HbA1c ≥7% and consecutive HbA1c-measurements within 18 months. Cases attained HbA1c-goal (HbA1c <7%) within 18 months. Controls did not attain HbA1c-goal. Compliant cases and controls on metformin monotherapy were included in the analyses. Dosing frequency was dichotomized into once-daily and twice-daily or more. In the multivariate analysis we considered OGLD-dose, baseline HbA1c, prescriber and number of HbA1c-measurements. **RESULTS:** The study cohort included 3107 new OGLD-users. The analyses included 753 cases and 477 controls using metformin. Dosing twice-daily or more was associated with a 71% higher probability of attaining goal (OR 1.71 (95%CI 1.31–2.24)) compared to once-daily dosing, after adjustment for baseline HbA1c and prescriber. We could not distinguish between the effect of dose and dosing frequency as these were closely related. Statistical testing in the analyses stratified by dose was prohibited by small numbers. **CONCLUSION:** About 40% of compliant metformin users were not at goal because of dosing problems. A strong correlation between total daily dose and dosing frequency did, however, not permit to identify one of these dosing items as most important attribute.

WITHDRAWN **PDB3**

PDB4

ESTIMATION OF STUDY POPULATION SIZE FOR EFFECTIVENESS OUTCOMES AT 6 AND 12 MONTHS VIA ELECTRONIC MEDICAL RECORDS

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The lag between product launch and prescribing impacts research timing. This will describe methods applied to a population treated with a new antidiabetic agent, exenatide, to project patient counts for 6 months and 12 months real-world outcomes analyses. Patients prescribed exenatide via the General Electric Electronic Medical Record (EMR) database by March 31, 2007 were identified. The proportions of patients remaining active 6 months and 12 months on March 31, 2007 and with baseline and follow-up hemoglobin A1C values were identified. Starts for 2Q07 were estimated based on 4Q06 to 1Q07 growth, and the number of patients who would have started exenatide at least 6 months or 12 months before December 31, 2007 was projected. Rates and portions with A1C values were applied to these counts to predict how many would be active at least 6 months and 12 months on December 31, 2007 and have outcomes data. Exenatide was prescribed for 8372 patients through March 31, 2007. A total of 5392 and 2240 started exenatide at least 6 months or 12 months prior to March 31, 2007. A total of 2853 (52.9%) had 6 months and 1152 (51.4%) had 12 months activity. Of these 1721 (60.3%) and 789 (68.5%) had baseline and follow-up A1C readings. The rate for 1Q07 was 20%; thus the estimated number prescribed exenatide by the end of 2Q07 was 10,043. Thus, 10,043 and 6946 would be prescribed exenatide at least 6 months and 12 months before December 31, 2007. Of these, 3207 and 2447 would be active and have baseline and follow-up A1C values. Estimates based on prescribing growth and patient retention was used to estimate patient counts for outcomes analysis. This facilitates research and planning for research on a new product. A validation of estimates will be conducted and reported when available.

PDB5

COMPARISON OF CLINICAL EFFECTIVENESS AND SAFETY OF GLULISINE VERSUS INSULIN LISPRO, ASPART AND REGULAR HUMAN INSULIN IN PATIENTS WITH TYPE 1 AND 2 DIABETES

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OBJECTIVE: The aim of this analysis was to compare clinical effectiveness of insulin glulisine versus insulin lispro, aspart and regular human insulin in patients with type 1 and 2 diabetes. **METHODS:** The clinical effectiveness was analyzed according to guidelines of Cochrane Collaboration and HTA Agency in Poland (AOTM). The comparison of insulin glulisine with comparators was performed as direct comparisons. **RESULTS:** Patients with type 1 diabetes: There was no statistically significant difference between insulin glulisine and insulin lispro, aspart and regular human insulin in change in mean HbA1c from baseline. Also there was no statistically significant difference between groups in number of patients with hypoglycemia (overall, nocturnal and severe). The comparison of safety parameters for insulin glulisine versus insulin lispro, aspart and regular human insulin didn't show significant differences between analyzed groups. Patient with type 2 diabetes: Meta-analysis of two clinical trials showed no statistically significant difference between insulin glulisine and regular human insulin in change of mean HbA1c. However in one study there was statistically significant difference in favour of insulin glulisine compared to regular human insulin in change of HbA1c –0.11%(95% CI: –0.21; –0.008) after 26 week of follow up. There was relevant difference between the two groups in favour of insulin glulisine in reporting of nocturnal hypoglycemia OR: 0.73 (95% CI: 0.57; 0.94). Frequency of adverse events was comparable between groups. **CONCLUSION:** Insulin glulisine has efficacy comparable to insulin aspart, lispro and regular human insulin in patients with type 1 diabetes. Insulin glulisine, in comparison with regular human insulin is more effective in treatment of patients with type 2 diabetes. There are no differences in safety between analyzed comparators.

WITHDRAWN **PDB6**

PDB7

EVALUATION OF INSULIN CONTAINING ANTI-DIABETIC REGIMENS IN HIGH-RISK CARDIOVASCULAR PATIENTS WITH A PRE-TREATMENT A1C MEASUREMENT GREATER THAN 9%

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OBJECTIVE: The purpose of this analysis was to determine if high-risk cardiovascular patients with concomitant diabetes and a pre-treatment A1c measurement greater than 9% experienced better outcomes with insulin containing anti-diabetic medication regimens than similar patients not taking insulin. **METHODS:** High-risk cardiovascular patients with concomitant diabetes and a pre-treatment A1c measurement of greater than 9% from a large western United States integrated health care system were evaluated for an A1c measurement at least three months prior to treatment initiation and a follow-up measurement at least three months following initiation. In the case of patients taking insulin, the three month follow-up period started with the initiation of insulin. Change in A1c resulting from medication treatment was evaluated using a two-step endogenous treatment regression model, with insulin as the endogenous treatment variable. Exogenous independent variables included hypertension diagnosis, hyperlipidemia diagnosis, age, gender, and distance from treatment goal (A1c less than 7%) at baseline. Standard errors for beta coefficients were computed using HCCM3. **RESULTS:** Of 11,181 diabetic patients, 707 (314 on insulin) patients met the inclusion criteria. Although both insulin and non-insulin containing treatment regimens reduced A1c from baseline to follow-up, patients on insulin were associated with a greater reduction in A1c than patients not on insulin. The difference in change was 2.6% and was statistically significant ($p = 0.0029$). **CONCLUSION:** Use of insulin in an anti-diabetic regimen in high-risk cardiovascular patients with concomitant diabetes and a pre-treatment A1c greater than 9% resulted in a significantly greater reduction in A1c compared to patients not taking insulin.

PDB8

DEFINING HYPOGLYCEMIA AND ASSESSING ITS AFFECT ON OUTCOMES IN THE HOSPITAL SETTING

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Quantify the impact of hypoglycemia on outcomes of hospitalized diabetic patients and determine how variations in the definition of hypoglycemia affect outcomes. This study used an EMR database of inpatient and ED encounters for adults with diabetes treated at 70 hospitals during 2000–2006. Patients presenting to

the ED and subsequently admitted as inpatients were considered as one encounter. Encounters with hypoglycemia were categorized into 3 mutually exclusive groups: 1) encounters due to hypoglycemia required a primary inpatient diagnosis or any ED diagnosis of hypoglycemia (ICD-9-CM code 251.0, 251.1, or 251.2); 2) encounters in which patients presented with hypoglycemia (ie, first lab blood glucose [BG] during the first 24 hours in the hospital < 70 mg/dL); and 3) encounters in which patients developed hypoglycemia only after the first 24 hours in the hospital. Outcomes were total charges, length of stay, discharge to a skilled nursing facility (SNF), and inpatient mortality. Encounter types 2 and 3 were each compared with encounters without hypoglycemia (ie, all BG values ≥70 mg/dL). Comparisons were adjusted for potential confounders (e.g., reasons for hospitalization, comorbidities, propensity score for hypoglycemia) using multivariate regression models. Hypoglycemia was rarely used as a primary diagnosis. Of 519,317 encounters (n = 215,922 diabetic patients), 732 (0.14%) had hypoglycemia as the reason for the encounter, and most (91%) were ED only without admission. However, in 8971 encounters (1.73%), patients presented with hypoglycemia. In an additional 19,487 encounters (3.75%), patients developed hypoglycemia. All outcomes for patients who developed hypoglycemia were significantly different than those for patients without hypoglycemia. However, only charges and odds of discharge to a SNF were significantly associated with presentation with hypoglycemia. The effect of hypoglycemia on outcomes depends on when hypoglycemia is defined and is more pronounced in patients who developed hypoglycemia than in patients who presented with hypoglycemia.

PDB9

TYPE 2 DIABETES IN YOUTH: 2002 AND 2006 PREVALENCE AND OBESITY IN A PRIMARY CARE SETTING

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OBJECTIVE: This study estimates the prevalence of type 2 diabetes (T2DM) in youth treated in a primary care setting. Published prevalence estimates range from 0.2 to 1.5 per 1000, varying by estimation population. This study also quantifies the association between T2DM and obesity and seeks to confirm clinical links that have been established between T2DM among youth and obesity. **METHODS:** A cross-sectional analysis was conducted in the General Electric Electronic Medical Record (EMR) database in 2002 and 2006. The prevalence population included youth aged 5 to 19 with continuous database activity during the year. T2DM included two T2DM ICD-9 codes, one T2DM ICD-9 code and a prescription for insulin, a prescription for an oral antidiabetic agent, or two fasting blood glucose levels ≥126 mg/dl during or prior to the estimation year, without type 1 diabetes or polycystic ovary syndrome. Findings were stratified by baseline BMI. The odds of developing T2DM by BMI category were estimated by logistic regression. **RESULTS:** The 2002 and 2006 prevalence populations included 89,087 and 107,857 youth respectively. The prevalence of T2DM per 1000 was 2.20 in 2002 and 4.45 in 2006. Of those with a baseline BMI reading, 8.0% and 9.4% were obese (BMI > 30 kg/m^2) in 2002 and 2006 respectively. T2DM prevalence in the obese was 6.8 and 22.7 per 1000 in 2002 and 2006 respectively; age, gender and race adjusted odds of the obese developing T2DM relative to the normal weight population were 6.56 and 11.49 in 2002 and 2006 respectively ($P < 0.001$ for both). **CONCLUSION:** Obesity substantially increases T2DM risks. The prevalence of T2DM in a population of youth routinely treated in a primary care setting is higher than other recent estimates and increased dramatically in a four year time frame. Additional research is warranted to identify treatment trends and outcomes in youth with T2DM.

PDB10

OBESITY IS MORE PREVALENT AMONG ABORIGINALS WITH DIABETES AS COMPARED TO ALL CANADIANS WITH DIABETES

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OBJECTIVE: The rate of heart disease is 1.5-fold greater among Aboriginals compared to the general Canadian population. Risk factors such as smoking, hypertension, dyslipidemia, obesity and diabetes are also more prevalent. For example, type 2 diabetes is 3.6–5.3 times more prevalent among Aboriginals. Obesity is relatively common in diabetes, contributing to poor diabetes control and the development of its associated complications. It is of interest to compare the prevalence of obesity among Aboriginals with diabetes to all Canadians with diabetes. **METHODS:** A MEDLINE search was conducted (1966–2007) using the following MeSH terms: Indians—North American, Canada, diabetes mellitus, obesity and body mass index (BMI). Population-based studies reporting the proportion of Aboriginals with diabetes that were overweight (e.g. ≥25 kg/m^2 for women, ≥27 kg/m^2 for men) or obese (≥30 kg/m^2) were retrieved. Prevalence estimates of elevated BMIs for Canadians with diabetes were obtained from the LCDC National Population Survey (1996–1997) and the Ontario Diabetes Database (1996–1997; Ontario Health Survey). **RESULTS:** Twenty-three studies were retrieved. Seventeen studies were excluded because either the patient populations or definitions of obesity/overweight differed between studies. Ranges of 76.2–86.5% of Aboriginals with diabetes were either overweight or obese compared to 59.4% of all Canadians with diabetes. Furthermore, 44.1–69.6% of Aboriginals with diabetes were obese compared to 28.6% of all Ontarians with diabetes. **CONCLUSION:** When compared with the general Canadian population with diabetes, elevated BMI is more commonly observed among Aboriginals with diabetes. These findings suggest that obesity, as a risk factor for poor diabetes control and heart disease, is not optimally managed within the Aboriginal diabetes population and may pose a great burden to the Aboriginal community. The precise impact of obesity and diabetes on the health of Aboriginals warrants further research.

PDB11

PREVALENCE OF AND RISK FACTORS FOR HOSPITALIZATIONS IN PATIENTS WITH TYPE 2 DIABETES IN SOUTH KOREA

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OBJECTIVE: To estimate prevalence of hospitalizations in diabetic patients, to determine factors which influence hospitalizations attributable to diabetes, and to calculate length of stay (LOS) using health insurance claims data. **METHODS:** This retrospective cohort study used health insurance claims data collected from three Catholic University Medical Centers in South Korea. Type 2 diabetes patients were identified if patients received treatment for diabetes (ICD-10 code of E11x) at least

once annually during the study period of 2000–2005, were >=30 years old, and did not have a diagnosis of pregnancy or cancer. Hospitalization attributable to diabetes was defined as admissions due to diabetes, diabetic complications, or cardiovascular diseases. Cox-proportional hazard model was developed to determine significant factors for hospitalizations after adjusting for the study variables. Two-part model (First part: logistic regression and second part: generalized linear model with log link function) was utilized to estimate mean length of stay. **RESULTS:** A total of 7952 patients with type 2 diabetes were identified with mean age of 57.4. Approximately 5.4% of them were hospitalized due to diabetes. Type 2 diabetes patients were more likely to be admitted if they were older than 65 years (relative risk (RR) = 1.36; 95% confidence interval (95%CI) = 1.09–1.71), took both insulin and oral antidiabetic medications (RR = 4.31; 95% CI = 3.30–5.63) compared to patients without diabetic treatment, or had frequent physician office visits (RR = 2.06; 95% CI = 1.53–2.76). Overall, patients stayed at the hospital on average of 2.23 ± 0.08 days. **CONCLUSION:** Type 2 diabetes patients who took both insulin and oral antidiabetic medications due to poor glucose control were more likely to be admitted to hospital. It is recommended that aggressive early intervention for controlling blood glucose and improving compliance with diabetes treatment may prevent hospitalizations related with diabetes.

PDB12

CLINICAL AND ECONOMIC OUTCOMES RELATED TO A PAY-FOR-PERFORMANCE PROGRAM

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OBJECTIVE: Physician pay-for-performance are gaining momentum as an approach to improve health care quality in the United States. The objective of this study was to show the beneficial effects of physician incentive programs for the treatment of diabetic patients as well as the potential for cost saving. **METHODS:** Administrative claims data from a large regional health plan were used through the 2004–2005 time-frame. Diabetic patients age 18–75 with private health insurance coverage were included in the analysis. Multivariate Poisson regression was used to model the likelihood of diabetes-related hospitalizations between patients who were being treated by a physician participating in the incentive program and those that were not. Likewise, cost savings associated with diabetic patients treated by physicians participating in the incentive program was also computed. **RESULTS:** Over a two year period, patients in the P4P program showed a lower combined predicted number of hospitalizations (0.31) than that of patients not in a P4P program (0.39). In addition, cost benefit analysis using decision tree modeling showed the costs of the P4P program was entirely covered by the reduction in cost resulting from decreased hospitalization rates. With the incentive program, the health plan saved approximately $24 per adult diabetic and a total cost savings of $675,000. Sensitivity analysis shows that the higher quality of care resulting from the incentive based programs directly benefits outcomes of diabetes patients with an added benefit of reducing program cost. **CONCLUSION:** The cost savings associated with physician pay-for-performance programs depend highly on the effectiveness of the program to improve delivery of quality care. Physician incentive programs have the potential to improve patient outcomes as well as lead to economic benefits for payers.

PDB13

PREDICTING INPATIENT HOSPITALIZATION RISKS FOR MEDICAID DIABETES PATIENTS

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OBJECTIVE: To develop a model to predict the probability of diabetes patients having inpatient hospitalization in the following year. **METHODS:** A retrospective cohort study was conducted based on a population of 322 type II diabetes patients age >=19 and enrolled in a Medicaid managed care plan from the year 2003 to 2005. Models were developed by using medical/pharmacy utilization data to predict the probability of having the following events in the next year: (1) whether the patient had any inpatient hospitalization, (2) whether the patient had any micro/macro vascular inpatient hospitalization, (3) whether the patient had any metabolic related inpatient hospitalization and (4) whether the patient had any infectious inpatient hospitalization. Main predictors of interests are diabetes compliance and the use of statin. Covariates include diabetes treatment pattern, age, sex, co-morbidities among other variables. Logistic model is used to conduct the analysis. **RESULTS:** The study population was 74% female with an average age of 49.2 (S.D = 8.4). Non-adherence of diabetes drug (odds ratio = 1.57, 95% CI: 1.09–2.24), use of statin (odds ratio = 0.58, 95% CI: 0.39–0.85), and previous inpatient history (odds ratio = 3.50, 95% CI: 2.42–5.07) were significant in predicting any inpatient hospitalization. Non-adherence of diabetes drugs was not a significant predictor for micro/macro vascular events (odds ratio = 0.74, 95% CI: 0.33–1.67), but it was associated with significantly increased probabilities of having metabolic events (odds ratio = 1.58, 95% CI: 1.03–2.43) and infectious events (odds ratio = 2.70, 95% CI: 1.10–6.66). The use of statin was significant only for predicting metabolic events (odds ratio = 0.49, 95% CI: 0.32–0.77). It was not significant for predicting vascular events (odds ratio = 0.98, 95% CI: 0.45–2.15) and infectious events (odds ratio = 1.40, 95% CI: 0.49–3.72). **CONCLUSION:** The modeling results show that improving compliance of diabetes drug and encouraging the use of statin could be associated with reducing inpatient hospitalizations in a short period of time.

DIABETES/ENDOCRINE DISORDERS—Cost Studies

PDB14

BUDGET IMPACT OF ADDING FIXED-DOSE COMBINATION OF PIOGLITAZONE PLUS GLIMEPIRIDE TO A FORMULARY PLAN OVER A THREE-YEAR TIME FRAME

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OBJECTIVE: To assess the budgetary impact of adding the fixed-dose pioglitazone plus glimepiride to a managed care formulary plan over a three-year period (2006–2008). **METHODS:** This model is an Excel-based spreadsheet which assumes a hypothetical scenario wherein a plan comprising one million covered lives assesses the financial impact of pioglitazone plus glimepiride to formulary. The prevalence of type 2 diabetes is assumed to be 4.64% or approximately 46,400 members. Existing oral antidiabetic (OAD) agents on the formulary include TZDs (pioglitazone, rosiglitazone, TZD combinations with metformin, & rosiglitazone plus glimepiride), sulfonylureas (glipizide, glyburide, glimeperide), metformin, & a DPP4 inhibitor (sitagliptin). Costs for these agents were based on WAC (2006). Market shares were based on internal market research and IMS data. Metrics of budgetary impact are reported in terms of annual treatment costs & per member per month (PMPM) costs. These

metrics were adjusted for patient compliance with OADs as reported in the literature. These metrics are reported as adjusted and unadjusted estimates for patient compliance over a three-year time frame. **RESULTS:** In this scenario, market share for pioglitazone plus glimepiride was assumed to increase from 0.04% (2006) to 0.36% (2007) to 0.50% (2008). Projected annual treatment costs adjusted for compliance ranged from $22,240 (2006) to $200,164 (2007) to $278,006 (2008). Unadjusted estimates range from $35,295 (2006) to $317,652 (2007) to $441,183 (2008). Projected PMPM costs adjusted for compliance ranged from $0.002 (2006) to $0.017 (2007) to $0.023 (2008). Unadjusted PMPM estimates range from $0.003 (2006) to $0.026 (2007) to $0.037 (2008). **CONCLUSION:** The budget impact of adding pioglitazone plus glimepiride on formulary was minimal over a three-year time frame in both scenarios. This is driven by anticipated market projections estimating the utilization of pioglitazone plus metformin among the class of OAD agents.

PDB15

COSTS OF PEN (NOVOPEN(r) 3) VERSUS SYRINGE IN THE TREATMENT OF DIABETES MELLITUS TYPE 2—A PHARMACOECONOMIC STUDY FROM THE SLOVAK REPUBLIC

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OBJECTIVE: There is a practically stable 5.3 % prevalence of diabetes mellitus (DM) in Slovakia. The treatment ratio was as follows: 47.6 % patients are on diet, 30.8 % on PAD and 21.6 % on insulin. The main objective of this study was to determine if the intensified insulin therapy with insulin pen is cost-effective compared to conventional therapy. **METHODS:** Direct medical an non direct costs were evaluated in retrospective randomized study in patients with DM type 2. A group of 48 patients on intensified insulin therapy (IIT) was compared with a group of 28 patients treated with conventional therapy (CT). **RESULTS:** The average duration of DM was 113.51 months in IIT group and 147.67 months in CT group. The significant difference ($p < 0.05$,s) was observed in age (53.19 in IIT vs 55.11 in CT) and in serum cholesterol (6.14 in ITT vs 6.65 in CT). The hospital costs were higher in IIT: €568 vs. €511 in CT. The laboratory costs were lower in IIT: €133 vs. €167 in CT. IIT had higher costs for reimbursed drugs, glucometers and insulin pens by Health Insurance Companies: €1065 vs. €1024 in CT. No statistical difference was recorded in co-payments: €99 in IIT vs. €100 in CT. Indirect patients costs based on time loss were €185 in IIT vs. €227 in CT. The total costs per patient per year were €1972 in IIT vs. €1964 in CT. **CONCLUSION:** The treatment of DM type 2 with insulin pen NovoPen® 3 is clinically and economically effective in comparison to the treatment with syringe. The estimated costs of LYS are €4759 in men and €6519 in women per patient with DM in Slovakia.

PDB16

THE BUDGET IMPACT OF APIDRA(r) (INSULIN GLULISINE) REIMBURSEMENT IN POLAND

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OBJECTIVE: To assess the impact of Apidra®, a new rapid-acting insulin analog used in type 1 and 2 diabetes, on the health care system in Poland. **METHODS:** Budget impact analysis has been programmed using Microsoft Excel® 2003. Five-year population-based model assumes that Apidra® will gain market shares from rapid- and short acting insulins in proportion to their original market shares distribution. Limit and reimbursement rate of Apidra® was set equal to that of other rapid/short acting insulins. In addition to the cost of insulins, the cost of blood glucose monitoring strips was included in the total annual costs. The perspective of: 1) public payer, 2) public payer + patient; was considered separately. A range of compliance levels were also taken into account. Sensitivity analysis (including the analysis of extreme scenarios—most pessimistic and optimistic) was performed to account for uncertainty in input parameters. **RESULTS:** Financing Apidra® from public means will have no consequences for a public payer, which results from equal limits for all rapid- and short acting insulins. From the perspective of both payers for health care services (NHF and patient), incremental costs associated with introducing Apidra® to the market increase from 642–1 018 PLN (0.0001–0.0002%) in year one to 20 307–32 226 PLN (0.0044–0.005%) in the 5th year post-launch, depending on the drug compliance level assumed (230 or 365 days/year). Results were most sensitive to the change of Apidra(r) price. **CONCLUSION:** Results of the analysis indicate that decision to finance Apidra® from public means in Poland would have no consequences for a public payer, and the impact from the perspective of both payers (public payer and patient) is not likely to be significant.

PDB17

AN EVALUATION OF EXPECTED WASTE OF GROWTH HORMONE PEN DEVICES AND AN ELECTRONIC GROWTH HORMONE DELIVERY DEVICE

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OBJECTIVE: Somatropin is human growth hormone (GH) produced by recombinant DNA technology. Several somatropin products with unique delivery devices are available. When administering the last dose from a device, patients may have an insufficient amount of GH remaining for a full dose. Based on a survey of parents/patients using pen devices conducted at the 2007 MAGIC Foundation Convention, 63% of respondents reported that they were likely to discard this remaining amount left in the cartridge (i.e., waste). easypod, an electronic GH delivery device for somatropin (rDNA origin) for injection (EMD Serono, Inc.), contains a dose spread feature designed to minimize waste. A model was developed to estimate potential GH waste per patient with pen devices and the easypod device and quantify the potential annual economic impact. **METHODS:** Base case model utilizes a daily dose (2 mg) reflective of the national mean for all GH pen devices (Wolters Kluwer, 2007). A 10% mechanical loss is applied uniformly across all devices based on the reported mechanical loss in the prescribing information for somatropin (rDNA origin) for injection (EMD Serono, Inc.). Model assumes that the easypod dose spread function (±10%; ±25%; or ±50%) is activated by the clinician (base case utilizes ±25%). This function minimizes waste by automatically adjusting the daily dose (+/–) to optimize the cartridge content; the cumulative average of injected doses is equal to the prescribed daily dose. Annual cost of GH waste per patient for each device is reported (wholesale acquisition cost, Medispan, 2007). **RESULTS:** Expected annual cost of GH waste per patient was lowest for easypod ($112). Results for pen devices ranged from $794 to $3363 (using largest cartridge size for each product). Results fluctuate depending on daily dose, cartridge

size and dose spread assumptions. **CONCLUSION:** Cost of GH waste can be an important consideration when evaluating GH devices.

PDB18

COMPARISON OF RESOURCES UTILIZATION (RU) AND COST IN DRUG NAÏVE TYPE 2 DIABETES (T2D) PATIENTS TREATED WITH ROSIGLITAZONE (RSG) VS. SULFONYLUREA (SU) MONOTHERAPY

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OBJECTIVE: The objective of this study was to compare RU and costs for drug naïve patients treated with RSG versus SU first-line monotherapy using real-world claims data. **METHODS:** Based on medical, pharmacy, and disability insurance claims data between October 2001 and December 2004, patients with a diagnosis T2D who were newly initiated on an OAD, ≥18 years old, and had ≥60 days of uninterrupted treatment were analyzed. Frequency of inpatient and outpatient visits and average direct (inpatient, outpatient, and pharmacy) and indirect (work-loss) costs were compared between the RSG and SU groups. **RESULTS:** A total of 3377 RSG and 11,778 SU patients met the inclusion criteria with RSG patients being younger (63.8 vs. 66.9 years, $p < 0.001$) with less co-morbidities (Charlson co-morbidity index 0.95 vs. 1.23, $p < 0.001$) at baseline. During treatment, RSG patients incurred fewer inpatient visits (0.47 vs. 0.77 visits per patient per year (PPPY), $p < 0.001$), outpatient visits (17.0 vs. 17.9 visits PPPY, $p < 0.001$), and hospital days (1.6 vs. 2.9 days PPPY, $p < 0.001$) than SU patients. The total direct medical cost was lower in the RSG group ($1065 vs. $1315 per patient per month (PPPM), $p < 0.001$) than the SU group, including lower inpatient and outpatient cost ($717 vs. $1046 PPPM, $p < 0.001$) but higher pharmacy cost ($348 vs. $270 PPPM, $p < 0.001$). After taking into account the indirect work-loss cost, the total direct and indirect cost was significantly lower in the RSG group ($1103 vs. $1355 PPPM, $p < 0.001$). Multivariate analysis controlling for age, gender, co-morbidities, and other covariates confirmed that the RSG group was associated with a significantly lower total cost than the SU group (cost difference: $92.75 PPPM, $p = 0.012$). **CONCLUSION:** This observational study of over 15,000 patients initiated on first-line monotherapy shows that RSG patients incur significantly lower resource utilization and costs than SU patients, outweighing higher pharmacy cost.

PDB19

ECONOMIC EVALUATION OF SOMATROPIN (NORDITROPIN) FOR THE TREATMENT OF SHORT CHILDREN BORN SMALL FOR GESTATIONAL AGE (SGA)

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OBJECTIVE: Current treatment options for short children born small for gestational age (SGA) are limited; however, the growth hormone somatropin (Norditropin) has been shown to normalise height in childhood and adolescence compared to no treatment. The aim of this study was to establish whether somatropin (Norditropin) was a cost-effective treatment option for short children born SGA compared to no treatment. **METHODS:** A decision tree model was used to calculate the relative costs and health benefits associated with somatropin (Norditropin) treatment vs no treatment over the lifetime of short children born SGA. The analysis was undertaken from a UK National Health Service (NHS) perspective; unit costs (GBP; 2007) were sourced from relevant UK health care providers. Clinical effectiveness data were taken from a long-term, multi-centre, double-blind, randomised clinical trial comparing the effects of somatropin (Norditropin) to no treatment. Utility data was derived from a recent UK-based study which assessed the relationship between short stature and HRQoL. Sensitivity analyses were conducted to assess the degree of uncertainty surrounding the data. **RESULTS:** Over a patient's lifetime, somatropin (Norditropin) (0.033 mg/kg/day) was associated with an additional 2.74 quality-adjusted life years (QALYs) and an incremental cost of GBP73,545 compared with no treatment. As a result, somatropin (Norditropin) was associated with an incremental cost per QALY of GBP26,794 compared with no treatment. Probabilistic sensitivity analysis, in which all parameters within the model were varied, showed that there was a high probability that somatropin (Norditropin) was cost effective compared to no treatment, based on a willingness to pay threshold of GBP30,000 per QALY. **CONCLUSION:** Based on a willingness to pay threshold of GBP30,000 per QALY, somatropin (Norditropin) is a cost-effective treatment strategy for short children born SGA, providing substantial incremental health benefits at an additional cost.

PDB20

COST-EFFECTIVENESS OF INSULIN DETEMIR COMPARED TO NPH INSULIN FOR TYPE 1 DIABETES MELLITUS (T1DM) IN THE CANADIAN PAYER SETTING: MODELING ANALYSIS USING A RANDOMIZED CONTROLLED TRIAL

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OBJECTIVE: Insulin detemir represents a class of long-acting soluble insulin analogues intended to address basal insulin requirements for patients with diabetes. Because direct acquisition costs of newer medications are higher than older insulin treatments, payers are interested in their long-term value. This study was conducted to quantify the long-term cost-effectiveness of insulin detemir compared to intermediate-acting NPH insulin for the treatment of T1DM in Canada. **METHODS:** The CORE Diabetes Model was used to project lifetime clinical and economic outcomes for T1DM patients on insulin detemir versus NPH insulin. A slight advantage for insulin detemir in HbA1c (–0.12%) and significant reductions in major (69%) and minor (25%) hypoglycemic events were modeled. These clinical assumptions, as well as cohort characteristics (baseline age and HbA1c of 27 and 8.9%, respectively), transition probabilities, utilities, dis-utilities, direct treatment and complication costs (from a Canadian provincial payer perspective) were derived from recent published literature and on-line sources. Both clinical and economic outcomes were discounted at 5% per annum. **RESULTS:** Average total direct costs per patient were CAN$88,403 for insulin detemir and CAN$76,551 for NPH using a lifetime horizon. A 61% reduction in major hypoglycemic events costs for detemir (CAN$765) vs. NPH (CAN$1965) were observed. Quality-adjusted life years (QALYs) increased by 0.344 years (discounted) with detemir and were largely due to decreased hypoglycemic events. The resulting incremental cost-effectiveness ratio (ICER) for detemir vs. NPH was CAN$34,418/QALY. **CONCLUSION:** The ICER obtained in this analysis provides evidence for the long-term cost-effectiveness of insulin detemir compared to NPH in T1DM and is consistent with current Canadian standards. The overall value of detemir was driven primarily by its favorable impact upon

hypoglycemic events as well as lower costs in treating major hypoglycemic events.

PDB21

COST-EFFECTIVENESS OF INSULIN DETEMIR COMPARED TO NPH INSULIN FOR TYPE 2 DIABETES MELLITUS (T2DM) IN THE CANADIAN PAYER SETTING: MODELING ANALYSIS USING AN OBSERVATIONAL STUDY

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OBJECTIVE: Insulin detemir represents a class of long-acting soluble insulin analogues intended to address basal insulin requirements for patients with diabetes. Because direct acquisition costs of newer medications are higher than older insulin treatments, payers are interested in their long-term value. This study was conducted to quantify the long-term cost-effectiveness of insulin detemir compared to intermediate-acting NPH insulin for the treatment of T2DM in Canada. **METHODS:** The CORE Diabetes Model was used to project lifetime clinical and economic outcomes for T2DM patients on insulin detemir versus NPH insulin. A slight advantage for insulin detemir in HbA1c (–0.18%) and significant reductions in major (93%) and minor (73%) hypoglycemic events were modeled. These clinical assumptions, as well as cohort characteristics (baseline age and HbA1c of 59 and 8.3%, respectively), transition probabilities, utilities, dis-utilities, direct treatment and complication costs (from a Canadian provincial payer perspective) were derived from recent published literature and on-line sources. Both clinical and economic outcomes were discounted at 5% per annum. **RESULTS:** Average total direct costs per patient were CAN$74,227 for insulin detemir and CAN$68,509 for NPH using a lifetime horizon. An 87% reduction in major hypoglycemic events costs for detemir (CAN$289) vs. NPH (CAN$2,244) were observed. Quality-adjusted life years (QALYs) increased by 0.304 years (discounted) with detemir and were largely due to decreased hypoglycemic events. The resulting incremental cost-effectiveness ratio (ICER) for detemir vs. NPH was CANS18,840/QALY. **CONCLUSION:** The ICER obtained in this analysis provides evidence for the long-term cost-effectiveness of insulin detemir compared to NPH in T2DM and is consistent with current Canadian standards. The overall value of detemir was driven primarily by its favorable impact upon hypoglycemic events as well as lower costs in treating major hypoglycemic events.

PDB22

COST-EFFECTIVENESS ANALYSIS OF CONTINUOUS SUBCUTANEOUS INSULIN INJECTION VS. MULTIPLE DAILY INJECTIONS IN TYPE 1 DIABETES PATIENTS: AN INTERNATIONAL COMPARISON

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OBJECTIVE: To review the projected long term costs and outcomes of continuous subcutaneous insulin infusion (CSII) compared with multiple daily injections (MDI) of insulin in adult type 1 diabetes mellitus (T1DM) patients in the USA, Canada (CAN), Australia (AUS), and the United Kingdom (UK). **METHODS:** A valid health economic model was used to determine the incremental cost-effectiveness ratio (ICER) of CSII compared with MDI among adult patients with T1DM for all four countries. The primary input variable was change in HbA1c and was assumed to be a −1.2% improvement for CSII vs. MDI. A series of Markov constructs simulated the progression of diabetes-related complications. The average annual costs for CSII compared with MDI were locally derived (a 7–8 year pump life was assumed). The costs of optimal drug therapy, procedures and complications were derived from published federal and industry specific data. A 60-year time horizon was used for all analyses and a discount rate of either 3.0% (USA, UK) or 5.0% (CAN, Australia) per annum on costs and clinical outcomes were used. **RESULTS:** Treatment with CSII vs. MDI was associated with an improvement in quality-adjusted life years (QALYs) gained of 1.061, 0.655, 0.467 and 0.760 for adults in the USA, CAN, AUS and the UK, respectively. ICERs were USD$16,992, CAN$23,797, AUS$74,147 and ≤25,648 per QALY gained for CSII vs. MDI in adults with T1DM. Improved glycemic control from CSII treatment led to a lower incidence of diabetes complications; most prominently for proliferative diabetic retinopathy, end stage renal disease and peripheral vascular disease. **CONCLUSION:** Setting the willingness to pay at the accepted level for each country (USD$50,000/QALY, CAN$50,000/QALY, AUS$76,000/QALY and ≤30,000/QALY), the analyses demonstrated that CSII is a cost-effective treatment option for all four countries when compared to MDI for adult TIDM patients.

PDB23

COST-EFFECTIVENESS ANALYSIS OF CONTINUOUS SUBCUTANEOUS INSULIN INJECTION VS. MULTIPLE DAILY INJECTIONS IN TYPE 1 DIABETES PATIENTS: A CANADIAN PERSPECTIVE

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OBJECTIVE: To project long term costs and outcomes of continuous subcutaneous insulin infusion (CSII) compared with multiple daily injections (MDI) of insulin in adult type 1 diabetes mellitus (T1DM) patients in Canada. **METHODS:** A valid health economic model was used to determine the incremental cost-effectiveness ratio (ICER) of CSII compared with MDI among adult patients with T1DM from a Canadian provincial government perspective. The primary input variable was change in HbA1c. A series of Markov constructs simulated the progression of diabetes-related complications. The annual cost for CSII and MDI were CND $6,347.18 and CND $4,650.20, respectively. The cost of pump, procedures, complications, and optimal drug therapy were derived from Canadian-specific sources and other published data. A 60-year time horizon and a discount rate of 5.0% per annum on costs and clinical outcomes were used. **RESULTS:** Treatment with CSII was associated with an improvement in quality adjusted life expectancy of 0.655 vs. MDI. ICERs were CND$27,264 per life-year and CND$23,797 per quality-adjusted life year gained for CSII vs. MDI. Improved glycemic control from CSII treatment led to a lower incidence of diabetes complications. The cumulative incidence of proliferative diabetic retinopathy was reduced by 29% (relative risk [RR] = 0.706) with a number needed to treat (NNT) of ten patients. The cumulative incidence of end-stage renal disease (ESRD) was reduced by 20% (RR = 0.796) with a NNT of 21 patients. Finally, the findings for cardiovascular complications showed that the cumulative incidence of peripheral vascular disease was reduced by 16% (RR = 0.839); with a NNT of 46 patients. Setting the willingness to pay at ~CND$27,000/LYG, the analysis demonstrated that CSII is cost-effective for adult patients with T1DM. **CONCLUSION:** This study shows that CSII is a cost-effective treatment option when compared to MDI in Canadian adults with T1DM.

PDB24

LONG-TERM CLINICAL AND COST OUTCOMES OF TREATMENT WITH INSULIN DETEMIR PLUS INSULIN ASPART IN TYPE 1 DIABETES PATIENTS IN THE CZECH SETTING; DATA FROM THE PREDICTIVE STUDY

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OBJECTIVE: PREDICTIVE was a large, multi-national, observational study assessing the safety and efficacy of insulin detemir (IDet) in real life clinical practice. The aim of this health economic study was to assess the cost-effectiveness of Idet and Insulin aspart (IAsp) versus human soluble insulin (HSI) and neutral protamine Hagadorn (NPH) in patients with type 1 diabetes, based on the Czech sub-cohort of the PREDICTIVE study. **METHODS:** A published and validated computer simulation model was used to project long-term economic and clinical outcomes in a simulated cohort of type 1 diabetes patients treated with either IDet and IAsp or HSI and NPH, in a Czech setting. Probabilities of complications and HbA1c-dependent adjustments were derived from the PREDICTIVE trial. Complication and treatment costs were obtained from Novo Nordisk s.r.o. and projected over patient lifetimes from a societal perspective in the Czech Republic. Future costs and clinical benefits were discounted at 5% per annum. **RESULTS:** IDet + IAsp versus HIS + NPH treatment was projected to improve life expectancy by approximately 0.17 years (11.52 ± 0.14 versus 11.35 ± 0.13 years) and quality-adjusted life expectancy by 0.70 quality-adjusted life years (QALYs) (6.97 ± 0.09 versus 6.28 ± 0.08 QALYs). Treatment and complication costs associated with IDet + IAsp treatment were projected to be lower over patient lifetimes than with HIS + NPH (Czech Crowns (Kè) 921,722 ± 38,714 versus Kè 1,145,728 ± 38,599 per patient, difference Kè –224,006). IDet and IAsp were associated with a delay to the onset of any diabetes-related complication by a mean of 0.17 years (0.77 versus 0.60 years). **CONCLUSION:** A Czech sub-analysis of data from the PREDICTIVE study has demonstrated cost and clinical benefits for patients with type 1 diabetes. IDet + IAsp treatment was projected to be associated with improvements in life expectancy, QALYs and was cost saving compared to NHP + HSI in the Czech setting.

PDB25

COSTS AND EFFECTIVENESS OF INSULIN VS. ROSIGLITAZONE IN TYPE 2 DIABETES AFTER METFORMIN MONOTHERAPY FAILURE

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OBJECTIVE: Czech guidelines recommend additional therapy with sulfonylurea, insulin or thiazolidinediones (TZD) after metformin monotherapy failure in type 2 diabetes. However TZD in Czech are perceived to represent a cost intensive treatment compared to insulin. The aim of this study was to assess annual direct medical costs/reimbursement in patients treated either with 1) rosiglitazon + metformin, or 2) insulin (monotherapy or combination) from the health care perspective. Further we performed a cost-effectiveness calculation related to HbA1c decrease. **METHODS:** Total 199 patients with completed 12 months TZD or insulin treatment, who failed metformin monotherapy, were included into the analysis. Following data were recorded retrospectively: Medication, consultations related to diabetes, hospitalization (incl. ward type and lengths), devices for insulin application, patient education, selfmonitoring costs, sick-leave and HbA1c values at the beginning and end of the assessed period. Costs were calculated in 2007 prices. **RESULTS:** Age in both groups was comparable. Insulin patients had significantly higher entry and final HbA1c values (8.3% vs. 7.3% and 6.5% vs. 6.0% $p < 0.05$). Insulin treated had higher mean annual costs compared to TZD (€867 vs. €643 $p < 0.05$); however costs per 1% HbA1c decrease were comparable between groups (€475 vs. €469). Mean total costs for a subgroup of patients who achieved HbA1c of ≤6.0% (indicating satisfactory compensation) at the end of assessment were also significantly higher in the insulin group (802€ vs. €610 $p < 0.05$) despite similar entry and final HbA1c levels. Costs per 1% HbA1c decrease were comparable also in this subgroup (€375 vs. €366). **CONCLUSION:** Insulin or TZD added on after metformin monotherapy failure in type 2 diabetes resulted in comparable costs per 1% HbA1c decrease. Outcomes were robust also for patients who achieved HbA1c levels of ≤6.0%. Both treatment options result in similar cost-effectiveness from an annual perspective.

PDB26

ECONOMIC EVALUATION OF THE TREATMENT WITH QUINAGOLIDE IN PATIENTS WITH HYPERPROLACTINAEMIA, TUMOUR REDUCTION

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OBJECTIVE: To determine the strategy most cost-effective between Quinagolide, Bromocriptine and Cabergoline in patients with Hyperprolactinaemia respect to the tumour percentage reduction. **METHODS:** A cost-effectiveness analyses was made, the efficacy measures were obtained from a meta-analysis of clinical trials of patients with hyperprolactinaemia who were treated with some of the alternatives of the study. A microcosting was performed through a pickup data instrument that was validated previously, the information was validated with a Mexican panel experts. The perspective was from Mexican Institute of Social Security. The parameters obtained were introduced to the model (decision tree) in order to obtain the total cost average by a Monte Carlo microsimulation with 100,000 iterations until was obtained a mistake less than 3%. The variables used in the analyses were the proportion of percentage reduction in tumour mass with respect to the baseline, with the information obtained was performed a Cost-effectiveness analyses and probabilistic sensitivity analyses. **RESULTS:** The higher cost of the treatment was with Bromocriptine (USD$3687) and the cheaper alternative was Quinagolide (USD$3347). Quinagolide was the most effective option (80%) compared with Bromocriptine. The cost per unit decreased in the percentage of tumour is smaller with Quinagolide (USD$4184), while Bromocriptine and Cabergoline have a higher cost (USD$6145 and USD$5243 respectively). The incremental analyses show that Quinagolide was dominant. Bromocriptine and Cabergoline are more expensive and less effective (dominated). The sensitivity analyses of probabilistic type showed that the Health Net Benefits, Monetary Net Benefits and the Acceptability curves were favourable for Quinagolide independently the willingness to pay. **CONCLUSION:** Quinagolide is the dominant option in patients with Hyperprolactinaemia. Quinagolide gives more Health Net Benefits and Monetary Net Benefits that Bromocriptine and Cabergoline independently the willingness to pay.

PDB27

THE COST-EFFECTIVENESS OF INSULIN GLULISINE IN TYPE 2 DIABETES IN POLAND

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OBJECTIVE: To determine the relative cost-effectiveness of insulin glulisine versus other rapid- and short acting insulins in patients with Type 2 (T2DM) diabetes applied in a Polish setting. **METHODS:** Treatment effects were extracted from identified RCTs assessing the effects of insulin glulisine in patients with diabetes. The analysis was performed from the health care payer (Polish NHF and patient) perspective, with a time horizon of one year. Cost-utility analysis (CUA) was performed for the comparison of insulin glulisine and regular human insulin (RHI). In the absence of significant difference in clinical effectiveness, cost-minimization analysis (CMA) of insulin glulisine versus other analogs (lispro, aspart) was chosen. A range of sensitivity analyses were performed to account for uncertainty in input parameters. **RESULTS:** 1) CUA: insulin glulisine was associated with increased QALYs (0.0044) resulting from reduction in nocturnal hypoglycaemia episodes, and higher costs (181 PLN per patient) compared with RHI, with the ICER of 41,385 PLN per QALY gained. The ICERs were most sensitive to the change in the number of nocturnal hypoglycaemia episodes, and 2) CMA: the cost of insulin glulisine treatment was lower than that of lispro and aspart (with the 1 year difference of 77PLN and 278PLN, respectively). **CONCLUSION:** Results of the analysis indicate that insulin glulisine is likely to represent a good value for money in the treatment of type 2 diabetes in Poland.

PDB28

COST-EFFECTIVENESS ANALYSIS OF DOPAMINE AGONISTS FOR THE TREATMENT OF INFERTILITY ASOCIATED TO HYPERPROLACTINEMIA IN MEXICO

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OBJECTIVE: An excess of prolactin above 25 ng/mL (hyperprolactinemia) can be identified in up to 10% of the population and in women is cause of infertility. The purpose of the study was to model the economic and health consequences of cabergoline, bromocriptine and the sequential therapy (ST) (defined as the treatment initiated with bromocriptine followed by cabergoline) in the management of women with hyperprolactinemia who desired to be pregnant from the health care payer's perspective. **METHODS:** A cost-effectiveness analysis was developed using a Bayesian decision-tree model. The model simulates costs and effectiveness outcomes in a 31-months period. Effectiveness measure was the percentage of women who got pregnant during the analysis period. The comparators were cabergoline (0.5 mg twice a week), bromocriptine (5 mg/24 hrs) and sequential therapy. Resource use and cost data were obtained from hospital records of patients (between 20–40 yrs old who previously told their intention to get pregnant) being treated at a third-level hospital within the Social Security Institute for State Workers (ISSSTE) in Mexico City (n = 18). Effectiveness data and model transition probabilities were obtained from international published literature. Costs and health outcomes were discounted using a 3% annual rate. The decision-tree model was calibrated according to international guidelines. One-way and probabilistic sensitivity analyses were performed using Monte Carlo Simulation first-order approach. **RESULTS:** Patients who received ST experienced more effectiveness (43%) compared with patients treated with cabergoline (40%) and bromocriptine (26%). Mean costs per patient were higher with cabergoline (US$5027 ± 500) compared with ST (US$4356 ± 774) and bromocriptine (US$3955 ± 769). The ICERs using bromocriptine as baseline treatment, were US$2367 ± 506 and US$7443 ± 6376 for ST and cabergoline, respectively. Sensitivity analyses showed that cabergoline could be a cost-saving therapy reducing its price in 18% ($p < 0.05$). **CONCLUSION:** In Mexico, ST demonstrated to be a cost-effective strategy for the treatment of infertility associated to hyperprolactinemia in women who want to get pregnant.

PDB29

PHARMACOECONOMIC EVALUATION OF CABERGOLINE FOR THE MANAGEMENT OF HYPERPROLACTINEMIA CAUSED BY HYPOPHYSEAL MICROADENOMA IN MEXICO

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OBJECTIVE: Hyperprolactinemia is a clinical condition characterized by consistent elevation of plasmatic prolactin levels above 25 ng/mL. The aim of this analysis was to estimate the cost-effectiveness ratios of cabergoline, bromocriptine and the sequential therapy (defined as the treatment initiated with bromocriptine followed by cabergoline) in patients with hyperprolactinemia caused by hypophyseal microadenoma within the Social Security Institute for State Workers (ISSSTE). **METHODS:** A cost-effectiveness analysis was developed using a Bayesian decision-tree model from the Mexican payer's perspective. The model simulates costs and effectiveness in a 31-months period. Effectiveness measure was the number of months with prolactin levels controlled. Efficacy data and model transition probabilities were obtained from international literature. The comparators were cabergoline (0.5 mg twice a week), bromocriptine (5 mg/day) and sequential therapy. Resource use and cost were obtained from hospital records of patients being treated at a third-level hospital from ISSSTE in Mexico City (n = 43). Costs and health outcomes were discounted using a 3% annual rate. One-way and probabilistic sensitivity analyses were performed using the Monte Carlo Simulation first-order approach. **RESULTS:** Cabergoline, yielded 27.9 months of patients with prolactin levels controlled followed by the sequential therapy with 20.3 months and bromocriptine (17.7 months). The mean treatment costs were US$5046 ± 504 for cabergoline; US$4341 ± 789 for the sequential therapy and US$3937 ± 785 for treatment with bromocriptine. ICERs estimated using bromocriptine as the baseline treatment were US$103 ± 89 and US$151 ± 32 for cabergoline and sequential therapy, respectively. Based on the one-way sensitivity analysis, cabergoline strategy could be a cost-saving therapy with a reduction of 27% in its price. Probabilistic sensitivity analyses showed that carbergoline was the treatment more cost-effective ($p < 0.05$). **CONCLUSION:** In Mexico, cabergoline treatment was the most cost-effective alternative because of its higher number of months with prolactin levels controlled and surgeries avoided. These results should be taken into account by Mexican health professionals in the management of hyperprolactinemia.

PDB30

A MODELLED COST-EFFECTIVENESS ANALYSIS OF SWITCHING PATIENTS WITH POORLY CONTROLLED TYPE 2 DIABETES TO INSULIN DETEMIR FROM ORAL ANTIDIABETICS OR NPH IN THE AUSTRIAN SETTING; DATA FROM THE PREDICTIVE STUDY

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OBJECTIVE: This is a health economic evaluation of the long acting insulin analogue, insulin detemir (IDet) when type 2 diabetes patients are switched from either oral antidiabetics (OAD) or from neutral protamine Hagedorn (NPH) insulin. The data used as clinical input for the analysis was the Austrian subpopulation of the large observational trial, PREDICTIVE. **METHODS:** A published validated diabetes model was used to estimate the long-term cumulative incidence of complications, life expectancy (LE), quality-adjusted life expectancy (QALE) and lifetime costs when switching to IDet from OADs or NPH. The outcomes were modeled based on the clinical findings and validated Austrian costs and treatment patterns. The analysis used the-third party health care payer perspective. Future costs and clinical benefits were discounted at 5% per annum. **RESULTS:** Conversion to insulin detemir was projected to improve life expectancy by 0.624 years when switching from OADs and 0.201 years from NPH. Quality-adjusted life years (QALYs) increased by 0.52 versus OADs and 0.368 versus NPH. Direct medical costs over patient lifetimes were projected to be increased by €5585 compared to OAD-treatment and €2206 versus NPH treatment. Thus, incremental cost-effectiveness ratios of IDet versus OAD and NPH treatment were €10,739 and €5,996, respectively. Estimates were controlled by multiple sensitivity analyses and were found to be robust. Probabilistic sensitivity analyses showed that the cost-effectiveness acceptability percentages with a threshold of €30,000 were 100% for OAD switch and 99.9% for NPH switches. **CONCLUSION:** Short-term improvements seen when switching to IDet from OADs or NPH were projected to show improvements in quality-adjusted life expectancy with a cost-effectiveness ratio which fell well within the range usually considered acceptable value for money.

PDB31

COST-EFFECTIVENESS OF DETEMIR VERSUS NPH FOR TYPE 1 DIABETES PATIENTS TREATED WITH BASAL-BOLUS THERAPY IN PORTUGAL

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OBJECTIVE: A pooled analysis of three clinical trials showed the therapy benefits of treating type 1 diabetic patients (mean age 40.3 years, duration of diabetes 16.3 years, HbA1c 8.3%, BMI 25.2 $kg.m^{-2}$) with insulin detemir (IDet) versus neutral protamine Hagedorn (NPH) insulin as the basal component of basal-bolus therapy when used in combination with either insulin aspart (IAsp) or human soluble insulin (HSI). The analysis demonstrated a short-term improvement for detemir over NPH in HbA1c (0.13% points lower), a decrease in hypoglycemic events (by 4%) and lower body mass index (BMI) (0.21 $kg.m^{-2}$). **METHODS:** A published validated diabetes model was used to estimate the long-term cumulative incidence of complications, life expectancy (LE), quality-adjusted life expectancy (QALE) and lifetime costs for IDet versus NPH regimens. Treatment pattern and costs in the Portuguese setting were taken from published sources and validated with clinical experts. All outcomes were discounted at 5% annually. **RESULTS:** The IDet arm was associated with an increase in life expectancy, compared to NPH, of 0.062 years with a resulting gain in QALE of 0.184 quality-adjusted life years, QALYs (±SD) (6.3 ± 0.06 versus 6.12 ± 0.06 QALYs) due to a reduction in diabetes-related complications. Increased treatment costs for IDet resulted in greater total lifetime costs per patient than with NPH (€37,760 ± 743 versus €33,403 ± 738), leading to an incremental cost-effectiveness ratio of €23,691 per QALY gained. The results were robust when tested for parameter sensitivity. Cost-effectiveness acceptability with a threshold of €50,000 is 90%. **CONCLUSION:** Short-term improvements seen with IDet versus NPH in basal-bolus therapy were projected to show improvements in quality-adjusted life expectancy with a cost-effectiveness ratio which fell well within the range usually considered acceptable value for money.

PDB32

ECONOMIC EVALUATION OF LONG TERM SOMATOSTATIN ANALOGS IN THE TREATMENT OF ACROMEGALY IN MEXICO

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OBJECTIVE: To compare medical costs between long term somatostatin analogs, lanreotide Autogel and octreotide LAR in the treatment of patients with Acromegaly, from an institutional perspective. **METHODS:** Cost-effectiveness analysis using a decision tree model that simulates the cost and efficacy of the treatment of acromegaly with long term somatostatin analogs, for a temporary horizon of 15 months was conducted. The effectiveness measure was the percentage of patients achieving a reduction in IGF-1 and growth hormone levels, obtained from clinical trials published in international literature. The average dose used in the analysis was 96.9 for lanreotide Autogel and 26.4 for octreotide LAR. Only direct medical costs were considered in the analysis. Costs were estimated using 2007 prices and are expressed in United States dollars (exchange rate of 10.93 pesos per US dollar). **RESULTS:** The treatment with lanreotide Autogel showed the best average cost per acromegalic patient treated with $21,645.60, followed by the treatment with octreotide LAR with a cost of $24,614.40. Thirty percent of patients achieved a reduction of IGF-1 and growth hormone to safe levels with both treatments. Thus, the treatment with lanreotide Autogel had the lowest cost per successfully treated patient: $72,151.90; followed by the treatment with octreotide LAR with a cost of $82,047.80. The univariate and probabilistic sensitivity analysis both showed that results of the base analysis do not change, provided that the price ratio of comparators is less than 1.18. **CONCLUSION:** The percentage of patients achieving normal IGF-1 and growth levels is similar for both treatments. Lanreotide Autogel is the treatment associated with a lower drug cost in the Mexican context.

PDB33

COST MINIMIZATION ANALYSIS OF DIFFERENT GROWTH HORMONE DEVICES BASED ON TIME-AND-MOTION SIMULATIONS

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OBJECTIVES: Premixed and prefilled disposable devices are now available to administer liquid Human Growth Hormone (hGH). The study objective was to conduct a Cost Minimization Analysis

(CMA) based on Time-and-Motion (TM) simulations designed to allow comparison of the complexity related to hGH preparation and administration. **METHODS:** Nurses naïve to hGH administration or similar drug-device combinations were recruited to evaluate four hGH pen devices via TM simulations. Five videotaped and timed trials for each product were evaluated based on four phases: 1) Learning (initial instructions for use); 2) Preparation (arranging device for use); 3) Administration (actual injection); and 4) Storage (provide for product viability between doses). The CMA applied costs related to parental opportunity costs categorized as wages (U.S. Bureau of Labor Statistics averages), drugs (First Databank WAC prices), and injection supplies. **RESULTS:** Two pen devices (Norditropin NordiFlex NNF, Norditropin NordiPen NNP) take less Total Time (<) to use than the comparators (Genotropin GTP < Humatrope Pen HTP, $p < 0.05$). Most time savings were directly related to differences in Learning ($p < 0.05$) and Preparation times ($p < 0.05$). Between the four hGH devices, the NNF/NNP pens appeared easier to learn to use than the HTP/GTP pen devices (NNF = NNP < HTP < GTP, $p < 0.05$) and were also easier to prepare for use (GTP < HTP, $p < 0.05$). User "learning curve" slopes decreased with practice ($p < 0.05$) over the five trials. Once any product was prepared for use, Administration and Storage times were nearly identical ($p > 0.05$). Parental time cost (opportunity cost) savings were greater in devices that were easier to Learn and Prepare for use (NNF 16% < NNP 24% < GTP 7% < HTP). Supplies costs were <1% of drug costs for all devices. **CONCLUSIONS:** Simulation-generated data demonstrated the value of multi-dimensional product-device analysis and revealed that NNF and NNP took less Total Time vs. comparators.

PDB34

ASSESSING DIFFERENCES IN UTILIZATION AND COSTS BETWEEN INSULIN DETEMIR (LEVEMIR®) AND INSULIN GLARGINE (LANTUS®) USERS

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OBJECTIVE: To assess differences in overall and diabetes-related cost and utilization between diabetes patients treated with insulin detemir and insulin glargine. **METHODS:** Retrospective data analysis included commercial enrollees in a large US health plan with medical and pharmacy benefits. Patients were identified if their first prescription claim (index) for insulin detemir or insulin glargine occurred between May 1, 2006 and December 31, 2006. Eligible patients were required to have 6 months of continuous enrollment pre- and post-index date, no evidence of insulin detemir or insulin glargine use during pre-index and an A1C reading during the pre-index period. Primary outcomes include daily average consumption (DACON) of insulin detemir or insulin glargine and overall and diabetes-related cost. Differences in outcomes between insulin detemir and insulin glargine users were adjusted for baseline characteristics through generalized linear modeling (GLM). Propensity score matching was used to reduce selection bias between the two groups. **RESULTS:** There were 153 insulin detemir and 640 insulin glargine patients in the study, with no significant difference in age, gender and diabetes types between the two groups. Adjusted DACON for insulin detemir users was 34.3 units/day compared to 32.9 units/day for insulin glargine ($p = 0.51$). Adjusted diabetes-related pharmacy cost for insulin detemir users was higher than insulin glargine patients ($1467 vs. $1255; $p < 0.01$). However, adjusted diabetes-related medical cost for insulin glargine users was more than twice that of insulin detemir users ($2304 vs. $1091; $p < 0.01$). Moreover, adjusted overall medical cost for insulin glargine users was also much higher compared to insulin detemir patients ($7497 vs. $6221; $p < 0.05$). No difference in overall pharmacy cost was observed. **CONCLUSION:** No significant difference in DACON between insulin detemir and insulin glargine users was observed. Although insulin detemir patients pay more for diabetes-related prescription medications, these costs were more than offset by significantly lower diabetes-related and overall medical costs.

PDB35

CLINICAL AND ECONOMIC CHARACTERISTICS OF PATIENTS WITH DIABETIC NEUROPATHY

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OBJECTIVE: To examine medical conditions associated with diabetic neuropathy (DN) and to identify drivers of health care charges and utilization using administrative claims database. **METHODS:** We studied commercially-insured individuals aged 18–64 with 24 months continuous enrollment in a national health plan. DN patients were identified by having ≥1 claim with a DN diagnosis between July 2004 and June 2005. Using propensity scoring, we selected a demographically-matched control cohort of patients with diabetes (10:1 ratio to DN). We compared disease prevalence, Year 2 distribution of charges, and reasons for ER visits and inpatient admissions between DN patients and controls. Logistic regression was used to assess the marginal contribution of DN to the most common reasons for ER and inpatient admissions controlling for differences in overall illness burden. **RESULTS:** Compared with controls (n = 86,550), DN patients (n = 8655) had more unique number of co-morbid medical conditions (9.7 vs. 6.8) and higher ($41,394 vs. $16,983) total medical charges. Both groups had the highest medical charges for inpatient services, followed by outpatient hospital and pharmacy use. Compared with controls, more DN patients had ER visits (13% vs. 9%), inpatient hospital encounters (28% vs. 13%), and longer hospitalizations (2.4 vs. 0.6 days). The top five reasons for ER visits were the same for both groups, with nonspecific backache being the most common. Three of the top five reasons for inpatient admissions were also the same: coronary atherosclerosis and other chronic ischemic heart disease, chest pain, and cellulitis. Controlling for excess illness burden, DN patients were still at a higher risk for hospitalizations due to chest pain, heart failure, and cellulitis. **CONCLUSION:** DN patients had significantly more co-morbid medical conditions, ER visits, inpatient admissions, and longer hospitalizations than age-and-sex matched controls.

PDB36

HEALTH SERVICE COSTS AND RESOURCE UTILIZATION AMONG MANAGED CARE ENROLLEES WITH GOUT AND RENAL DISEASE

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OBJECTIVE: To examine health care expenditures and utilization among gout patients by severity of renal disease. **METHODS:** A retrospective claims analysis using commercial enrollees in a U.S. health plan age ≥18, treated with pharmaceuticals for incident gout between Janaury 1, 2002 and December 31, 2005, without cancer. Annual health service costs and utilization were compared by severity of renal disease (using a claims-based algorithm) with descriptive analysis and generalized linear modeling (GLM). **RESULTS:** Renal disease was evident in 745 (9%) of 8039 sub-

jects. Mean annual costs were $18,630 (SD$40,365) and $4510 (SD$11,185) among those with and without renal disease ($p < 0.001$). Subjects with renal disease had 13.03 (SD11.50) office visits and 0.46 (SD0.85) hospitalizations (average length of stay of 8.63 days (SD14.60)) per year compared to 6.50 (SD7.31), 0.09 (SD0.31) and 3.63 days (SD10.36) in those without renal disease ($p < 0.001$, all measures). Among subjects with renal disease, 398 (54%), 175 (23%), and 172 (23%) were classified with mild, moderate, and severe disease. Annual total health care costs were $10,888 (SD$21,676), $13,692 (SD$18,114) and $41,570 (SD$70,502) among these subjects ($p < 0.001$). A GLM model adjusting for age, gender, rate of gout flares, use of allopurinol and Charlson comorbidity score indicated that costs were 1.89, 2.17, and 4.91 times greater among subject with mild, moderate and severe renal impairment compared to those with no renal disease. Subjects with mild, moderate, and severe disease had annual hospitalization rates of 0.25 (SD0.50); 0.58 (SD0.99); and 0.83 (SD1.16) ($p < 0.001$). **CONCLUSION:** Health care expenditures and utilization among subjects with incident gout is substantially higher among those with renal disease, increasing substantially with severity. Better management may result in reduction in health care cost and resource utilization.

PDB37

FACTORS ASSOCIATED WITH HEALTH CARE COSTS AMONG ELDERLY PATIENTS WITH DIABETIC NEUROPATHY

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OBJECTIVE: There are limited data on the economic impact of mood disorders among patients with diabetic neuropathy (DN). This study examines factors associated with health care costs among elderly DN patients with or without depression/anxiety (DA). **METHODS:** Using a retrospective cohort design and administrative claims data, we assessed the predictors of total health care costs over a one-year follow-up period for over-age-65 patients with 1+ diagnosis of DN. The index date was defined as the first observed medical claim with a diagnosis for DN in 2005. Patients with continuous eligibility for 12 months prior to and following the index date were included. Two cohorts of patients were constructed for individuals with DA (DN-DA) or without (DN-only). Multivariate linear regression was performed to assess whether DN-DA patients have higher health care costs than DN-only patients, controlling for demographic and clinical characteristics (diabetes-related comorbidities and treatment regimen for diabetes observed within 12 months prior to index date). **RESULTS:** We identified 16,831 DN-only patients, and 1699 DN-DA patients. The DN-only and DN-DA groups were similar by age (75.6 vs 75.4, $p = 0.44$), but DN-DA patients were more likely to be female (56% vs. 47%, $p < 0.01$). DN-DA patients had higher prevalence of diabetes-related comorbidities for cardiovascular disease, nephropathy, neuropathy, obesity, and hypoglycemic events than DN-only patients (all $p < 0.01$). Controlling for differences in demographic and clinical characteristics, DN-DA patients had $9785 ($p < 0.01$) higher total health care costs than patients with DN-only. Factors associated with increased costs included insurance type, geographical region, diabetes-related comorbidities, and insulin therapy. **CONCLUSION:** These findings indicate that the health care costs were significantly higher for DN patients with depression/anxiety relative to those without these mood disorders.

PDB38

PREVALENCE OF OTHER DIABETES-ASSOCIATED COMPLICATIONS AND ITS IMPACT ON HEALTH CARE CHARGES AMONG PATIENTS WITH DIABETIC NEUROPATHY

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OBJECTIVE: Diabetic neuropathy (DN) is one of the most common complications associated with diabetes. Other diabetes-related complications include depression, cardiovascular disease, stroke, renal complications, skin problems, visual impairment, and amputation. This study assesses the prevalence of other diabetes-related complications and its marginal contribution on medical charges among DN patients. **METHODS:** Commercially insured patients aged 18–64 with at least 1 claim of DN anytime between July 2004 and June 2005 (Year 1) enrolled in a large health plan were selected. A demographically-matched control cohort of patients with diabetes was constructed via propensity scoring with a 10:1 ratio to DN cohort. Both DN patients and controls had 12 months of continuous enrollment in both Year 1 and Year 2 (July 2005-June 2006). The prevalence of other diabetes-associated complications was compared between DN patients and controls. Using multivariate regressions, we examined the marginal contribution of ≥1 other diabetes-related complications on Year 2 medical charges for both cohorts controlling for comorbidities. We also assessed the impact of DN on medical charges. **RESULTS:** Fewer DN patients (11% out of 8655) had no other diabetes-related complications than controls (24% out of 86,550). Prevalence was statistically higher for all other diabetes-related complications in the DN group than in the control cohort with heart disease being the most common in both groups (76% for DN vs. 68% for controls). Controlling for comorbidities, patients with ≥1 other diabetes-related complications had statistically higher pharmacy and total medical charges for both DN and controls. Charges were also higher for DN patients among those with or without other diabetes-related complications. **CONCLUSION:** DN can occur in absence of other diabetes-related complications. DN and other diabetes-related complications have significant impact on medical charges.

PDB39

FACTORS ASSOCIATED WITH HIGH TREATMENT CHARGES IN PATIENTS WITH DIABETIC NEUROPATHY

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OBJECTIVE: To identify factors associated with high health care charges in patients diagnosed with diabetic neuropathy (DN). **METHODS:** Data were extracted from a large, commercial health plan database between July 2004 and June 2006. Patients aged 18–64 were selected if they had a DN diagnosis (ICD9: 357.2x; 250.6x) between July 2004 and June 2005 (Year 1) and were continuously enrolled over the study period. High (low) charges groups were constructed for patients in the top and bottom decile of annual charges. Comorbidities in Year 1 were identified, and total charges in Year 2 (July 2005-June 2006) were examined. Logistic regression was used to identify factors associated with high charges. The factors considered were age, gender, type of health plan, and other comorbidities. **RESULTS:** A total of 8655 DN patients (mean age 51 years, 46% female) were included in the study. Compared to the low charges group, patients in the high charges group had significantly more unique number of co-morbid medical conditions (16 vs. 10) and higher charges ($231,898 vs. $20,213) (both $p < 0.001$). The high charges group contributed 56% of the total charges of all DN patients. Factors significantly ($p < 0.001$) contributing to high charges included dialysis status (OR = 19.2),metastatic cancer

and acute leukemia (OR = 3.4), end-stage liver disease (OR = 2.8), renal failure (OR = 2.8), kidney transplant status (OR = 2.8), severe hematological disorders (OR = 2.4), decubitus ulcer of skin (OR = 1.9), congestive heart failure (OR = 1.9), pancreatic disease (OR = 1.7), and major depressive/bipolar/paranoid (OR = 1.7), peripheral vascular disease (OR = 1.6), and type 1 diabetes (OR = 1.4). Age, gender, and type of insurance were not significantly related to high charges. **CONCLUSION:** The most expensive DN patients spent over 50% of the total charges. The comorbidities of DN patients incurred significant treatment charges. Managing comorbidities is important for treating patients with DN.

WITHDRAWN **PDB40**

PDB41

MEDICAL CARE OF PATIENTS WITH DIABETIC NEUROPATHY: IMPACT OF TYPE 1 DIABETES AND PRESENCE OF OTHER DIABETES-RELATED COMPLICATIONS

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OBJECTIVE: Type 1 (T1D) and type 2 (T2D) diabetes are serious and costly medical conditions. Complications related to diabetes include diabetic neuropathy (DN), heart disease, kidney disease, visual impairment, depression, and amputation. Using claims data, we estimated the impact of T1D or any other diabetes-related complications on health care charges and utilization among DN patients. **METHODS:** Individuals who were 18–64 years old and continuously enrolled in a large US commercial plan between July 2004 and June 2006 were identified. The DN cohort was constructed by selecting patients with at least 1 DN diagnosis anytime between July 2004 and June 2005 (Year 1). We compared the prevalence of other diabetes-related complications by type of diabetes (T1D vs. T2D). Among DN patients with no or >/=1 other diabetes-related complications, we used multivariate regressions to assess the marginal contribution of T1D vs. T2D on Year 2 (July 2005 through June 2006) health care charges and utilization. **RESULTS:** The majority of DN patients (7720 out of 8665) had >/=1 other diabetes-related complications, and T1D accounted for 42% of the DN cohort. T1D patients had more co-morbid medical conditions than patients with T2D (7.6 vs. 6.1 among patients with no other diabetes-related complications; 13.4 vs. 10.3 among those with >/=1 other diabetes-related complications). The prevalence was higher for all other diabetes-related complications, except heart disease, among patients with T1D than patients with T2D. Controlling for comorbidities, patients with T1D or T2D had similar health care utilization among DN patients with no other diabetes-related complications; however, patients with T1D had significantly higher total medical charges than patients with T2D among those with >/=1 other diabetes-related complications. **CONCLUSION:** Many DN patients have T1D and other diabetes-related complications, which can have significant impact on health care charges and utilization.

PDB42

COST OF ILLNESS STUDY OF TYPE 2 DIABETES MELLITUS IN LATIN AMERICA

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OBJECTIVE: We previously developed an incidence-based Markov model to estimate the lifetime cost of type 2 diabetes (T2DM) in Colombia. Here, we adapted it to seven other countries, representing almost 77.9% of Latin America. To estimate the total direct and indirect lifetime costs of T2DM in Latin America. **METHODS:** The model was adapted to each country using country-specific epidemiologic rates and cost inputs. Due to the lack of centralized databases in this region, purchase power parity conversion factor was used. Costs in 2007 USD (adjusted using the Consumer Price Index) and outcomes were modeled over a 32-year time horizon using a 5% discount rate for both. We calculated the direct, indirect, and total cost/patient/year, then used epidemiological data to extrapolate to all persons with T2DM in each country. Costs were summed for the eight countries, then projected to Latin America, weighing by population estimates. **RESULTS:** Total direct costs for Latin America were $22.8 billion, indirect costs were $46.9 billion, for a total of $69.7 billion for 2007. Colombia had the lowest total cost/patient/year $847, although Venezuela had lowest direct costs ($254 versus $288) and Peru had lowest indirect costs ($547 versus $559); Mexico was highest ($1340/patient/year); Brazil and Mexico were responsible for 63% of direct and 62% of indirect costs in Latin America. These costs differ from those estimated using a prevalence based model (direct = $10.7, indirect = $54.5, total = $65.2 billion). **CONCLUSION:** This study presents new tools to estimate the cost of illness for type 2 diabetes in Latin America. However, results must be considered as rough estimates and validations are required to verify them.

PDB43

DETERMINANTS OF THE ECONOMIC BURDEN OF DIABETES HOSPITALIZATIONS IN TENNESSEE

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OBJECTIVE: Tennessee residents face a heavy economic burden of diabetes. Costs of hospitalization and treatment were $2.9 billion in 2003, with Tennessee ranking fifth among the 50 states in the prevalence of diagnosed diabetes. This study explores the factors influencing these high inpatient and outpatient hospital costs for patients with a primary diagnosis of diabetes in Tennessee. We hypothesize that total charges will be most associated with number or type of comorbidities, and also influenced by race/ethnicity, source of admission, and type of insurance. **METHODS:** This study utilized inpatient and outpatient files from the 2003 Tennessee Hospital Discharge Data. Regression models of log inpatient and outpatient charges were estimated for all hospitalizations with a primary diagnosis of diabetes (ICD-9 code: 250). **RESULTS:** As predicted, the most significant cost drivers were co-morbidities. A secondary diagnosis of diabetic ulcer added nearly $4800 to inpatient charges for diabetics, and a diagnosis of heart failure contributed an additional $2000. For outpatients, a secondary diagnosis of fluid balance disorders added $511 to total charges. Blacks, males, the elderly, and those insured by managed care plans had significantly higher inpatient charges (all $p < 0.01$). In contrast, blacks, females, and those with private insurance had significantly higher outpatient charges (all $p < 0.01$). **CONCLUSION:** To design strategies for decreasing the high cost of diabetic treatment, it is critical to understand the factors that induce increases in cost. The analysis revealed that of the seven most frequent co-morbidities, ulcers contributed most to the cost of diabetic hospitalizations. Complications of diabetic ulcers may have necessitated further or longer treatment, ultimately increasing charges. Thus, one strategy to reduce excessive costs of treatment is to focus on ulcer prevention among diabetics.

PDB44

COST-EFFECTIVENESS OF THE USE OF ANGIOTENSIN-II-RECEPTER BLOCKERS IN PATIENTS WITH TYPE 2 DIABETES AND NEPHROPATHY IN JAPAN

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OBJECTIVE: To assess the cost-effectiveness of the use of telmisartan (angiotensin-II-recepter blocker, ARB) in patients with type 2 diabetes and microalbuminuria in Japan. **METHODS:** We developed the life-time Markov model that predicts the progression of diabetic nephropathy. Probabilities of disease progression were taken from the results of INNOVATION study, which was the first large-scale clinical study to investigate prevention of overt diabetic nephropathy using an ARB in normotensive and hypertensive Japanese patients with type 2 diabetes. Sixty-two year-old Japanese male patients with type 2 diabetes and microalbuminuria were chosen as the model cases for this analysis. Three management strategies were compared: 1) use of telmisartan at the dose of 80 mg daily (T80); 2) use of telmisartan at the dose of 40 mg daily (T40); and 3) no ARB treatment (control). Payers' perspective was considered to estimate the costs. The costs for laboratory tests and pharmaceuticals were obtained from the National Price List of 2007. The cost of dialysis was derived from a published article. Quality-adjusted life years (QALYs) was used to describe the health outcomes. Discounting for both the future cost and the health outcome was performed at an annual rate of 3%. **RESULTS:** As compared with the expenditure in the control group, a projected saving of 120 million yen and 490 million yen, respectively, was estimated for every 1000 patients on T80 and T40. T80 added 2870 QALYs, whereas T40 added 1760 QALYs in 1000 patients. The incremental cost-effectiveness ratio for T80 as compared with that for T40 was 330,395 per QALY gained. T80 was considered to be cost-effective as compared with T40 and no ARB treatment under a wide range of plausible assumptions. **CONCLUSION:** Use of telmisartan at the dose of 80 mg daily in male patients with type 2 diabetes and microalbuminuria appeared to be a cost-effective treatment in Japan.

PDB45

CANADIAN COST UTILITY ANALYSIS COMPARING EXENATIDE VERSUS INSULIN GLARGINE IN PATIENTS WITH TYPE TWO DIABETES

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OBJECTIVE: The aim of this study was to assess the incremental cost per quality-adjusted life year of exenatide versus insulin glargine when added to oral therapy for patients with poorly controlled type 2 diabetes from the Canadian health care perspective. **METHODS:** Costs and quality-adjusted life years (QALYs) were modelled for fifty years using the CORE Diabetes Model, a validated and peer reviewed computer simulation model. The model simulates the progression of diabetes related complications based on data from the published literature. Analyses were conducted for a cohort of patients with the same characteristics as those participating in a randomized controlled trial comparing exenatide to insulin glargine. Progression was modified by the treatment effects observed in the clinical trial. Costs and QALYs were derived by weighting events by published utility values and Canadian specific costs for 2007. Costs and QALYs were discounted at 5% as per Canadian guidelines. Extensive sensitivity analyses were conducted relating to all treatment effects including the impact on weight. In addition, probabilistic sensitivity analysis assessed the probability that treatments were cost-effective given the available data. **RESULTS:** Exenatide was associated with higher lifetime costs per patient than insulin glargine (CDN$57,400 versus CDN$44,900), but with higher expected QALYs (5.68 versus 5.33) at a cost per QALY gained of CDN$36,300. Results were most sensitive to changes in the impact of treatment on weight: when assuming no reduction in weight with exenatide, the incremental cost per QALY was greater than CDN$50,000. The probabilistic analysis found that the probability that exenatide is cost effective (assuming a threshold of CDN$50,000) is 75%. **CONCLUSION:** Based on previous decisions relating to the funding of treatments for chronic therapy in Canada, these results demonstrate that exenatide may represent a cost-effective alternative to insulin glargine in this specific patient population.

WITHDRAWN **PDB46**

WITHDRAWN **PDB47**

PDB48

LOST PRODUCTIVITY ASSOCIATED WITH TYPE 1 AND TYPE 2 DIABETES IN A COMMERCIALLY-INSURED POPULATION

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OBJECTIVE: Indirect costs due to lost productivity account for an estimated one-third of the total economic burden associated with diabetes. Little is known about the relative contributions of type 1 (T1DM) and type 2 diabetes (T2DM) to indirect costs. This study quantifies and compares the amount of work loss incurred by individuals with T1DM and T2DM. **METHODS:** Productivity data (Thomson MarketScan) from a database of the commercially-insured was used to identify individuals for analysis. Patients with diabetes in the pre-period with at least two claims for an antidiabetic drug in 2005 and 24 months of continuous enrollment were selected. Control groups of persons without diabetes were selected using propensity score matching. Total number of days lost due to paid absence and short-term disability (STD), conditional upon work loss, were evaluated. Associated costs were estimated using an average hourly wage and benefit rate of $30.00. **RESULTS:** A total of 877 patients with T1DM and 7033 patients with T2DM were identified. Patients with T1DM who incurred work loss missed an average of 25.4 days due to absence and 45.6 days due to STD, valued at $6108 and $7659, respectively. Patients with T2DM with work loss missed an average of 29.7 days due to absence and 46.5 days due to STD, valued at $7136 and $7812, respectively. Patients with T1DM missed significantly more days due to STD than did their matched controls (45.6 vs. 37.5 days) ($p < 0.0001$); patients with T2DM had significantly more absence days than their matched controls 29.7 vs. 27.7 days) ($p < 0.0001$). **CONCLUSION:** Patients with T2DM incurred more work loss than patients with T1DM. Patients with T1DM incurred more work loss due to STD, but not to paid absence, than did their non-diabetic controls, while patients with T2DM had more work loss due to paid absence, but not STD, than did their matched controls.

PDB49

INFLUENCE OF FAMILY STRUCTURE ON EMERGENCY ROOM UTILIZATION OF DIABETIC MOTHERS

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OBJECTIVE: This study is designed to determine if single diabetic mothers utilize emergency room services more frequently when compared to coupled mothers. **METHODS:** Medical Expenditure Panel Survey (MEPS) data from 2002–2005 were used in this cross-sectional analysis. Mothers were included if they had been told they had diabetes by a health care professional. Chi-square analysis was used to determine differences between single and coupled mothers in regards to sociodemographic characteristics. Simple logistic regression was used to determine if single diabetic mothers were more likely to visit the emergency room than coupled mothers. Multivariate logistic regression model was used to adjust for age, income, race, insurance status, and education. The complex survey design of MEPS including sampling strata, primary sampling units, and personal weights were reflected in the analysis. An alpha level of 0.05 was used to determine statistical significance, and all analysis were performed using SAS. **RESULTS:** Single diabetic mothers were significantly more likely to be black, and come from lower income groups. Coupled diabetic mothers were significantly more likely to have a degree beyond high school, and to have private insurance. Before adjustment for covariates , single diabetic mothers were 2.3 times as likely to use emergency room than coupled mothers ($p < 0.05$). After adjustment for covariates, single diabetic mothers were 1.9 times as likely to visit the emergency room (95% confidence interval: 1.15–3.14). **CONCLUSION:** Among diabetic mothers, being single is a significant risk factor in determining emergency room utilization. Further research is needed to determine what factors place single diabetic mothers at greater risk for emergency room use. Future interventions designed to decrease emergency room use in diabetics may be targeted to single mothers.

PDB50

INCREASED HOSPITALIZATIONS BY CHILDREN WITH TYPE 2 DIABETES

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OBJECTIVE: Type 2 diabetes has been reported with increasing frequency among children aged 17 or younger (hereafter referred to as "children") in the United States (US). However, while it is known that the prevalence of type 2 diabetes among children is growing, there is little information about their hospital use. This study is purposed to study the trend of hospitalizations with type 2 diabetes among children between the year 1997 and 2003 in the US. **METHODS:** The study was based on the Kids Inpatient Database (KID), a nationally representative probability sample sponsored by the Agency of Health Research and Quality (AHRQ). The KID, a database of hospital stays for children, includes annually two million to three million pediatric inpatient records selected from over 2500 to 3500 US community hospitals. **RESULTS:** The numbers of hospitalization made by children with type 2 diabetes were 2209, 4232, and 5840 in the year 1997, 2000, 2003, respectively. Adjusting for the growth of population size, the rate of hospitalization with type 2 diabetes was 2.5 times larger in 2003 compared to 1997. During the same time period, the number of hospitalization made by children with type 1 diabetes was 33,504, 35,541, and 36,439. This growth of the hospitalization rate was the same as that of the children population in US. Therefore, adjusting for the population size, the rate of hospitalization with type 1 diabetes remained the same. **CONCLUSION:** Given that the symptoms of type 2 diabetes take a long time to develop, even small numbers of hospitalizations are alarming. Furthermore, unlike that of type 1 diabetes, the hospitalization with type 2 diabetes was rapidly on the rise. With a continuous increase in obesity among children, the burden of type 2 diabetes is a growing public health concern.

DIABETES/ENDOCRINE DISORDERS—
Patient-Reported Outcomes

PDB51

A RESTROSPECTIVE ANALYSIS OF MEDICATIONS ADHERENCE AND ASSOCIATED HEALTH CARE COST FOR THE DIABETIC PATIENTS

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OBJECTIVE: Determine the adherence to diabetes medications in the treatment of diabetic patients and associated health care cost. **METHODS:** The study sample from a large PBM claims database from January 1, 2005 through December 31, 2006. Patients were included if they had diagnosis of diabetes, received at least 1 diabetes medication and were continuously enrolled during the study period. Medication adherence rates were measured as percentage of days that the patient possessed any available diabetic drug from July 1, 2005 to July 1, 2006. Each study member was placed into 1 of 3 mutually exclusive adherence category, defined as $0 \leq MPR < 0.5$ (non-adherent group), $0.5 \leq MPR < 0.8$ (partially adherent group), $0.8 \leq MPR \leq 1$ (adherent group). Descriptive analyses were conducted within each category to assess the patient characteristics and health care costs; Multivariate regression models were conducted to determine the impact of adherence on the health care costs controlling for confounding factors. **RESULTS:** A total of 4262 patients were included. Non-adherent, partially–adherent and adherent patients accounts for 12.9%, 19.1% and 68.2% respectively. The average diabetes-related medical care costs in the 18 months post-index period decreased as the adherence level increased. The average overall medical care costs in the 18 months post-index period also decreased as the adherence level increased. The average overall health care costs of partially adherent group and adherent group are both lower than non-adherent group. After controlling for patient characteristics, comorbidities, and health care cost in the six months pre-index period the multivariate regression showed low drug adherence level was significant predictors of both higher diabetes-related medical care costs ($p < 0.0001$) and higher overall total medical care cost costs ($p < 0.001$). **CONCLUSION:** Non-adherent diabetic patients have higher diabetes-related and overall medical care cost than partially adherent diabetic patients and adherent diabetic patients. Investment in disease management programs to promote adherence with medication regimen may needed for these non-adherent diabetic patients.

PDB52

SYSTEMATIC REVIEW OF ADHERENCE, COMPLIANCE AND QUALITY OF LIFE IN TYPE 2 DIABETES PATIENTS

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To evaluate the quality of life as an outcome of adherence and compliance in type 2 diabetes and to predict the barriers and strategies to improve adherence. Data were obtained by search-

ing Pubmed between 2002 and 2007 for studies assessing quality of life as an outcome due to adherence or compliance. Search terms included were "Diabetes Mellitus Type 2, Compliance, Medication Adherence" and various combinations of these terms. There was no specific criterion to include or exclude studies. All studies which fit into the purpose for literature review were analyzed. Patient education was found to be an intervention that enhances the quality of life. Use of different drug and drug delivery methods than conventional drugs were also found to improve quality of life. Age, gender, and treatment problems associated with insulin are risk factors for discontinuation and non-adherence to medications. Older patients were found to be adherent than younger patients. Forgetting to follow regimen, disruption of routine and adverse effects were some barriers reported in the literature. The main strategies for medication adherence were found to be individualized daily routines, reminder devices such as a day of the week, pillbox, and use of a special place. There are not many studies done to date to evaluate the quality of life as an outcome due to adherence and compliance. Further research in this area will help better the understanding of relationship between quality of life as an outcome due to adherence or compliance.

WITHDRAWN **PDB53**

PDB54

DEVELOPMENT OF A CLASSIFICATION SYSTEM FOR A DIABETES-SPECIFIC PREFERENCE-BASED MEASURE OF HEALTH

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OBJECTIVE: To develop a classification system (CS) for a diabetes-specific preference-based measure of health (PBMH). **METHODS:** Plausible attributes for the PBMH were identified by Classical Test Theory, using Factor Analysis of responses from Type 2 Diabetes patients (n = 385) to the 18-item Audit of Diabetes-Dependent Quality of Life (ADDQoL). A seven-member expert panel then provided qualitative input for content. Three pilot rounds in outpatient and community settings produced data from people with Type 1 and Type 2 diabetes (n1 = 52, n2 = 65, n3 = 111) that were analyzed using Modern Test Theory, based on Rasch Analysis (RA), for 1) fit of selected attributes to the Rasch Model, and 2) scaling of severity levels for attributes. **RESULTS:** Principal Axis Factoring with Promax rotation identified two plausible attributes from six ADDQoL items. In a structured survey, experts rated the importance of all ADDQoL and additionally important items, and suggested attributes that might be described using sets of related items. A CS was developed consisting of five independent attributes, with each question containing a description based on the item content of the respective attribute and four sentences describing severity levels. Maintaining this format, the wording in the CS was further modified based on additional input from experts and RA after each pilot. The final attributes were: Physical Ability & Energy, Relationships, Mood & Feelings, Enjoyment of Diet, and Satisfaction with Management of diabetes. Results of the third pilot indicated Infit and Outfit MNSQ for the five attributes ranging between 0.88 and 1.10. Person and Item reliabilities were 0.65 and 0.92, while the respective separation ratios were 1.36 and 3.34. Severity levels used were supported by Rating Scale Diagnostics indicated by RA. **CONCLUSION:** Results of the statistical analyses indicate that the PBMH has desired psychometric properties. Research on the estimation of a utility scoring algorithm and validation testing of this PBMH is ongoing.

WITHDRAWN **PDB55**

PDB56

PREFERENCES FOR ORAL ANTIDIABETIC AGENTS AMONG PEOPLE WITH TYPE 2 DIABETES

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OBJECTIVE: The objective of this study is to quantify the strength of preferences and likely adherence to therapy of people with type 2 diabetes mellitus (T2DM) for outcomes of oral antidiabetic agents (OADs). **METHODS:** Currently many of the available OADs for T2DM are associated with side effects such as weight gain and nausea and vomiting. Understanding patient preferences for medications with different attributes is important for predicting likely adherence to OAD treatments with different side-effects. We developed a web-based instrument to elicit treatment preferences. Inclusion criteria were people 18 years of age and older who were insulin-naïve and currently taking OADs to treat T2DM. The instrument included ten stated-choice trade-off tasks. Subjects chose between pairs of hypothetical medication alternatives, each including change in HbA1c levels, number of mild-to-moderate hypoglycemic events per month, water retention, weight gain in the first six months of treatment, mild stomach upset, and risk of heart attack. Sample sizes were 200 in the United States and 200 in the UK. **RESULTS:** The majority of subjects were white, married, and female. Subjects were willing to make tradeoffs between all medication attributes. On average, subjects would accept significant weight gain if the medication yielded a reduction in HbA1c that resulted in optimal control (6.5%). However, subjects' stated adherence was significantly lower for treatments with weight gain, increased heart-attack risk, or persistent nausea and vomiting. The UK sample was less tolerant of hypoglycemic events. **CONCLUSION:** While people with T2DM believe glucose control is important, medication side-effects influence patients' treatment choices. Efficacy as measured under controlled, clinical-trial conditions may overstate actual treatment effectiveness as a result of patient concerns over OAD side effects.

PDB57

CONTENT DEVELOPMENT FOR A NEW INSTRUMENT TO ASSESS PATIENT AND PARENT PREFERENCE FOR GROWTH HORMONE REPLACEMENT THERAPY DELIVERY DEVICES

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OBJECTIVE: Few patient-reported outcome measures for growth hormone (GH) replacement therapy have been formally validated and none address preference for a particular delivery method. Our objective was to formally develop a new instrument to assess child and parent satisfaction with and preference for GH therapy delivery devices. **METHODS:** An instrument item pool was generated by combining the following four steps: 1) thorough literature review to identify relevant domains and questions, 2) consultation with clinicians knowledgeable about treatment of GH deficiency, 3) identification of indicators specific to GH delivery devices, and 4) input from families with children aged 10–16 years receiving GH therapy, including both new (2 to 12 weeks) and established (≥12 weeks) users. Structured feedback forms were completed during cognitive interviews with focus groups on relevance of questions, missing

topics, understandability, and feasibility of use. Based on the above steps, a preliminary instrument was created for validation testing. **RESULTS:** Key themes generated from literature, clinicians, and families included various aspects of pain, difficulty using the device, embarrassment, and time involved affecting productivity, convenience, and compliance. Two versions of the preference instrument were created to reflect the child and parent perspectives. A 4-point Likert scale was used for most questions. The child version included 38 survey items on clarity of instructions (2), preparation (7), administration (4), convenience (3), pain (5), embarrassment (2), anxiety (2), productivity (4), compliance (3), mood (1), and overall satisfaction (5). All items from the child questionnaire were included in the parent version, supplemented with five questions regarding administration, parent productivity, and parent overall satisfaction. **CONCLUSION:** Areas of concern for families using GH delivery devices include pain, productivity, and convenience. This new instrument, which may offer clinicians and researchers an opportunity to evaluate different device alternatives for GH replacement therapy, will soon undergo formal validation testing.

PDB58

ASSOCIATION BETWEEN THE DIABETES-39 (DM-39) AS A PATIENT REPORTED OUTCOME (PRO) AND HBA1C IN A CLINICAL TRIAL INVOLVING INSULIN THERAPY

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OBJECTIVE: To assess the association between the DM-39 and HbA1c in a large insulin clinical trial (acronym: DURABLE) where HbA1c is a primary efficacy endpoint. **METHODS:** The DURABLE trial enrolled insulin-naïve type 2 diabetes patients then randomized them to lispro mix 75/25 bid or glargine qd. Trial participants completed the DM-39 at baseline prior to receiving insulin. The DM-39 is a 39-item diabetes-specific PRO measure with 5 domains: Energy/Mobility (15-item), Diabetes Control (12-item), Anxiety/Worry (4-item), Social Burden (5-item), and Sexual Function (3-item). Each domain's score ranged from 0–100 with a higher score representing worse PRO. We used Spearman's correlation to assess the overall association with HbA1c. We also conducted analysis of variance (ANOVA) with pairwise comparisons using Scheffe adjustment to compare the mean scores reported by patients with baseline HbA1c <8.0% (group A); 8.0–8.9% (B); 9.0–9.9% (C); and >10% (D). **RESULTS:** A trial subgroup of 867 patients (mean age = 56.8 years, duration of diabetes = 9.6 years, HbA1c = 8.9%. 42% female, 65% Caucasian) provided the data. Correlations with HbA1c were low (ρ range: 0.01–0.18) with Diabetes Control ($\rho = 0.18$), Anxiety/Worry ($\rho = 0.10$), and Social Burden ($\rho = 0.11$) resulting in statistically significant correlations ($p < 0.01$). Overall ANOVA p-values were statistically significant for Diabetes Control (mean scores for groups A, B, C, and D = 37.5, 39.7, 43.7, and 46.2, respectively, $p < 0.001$); Anxiety/Worry (41.5, 42.2, 48.5, and 47.0, $p = 0.003$); and Social Burden (22.2, 21.6, 25.5, and 28.3, $p < 0.001$). Pairwise comparisons were statistically significant for Diabetes Control (A vs. C, A vs. D, and B vs. D); Anxiety/Worry (A vs. C); and Social Burden (A vs. D and B vs. D). **CONCLUSION:** DM-39 is weakly associated with HbA1c. However, our findings suggest that some targeted domains (e.g., Diabetes Control) may be useful in assessing the changes in PRO for clinical trials evaluating insulin initiation with a primary endpoint of HbA1c.

PDB59

IMPACT OF DOCTORS' INSTRUCTIONS ON LIFESTYLE BEHAVIORS AMONG DIABETES POPULATION IN USA

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OBJECTIVE: The study evaluated the impact of a doctor's or a health professional's instructions on lifestyle behaviors among the US adult diabetic population. **METHODS:** The study population was adult diabetic subjects in the latest National Health and Nutrition Examination Survey (NHANES) 2005–2006. Multivariate logistic regression was employed adjusting for the survey design using STATA software. A total of 459 diabetic subjects aged 18 and over were enrolled, which represented about 15 million US adults with diabetes. The three dichotomous categorical independent variables of interest were whether the subject had been told by their doctor or health professional in the last year to lower their risk of certain diseases by controlling weight, by increasing physical activity, or by reducing fat or calorie intake. The outcomes of interest were whether action was currently being taken by the subject to follow that past advice. **RESULTS:** After controlling potential confounders (including demographics, education, and disease severity), it was found that subjects who were told by their doctor or health professional to lose weight were more likely to be working on weight control, compared with those not told to do so ($p < 0.001$). Similar results were found for exercise advice ($p = 0.001$) and diet advice ($p = 0.002$). This cross-sectional analysis cannot confirm causality and recall bias cannot be eliminated. **CONCLUSION:** The study suggests that advice by a doctor or a health professional has great impact on diabetic patients to take actions in changing their lifestyle behaviors.

PDB60

DISCREPANCIES BETWEEN IMPORTANCE AND EVALUATION OF INSULIN DELIVERY SYSTEM (IDS) FEATURES CONTRIBUTE TO IDS SATISFACTION IN PATIENTS WITH TYPE 2 DIABETES

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OBJECTIVE: Differences between patient-rated importance of insulin delivery system (IDS) features and patient evaluation of those features in current IDS may contribute to patient satisfaction. This study aimed to examine: 1) the importance of 12 IDS features to patients with type 2 diabetes (T2DM); 2) the discrepancies between feature importance and patient evaluation of those features in current IDS; 3) the relationship between discrepancies and IDS satisfaction. **METHODS:** Patients with T2DM currently using insulin were administered a web-based survey including questions on demographics, insulin therapy, and a modified Insulin Injection Preference questionnaire (mIIP-q). The mIIP-q asks patients to evaluate the extent to which they agree their current IDS has each of the 12 features representing 3 components ("ease of use," "activity interference," and "social acceptability"). Patients were also asked to rank and rate the importance of the 12 IDS features. Discrepancy scores were calculated by subtracting the feature importance score from the feature evaluation score. Correlation and stepwise linear regression analyses were conducted to assess the relationship between discrepancy scores and IDS satisfaction. **RESULTS:** A total of 681 patients (48% male, mean age = 57) participated in the survey. All IDS features in the mIIP-q were considered important (mean rating >50 on a 0–100 scale). The feature "easy to control blood sugar" showed the highest discrepancy score, followed by all "activity interference" features ($P < 0.01$). Discrepancy scores for

all 12 features were associated with IDS satisfaction ($P < 0.01$), but only discrepancy scores for "easy to control blood sugar," "reduces my reluctance to use insulin," "easy to get insulin dose needed," and "convenient to use" were significant predictors of IDS satisfaction, as were HbA1C and health status ($R2 = 0.31$; $P < 0.05$). **CONCLUSION:** IDS features are important to patients with T2DM; therefore resolving discrepancies between feature importance and patient evaluation of IDS features may improve patient satisfaction and facilitate diabetes management.

PDB61

PREDICTORS OF INSULIN DELIVERY SYSTEM USE IN PATIENTS WITH TYPE 2 DIABETES

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OBJECTIVE: Understanding what Insulin Delivery System (IDS) features are important to patients with type 2 diabetes (T2DM) is essential to the development of improved IDSs. The objective of this study was to determine what characteristics are associated with (or predict) users of insulin pens vs. vial and syringe (V/S). **METHODS:** Patients with T2DM were administered a web-based survey that included questions about demographics, comorbidities, glycemic control, and insulin use; ratings of the importance of 12 IDS features; and an evaluation of features of the current IDS. Two logistic regression analyses were performed with the respondent characterization of their IDS as insulin pen or V/S as dependent variables. Variables significantly ($p < 0.05$) associated with dependent variables, a priori, were included as independent variables. **RESULTS:** A total of 681 insulin-using T2 patients in the US (52% female; mean age = 57 years; 88% Caucasian; 85% on insulin >1 year, 86% used V/S) participated in the survey. Significant predictors ($p < 0.05$) for insulin pen use: Patient: "is a homemaker" (OR, 0.177), "agrees their IDS does not interfere with plans for short trips" (OR, 5.942), "agrees their IDS is easy to carry away from home" (OR, 0.054), "rates their IDS ease to carry away from home as 'important'" (OR, 2.558), "uses Byetta" (OR, 0.067), "injects insulin >twice/day" (OR, 0.235), "has never been diagnosed with depression" (OR, 0.367). Significant predictors ($p < 0.05$) of V/S use: Patient: "is dissatisfied with their IDS regarding insulin use" (OR, 111.767), "disagrees their IDS makes it easy getting ready for next dose" (OR, 0.006), "has cancer" (OR, <0.0001), "uses Glargine" (OR, <0.0001), "is not using insulin lispro" (OR, 0.013), "has a higher number of adults in the household", "rates IDS discreetness as 'least important' " (OR, 206.347). **CONCLUSION:** Overall, multiple injections and need for portability predict insulin pen use; not valuing discreteness and dissatisfaction predict V/S use.

DIABETES/ENDOCRINE DISORDERS—Health Care Use & Policy Studies

PDB62

DETERMINANTS OF INSULIN INITIATION FOR PATIENTS WITH TYPE 2 DIABETES

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OBJECTIVE: To examine the effects of sociodemographic characteristics, health status, comorbidity, provider, medication and financial variables on insulin initiation behavior for type 2 diabetics on multiple oral antidiabetic medications. **METHODS:** The 2002–2006 MarketScan Research Databases were used to study the health care utilization and expenditure patterns of adults with type 2 diabetes in employer-sponsored health plans in the United States. The utilization patterns of 38,768 patients with Type 2 diabetes who were adherent to one oral antidiabetic medication and added a second oral medication for at least 6 months were analyzed. Two outcomes were examined: insulin initiation within 12 months and the amount of time to insulin initiation. Multivariate logistic models were used to estimate the effects of the explanatory variables on the likelihood of insulin initiation. Cox proportional hazard models with prescription drug and office visit copayments as time-varying covariates were used to estimate the effects of the explanatory variables on the amount of time to insulin initiation. **RESULTS:** A total of 16.5% of patients initiated insulin within one year. A variety of determinants were associated with insulin initiation within a year: age (Adjusted Odds Ratio 0.982, 95% CI (0.980, 0.985)), health status indicated by the presence of factors such as heart disease (AOR 1.48 (1.317, 1.654)), myocardial infarction (AOR 1.32, (1.068, 1.640)), diabetic retinopathy (AOR 1.26, (1.120, 1.406)), the number of nondiabetes medications (AOR 1.03, (1.030, 1.039)), and insulin copayments (AOR 0.998, (0.995, 1.000)). The amount of time to insulin initiation was also affected by similar factors. **CONCLUSION:** Health status appears to be the strongest predictor of insulin initiation in patients initiating insulin for type 2 diabetics who are adherent to oral medications. Providers, health plans and employers should be aware of the factors that influence the addition of a medication to a treatment regimen for chronically-ill patients.

PDB63

AN ECONOMIC EVALUATION OF A DIABETES DISEASE MANAGEMENT PROGRAM FOR ADULT MEDICAID CLIENTS IN THE STATE OF COLORADO, UNITED STATES

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OBJECTIVE: To evaluate the one to two year changes in health care costs and disease-related process measures associated with the a disease management program initiated in 2002 for higher-risk, higher-expenditure adult fee-for-service Medicaid clients with diabetes in the State of Colorado, United States. **METHODS:** This retrospective database analysis employed a pre-post and propensity-score matched analysis assessing direct costs from the perspective of a public payer. Data analyzed included comprehensive medical and pharmacy claims, patient demographics (i.e., age, gender, race), medical and pharmacy resource utilization claims (e.g., selected prescription drug use and laboratory testing procedures conducted), diagnostic information, and eligibility/enrollment status. Multivariate regression techniques were utilized to ascertain differences between the disease management and matched comparator groups. **RESULTS:** Of the 388 Medicaid clients that were eligible and initially contacted for enrollment, 41 (11%) completed at least one year and 10 (3%) completed an entire two years of the program. Enrollees were typically older, female, and of a non-white race or ethnicity. Among those enrolled for one year or more, significant decreases in overall medical costs were observed relative to matched comparators during both Year 1 and Year 2 of the interventions (Year 1 = 44.4% decrease, $p < 0.001$ and Year 2 = 67.1% decrease, $p < 0.010$). Overall pharmacy costs were lower for the disease management group during Year 2 (64.0% decrease, $p = 0.013$), as were diabetes-related pharmacy costs (64.9%, $p = 0.005$). Effect sizes based upon multivariate analyses were observed to be small. **CONCLUSION:** Based on this analysis of 41 clients completing at least one year of diabetes

disease management program, significantly lower costs were noted during Year 1 which continued and expanded through Year 2 relative to matched comparators. Beyond claims analyses, however, incremental cost-effectiveness of disease management programs must also consider program-specific expenditures and clinical outcome measures.

PDB64

PHYSICIAN PRACTICE SPECIALTY AND TYPES OF ANTI-DIABETIC TREATMENTS FOR PATIENTS WITH TYPE 2 DIABETES: ARE THEY ASSOCIATED?—A LARGE NATIONAL OBSERVATIONAL STUDY IN A MANAGED CARE SETTING

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OBJECTIVE: To examine whether physicians' practice specialties are associated with the types of anti-diabetic treatments for patients with type 2 diabetes (T2D). **METHODS:** A retrospective study design was used based. All T2D patients' (N = 1,819,323) medication histories in a 12 month period were examined and classified into 9 treatment types (no anti-diabetic medication, oral anti-diabetic medication (OAD), basal insulin only, prandial insulin only, basal insulin with OAD, prandial insulin with OAD, basal/prandial insulin, basal/prandial insulin(including premixed insulins) with OAD, other insulin regimens). Physicians practice specialties were classified into five categories (family medicine, internal medicine, other primary care specialists, endocrinologists, other specialties). A two-way contingency table was created with Chi-square test and Fisher's exact test to examine the possible association between physicians' practice specialty and the types of anti-diabetic treatments they prescribed. **RESULTS:** Both the Chi-square test and the Fisher's exact test had $p < 0.0001$, indicating that physicians' practice specialty and their patients' anti-diabetic treatment choices were statistically significantly associated. The contingency table suggests that the percent of patients receiving no anti-diabetic medications varied across specialties from 36.0% in patients who visited an endocrinologist to 49% and 52% in patients who visited a family medicine physician or internist, respectively. The percent of patients receiving OAD only varied across specialties from 33.1% in patients who visited an endocrinologist to 46.8% in patients who saw a family medicine physician, and 43.6% in patients under the care of an internist. And the percent of patients receiving insulin as part of their regimen varied across specialties from 4.12% in patients who visited a family medicine physician to 12.3% in patients who visited an endocrinologist. **CONCLUSION:** Physicians' practice specialty is strongly associated with anti-diabetic medications prescribed for patients with T2D. Further research to examine outcomes differences across physician specialties is needed.

PDB65

COMPARISON OF FOUR HEALTH STATE PREFERENCE MEASURES AMONG PATIENTS ENROLLED IN THE ACTION TO CONTROL CARDIOVASCULAR RISK IN DIABETES TRIAL

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OBJECTIVE: In the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial (a 10-year, 70 site study of diabetes treatments), four health state preference measures (HSPMs), which vary in theoretical constructs, are being collected. Our objectives were to compare baseline values of the feeling thermometer (FT), the Health Utilities Index, Mark 2 and Mark 3 (HUI-2 and HUI-3), and the SF-6D, derived from the Short Form 36 and to explore associations between each HSPM and 29 baseline clinical and demographic characteristics. **METHODS:** Participants (n = 2053) were randomly selected for the cost effectiveness sub-study of ACCORD. To compare the HSPMs, we determined correlations between the measures, by overall score and within each quartile range. We used multivariate regression models to identify relationships between clinical and demographic characteristics for each HSPM. **RESULTS:** The mean ± standard deviation HSPMs were: FT = 0.756 ± 0.167, HUI-2 = 0.823 ± 0.146, HUI-3 = 0.712 ± 0.260, and SF-6D = 0.684 ± 0.085. Although all 4 measures were significantly correlated with each other (Spearman r = 0.29–0.84 ($p < 0.0001$); relationships were weaker between the FT and the other measures (0.29–0.38) and strongest between the two HUI measures (0.84). By quartiles of HSPM, significant correlations were more common at the lowest quartile. In multivariate regression analyses, we identified significant associations ($p < 0.01$) between HSPM values and age (positive), gender (lower for females), years of education (positive), and race (lower for non-white). Clinical characteristics inversely associated with HSPMs were duration of diabetes, current smoking, secondary cardiovascular disease, total cholesterol, waist circumference, and body mass index. Number of medications (blood pressure, glycemic, or lipid) were not significantly associated with HSPMs. Glycosylated hemoglobin values were inversely related to FT only. **CONCLUSION:** Our results suggest that the four instruments,result in different HSPM values. Relationships with clinical and demographic variables vary by HSPM. Therefore, results of cost-effectiveness results may be impacted by the specific HSPM applied.

PDB66

HEALTH CARE UTILISATION AND EXPENDITURES ASSOCIATED WITH TREATMENTS OF DIABETES MELLITUS WITHIN THE SLOVAK REPUBLIC

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OBJECTIVE: The aim of this study was to collect comparable and reliable data about consumption of drugs for treatment of diabetes mellitus in Slovakia during the period 1996–2006. **METHODS:** Data of wholesalers (following ATC/DDD), who are legally obliged provide this information to the Slovak Institute for Drug Control, was used for the analysis. The results were expressed in the numbers of the packages, finance units (€) and defined daily doses per 1000 inhabitants per day (DID). **RESULTS:** The collected data shows a moderate increases in the antidiabetic's consumption from 1996 to 2006 in term of DID (in 1996 (27.03), in 2001 (32.62) and in 2006 (37.90). A slight increase in A10AB group (Insulins and analogues, fast-acting) in 1996 (1.88), in 2001 (2.79) and in 2006 (4.64), a slight decrease in A10AC group (Insulins and analogues, intermediate-acting) in 1996 (4.25), in 2001 (3.74) and in 2006 (3.35), a moderate increase in A10AD (Insulins and analogues, intermediate-acting combin.) in 1996 (0.51), in 2001 (2.36) and in 2006 (3.25), a steady increase in A10AE (Insulins and analogues, long-acting) in 2001 (0.03) and in 2006 (0.89), a dramatic increase in A10BA (Biguanides) in 1996 (4.45), in 2001 (5.75) and in 2006 (9.46), relatively stable consumption in A10BB (Sulfonamides, urea derivatives) in 1996 (15.33), in 2001 (17.19) and in 2006 (14.76)

and a moderate increase in A10BD (Biguanides and sulfonamides in combination) in 2001 (0.07) and in 2006 (1.41) in term of DID can be seen from this analysis. Financial expenditures for antidiabetics were (in 1996 (€9,772,000), in 2001 (€18,169,000) and in 2006 (€26,541,000). **CONCLUSION:** Inseparable components of the Slovak drug policy must be viewed realistically with regard to the antidiabetics' consumption. Adherence to principles of diabetes mellitus treatment's guidelines lead to fundamental short and long term financial savings within health care systems.

PDB67

DESCRIPTIVE ANALYSIS OF BODY WEIGHT AND CLINICAL EFFECTIVENESS MEASURES ASSOCIATED WITH TYPE 2 DIABETES THERAPIES IN A PRIMARY CARE ELECTRONIC MEDICAL RECORD DATABASE

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OBJECTIVE: In the treatment of type 2 diabetes (T2D), achieving glucose control often requires multiple therapies. The class of antidiabetic agents called incretin mimetics offers an alternative mechanism to diabetes management. This work describes the baseline demographic and clinical characteristics of a T2D population in a primary care setting before they initiated treatment with the incretin mimetic, exenatide. **METHODS:** Patients were extracted from the General Electric (GE) electronic medical record (EMR) database from January 1, 2000 through June 30, 2007. Patients with T2D (diagnosis, oral antidiabetic drug prescription, two consecutive fasting blood glucose levels ≥126 mg/dL, or A1C ≥7.0%) were identified, as were those with at least one prescription for exenatide. Using these data, descriptive statistics were calculated for these populations. **RESULTS:** Of the 11,601 patients with a prescription for exenatide, nearly all had T2D (96%). A total of 7425 of the patients with a prescription of exenatide were ≥18 years of age and had at least 395 days of records prior to the index date. Compared to the 510,623 T2D patients on other treatments with these same age and records restrictions in the GE EMR, those patients on exenatide were significantly heavier (204.2 lbs. vs. 244.2 lbs. ($p < 0.001$)) with higher BMI (32.9 kg/m^2 vs. 38.7 kg/m^2 ($p < 0.001$)). A larger percentage of the exenatide population was obese or extremely obese than the population on other treatments (89% vs. 61% ($p < 0.001$)). The portion of the exenatide population with baseline A1C ≥9.0 was higher than that of the population on other treatments (56% vs. 12% ($p < 0.001$)) and, compared to the total, exenatide patients had significantly higher mean A1Cs (7.2% vs. 8.1% ($p < 0.001$)). **CONCLUSION:** These results suggest that exenatide is being added to T2D treatment regimens in obese patients with relatively high A1C levels to achieve better diabetes control.

PDB68

AN ASSESSMENT OF THE IMPACT OF THE COVERAGE GAP UPON MEDICARE PART D BENEFICIARIES UTILIZING INSULIN

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OBJECTIVE: To assess the extent of, exposure to, and medication expenditure trends associated with insulin-treated patients reaching the Medicare Part D standard beneficiary prescription coverage gap (i.e., 'doughnut hole') and catastrophic coverage. **METHODS:** Patients receiving various insulin formulations and mixtures throughout 2006 were investigated via a prescription transaction-level retrospective database that captured 50% of all retail dispensing activity within the U.S. Analyses focused upon the coverage gap and catastrophic coverage within standard beneficiaries regarding: 1) the number of patients entering; 2) the month of entry; and 3) medication expenditures. **RESULTS:** Overall, 324,430 Medicare beneficiaries received an insulin regimen in 2006, consisting of 41% dual-eligibles (n = 131,611), 32% low-income subsidiaries (n = 105,151), and 27% standard beneficiaries (n = 87,668). Across all coverage groups, oral antidiabetic agents and insulin comprised 66–72% of monthly drug expenditures. Of those potentially being exposed to a coverage gap, 46% reached the 'doughnut hole' (12% of all Part D beneficiaries) and 12% entered catastrophic coverage (3% of all Part D beneficiaries). Among the near 55,300 standard beneficiaries (63% of 87,668) enrolling in Part D by March 2006, prescription expenditures peaked in the month prior to entering the coverage gap, followed by an immediate 20–25% drop in the month thereafter. Decreased expenditures broadly corresponded to a decrease in the number of diabetes agents dispensed. **CONCLUSION:** This analysis found that 46% of all insulin-treated patients covered by the Medicare Part D standard benefit (12% of all Part D beneficiaries) were exposed to the coverage gap in 2006, characterized by a shifting of full financial responsibility to beneficiaries for outpatient medications. Entry was followed by a 20–25% decrease in expenditures and, more generally, in the number of diabetes agents received. These findings warrant continued evaluation of coverage policies and any subsequent cost-shifting or deferrals in care that may occur, particularly for chronic diseases.

PDB69

COMPARISON OF HEALTH CARE UTILIZATION AND COSTS IN TYPE 2 DIABETES PATIENTS INITIATING ANALOG AND HUMAN INSULINS

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OBJECTIVE: Use of adjunctive insulin therapy with oral antihyperglycemic agents in patients with type 2 diabetes (T2D) has been growing in the US following demonstration in the U.K. Prospective Diabetes Study that intensive therapy regimens increased glycemic control and reduced microvascular complications. The primary objective in this study was to compare the effect of analog insulin with human insulin usage on all-cause and diabetes-attributable direct health care costs and utilization in patients with type 2 diabetes. **METHODS:** Using the MarketScan Research Database, commercially insured patients were selected who initiated insulin therapy with analog or human insulins during 2001–2005, had no insulin claims 12 months prior to starting therapy, and a type 2 diabetes diagnosis during the study period. Patients were followed 12-months from insulin therapy initiation, and were stratified according to their therapy as receiving analog insulin only (n = 18,205), human insulin only (n = 7035), or both analog and human insulins (n = 5040). Health care utilization and expenditures were compared between treatment groups and between pre-index and post-index periods. Generalized multi-valued propensity score weighting was used to control for observable differences in distributions of pretreatment variables among treatment groups. **RESULTS:** Although mean costs for insulin and other prescriptions were lowest for patients receiving only human insulin, mean post-index total all-cause health care costs for analog insulin patients ($17,059)

were significantly lower compared to human insulin only patients ($20,709, $p < 0.001$) and those receiving both analog and human insulins ($28,679, $p < 0.001$). Inpatient visits, length of stay, emergency visits, and clinic visits were also significantly lower ($p < 0.001$) for analog-only patients. Hypoglycemia-related costs and utilization and overall diabetes-related utilization followed the same patterns. **CONCLUSION:** Patients receiving only analog insulin had higher insulin costs but lower post-index total health care costs and utilization, whether all-cause or diabetes-related, compared to patients receiving human insulin or a combination of analog and human insulins.

PDB70

IMPACT OF ANEMIA ON HOSPITALIZATION COSTS IN PATIENTS WITH DIABETES AND CHRONIC KIDNEY DISEASE

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OBJECTIVE: Anemia is a well known complication associated with CKD. However, there are little data regarding its association with hospitalizations. The purpose of this study was to investigate whether anemia is associated with increased hospitalization costs in patients with diabetes and chronic kidney disease (CKD). **METHODS:** An analysis of medical claims and laboratory data between January 2000 and February 2006 from over 45 health plans contributing to the Ingenix Impact National Managed Care Database was conducted. Inclusion criteria were ≥2 hemoglobin (Hb) values, ≥2 claims (within a 90-day period) for diabetes mellitus preceding ≥1 claim for CKD and ≥2 glomerular filtration rate values of <60 mL/min/1.73 m^2, and not yet on dialysis. Patients were excluded if they had cancer or lupus, received organ transplantation or chemotherapy, or were treated for anemia with an erythropoiesis-stimulating agent or blood transfusions. An open-cohort design was used to classify patients into observation periods of anemia (Hb < 11 g/dL), within the K/DOQI treatment recommendations, and non-anemia, which allowed for changes in anemia status over time. Both univariate and multivariate analyses were conducted to compare periods of anemia and non-anemia for average yearly hospitalization costs. **RESULTS:** A total of 708 patients with diabetes and CKD formed the study population. Mean age was 65 years; 44% women. Anemia was associated with a significant increase in hospitalization costs, with an unadjusted incremental yearly cost of $17,072 (anemia: $25,342; non-anemia: $8270; $p < .001$) relative to non-anemia. The majority of hospitalizations (57%) were related to cardiovascular disease, with anemia increasing the cost of cardiovascular-hospitalizations by $8647 (anemia: $13,723; non-anemia: $5076; $p < .001$). After controlling for covariates, anemia remained significantly associated with a hospitalization cost increase. **CONCLUSION:** The current study based on real-life practice data demonstrated that anemia in patients with diabetes and CKD was associated with a significant increase in hospitalization costs.

PDB71

EVALUATION OF ECONOMIC OUTCOMES, ADHERENCE, AND GLYCEMIC CONTROL FOR DIABETIC PATIENTS IN A PHARMACIST-RUN MEDICATION MANAGEMENT PROGRAM

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OBJECTIVE: To measure the effects of a pharmacist-run medication management program on medication adherence, glycemic control, and total health care expenditures. **METHODS:** Scott & White Health Plan (SWHP) claims data were evaluated to identify high-risk diabetics aged 18–63 years, defined as those who demonstrate poor glycemic control (HbA1c >7.5%) and utilized >$600 of prescription medications the year prior to study enrollment. A control group was identified who met the same inclusion criteria, but who were not invited to the program due to geographic constraints. Medical utilization costs were analyzed beginning one year prior to study enrollment and included inpatient, outpatient, emergency department, and prescription costs. Health system charges, standardized to 2006 dollars, were used as a surrogate for costs. Intervention costs were estimated from pharmacists' wage rates. Medication adherence was calculated as medication possession ratio (MPR) of oral antidiabetic agents. HbA1c results were analyzed to determine glycemic control. **RESULTS:** Analysis of 46 subjects and their matched controls one year after program implementation showed positive trends, although none of the results were statistically significant. The mean MPR for the intervention group increased from 0.69 to 0.79, while there was no change from a baseline of 0.64 for controls [$p = 0.24$]. Intervention patients demonstrated a greater improvement (9.5% to 8.2%) in HbA1c than controls (9.5% to 8.7%) [$p = 0.15$]. Although total monthly health care costs increased in both the intervention ($1448 to $1756; difference = $308 ± $2016) and control groups ($1089 to $1745; difference = $656 ± $2641) [$p = 0.46$], the increase was lower in the intervention group. **CONCLUSION:** Patients in the intervention group trended toward better medication adherence and a greater decline in HbA1c than controls. We expect the trend of cost savings will continue and strengthen in the future due to long-term benefits associated with sustained glycemic control.

PDB72

THE NEED FOR EARLIER INSULIN INITIATION AND INTENSIFICATION AMONG PATIENTS WITH TYPE 2 DIABETES: EVIDENCE FROM HEALTH CLAIMS AND LABORATORY DATABASE

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OBJECTIVE: Patient and provider "psychological insulin resistance" can contribute to a delay in initiation of insulin therapy in patients with type 2 diabetes (T2DM). Consequently, by the time patients initiate insulin, complications may have already developed. If patients initiate insulin but therapy is not intensified to reach glycemic goal (HbA1c 7%), the ability to prevent or delay complications may be compromised. The objective of this study was to determine differences in the incidence of complications of diabetes between patients with HbA1c <7% and those with HbA1c ≥7%. **METHODS:** US health claims and clinical laboratory data from 2003–2005 were used to identify and stratify patients by mean HbA1c (controlled 7% vs. suboptimally controlled 7%) for analysis. Cohort was limited to

T2DM patients on insulin-only regimens with at least one HbA1c value in the database and six months continuous eligibility pre-post HbA1c index. Data on HbA1c, insulin regimen, complications and demographic characteristics of all patients were analyzed using descriptive statistics. **RESULTS:** Of 689 patients, 29% had HbA1c 7% (mean age 52 years; female 40%; mean HbA1c 5.9%; basal-only 73%; basal-bolus 25%) while 71% had HbA1c 7% (mean age 51 years; female 41%; mean HbA1c 9.3%; basal-only insulin 63%; basal-bolus insulin 34%). The nature and incidence of microvascular complications in the two groups were: diabetic foot complications 2% and 6% ($p < 0.05$), neuropathy 13% and 9%, retinopathy 9% and 13%, kidney disease 5% and 7% for patients with HbA1c <7% and ≥7%, respectively. **CONCLUSION:** A sizable proportion of T2DM patients were uncontrolled on their current insulin regimen. This may reflect undue delay in insulin initiation and intensification by patients and providers. Moreover, a considerable proportion of patients at goal show signs of complications, signifying the urgency of earlier insulin initiation and more aggressive intensification to ameliorate current sub-optimal glycemic control.

PDB73

NON-INJECTABLE INSULIN—TO PAY OR NOT TO PAY?

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OBJECTIVE: To systematically review the literature and published recommendations from four Health Technology Assessment Agencies (HTAAs) in order to report what may have contributed to the dearth of reimbursement of non-injectable insulins. **METHODS:** Two independent researchers systematically reviewed the published literature from 2003–2007 using the MEDLINE, EMBASE, and Cochrane databases. Publications of human trials involving non-injectable insulins reported in any language were included. Keywords such as Insulin, Oral OR Inhalation OR Aerosols OR Mist OR Spray OR Sublingual OR Nebulizers OR Vaporizers OR Intranasal OR Dermal OR Buccal with the indication of Diabetes Mellitus Type 1 OR Diabetes Mellitus Type 2 were used. Clinical trials, with at least one intervention being a non-injectable insulin, were included. Exclusion criteria included inappropriate research design, outcomes not reported and/or not extractable. Listing decisions posted on the websites of the National Institute for Health and Clinical Excellence in the UK, the Scottish Medicines Consortium, the Institute for Quality and Efficiency in Health Care in Germany, and the Common Drug Review in Canada were reviewed. **RESULTS:** Of 233 identified citations, 20 articles were included for full text review. Reported outcomes included standard clinical efficacy measures (e.g., postprandial glucose levels, HbA1c reduction) and tolerability. Few articles (N = 3) reported outcomes such as patient preference for treatment, general health-related quality of life, final health outcomes, and/or satisfaction. No studies were specifically designed for reimbursement purposes. There was a paucity of utility measures, the lack of which was the main criticism by the HTAAs leading to either "not to list" or very restricted listing recommendations. Other HTAA comments were the use of secondary versus primary clinical outcomes and the absence of adherence information. **CONCLUSION:** Clinical studies for non-injectable insulins do not include adequate information and/or outcomes that are required by decision makers for reimbursement recommendations.

WITHDRAWN **PDB74**

PDB75

PRESCRIBING PATTERN AND PREDICTORS ASSOCIATED WITH THE USE OF HYPOGLYCAEMIC DRUGS: A CROSS-SECTIONAL STUDY IN ITALIAN GENERAL PRACTICE

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OBJECTIVE: To describe first and second-line use of antidiabetic drugs for management of type 2 diabetes in Italy, and to identify potential predictors associated with the use of antihyperglycemic drugs. **METHODS:** Primary care data were obtained from 400 Italian General Practitioners (GPs) providing information to the Health Search/Thales Database (HSD). All patients with a doctor-diagnosis of type 2 diabetes during the years 1996–2006 were selected. First and second-line drug therapy episodes were evaluated by assessing the sequential fulfilment of prescriptions of a particular antihyperglycemic drug class (or combination), which followed the diabetes diagnosis. A sub-sample of diabetic patients, with a registered diagnosis until the December 31, 2003 was also selected to evaluate the time-dependant clinical and demographic characteristics associated with the use of different antihyperglycemic drugs across the years 2004–2006. **RESULTS:** A total of 19,561 diabetic patients had diabetes drug therapy episodes between 1996 and 2006. Monotherapy with metformin increased (from 4.1% in 1996 to 44.8% in 2006), while monotherapy with sulfonylureas decreased over time (from 32.7% to 23.9%) as first line therapy. Thiazolidinedione (from 0.3% to 0.6%)and other oral antihyperglycemics (from 0.7% to 4.3%) also raised over the period. Second-line drug therapy episodes shown the same trend during study period with a substantial increased use of thiazolidinedione (from 2.5% to 3.8%). As regards prevalent patients characteristics, hypercholesteremia and obesity were significantly associated with the use of thiazolidinediones while coronary artery disease, chronic renal and hepatic failure were associated with insulin use. **CONCLUSION:** Antihyperglycemic prescription patterns in Italy dramatically changed from 1996 to 2006 with increased use of metformin and decreased use of sulfonylureas. The introduction of thiazolidinediones to the marketplace seems not change the management of diabetes mellitus as first line-treatment, although this drug class is preferred in chronic patients particularly affected by hypercholesteremia and obesity.

PDB76

PROFILING PHYSICIAN PRESCRIPTION BEHAVIOR WITH CANONICAL CORRESPONDENCE ANALYSIS

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OBJECTIVE: To profile physician prescription Behavior for patients with type 2 diabetes in a managed care setting. **METHODS:** We used a retrospective cohort study design with patient-de-identified national health claims databases (70+ million unique lives from January 1, 2098 through December 31, 2004). Patients with T2D were identified based on ICD-9-CM codes, and were grouped into 6 cohorts (general practitioner, other primary care specialist, internist, endocrinologist, cardiologist, and other specialties) based on the practice specialty of physicians who prescribed the first insulin for their

patients. For each cohort, we calculated proportions of patients with T2D using 7 individual insulin regimens (basal only, bolus only, basal-bolus, basal only with oral anti-diabetic medication (OAD), bolus only with OAD, basal-bolus with OAD, other). Chi-square test and Fisher's exact test were used to examine the association between patients' insulin regimens and the specialty of the physician who initiated their insulin use. Further we used canonical correspondence analysis to explore the association between practice specialty and patients' insulin regimens. **RESULTS:** Both the Chi-square statistics ($p < 0.0001$) and the Fisher's exact test ($p < 0.000001$) indicate that patients' insulin regimens are strongly associated with physicians' practice type. The canonical correspondence analysis suggest that 86.27% of principal inertia could be explained by a dimension on which OAD use is correspond closely with general practitioners, endocrinologist, and internist practice specialties. The canonical correspondence analysis results also indicate that physicians' choice of insulin initiation regimen was statistically significantly associate with their practice specialties. **CONCLUSION:** The practice specialty of the physicians initiating insulin is strongly associated with their patients' overall insulin regimens. Compared to other physician practice specialties, endocrinologists were most likely to prescribe basal-bolus insulin with OAD, and least likely to prescribe basal only insulin.

PDB77

INVOLVEMENT OF LAY VOLUNTEERS IN TRAINING ON SELF-MANAGEMENT OF PATIENTS WITH DIABETES IN THE UNITED KINGDOM—COST IMPLICATIONS

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OBJECTIVE: A recent randomised clinical trial demonstrated that specialist health professionals (SHP) and volunteer peer advisors in diabetes (PAD) are equally effective in delivering training programs for self-management of diabetes, based on a validated five-item knowledge questionnaire. The objective of this study was to compare the costs of training delivered by SHP and by PAD. **METHODS:** Cost of SHP (specialist nurse) in the NHS setting, including their education/training costs, was obtained from published sources. Cost of training of PAD was based on actual resource utilization during their training: 33 sessions (including instruction and mentoring) of 90 min each were needed at cost of time of a SHP trainer per group of 15. Intervention time for groups of 15 was 6 training session of 90 min each, based on the clinical trial. Patient concordance was included in the analysis. All costs were for 2007. As many volunteers discontinue their commitment, assumptions as to their prospective engagement were tested in scenario analysis. Effects of the voluntary involvement of PAD on their own health and cost outcomes, and cost consequences of the effects of training were not considered. **RESULTS:** The cost per patient completing the training delivered by SHP was ≤45.19. The cost for PAD depended on the number of courses delivered after they have been trained: for one course scenario, the cost was ≤21.52, for 3 courses ≤7.17, and for five courses ≤4.30. The respective cost savings per 1000 patients completing the training were ≤23,673, ≤38,021, and ≤40,891. Engaging PAD instead of SHP to train 1000 patients would allow the NHS to provide training on self-management in diabetes to additional 1100–9500 patients. **CONCLUSION:** Engaging volunteer peer advisors in the training on self-management of diabetes is a highly cost-saving intervention with potentially considerable implications for public health in the UK.

PDB78

MEASURING THE IMPACT OF AN EDUCATIONAL PROGRAM ON PHYSICIAN PRACTICE PATTERNS: EXPERTMD™ CV DIABETES

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OBJECTIVE: Controlling risk factors/using cardioprotective therapies can reduce cardiovascular (CV) morbidity/mortality in diabetic patients 1)translating this evidence into practice can be challenging, and 2) many patients receive inadequate care. In an effort to help improve the care primary care physicians provide to patients with Diabetes (DM) in Canada, the ExpertMD™ CV Diabetes program was developed. To assess the impact of the ExpertMD™ program in improving physicians' management of the CV complications of DM patients. **METHODS:** A total of 100 Canadian family physicians (FPs) voluntarily participated in the program. Physicians' management of the CV complications of patients with DM was assessed before (Pre-) and After (Post-) implementation of the ExpertMD™ program via self-audit. Clinical data parameters, gathered via case report forms submitted on-line, examined State of Care at Visit Entry and Visit Exit, Pre- and Post-Program. Twenty-four FPs recruited as a control group solely for the self-audit submitted paper-based forms to the data centre. Data were cleaned/analyzed by Groupe D'analyse, Ltee, Montréal, QC. **RESULTS:** At Visit Entry, more patients were at BP goal (<130/80) Post program in both FP groups (ExpertMD™: 34.3% vs. 29.2%, $p = 0.01$; Control: 47.5% vs. 34.3%, $p = 0.02$). At Visit Exit, Physician management of glucose (A1c <3 months, 80.8% vs. 77%, p: 0.05), cholesterol screening <12 months (93.7% vs. 89.5%, p: 0.002), ACR screening <12 months (95.6% vs. 90.5, p: 0.0004), obesity screening via waist measurement (28.2% vs. 12.5%, $p < 0.0001$) and ASA use (86.9% vs. 77.5%, $p < 0.0001$) was significantly higher Post- versus Pre- program for ExpertMD™ participants. Post- program Control FPs checked BP at office visit (100% vs. 74.9%, $p < 0.0001$), monitored ACR (92.8% vs. 83.5%, $p = 0.04$) and used ASA (96.1% vs. 82.4%, p: 0.0002) significantly more often. **CONCLUSION:** The results indicate the ExpertMD™ CV Diabetes program positively impacted physician practice patterns, enhancing the care provided to DM patients.

PDB79

USING DECISION ANALYTIC METHODS TO REDUCE COSTLY LABORATORY ERRORS: A TEST OF A PROBABILISTIC AUTOVERIFICATION SYSTEM

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OBJECTIVE: Medical errors are a significant and costly problem in the United States. They kill more Americans each year than motor vehicle accidents, breast cancer, and AIDS (Institute of Medicine 1999). Our objective is to develop a Bayesian method to detect mismatched specimens using blood laboratory data from the National Health and Nutrition Examination Survey (NHANES) and to compare this method to an existing automated rule-based approach, LabRespond. **METHODS:** The sample consisted of 6486 participants separated into a training

(N = 2000) and a test set (N = 4486). A proportion of glucose and HbA1c specimens were mismatched by randomly switching either HbA1c or glucose results. The outcome of interest was correct classification of vials as either 'matched' or 'mismatched'. The outcome was predicted using a Bayesian network that encoded probabilistic relationships among analytes, self-reported diabetes status and a latent 'mismatch' variable. Performance was compared against an established approach LabRespond via area under the receiver-operating characteristics curves (AUCs). An AUC = 1.0 and 0.5 represents perfect prediction and random guessing respectively. **RESULTS:** The network was predictive of glucose and HbA1c mismatches that produced 20 mg/dL glucose and 1 point HbA1c discrepancies between true and mismatched scores (AUC = 0.84 (+/–0.03)). The network also identified errors among those self-reporting diabetes (N = 329) AUC = 0.81 (+/–0.02) and predicted self-report of diabetes diagnosis AUC = 0.95 (+/–0.01). The network also performed better ($z = 12.04$, $p < 0.001$) than LabRespond (AUC = 0.76 +/– 0.01). **CONCLUSION:** A Bayesian network that models probabilistic relationships among analyte values can accurately identify mismatched specimens. The algorithm is best at identifying mismatches that result in a clinically significant magnitude of error. Information about diabetes diagnosis acted to reduce uncertainty in a mismatch. Decision analysis may be have direct application in reducing cost at point-of-care.

PDB80

REDUCING COSTS AND IMPROVING OUTCOMES BY REDUCING MEDICAL ERRORS: A COMPARISON OF EXPERTS WITH PROBABLISTIC LABORATORY ERROR DETECTION IN A POPULATION OF PRE-DIABETICS

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OBJECTIVE: Human evaluation of laboratory errors is a costly standard of practice. Automating error detection may reduce costs and improve patient outcomes. To compare an automated probabilistic approach (Bayesian network) to human expert error detection in a pre-diabetic population. **METHODS:** Two test sets (A and B) each N = 60 were generated from the results of the Diabetes Prevention Program (DPP). Glucose values were randomly drawn from a pre-diabetic distribution and expected HbA1c score was estimated by the DPP based formula: $HbA1c = 4.22 + 0.1604 \times Glucose$. In each test set, 37% of the HbA1c scores were mismatched to generate vial labeling errors. Eleven experts recruited from the American Academy of Clinical Chemists and a Bayesian network evaluated the results to detect mismatched vials. Six and five experts were assigned to test sets A and B respectively. Receiver-Operating Characteristics (ROC) curves were generated for each expert and for the Bayesian network and area under the curves (AUCs) were compared via null hypothesis testing. An AUC = 1 and 0.5 represents perfect prediction and random guessing respectively. **RESULTS:** The Bayesian network was predictive of glucose and HbA1c mismatches in both Test Set A (AUC = 0.86 (+/–0.05)) and Test Set B (AUC = 0.93 (+/–0.04)). Expert performance was on average worse in Test Sets A (AUC = 0.74 (+/–0.07)) and B (AUC = 0.76 (+/–0.07)). Individual analysis revealed that the network performed significantly better ($z < 1.96$, $p < 0.05$) than 7 of the 11 experts; in no case did the network perform worse than the experts. **CONCLUSION:** A Bayesian network that models probabilistic relationships among analyte values is often better than laboratory experts at identifying laboratory errors. This suggests that an automated program may help reduce costs and improve patient outcomes in the laboratory.

HEALTH CARE INTERVENTIONS—Cost Studies

PHC1

A COST COMPARISON OF CARDIAC SURGERIES BY CHOICE OF FIBRIN SEALANT

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OBJECTIVE: Fibrin sealants are efficacious in reducing perioperative bleeding during a variety of surgical procedures, which may result in decreased hospital costs and lengths of stay (LOS). This study sought to compare hospital costs and LOS by three fibrin sealants used in cardiac surgical procedures. **METHODS:** Data were extracted from a large U.S. hospital-based, service-level comparative database. Procedures were identified using principal ICD-9 codes. Patients who received either FloSeal® only or one of two comparison products (Gelfoam® + thrombin or Surgicel® + thrombin) and were discharged from hospital between April 1, 2003 and September 30, 2006 were included. Costs were considered from the hospital perspective and were derived from either reported actual costs or an estimated calculation of costs-to-charges from the Medicare Cost Report. Regression modeling with log transformation was employed to compare differences in fixed hospital costs (those insensitive to volume), variable costs (those sensitive to volume), and post-operative LOS. Control variables included age, gender, All Patient Refined-Diagnosis Related Group severity codes, region, hospital teaching status, bed size, population served (urban or rural), and primary payer. **RESULTS:** A total of 35,672 discharges were included. The regression models showed that patients who received Gelfoam + thrombin had higher fixed and variable costs (+21% and +40%, $p < 0.01$, respectively) and Surgicel + thrombin had higher fixed and variable costs (+18% and +14.5%, $p < 0.01$, respectively) compared to FloSeal. In terms of fixed costs, this amounted to an additional $21,803 for Gelfoam + thrombin and an additional $19,208 for Surgicel + thrombin cohorts. In variable costs, this amounted to an additional $26,609 for Gelfoam + thrombin and $22,181 for Surgicel + thrombin cohorts. All three cohorts had similar post-operative LOS. **CONCLUSION:** FloSeal demonstrated cost reduction in hospital stays for cardiac procedures, compared to two other fibrin sealants. Given small margins achieved by hospitals today, cost-effective surgical aids with better or similar outcomes should be considered in surgical service lines.

PHC2

A COMPARISON OF COSTS ASSOCIATED WITH SPINAL SURGERIES BY CHOICE OF FIBRIN SEALANT

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OBJECTIVE: Fibrin sealants are used in a variety of surgical procedures to reduce wound bleeding. This may consequently decrease hospital costs and lengths of stay (LOS). This study sought to compare costs and LOS following fibrin sealant use during spinal surgery. **METHODS:** Data were extracted from a large U.S. hospital-based, service-level comparative database. Procedures were identified using principal ICD-9 codes. Patients who received either FloSeal® only or one of two comparison products (Gelfoam® + thrombin or Surgicel® + thrombin) and were discharged from hospital between April 1, 2003 and September 30, 2006 were included. Costs were considered from the hospital perspective and were derived from either reported actual costs or

an estimated calculation of costs-to-charges from the Medicare Cost Report. Regression modeling with log transformation was employed to compare differences in fixed hospital costs (those insensitive to volume), variable costs (those sensitive to volume), and post-operative LOS. Control variables included age, gender, All Patient Refined-Diagnosis Related Group severity codes, region, hospital teaching status, bed size, population served (urban or rural), and primary payer. **RESULTS:** A total of 82,788 discharges were included. The models demonstrated that patients who received Gelfoam + thrombin had higher fixed and variable costs (+6.1% and +7.3%, respectively, $p < 0.01$) and Surgicel + thrombin patients had higher fixed and variable costs (+18% and +10%, $p < 0.01$, respectively) compared to FloSeal only. In terms of fixed costs, the predicted increase was $15,956 for Gelfoam + thrombin and $18,639 for Surgicel + thrombin patients. In terms of variable costs, the predicted increase was $25,413 per Gelfoam + thrombin and $24,909 per Surgicel + thrombin patient. Surgicel+ thrombin patients also had higher (+6%, $p < 0.01$) post-operative LOS compared to FloSeal patients. **CONCLUSION:** FloSeal demonstrated significant cost reductions and post-operative LOS, compared to other commonly-used products. Limited prospective reimbursements based on a DRG system make it necessary for health care providers to consider more cost-effective surgical aids for spinal surgeries.

PHC3

COST-EFFECTIVENESS MODELING OF DENTAL IMPLANT 1ST LINE STRATEGY VERSUS BRIDGE

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OBJECTIVE: We assessed the cost-effectiveness of dental implant 1st line strategy versus fixed partial denture (and denture) in patients suffering from one single missing tooth. **METHODS:** The model used a simulation decision framework over a 20-year period. Potential treatment switches can occur every 5 years. Transition probabilities came from literature, epidemiological reports or expert opinions. They have been programmed using specific distribution ranges to simulate the patients and practice variability, and to take into account parameters uncertainty. Direct medical costs have been assessed according to a specific cost survey in France. Probabilistic sensitivity analyses were conducted using 5000 Monte-Carlo simulations generating confidence intervals of model outcomes. **RESULTS:** The cost distribution indicates a peak at €3000 for the bridge strategy. The distribution for the implant strategy is more flat, showing the maximum ranging from €2500 to €3500. The model simulations establish that total mean cost of the bridge 1st line strategy is €4385 per patient over 20 years (minimum: €1850; maximum: €17,267), providing 69% of success rate. Total mean cost of the implant 1st line strategy is €3517 per patient over 20 years (minimum: €1990 Euros; maximum: €10,221 Euros), with 92% of success rate. Differences are statistically significant for both total mean costs ($p < 0.001$) and success rate ($p < 0.001$). The mean cost-effectiveness (cost per functional dental unit in position) is shown in Figure 3c. It indicates that the bridge strategy is significantly higher ($p < 0.001$) than the implant strategy with €6286/success versus 3819 Euros/success respectively. **CONCLUSION:** This simulation modeling approach is the very first robust model in the field of implantology. Implant as the 1st line strategy appears to be the "dominant" strategy, considering the lower overall costs and the higher success rate.

PHC4

COST-EFFECTIVENESS ANALYSIS OF THROMBOPROPHYLACTIC STRATEGIES OVER 1 YEAR AFTER TOTAL HIP REPLACEMENT IN VETERAN PATIENTS

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OBJECTIVE: For 20 years, thromboprophylactic strategies (TSs) have been used after total hip replacement (THR). Our objective was to conduct a comprehensive cost effectiveness analysis (CEA) of TSs for THR from the health payer perspective. **METHODS:** We extracted national data for Veteran patients receiving THR, including 1-year follow-up of all heath care utilization and complications of venous thromboembolic events (VTE: deep vein thrombosis, pulmonary embolism), thombocytopenia, bleeding, and death. Diagnostic codes were used to identify most complications. A comparative CE model, incorporating fondaparinux, was developed. Incremental cost-effectiveness ratios (ICERs) were calculated to compare TSs. Life-years gained (LYG) were calculated using actuarial tables for life expectancy. Since fondaparinux was rarely used in the VA, we applied rates from published trials and used our data to estimate proportional increases in complication rates for fondaparinux from day 50 through one year. We applied VA costs. Fondaparinux costs were based upon mean costs of outcomes of the other TSs. One-way sensitivity analyses (SA) were performed by incorporating the mean probabilities of DVT in the other TSs into the least-costly TS or decreasing the costs of complication arms by one standard deviation in all but the least-costly TS. **RESULTS:** There were 1722 patients, 90 VTEs, and 48 deaths. Dalteparin was dominant; the least-costly per patient with fewest VTEs ($18,850, 2.4%) compared to warfarin ($18,953, 6.4%), enoxaparin ($19,965, 2.7%), enoxaparin/warfarin ($24,809, 21.6%), and fondaparinux ($20,759, 5.2%). Thus, ICERS indicated more costs and more events with other TSs. Deaths occurred in 2.4% of dalteparin patients versus 2.3% for enoxaparin and, estimated, 1.0%, for fondaparinux, thus ICERS for LYG were $35,754/LYG and $6381/LYG, respectively. Dalteparin and other treatments were dominant over warfarin (2.9% deaths) and enoxaparin/warfarin (6.0% deaths)for LYG. Each SA showed dalteparin remained the least-costly TS per VTE avoided. **CONCLUSION:** Dalteparin was slightly more effective and less costly.

PHC5

COST-EFFECTIVENESS ANALYSIS OF THROMBOPROPHYLACTIC STRATEGIES OVER ONE YEAR AFTER TOTAL KNEE REPLACEMENT IN VETERAN PATIENTS

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OBJECTIVE: There is a lack of cost effectiveness (CE) analyses of thromboprophylactic strategies (TSs) for total knee replacement (TKR) that incorporate outpatient care, long-term follow-up, or complications besides venothrombotic events (VTE: deep vein thrombosis, pulmonary embolism). The objective was to assess the CE of TSs for TKR from the health payer perspective including complications of VTE, hemorrhage, thrombocytopenia, and death. **METHODS:** We searched national Veterans Affairs (VA) datasets for all health care use, outcomes and VA costs for patients receiving TKR within one year. Our follow-up was one year. Diagnostic codes were used to identify complications. Life-years gained (LYG) were calculated using actuarial

tables. A comparative CE model, incorporating fondaparinux, was developed. Incremental cost-effectiveness ratios (ICERs) were calculated. Since no fondaparinux was used, we applied rates from published trials, and adjusted for the mean proportional increase in rates between 49 days (trial follow-up) and one year in Veterans. For fondaparinux, costs were estimated from mean costs of complications among the other TSs, with an adjustment for increased medication cost. One-way sensitivity analyses (SA) were performed by incorporating the mean probabilities of DVT among each other TSs into the least-costly TS or decreasing the costs of complication arms by one standard deviation. **RESULTS:** There were 3037 patients, 131 VTEs, and 53 deaths. Dalteparin was dominant; the least-costly per patient with fewest VTEs ($16,310, 1.0%) compared to warfarin ($17,803, 3.5%), enoxaparin ($19,253, 2.4%), enoxaparin/warfarin ($23,641, 22.7%), and fondaparinux ($19,577, 1.6%). Thus, ICERS indicated more costs and more events with other TSs. Deaths occurred in 2% of dalteparin patients, thus ICERS for LYG (deaths) were warfarin $27,004 (1.7%), enoxaparin $33,232 (1.5%), enoxaparin/warfarin $40,479 (1.1%), and fondaparinux $20,355 (estimated 1.2%). Each SA showed dalteparin remained the least-costly TS per VTE avoided. **CONCLUSION:** Dalteparin was the least-costly TS and had the fewest VTEs.

PHC6

COST-EFFECTIVENESS COMPARISON OF TENSION-FREE MESH REPAIR VS. TENSION SUTURE REPAIR METHODS OF INGUINAL HERNIA IN HUNGARY

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OBJECTIVE: The objective of this study was to compare the cost-effectiveness of tension-free mesh and tension suture methods of inguinal hernia repair in Hungary, from hospital and payer perspectives. **METHODS:** Cost effectiveness of open mesh vs. open non mesh was modeled with a Cohort Markov model. Model simulation runs in yearly cycles up to 15 years. Transition probabilities were derived from systematic review and other published sources. Costs were collected from two hospitals and from the payer in Hungary. Utility values were extracted from the published sources. Both costs and outcomes were discounted annually at 5%. In probabilistic sensitive analysis simulations were repeated 10,000 times. CEAC curves were generated as a result of simulation for all scenarios. **RESULTS:** Over a 5 and 15 year period open mesh provides greater benefits in terms of more QALYs and fewer recurrences at a cumulatively higher cost than open non mesh procedures. Cost per one additional QALY is €13,221 in a 5 years time horizon and €2819 in a 15 years time horizon from a payer perspective. Cost per one recurrence avoided is €885 in a 5 years time horizon and €173 in a 15 years time horizon from payer perspective. When the costs from a hospital perspective are used the open mesh option is the dominant technology over the open non mesh option. Results in the probability sensitivity analysis are very similar to deterministic analysis. In the five year perspective open mesh is the more cost effective option in comparison to open non mesh option when the value for society's willingness to pay for a QALY exceeds €6000 (€700 in the 15 years perspective). **CONCLUSION:** Findings suggest open mesh hernia repair method as a very cost effective therapy from both hospitals and payer perspectives for the inguinal hernia treatment in Hungary.

PHC7

COST-EFFECTIVENESS COMPARISON OF TENSION-FREE MESH REPAIR VS. TENSION SUTURE REPAIR METHODS OF INGUINAL HERNIA IN POLAND

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OBJECTIVE: To compare the cost-effectiveness of tension-free mesh and tension suture methods of inguinal hernia repair in Poland, from hospital and payer perspectives. **METHODS:** Cost effectiveness of open mesh vs open non mesh was modeled with a Cohort Markov model. Model simulation runs in yearly cycles up to 15 years. Transition probabilities were derived from systematic review and other published sources. Costs were collected from four hospitals and from the payer in Poland. Utility values were extracted from the published sources. Both costs and outcomes were discounted annually at 5%. In probabilistic sensitive analysis simulations were repeated 10,000 times. CEAC curves were generated as a result of simulation for all scenarios. **RESULTS:** Over a 5 and 15 year period open mesh provides greater benefits in terms of more QALYs and fewer recurrences at a cumulatively higher cost than open non mesh. The cost per one additional QALY is €16,730 in a 5 years time horizon and €3236 in a 15 years time horizon from a payer perspective (€16,485 and €3061 respectively from a hospital perspective). Cost per one recurrence avoided is €1096 in a 5 years time horizon and €199 in a fifteen years time horizon from a payer perspective (€1103 and €188 respectively from hospital perspective). Results from the probability sensitivity analysis are very similar to deterministic analyses. In the five year perspective open mesh is more cost effective in comparison to the open non mesh option when the value for society's willingness to pay for a QALY exceeds €10,000 (€500 in the 15 years perspective). **CONCLUSION:** Findings suggest open mesh hernia repair method as a very cost effective therapy from both hospitals and payer perspectives for the inguinal hernia treatment in Poland.

PHC8

COST-EFFECTIVENESS COMPARISON OF TENSION-FREE MESH REPAIR VS. TENSION SUTURE REPAIR METHODS OF INGUINAL HERNIA IN SLOVAKIA

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OBJECTIVE: The objective of this study was to compare the cost-effectiveness of tension-free mesh and tension suture methods of inguinal hernia repair in Slovakia, from hospital and the payer perspective. **METHODS:** Cost effectiveness of open mesh vs open non mesh was modeled with a Cohort Markov model. Model simulation runs in yearly cycles up to 15 years. Transition probabilities were derived from systematic review and other published sources. Costs were collected from two hospitals and from the payer in Slovakia. Utility values were extracted from the published sources. Both costs and outcomes were discounted annually at 5%. In probabilistic sensitive analysis simulations were repeated 10,000 times. CEAC curves were generated as a result of simulation for all scenarios. **RESULTS:** Over a 5 and 15 year period open mesh provides greater benefits in terms of more QALYs and fewer recurrences than open non-mesh. When the costs from a payer's perspective are used the open mesh option is the dominant technology over open non mesh option (equal payment for open mesh and open non mesh options). The cost per one additional QALY is €1230 in a 5 years time horizon and the open mesh is the cost effective option in a 15 years time horizon from a hospital perspective. Cost per one

recurrence avoided is €82 in the 5 years time horizon and the open mesh is the dominant option in the 15 years time horizon from a hospital perspective. Results in the probability sensitivity analysis are very similar to deterministic analysis. **CONCLUSION:** Findings suggest open mesh hernia repair method as a very cost effective therapy from both hospitals and payers perspectives for the inguinal hernia treatment in Slovakia.

PHC9

THE POTENTIAL SAVINGS IN OPERATING ROOM TIME ASSOCIATED WITH THE USE OF SUGAMMADEX TO REVERSE SELECTED NEUROMUSCULAR BLOCKING AGENTS: FINDINGS FROM A HOSPITAL EFFICIENCY MODEL

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OBJECTIVE: Operating rooms (OR) are an expensive hospital resource. As a new selective reversal binding agent, sugammadex has been shown in clinical trials to reduce reversal time (time from reversal agent administration to full recovery) among patients receiving selected steroidal neuromuscular-blocking agents (NMBAs). Our goal was to develop a hospital efficiency model to assess the potential impact of sugammadex adoption on OR time. **METHODS:** A deterministic model was developed to estimate potential time savings associated with sugammadex adoption for the U.S. setting. Model inputs included surgical caseloads, utilization rates of NMBAs and reversal strategies, OR time components, and OR labor costs. The effects of reversal strategies on reversal time were evaluated using clinical trial data. Other model inputs were estimated using published literature and analyses of secondary hospital databases. OR time saved was defined as the difference in minutes required for all procedures performed per day in one OR before and after the introduction of sugammadex. Estimates of savings in OR staff costs (including OR nurse, OR technician, and certified registered nurse anesthetist) were generated under alternative assumptions about the likelihood that overtime is paid. Sensitivity analyses were performed on key model assumptions. **RESULTS:** In the base-case scenario, OR time saved by sugammadex was estimated to be 25 minutes per OR day or 612 hours annually in a typical US hospital with 6 ORs. Associated annual cost savings were estimated to range from $32,035 (25% of days involve overtime) to $96,105 (75% of days involve overtime). Findings also varied with the assumed adoption rate of sugammadex and hourly OR staff salaries. **CONCLUSION:** Sugammadex may save OR time and associated costs for U.S. hospitals, primarily by reducing overtime pay. The net financial benefit of sugammadex will depend on its cost and its adoption rate in clinical practice.

PHC10

AN ASSESSMENT OF HOSPITAL COSTS AND REIMBURSEMENT AMONG TOTAL HIP OR KNEE ARTHROPLASTY PATIENTS IN THE UNITED STATES THAT EXPERIENCE VENOUS THROMBOEMBOLISM

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OBJECTIVE: Deep vein thrombosis (DVT) and pulmonary embolism (PE), collectively known as venous thromboembolism (VTE), are well-known complications of total knee or hip arthroplasty (TKA and THA). This study examined the economic burden of VTE in arthroplasty surgeries from a US hospital perspective. **METHODS:** Patients at least 18 years old undergoing TKA and THA from January 1, 2002 to December 30, 2006 were extracted from a large, nationwide inpatient database. Rates of events, length of hospital stay, inpatient costs and reimbursed amounts (available for a small subset that could be linked to managed care data) were evaluated. Multivariate analyses were conducted on hospital costs to adjust for differences in demographic and clinical characteristics. **RESULTS:** Out of 259,524 hip and knee surgeries (mean age of 67 years), 1.0% of patients diagnosed with VTE during hospitalization (0.6% DVT only and 0.4% PE [with or without DVT]). Compared to patients without VTE, mean length of stay (LOS) for those with VTE was twice as long (8 vs. 4, $p < 0.0001$) and hospital costs were 48.0% higher ($20,850 vs. $14,092, $p < 0.0001$). Within the limited subset that had linked managed care claims data ($n = 5002$), mean cost of patients with VTE was 23.5% higher ($16,877 vs. $13,662, $p < 0.0023$); however, the amount reimbursed was on average 6.4% higher ($14,121 vs. $13,272, $p = 0.77$). After multivariate adjustment, DVT increased costs by $1421 following TKA and $3950 following THA; PE increased costs by $2862 following TKA and $4355 following THA ($p < 0.0001$ for all). **CONCLUSION:** Experiencing VTE complications substantially adds to the costs of TKA or THA. The increased hospital costs of patients with VTE did not appear to be adequately reimbursed. The overall economic impact of implementing prophylaxis to prevent VTE events can be projected.

HEALTH CARE INTERVENTIONS—
Patient-Reported Outcomes

PHC11

A SYSTEMATIC REVIEW OF STUDIES ON QUALITY OF LIFE IN ANIMALS

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OBJECTIVE: The objective of this project was to review published studies on quality of life (QoL) in animals. **METHODS:** An electronic search in EMBASE including MEDLINE using the key words "quality of life" and "animals" resulted in 1588 articles. Inclusion criteria for review was study on QoL, exclusion criteria were case studies with $n < 3$, and studies in laboratory animals as proxy for humans. **RESULTS:** A total of 48 studies were included for review, of which 40 were performed in dogs. The aim of nine studies was the development and validation of a questionnaire, three studies provided a checklist or background information on QoL in animals. In the remaining 36 studies QoL was assessed as outcome measure in specific diseases or treatments; however 30 of these studies were uncontrolled. Previously developed, used or validated questionnaires were included in only 3 studies. In 23 studies assessment of QoL was limited to one single question, addressed to the owners. In 30 of the 36 studies the evaluation of QoL was performed only at one time point after the start of an intervention, of which 3 studies retrospectively evaluated a baseline value. In 19 studies, all or part of the animals were already dead at the time of assessment. In 19 of the 30 uncontrolled studies QoL was rated as good to excellent (or equivalent in scores) in >50% of the animals, even in studies on severe conditions such as cancer or chemotherapy. **CONCLUSION:** Most of the studies assessing QoL as outcome used unvalidated questionnaires and included only one single question addressed to the owners. It is questionable whether the

multidimensionality of QoL can be assessed properly this way; especially in this specific situation where the owners are proxy reporters but also responsible for the well-being of the animal and therefore likely to be biased.

HEALTH CARE INTERVENTIONS—Health Care Use & Policy Studies

PHC12

STARR PROCEDURE FOR OBSTRUCTED DEFAECATION SYNDROME (ODS): 12-MONTH FOLLOW-UP

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OBJECTIVE: A European STARR registry was set-up to determine the short-term safety and effectiveness of the STARR procedure for obstructed defaecation syndrome. **METHODS:** STARR registries in Italy, Germany and the UK were designed with a web-based interface to allow pooling of results for combined analysis. Recruitment commenced in January 2006. Data collection included a symptom severity score (SSS), obstructed defaecation score (ODS), Cleveland clinic incontinence score, symptom-specific (PAC-QoL) and generic (ED-5Q utility and VAS) QoL score. All complications were recorded. Data collection was performed at baseline, 6 weeks, and 6 and 12 months. **RESULTS:** A total of 1456 patients were recruited and eligible for analysis. There were 214 (14.7%) male patients. The mean age was 54 yrs (range: 17–92). Mean operative time was 44mins (range: 15–210). Average length of stay was 3 days (range:1–36). By September 2007, 698 (48%) and 422 (29%) were eligible for analysis at 6 and 12 months. respectively. A significant symptomatic improvement was seen between baseline and 6 months and maintained at 12 months (SSS: baseline 24.1 (95%CI: 23.8,24.4) v's 12 months 12.5 (95%CI: 12.1,12.9), $p < 0.001$; ODS: baseline 15.3 (95%CI: 14.9,15.6) v's 12 months 5.8 (95%CI: 4.8,6.7), $p < 0.001$. This was reflected in a significant improvement in both PAC-QoL and ED-5Q QoL scores at both 6 and 12 months. Incontinence scores improved from 3.1 (95%CI: 2.9,3.3) at baseline to 2.9 (95%CI: 2.1,2.7) at 6 months and 1.9 (95%CI: 1.5,2.2) at 12 months ($p < 0.001$). 457 minor and major complications were reported, of which the most frequent were: unexpected pain (7.7%), urinary retention (6.8%), bleeding (4.5%), stapled line complications (3.2%), sepsis (1.4%), incontinence (1.3%). Postoperative defaecatory urgency was reported in 17% of patients. There was no mortality. **CONCLUSION:** STARR for ODS is safe,effective and significant improvement in QoL.

INDIVIDUAL'S HEALTH—Clinical Outcomes Studies

PIH1

PREVENTION OF FALLS AND FALL-RELATED INJURIES IN THE COMMUNITY-DWELLING ELDERLY: A REVIEW

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OBJECTIVE: As part of a broader analysis on aging in the community, the purpose is to perform a literature review to assess the effectiveness of interventions designed to prevent falls and fall-related injuries in community-dwelling elderly individuals. **METHODS:** A search was performed in OVID MEDLINE, MEDLINE In-Process and Other Non-Indexed Citations, EMBASE, CINAHL, Cochrane Library, and INAHTA/NHS EED between January 2000 and September 2007. Furthermore, all studies included in a Cochrane review published in 2003 were considered for inclusion. Studies were included if they were controlled trials in a population of community dwelling elderly and examined falls or fall-related injuries as an outcome. **RESULTS:** Fifty-nine studies were identified investigating the effectiveness of nine interventions. A meta-analysis found that exercise programs effectively reduced falls if they were 6 months or longer in duration (RR = 0.84 [95% CI: 0.76–0.93]) or were offered to the general population and not a high risk group (RR = 0.79 [0.70–0.90]). Environmental modifications were effective in individuals with a history of falls (RR = 0.66 [0.54–0.81]), and a gait stabilizing device for outdoor winter use effectively reduced falls (RR = 0.43 [0.29–0.64]) and injurious falls (RR = 0.10 [0.01–0.74]). Although neither hormone replacement therapy or vitamin D alone reduced falls or injuries, vitamin D plus calcium supplementation resulted in a reduction in the number of falls (RR = 0.83 [0.73–0.95]) and fractures (RR = 0.60 [0.39, 0.94]). Multifactorial interventions were only marginally effective in reducing falls in a high risk population (RR = 0.87 [0.76–1.01]), and there was no evidence that vision interventions or hip protectors were effective. **CONCLUSION:** Several interventions were identified which reduce the risk of falls and fall-related injuries in community-dwelling elderly, however special consideration must be given to the intervention duration and population risk profile when determining the most appropriate interventions to implement. An economic analysis that informs investment decisions to maximize the impact of reducing falls is currently underway.

PIH2

CONTRACEPTIVE FAILURE RATES AMONG MEDICAID AND NON-MEDICAID ENROLLEES

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OBJECTIVE: Contraceptive efficacy depends both on patient compliance and the characteristics of the method used. Efficacy rates can thus vary across different populations, particularly in women employing user-dependent methods (i.e., oral, condoms). This study measured the contraceptive failure rates in a Medicaid and a non-Medicaid population and evaluated the efficacy variance between the two groups. **METHODS:** Monthly contraceptive-use histories were constructed for all women using data from the 2002 National Survey of Family Growth (NSFG VI). Contraceptive use was defined by first contraception method mentioned in the survey. Poly-modal use was not defined. Women were classified as Medicaid enrollees if they reported having Medicaid coverage in the 12 months prior to the survey, or reported Medicaid payment for services. The final dataset included 1208 Medicaid-enrolled women and 6435 non-Medicaid enrolled women. Pregnancy rates were calculated each month and then annualized for women using user-dependent methods (oral contraceptives [OC], condom) or non-daily methods (IUD, injected, implanted birth control). **RESULTS:** Average annual contraceptive failure rates for Medicaid vs. non-Medicaid women were: oral pill—1.15% vs 0.13% ($p = 0.0051$); condom—2.05% vs. 0.55% ($p = 0.0015$); IUD—0.52% vs. 0.16% ($p = 0.5156$); injected or implanted—0.27% vs. 0.13% ($p = 0.3940$). OC failure rate was nearly 9-times higher in the Medicaid population than in the non-Medicaid population. Failures rates for IUD, injectables and implants were also higher but

the differences were not statistically significant. **CONCLUSION:** Study results largely correspond to previous published estimates (i.e., Trussell, 2004). Contraception failure rates for user-dependent methods were substantially greater in a Medicaid population than those in a non-Medicaid plan. The efficacy rates of non-daily methods were not statistically different across the two populations and thus may be the more appropriate option for a Medicaid patient or other patient subpopulations shown to have compliance issues.

PIH3

HOSPITALIZATIONS AND MORTALITY ASSOCIATED WITH INCIDENT POTENTIALLY INAPPROPRIATE MEDICATIONS USE AMONG ELDERLY INDIANA MEDICAID BENEFICIARIES RESIDING IN NURSING HOMES

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OBJECTIVE: Most studies of potentially inappropriate medications (PIMs) among older adults have focused on prevalence rather than incidence. This study determined one-year incidence of PIMs use among Indiana Medicaid beneficiaries 65 years old or older who resided in nursing homes and examined associations between incident PIM use and hospitalizations and mortality. **METHODS:** A retrospective analysis was conducted using Indiana Medicaid claims and enrollment files. Individuals were included in the sample if they were 65 years old or older, received Medicaid covered nursing home services from October 2002 through 12 months after starting a PIM in 2003 or until death in 2003, and were prescribed at least one new medication in 2003. Individuals who received any PIM in the three months prior to January 2003 were excluded. The 2003 Beers criteria were used to identify PIMs. Associations between incident PIM use, hospitalization and mortality were assessed using logistic regression models that controlled for age, gender, race, marital status, Charlson comorbidity scores, number of medications prescribed in 2003, and nursing home location. Selection bias was examined using seemingly unrelated bivariate probit models. STATA Intercooled for Windows was used for all statistical analyses. **RESULTS:** The study sample consisted of 7594 individuals. One-year incidence PIM use was 42.1%. Rhos, correlations of error terms from equations predicting hospitalizations and mortality, were not significant indicating no selection bias. Incident PIM users were more likely to be hospitalized (odds ratio {OR} = 1.27, 95% C.I. 1.10–1.47) and more likely to die (OR = 1.45, 95% C.I. 1.31–1.61) in 12 months after controlling for demographic and clinical characteristics. **CONCLUSION:** Incidence of PIM prescribing was high among elderly Indiana Medicaid beneficiaries residing in nursing homes. Individuals who began use of a PIM in 2003 were at a higher risk of hospitalization and at higher risk of dying.

PIH4

COMPARISON OF MEN AGE 21 YEARS AND OLDER WITH AND WITHOUT ERECTILE DYSFUNCTION ON CONCOMITANT PRESCRIPTION DRUG, COMORBID CONDITIONS, SMOKING STATUS AND BMI

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OBJECTIVE: Comparison of data collected in a electronic medical record (EMR) database on men age 21 years and older with and without erectile dysfunction (ED) on concomitant drug prescription, co-morbid conditions, smoking status and BMI. **METHODS:** A retrospective review of the General Electric Centricity MQIC research database containing the ambulatory health records of US patients was conducted. ED patients age 21 and older were identified by diagnosis, PDE5 and/or both; ≥18 month of activity and smoking status was required. Two non-ED age-matched (within +/–2 years) controls were randomly selected for and linked to each case. A matched case-control analysis was conducted using conditional logistic regression, with goodness of fit and residual analyses used to test validity and assumptions. **RESULTS:** Non-smokers compared to current smokers were less likely to develop ED. There was an increase odds of ED with each unit increase in BMI. Men with BMI 30–39.9 had the highest risk of ED (2.14 OR, 1.73–2.64 95% CI) compared to those with BMI ≤ 18.5. Antihypertensive, lipid lowering agents and diuretics had the highest relative odds for ED respectively (2.43 OR, 2.34–2.5 95% CI; 1.57 OR, 1.52–1.62 95% CI; 1.44 OR, 1.37–1.5 95% CI). None of the other risk factors or co-morbid conditions (cerebrovascular disease, kidney disease, anti-arrhythmics, and anti-neoplastics) was found to increase the risk of ED. **CONCLUSION:** EMR data provides a means for assessing risk factors for and associated conditions consistent with ED in a real-world setting, including the links between this condition and commonly used prescription drugs. The likelihood of developing ED was less for non-smokers and increased with increasing BMI and the use of antihypertensives, lipid lowering agents and diuretics.

PIH5

THE EFFECT OF INJURY SEVERITY ON THE INCIDENCE AND RESOURCE UTILIZATION-RELATED OUTCOMES OF DEEP VEIN THROMBOSIS AMONG PEDIATRIC TRAUMA ADMISSIONS IN THE UNITED STATES

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OBJECTIVE: To generate national estimates of the effect of injury severity on the incidence and associated resource utilization-related outcomes of deep vein thrombosis (DVT) among pediatric traumatic injury inpatient admissions in the United States. **METHODS:** Data from the 2003 HCUP KID dataset were analyzed for 240,387 hospital stays (unweighted = 146,512) for traumatic injury in patients ≤20 years old. Among these hospitalizations, cases of DVT were identified. Injury severity scores (ISS) were calculated using the ICDMAP90 software; four mutually exclusive categories corresponding to increasing severity were created. Weighted regression models estimated the effect of injury severity on the likelihood of DVT, controlling for patient- and hospital-specific characteristics. Additional models including interaction terms for DVT/injury severity category estimated the joint effect of these parameters on total costs and LOS. **RESULTS:** Among traumatic injuries identified, 648 patients (0.27%) had an ICD-9-CM code consistent with DVT, similar to previous estimates in the literature. Among observations with complete data, moderate [ISS = 9–15], severe [ISS = 16–24] and critical [ISS = 25+]) injuries increased the likelihood of DVT (Odds Ratio [p-value] = 2.13 [<0.0001], 2.49 [0.0001], and 3.53 [<0.0001], respectively), as compared to minor injuries (ISS = 0–8). Relative to minor injuries, severe and critical injuries among those with DVT (i.e., interactive effects) were associated with increased LOS. DVT and increasing severity each independently increased total costs, but interactive effects were not significant. **CONCLUSION:** In this study we quantify the effect of injury severity on the incidence and utilization-related outcomes of DVT among

those with traumatic injury in a multi-payer US population. Increasing severity appears to increase the likelihood of developing a DVT. Further, new interventions that mitigate the development of DVT may reduce the economic burden of traumatic injury among pediatric hospitalizations. Clinicians and other decision makers should be aware of the relationship between injury severity and DVT development and resource utilization-associated outcomes.

INDIVIDUAL'S HEALTH—Cost Studies

PIH6

ECONOMIC ASSESSMENT OF SILDAFENIL FOR THE MANAGEMENT OF PATIENTS WITH ERECTILE DYSFUNCTION (ED) SECONDARY TO DIABETES MELLITUS TYPE 2 (DM2) AND HYPERTENSION IN MEXICO

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OBJECTIVE: Medications used to control DM2 and hypertension are common associated with ED problems. This had affected adherence and therefore the long-term control of Mexican patients with those diseases, increasing long-term complications and health care costs. The purpose of the study was to evaluate the cost-effectiveness of using ED treatments as adjuvant therapies in patients with DM2 and hypertension from an institutional perspective. **METHODS:** A cost-effectiveness assessment was performed employing a ten-years decision tree model. Comparators used in the model were Sildenafil (50 mg/day-100 mg/day); Taladafil (20 mg/day) and Vardenafil (10 mg/day-20 mg/day). Effectiveness measure used was the number of hospitalization avoided related to uncontrolled-patients due to ED causes. The transition probabilities were obtained from international published literature and a local survey, previously validated, related to ED problems in Mexican patients(n = 146 with DM2; n = 326 with hypertension) at multiple second-level Hospitals within the Social Security Mexican Institute (IMSS). Resource use data was obtained from hospital records(n = 1000) and a 3% discount rate was used. The model was calibrated according to international guidelines. Probabilistic sensitivity analyses were performed using bootstrapping techniques. **RESULTS:** Savings per patient with DM2 were US$816.70 for sildenafil 50 mg/day; US$668.30 for sildenafil 100 mg/day; US$711.20 for tadalafil; US$646.30 for vardenafil 10 mg/day and US$603.50 for vardenafil 20 mg/day. Annual mean savings per patient with hypertension resulted in US$1627.00; US$1447.50, US$1520.80, US$1444.50 and US$1432.20; respectively following the order above. Patients treated with ED therapies avoided significant number of hospitalizations (complications) in both diseases and sildenafil 50 mg/day was the therapy which showed the higher number of hospitalizations avoided(23 for DM2 and 25 for hypertension). ICER's showed Sildenafil 50 mg/day as the dominant treatment. The results were robust to probabilistic sensitivity analyses and acceptability curves. **CONCLUSION:** ED therapies should be employed in males who show this problem secondary to DM2 and hypertension. These results could be used by Mexican decision-makers to generate cost-containment strategies.

PIH7

BURDEN OF ILLNESS OF HYPERTENSION AMONG WOMEN USING MENOPAUSAL HORMONE THERAPY

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OBJECTIVE: High blood pressure is common in menopausal women and some hormone therapies (HT) for menopause may contribute to increased blood pressure. However, the burden of illness (BOI) of hypertension in women receiving menopausal HT is not well-documented in the current literature. This study estimates the prevalence and economic burden of hypertension in this patient population. **METHODS:** Patients with at least one prescription for menopausal HT were selected from the PharMetrics database during the period from July 1, 2003–June 30, 2005. HT patients were divided into those with and without hypertension. The non-hypertensive cohort was propensity score matched to the hypertensive cohort, controlling for patient demographics, overall comorbidities, and type of HT use. The BOI of hypertension was defined as the difference in average annual total health care expenditures per person between the cohorts. **RESULTS:** The prevalence of menopausal HT use was 9.75% among potentially eligible patients in this commercially-insured sample. Hypertension was the most common comorbidity, with a prevalence of 34%. HT patients with hypertension (n = 106,729) had significantly higher average annual health care expenditures compared with matched HT patients without hypertension ($8,908 versus $5,960; difference of $2,948; $P < 0.001$). Less than 1% was due to differences in menopause-related care between the cohorts; 54% was attributable to hypertension-related care and 45% to the care of other common comorbidities, such as lipid disorders. **CONCLUSION:** Hypertension is the most common comorbidity among commercially-insured menopausal hormone therapy users in the United States. The annual incremental BOI of hypertension among HT users is both substantial and statistically significant, averaging $2,948 per patient per year. Given the number of menopausal women who use HT and the prevalence of hypertension in this cohort, employers and medical care payers should be interested in finding ways to lessen the burden associated with hypertension.

PIH8

COST-EFFECTIVENESS OF ORAL AND TRANSDERMAL CONTRACEPTIVES

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OBJECTIVE: In Ukraine the State program «Reproductive health of the nation for the period till 2015», providing reduction in the quantity of abortions is authorized, using hormonal contraception. The aim was to identify the most cost-effective oral or transdermal contraceptives using a provider perspective. **METHODS:** A decision tree was developed to compare the cost-effectiveness of oral contraceptive 3 mg drospirenone/0.03 mg ethinylestradiol (D-E) vs. 0.25 mg norgestimate/0.035 mg ethynilestradiol (NA-E) vs. transdermal contraceptive 6 mg norelgestromin/0.6 mg ethynilestradiol (transdermal N-E) for preventing a pregnancy per patient per year. Direct medical cost were based on average wholesale prices for medicines (01.10.2007), ans physician, laboratory costs based on tariffs of Lviv family planning center. Probability data that included compliance and pregnancy rates were extracted from randomized clinical trials and public resources. A probablistic sensitivity analysis of free parameters was conducted through a Monte-Carlo simulation. Key parameters were sampled from beta

disributions. **RESULTS:** In the base case, NA-E was found to be the most cost-effective alternative. NA-E cost 321UAH (1 USD = 5.05 UAH) compared to 930UAH for D-E, 1319UAH for transdermal N-E to prevent a single pregnancy per patient per year. Monte –Carlo sensivity analysis confirmed these findings. **CONCLUSION:** The cost-effectiveness ratio NA-E dominated all contraceptive strategies.These direct medical costs, in turn, were driven by differential compliance that favored NA-E.

PIH9

COST-EFFECTIVENESS ANALYSIS OF CONTRACEPTIVES AVAILABLE IN UNITED STATES

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OBJECTIVE: To conduct a cost-effectiveness analysis of contraceptives available in the United States from a payer's perspective. **METHODS:** A Markov model was constructed to simulate method failure (defined as ectopic pregnancy, abortion, or full-term birth) and costs among 17 contraceptive methods over a 5-year period: vasectomy, tubal ligation, injectable, implant, copper-T IUD, LNG-20 IUS, oral contraceptives, diaphragm, male condom, female condom, spermicides, sponge, patch, NuvaRing, withdrawal, periodic abstinence and no method. In each yearly cycle, subjects transition to "continue contraception", "method failure" or "plan disenrollment". Subjects remain on the method for the model duration after method failure or adverse effect. We assumed that 60% of unintended births are mistimed and would occur two years later. Failure rate, adverse event rates, and resource utilization were derived from comprehensive literature review and supplemented with expert opinion. Unit costs were obtained from published fee schedules and drug prices. Future costs and effectiveness were discounted at 3%/year. Sensitivity analyses were performed on cost and failure rates. **RESULTS:** Any contraceptive method is superior to "no method" in terms of costs and success rate. The three least expensive methods were copper-T IUD ($645), vasectomy ($713) and LNG-20 IUS ($930). The most effective methods (≥99.6% success rate) were vasectomy, implant, tubal ligation, LNG-20 IUS and copper-T IUD. Results were sensitive to variations in cost of contraception method, cost of unintended pregnancy and plan disenrollment rates. Moreover, with a longer time horizon, methods with high initial costs (ie, copper-T IUD, vasectomy and LNG-20 IUS) and high effectiveness rates become more cost-effective. **CONCLUSION:** Copper-T IUD, vasectomy and LNG-20 IUS are among the most effective methods currently available in the US market. This analysis demonstrates that differences in efficacy, method costs, cost of unintended pregnancies and time horizon are influential factors that determine the overall value of a contraception method.

PIH10

THE COST-EFFECTIVENESS OF ROUTINE SCREENING FOR VASA PREVIA AT 18–20 WEEKS GESTATION IN ONTARIO

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OBJECTIVE: To estimate the cost-effectiveness of screening for vasa previa at 18–20 weeks gestation. Several screening strategies were considered for singleton and twin pregnancies. **METHODS:** We constructed a decision-analytic model to estimate the incremental costs and benefits associated with screening for vasa previa at 18–20 weeks gestation. We compared the status quo of not screening to scenarios in which all singleton and twin pregnancies were screened using transvaginal color Doppler ultrasound. We also considered strategies in which only high-risk pregnancies were screened. Costs were collected primarily from the London Health Sciences Centre case costing initiative and from the OHIP Schedule of Benefits for Physicians. Other data estimates were obtained from published sources and expert opinion. Health benefits were measured in life-years (LY) gained. Costs and health benefits were estimated for a cohort of pregnancies in Ontario in 1 year. **RESULTS:** Compared to not screening, screening all twin pregnancies for vasa previa has an incremental cost effectiveness ratio (ICER) of less than $10,000 per LY gained. Among all risk factors in singleton pregnancies, velementous cord insertion is the strongest predictor of vasa previa. Identifying and screening pregnancies affected by velamentous cord insertion has an ICER of less than $10,000 per LY gained compared to not screening. Compared to screening only pregnancies identified as having a velamentous cord insertion, screening all pregnancies has an ICER of approximately $75,000 per LY-gained. Compared to screening for vasa previa in pregnancies identified as having any high risk indicator, routine screening of all pregnancies has an ICER of over $100,000 per LY gained. **CONCLUSION:** A strategy of screening all twin and all high-risk singleton pregnancies for vasa previa has a very low incremental cost effectiveness ratio and should be considered for adoption. However, routine screening of all pregnancies is not likely to be cost effective.

PIH11

IMPACT OF THE RISK SCORING MODEL ON THE COST-EFFECTIVENESS OF PALIVIZUMAB FOR RESPIRATORY SYNCYTIAL VIRUS PROPHYLAXIS IN PREMATURE INFANTS WITH A GESTATIONAL AGE OF 32–35 WEEKS IN CANADA

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OBJECTIVE: Prophylactic therapy with palivizumab, a humanized monoclonal antibody, reduces the number of respiratory syncytial virus (RSV)-related hospitalizations in preterm infants, including those in the 32 to 35 weeks gestational age (GA) subgroup. The cost-effectiveness of this therapy in Canada is unknown. To evaluate the cost-effectiveness of palivizumab as respiratory syncytial virus prophylaxis in premature infants born at 32 to 35 weeks GA, from both the payer (base-case) and societal perspectives. **METHODS:** A decision analytic model was designed to compare costs and benefits of prophylaxis in this subgroup of premature infants. Sensitivity analyses were performed to ascertain the robustness of the model by varying mortality, health utilities, discount rates and administration costs. SETTING: Canadian publicly funded health care system (base-case analysis). PARTICIPANTS: Canadian infants born at 32 to 35 weeks gestation without chronic lung disease. INTERVENTIONS: Palivizumab prophylaxis versus no prophylaxis. MAIN OUTCOME MEASURES: Expected costs and incremental cost-effectiveness ratio expressed as cost per quality-adjusted life-year (QALY) gained using $CAN 2006. **RESULTS:** The expected costs were higher for palivizumab prophylaxis as compared with no prophylaxis. The incremental cost-effectiveness ratio for the base-case scenario was $16,605 per QALY after discounting, which is considered cost-effective. Sensitivity analyses showed the model was robust through reasonable estimates of key variables. Sub-analyses that varied risk of RSV based on

the validated, Canadian risk scoring model were sensitive to the resulting variation in RSV-related hospitalization rates. In instances where risk was low, palivizumab was not cost-effective. However, for infants with at least moderate risk (2 or more risk factors), palivizumab had incremental costs per QALY that indicated moderate to strong evidence for adoption (range: $1,598 to $30,819 per QALY). **CONCLUSION:** Palivizumab was cost-effective and our model supports prophylaxis for infants born at 32 to 35 weeks GA, particularly those with moderate risk of RSV.

WITHDRAWN **PIH12**

PIH13

A CONCEPTUAL FRAMEWORK TOWARD A MODIFIED REFERENCE CASE FOR DEVELOPING COUNTRIES: INCORPORATING DONOR FUNDING FLOWS IN COST-EFFECTIVENESS ANALYSIS

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To make appropriate use of the growing economic evidence base in health care, developing countries need applications relevant to their own national health objectives. One objective is protection for individuals and governments against the financial risks of ill health, more critical in low-resource settings. Yet, advancements in cost-effectiveness analysis (CEA) have not focused on the importance of efficiency in contributing to this goal. The lowest income nations also rely heavily on external funds from donor countries and organizations. While the recent emergence of non-traditional donors has greatly increased funding levels for global health, the large scale, narrow focus and time limitations of some of the funding have also raised questions of their effects on national health priorities as well as on the opportunity costs of the interventions supported by this funding. In attaining efficiency with a view towards minimizing financial risk, CEA must address two issues in this case: that the additional resources are efficiently allocated and that the resources themselves are not a source of financial risk. This doctoral project proposes a conceptual framework for a CEA "reference case" in the broader context of health financing in developing countries. Suggested modifications of the prevailing reference cases are literature-based, iteratively guided by key informants. Costing and sensitivity analysis with respect to external funding are highlighted. An application to the introduction of rotavirus immunization illustrates the framework. The conceptual framework anticipates the imminent introduction of expensive new vaccines targeted at resource-poor, donor-dependant health systems. It allows analysts and policy-makers to harmonize efficiency and financial risk objectives. It also helps donors in assessing aid effectiveness of assisted programs. Ultimately, this framework improves the transferability and generalizability of existing CEA results by suggesting adjustments relevant to developing countries.

PIH14

ECONOMIC EVALUATION OF ATOSIBAN VERSUS BETA-MIMETICS IN THE TREATMENT OF PRETERM LABOUR IN GERMANY

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OBJECTIVE: Treatment of preterm labour constitutes considerable inpatient cost, and use of tocolytics is central in delaying birth to allow neonatal lungs to mature. The study aimed to compare cost implications of adverse events following tocolysis with atosiban and beta-mimetics. **METHODS:** Major literature databases were systematically searched to identify randomised clinical trials comparing atosiban with beta-mimetics during the initial 48 h of hospitalisation. Adverse events data from three double blind trials were included in a meta-analysis. Clinical resource use was determined based on routine practice in a regional German hospital. Cost of drug treatment was calculated based on trial protocols and German hospital drug purchase costs; analysis was performed for fenoterol, the only beta-mimetic licensed in Germany for tocolysis. Costs per case were calculated with G-DRG Grouper. Costs were expressed in €2007. **RESULTS:** Use of atosiban was associated with significantly lower frequency of adverse events compared to beta-mimetics. From the payer's perspective, cost-saving from using atosiban versus fenoterol was €423 per patient starting treatment. From the hospital's perspective, savings from using atosiban versus continuous fenoterol ranged from €259 for 18 hours of tocolysis to €105 for 48 hours; the respective values for bolus fenoterol were €244 and €55. From the combined perspective, using atosiban versus continuous fenoterol saved from €226 for 18 hours of tocolysis to €71 for 48 hours; versus bolus fenoterol the results were €211 and €21, respectively. In the probabilistic sensitivity analysis atosiban was cost-saving versus both continuous and bolus fenoterol in 100% of iterations at 18 hours and in at least 87% of iterations at 48 hours. **CONCLUSION:** Atosiban was cost-saving versus beta-mimetics in the treatment of preterm labour in Germany from the payer's, hospital's and combined perspectives. The results were robust in the probabilistic sensitivity analysis.

PIH15

STUDENT PHARMACIST INTERVENTIONS LEAD TO COST MINIMIZATION OF MEDICARE PART D PRESCRIPTION DRUG PLAN COSTS

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OBJECTIVE: Given the complexity of the Medicare Part D (MPD) prescription drug benefit, many Medicare beneficiaries lack the knowledge and experience to select optimal MPD prescription drug plans. This challenge is exacerbated in low-income and other vulnerable populations. A Cost-Minimization Analysis (CMA) was performed to determine whether and to what extent student pharmacists' interventions reduce out-of-pocket (OOP) prescription drug plan costs for Medicare beneficiaries. **METHODS:** Trained student pharmacists throughout California provided one-on-one MPD prescription drug plan consultations during community outreach events. Cost information for the participant's current and lowest-cost plan for 2008 was obtained by conducting a personalized plan search using the online MPD Plan Finder tool. **RESULTS:** Twenty-two outreach events were conducted statewide and data were collected from 250 Medicare beneficiaries. The mean ± SD age of the participants was 74.3 ± 9.1 years, and 91 (36.4%) were male. The mean ± SD (range) number of prescription drugs per participant was 5.6 ± 3.9 (0–26). Eighty-three participants (33.2%) had limited or no English proficiency, 82 (32.8%) had less than a high school education, and 102 (40.8%) were enrolled in both Medicare and Medicaid. Data from 95 participants (72 of whom were not enrolled in a MPD drug plan during 2007 and 23 of whom had incomplete data) were necessarily excluded for purposes of the CMA. For the other 155 participants, the median annual OOP costs for continued enrollment in their current MPD prescription drug plan in 2008 were $440.00, compared to $200.00 for the

lowest-cost 2008 plan. When cost savings were calculated by individual participant, this equated to a median annual OOP cost savings of $98.00 (22.3%) per participant. **CONCLUSION:** Trained student pharmacists can provide community-based interventions that reduce OOP prescription drug plan costs among underserved Medicare populations.

PIH16

THE DIRECT COSTS OF INJURIOUS FALLS IN SENIORS

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OBJECTIVE: Falls in the elderly pose significant health risk with substantial effects on health resource utilization and cost; 95% of hip fractures are due to falls. Previous estimates of the costs of falls used administrative data which underestimate falls incidence. We aimed to estimate the direct health costs of injurious falls requiring Emergency Department (ED) care. **METHODS:** Information was collected on patients >70 years who presented to the ED of Vancouver General Hospital. Fallers were identified though a search of ED census, ED presenting complaints, ED consultant records, and patient charts for reports of a fall. From hospital reports, data were collected on patient demographics, diagnoses, admission status, and hospital length of stay. Total costs were estimated for each fall from the third payer perspective. Unit cost estimates for ED visits, and hospitalizations were taken from a fully allocated hospital cost model. **RESULTS:** Between December 1 2006 and March 31 2007, we identified 390 falls by 381 individuals costing $2,520,641. The mean age of fallers was 83.6 years (SD:7.4); 69% were women. Fallers sustained 183 (47%) fractures—these included 70 hip (39%) and 22 pelvic (12%) fractures. Other common diagnoses were contusions/lacerations (n = 63, 16%), and syncope (n = 31, 8%). 134 (34%) falls resulted in hospital admission with an average length of stay of 31.6 days (SD:41.59) and mean cost of $18,375 (SD:23601). Logistic regression analysis showed that compared to those <80 years, those >80 years were more likely to be hospitalized (OR:1.8, 95% CI:1.1–3.0). Women were more likely than men to be hospitalized (OR = 1.5, 95% CI:0.9–2.4), however this association was not statistically significant. After adjusting for age and sex, a diagnosis of "fracture" was the strongest predictor of hospitalization (OR:15.5, 95% CI:8.2–27.2). **CONCLUSION:** Among seniors, the significant cost of fall related hospital admissions warrants increased fall prevention programs in this population.

PIH17

COST-EFFECTIVENESS OF MAGNETIC RESONANCE-GUIDED FOCUSED ULTRASOUND SURGERY FOR TREATMENT OF UTERINE FIBROIDS

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OBJECTIVE: Uterine fibroids are the most common tumours in women during their reproductive years, yet there is considerable paucity of data on treatments' effectiveness and costs. We developed a Markov model to compare currently available treatments with a new Magnetic Resonance Guided Focused Ultrasound Sound Surgery (MRgFUS). **METHODS:** Current practice, comprising of uterine artery embolization (UAE), myomectomy and hysterectomy, was compared with MRgFUS, the least invasive procedure. A Markov model was used to simulate the clinical outcomes, costs, age and quality-of-life parameters to provide informed decisions on the part of providers, payers, and patients. The results were expressed as costs per quality- adjusted-life-year (QALY) gained. The analysis was conducted from the perspective of the National Health Service (NHS) in the UK. All model parameters were based on the most recent literature (post 1999). The effects of uncertainty in the model's parameters were explored using extensive deterministic and probabilistic sensitivity analysis. **RESULTS:** MRgFUS is likely to be cost-effective. In the base scenario, it is dominant, that is, has a lower cost and better outcomes than existing treatments, although the QALY difference per woman is small. MRgFUS remains cost effective (≤30, 000 per QALY gained) when using alternative assumptions regarding current practice, health utility, and the effectiveness of alternative treatments (complication, recurrence, and procedural death rates). Multiple simulations show the range of outcomes that might be expected in all aspects of practice with the result that MRgFUS remains cost-effective in more than 86% of the simulations. **CONCLUSION:** The results of this study support the introduction of MRgFUS as a treatment for uterine fibroids. A treatment strategy starting with MRgFUS is potentially more effective and less costly than the current practice.

INDIVIDUAL'S HEALTH—Patient-Reported Outcomes

PIH18

ASSESSING THE ASSOCIATION BETWEEN SCORE DIFFERENCES ON THE PREMENSTRUAL SYMPTOMS IMPACT SURVEY (PMSIS) AND HEALTH-RELATED QUALITY OF LIFE

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OBJECTIVE: A woman's health-related quality of life (HRQoL) can be affected by her premenstrual symptoms. The study objective was to assess the association between HRQoL and score differences on the Premenstrual Symptoms Impact Survey (PMSIS), a six-item instrument for measuring impact of premenstrual symptoms on a woman's HRQoL. **METHODS:** Data were collected on the PMSIS and SF-12 Health Survey from a panel of representative U.S. women 18–45 years via Internet (N = 971). PMSIS scores were used to identify women "at risk for PMDD." Items from the SF-12 were dichotomized and regressed onto the standardized PMSIS scores with age as a covariate. Logistic regression was used to derive odds ratios (OR) for experiencing a particular outcome as a function of score differences between "at risk for PMDD" and the population mean of the PMSIS. **RESULTS:** The overall sample mean PMSIS score was 26.6 (on a standardized scale of 0–100 from no impact to severe impact). Higher PMSIS scores were significantly associated with increased risk of negative HRQL outcomes ($p < 0.01$). Women identified as "at risk for PMDD" (PMSIS score ≥ 64) had 383% increased risk of pain interfering with normal work; 320% increased risk of doing work or activities less carefully than usual due to emotional problems; 253% increased risk of feeling limited in work or activities due to physical health or feeling they accomplished less due to emotional problems; and 196% increased risk of feeling downhearted and depressed, and feeling little or no energy. **CONCLUSION:** There is a significant association between higher PMSIS scores (more severe impact due to premenstrual symptoms) and diminished role functioning, physical

and mental health well-being. The PMSIS can be a significant predictor of HRQoL in women with PMDD.

PIH19

PREDICTING RISK OF WORK LOSS ASSOCIATED WITH PREMENSTRUAL SYNDROME (PMS) AND PREMENSTRUAL DYSPHORIC DISORDER (PMDD) USING PHYSICAL COMPONENT SUMMARY (PCS) SCORE

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OBJECTIVE: Clinically significant PMS and its more severe form, PMDD, can impact women's physical health and interfere with their ability to work. This study used the Physical Component Summary (PCS) scores to predict work loss risk associated with the two diagnoses. **METHODS:** Two data sources were used. From the Medical Outcome Study (MOS), PCS scores from SF-36 Health Survey was regressed onto three work loss outcomes (inability-to-work-due-to-health-problems at baseline, work loss follow-ups at 6-months and one-year) with age and gender as covariates. In an Internet survey, the SF-12 Health Survey and retrospective component of American College of Obstetricians and Gynecologists (ACOG) for identifying "at-risk-for-clinically-significant-PMS" and retrospective criteria in DSM-IV-TR for identifying "at-risk-for-PMDD" were collected from a panel of representative U.S. women 18–45 years (N = 971). Given PCS scores from SF-12 in the Survey, regression coefficients derived from MOS logistic regressions were used to generate odds ratios (OR) of work loss risk for women with and without PMS or PMDD. ANOVA tests compared the probability differences in ORs within each diagnosis. **RESULTS:** A total of 17.7% and 6.0% of women were identified as "at-risk-for-clinically-significant-PMS" and "at-risk-for-PMDD", respectively. Statistically significant differences were observed in all outcome comparisons in both diagnoses ($p < 0.001$). Women not at risk for either diagnosis had risks of work loss comparable to the general population. Women "at-risk-for-clinically-significant-PMS" had a 139% increased risk of work loss with the concurrent state; those who worked at baseline had 32% increased risk of work loss at both follow-ups. Women "at-risk-for-PMDD" had a 181% increased risk of work loss at the concurrent state; those who worked at baseline had 46% increased risk of work loss at both follow-ups. **CONCLUSION:** Using PCS scores, women with either clinically significant PMS or PMDD were more likely to experience work loss than the general population, especially women with PMDD.

PIH20

PREDICTING RISK OF WORK LOSS ASSOCIATED WITH PREMENSTRUAL SYNDROME AND PREMENSTRUAL DYSPHORIC DISORDER USING MENTAL COMPONENT SUMMARY (MCS) SCORE

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OBJECTIVE: Clinically significant PMS and its more severe form, PMDD, can affect women mentally and interfere with their ability to work. This study used the Mental Component Summary (MCS) scores to predict work loss risk associated with the two diagnoses. **METHODS:** Two data sources were used. From the Medical Outcome Study (MOS), MCS scores from SF-36 Health Survey was regressed onto three work loss outcomes (inability-to-work-due-to-health-problems at baseline, work loss follow-ups at 6-months and one-year) with age and gender as covariates. In an Internet survey, SF-12 Health Survey and retrospective component of American College of Obstetricians and Gynecologists (ACOG) for identifying "at-risk-for-clinically-significant-PMS" and retrospective criteria in DSM-IV-TR for identifying "at-risk-for-PMDD" were collected from a panel of representative U.S. women 18–45 years (N = 971). Given MCS scores from SF-12 in the Survey, regression coefficients derived from MOS logistic regressions were used to generate odds ratios (OR) of work loss risk for women with and without PMS or PMDD. ANOVA tests compared the probability differences in ORs within each diagnosis. **RESULTS:** A total of 17.7% and 6.0% of women were identified as "at-risk-for-clinically-significant-PMS" and "at-risk-for-PMDD", respectively. Statistically significant differences were observed in all outcome comparisons in both diagnoses ($p < 0.001$). Women not at risk for either diagnosis had risks of work loss comparable to the general population. Women "at-risk-for-clinically-significant-PMS" had a 74% increased risk of work loss at the concurrent state; those who worked at baseline had 53% and 48% increased risk of work loss at 6-month and 1-year follow-ups. Women "at-risk-for-PMDD" had a 99% increased risk of work loss at the concurrent state; those working at baseline had a 70% and 63% increased risk at respective follow-ups. **CONCLUSION:** Using MCS scores, women with either clinically significant PMS or PMDD were more likely to experience work loss than the general population, especially women with PMDD.

PIH21

LITERATURE REVIEW OF DISCRETE CHOICE EXPERIMENTS TO ASSESS WOMEN'S PREFERENCES AND WILLINGNESS TO PAY FOR MATERNAL HEALTH SERVICES

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OBJECTIVE: Little is known about women's preferences and willingness to pay (WTP) for drug information services in pregnancy. Teratology information services (TIS) provide drug information to pregnant women via telephone. To inform planning of an economic evaluation of TIS, a literature review of previous program evaluations of maternal health services using discrete choice experiment (DCE) methodology was conducted. **METHODS:** A search of the literature in the databases PubMed, MedLine, and PsychLit, was performed. The search keywords used were "discrete choice experiment" and "pregnancy". The studies were critically reviewed. **RESULTS:** Five previous studies that have applied DCE methods in the context of pregnancy and maternal health were found. These studies have examined preferences for service attributes in relation to miscarriage management, in-vitro fertilization, prenatal screening for Down's syndrome, provision of emergency contraception, and provision of counseling services after rape. These studies found that preferred service attributes included good staff attitudes, continuity of care, sympathetic and non-judgmental treatment, privacy, and sensitive health care providers. Women were willing to pay to avoid pain and complications, and for good staff attitudes. **CONCLUSION:** Women's preferences and WTP for health care services that provide drug information during pregnancy remain unknown. A DCE approach to evaluating services avoids the methodological challenges associated with tracking and aggregating health outcomes in both the mother and her child over their lifetimes. DCEs are able to demonstrate the value of non-health attributes

by assessing patient preferences for non-health outcomes, such as interactions with the health care provider. Consideration of non-health outcomes will be important to include in future evaluations of maternal health services.

PIH22

CARESS: THE CANADIAN REGISTRY OF SYNAGIS®

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OBJECTIVE: To determine current usage of palivizumab prophylaxis, the compliance patterns, hospitalization rates and outcomes in children at high-risk of respiratory syncytial virus (RSV) infection through the development of a Canadian Registry Database (CARESS). **METHODS:** A prospective, longitudinal, observational, follow-up study of Canadian infants who received palivizumab prophylaxis in the 2006/2007 RSV season. Neonatal and demographic data were collected from the parent/caregiver upon enrollment. Parents/caregivers were contacted monthly (at next injection or by telephone) by site nurses for data on palivizumab utilization and compliance, and outcomes related to any respiratory tract events. **RESULTS:** Information was collected on 1224 infants who received at least one injection of palivizumab and who ranged in age from 2 days to 34 months (mean = 5.17 months). Participating children were typically male (57.4%) and Caucasian (72.2%). Gestational age was 31.5 ± 4.3 weeks. 914 infants (74.7%) received palivizumab primarily for prematurity (≤35 completed weeks gestational age), 119 (9.7%) had bronchopulmonary dysplasia and required supportive oxygen therapy, 119 (9.7%) had congenital heart disease and 72 (5.9%) were prophylaxed for other risk factors. A total of 76.9% of subjects received at least 4 injections of palivizumab, with a total of 5355 doses, overall. The majority of injections were administered within the recommended monthly time intervals (73.5%). There was a 5.1% hospitalization rate for respiratory tract events (e.g., bronchiolitis or pneumonia). The RSV positive hospitalization rate was 1.2% (proven RSV). Hospitalization rates for respiratory tract events were highest in those with bronchopulmonary dysplasia (12.8%, $p < 0.001$), and in those of Hispanic (15.4%) or Aboriginal descent (13.6%) ($p = 0.051$). **CONCLUSION:** Compliance with the course of palivizumab therapy was very good. The RSV hospitalization rate observed in the 2006/2007 CARESS season was lower than that previously documented in the scientific literature.

PIH23

PATIENT SATISFACTION WITH ERECTILE DYSFUNCTION TREATMENT: SILDENAFIL VS. FOOD SUPPLEMENTS

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OBJECTIVE: Patient satisfaction (PS) is an important outcome of erectile dysfunction (ED) treatment. One of the questionnaires used for PS assessment is EDITS (Erectile Dysfunction Inventory of Treatment Satisfaction). Besides PDE-5 inhibitors (sildenafil, tadalafil, vardenafil) various food supplements (FS), with limited efficacy evidence, are widely used in Czech Republic as they do not require medical prescription and are advertised directly to customers. This study represents a first direct comparison of patient's satisfaction with Viagra (sildenafil) vs. food supplements in erectile dysfunction and a cost-effectiveness analysis (CEA) for both treatments. **METHODS:** A retrospective analysis covering 612 patients who used either sildenafil or FS was performed in 27 urology outpatients clinics using the EDITS questionnaire. Eligible men had to be between 40 and 75 years old, using either sildenafil or FS during the past 4 months in the recommended dosing. Patients who consulted an urologist primarily because of ED or an acute event were excluded to avoid bias. Data about strength, pack size and number of monthly purchased packs were also collected for the CE calculation. **RESULTS:** Patients using sildenafil showed higher overall satisfaction scores (78.4 vs. 44.5 $p < 0.001$) and superiority in all questions directly connected to efficacy. Mean monthly acquisition costs for sildenafil were €61, for FS €32. CE was calculated as a fraction of monthly costs and satisfied patients (i.e. patients with a score of ≥50). These costs were €65/satisfied in sildenafil vs. €75/satisfied in FS groups. If incremental ratios of individual sildenafil strengths were compared to FS, the 25 mg was dominant; 50 and 100 mg showed ICER/months of €0.75 and €1.25 respectively. **CONCLUSION:** Sildenafil showed significant higher satisfaction rates in patients with ED compared to FS. Although monthly acquisition costs for sildenafil are almost double compared to FS, CE calculations are beneficial for the sildenafil group.

INDIVIDUAL'S HEALTH—Health Care Use & Policy Studies

PIH24

AN ANALYSIS OF POTENTIALLY INAPPROPRIATE MEDICATION USE IN THE DUALLY ELIGIBILE MEDICARE AND MEDICAID POPULATION USING THE NEW 2003 BEERS DRUG UPDATE

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OBJECTIVE: To examine rates of potentially inappropriate prescribing in a population dually eligible for Medicare and Medicaid using the new 2003 Fick update. The 2003 Fick update revises the previous 1997 Beers list—an internationally recognized list of drugs identified as potentially inappropriate to prescribe to seniors due to an elevated risk of adverse effects, developed by Dr. Mark Beers. **METHODS:** Descriptive analyses (population parameter assessments) were conducted on the 2003 Medicaid files for elderly enrollees dually eligible for Medicare and Medicaid. Inappropriate drugs independent of diagnosis as identified by the 2003 Fick update were analyzed. **RESULTS:** Our enrollee population was comprised of 5,412,678 enrollees (71% female, 41% age 65–74, 66% Caucasian) with 24% receiving an inappropriate drug per the 1997 Beers list; 34% per the 2003 Fick update. Across all census regions, Hispanic enrollees received the highest percentage of inappropriate drugs per the 2003 Fick update. Of enrollees with drug use (3,879,039 enrollees), 34% received an inappropriate drug per the 1997 Beers list; 47% per the 2003 Fick update. Hispanics had the highest percentage of drug recipients receiving an inappropriate drug in the Northeast region per the 2003 Fick update. Within therapeutic category, the number of inappropriate genitourinary products dispensed to total genitourinary products ranked the highest at 20% (the drug Nitrofurantoin prescribed most) per the 2003 Fick update. **CONCLUSION:** Based on the 2003 Fick update, 47% of elderly dually eligible Medicare and Medicaid drug recipients received inappropriate drugs. However, such use may be justified in some circumstances when the benefits outweigh the risks for an individual patient. Our findings provide evidence that the potential use of inappropriate drugs in Hispanics should be considered separately from other ethnicity groups. By comparing

drug use based on therapeutic category, genitourinary products were found to have the highest potential for inappropriate prescribing.

PIH25

VARIATIONS IN ANTIPSYCHOTIC THERAPY AND SHORT-TERM MORTALITY ACROSS LONG-TERM CARE HOMES

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OBJECTIVE: Recent studies have demonstrated increased short-term mortality among older adults with dementia who are prescribed antipsychotic drug therapy. Despite these findings, use of antipsychotics remains common in long-term care (LTC) homes. This study explores the real-world implications of variations in antipsychotic dispensing across LTC homes by assessing whether homes with higher rates of dispensing had higher rates of mortality among their residents. **METHODS:** Retrospective cohort study of 47,308 older adults with no history of psychoses who were newly admitted to 503 Ontario LTC homes between April 1, 2000, and March 31, 2004. Facilities were classified into quintiles according to their mean antipsychotic dispensing rates. All-cause mortality was examined across quintiles at 30 and 120 days after admission. **RESULTS:** The rate of antipsychotic dispensing ranged from 0 to 44.8% across LTC homes. The absolute baseline difference in 30-day (120-day) mortality between facilities dispensing highest versus lowest rates of antipsychotics was 1.4% (4.1%). Mortality was greater in the highest rate homes (adjusted hazard ratio 1.29, confidence interval 1.11 to 1.51 at 30 days; adjusted hazard ratio 1.28, confidence interval 1.17 to 1.39 at 120 days) compared to the lowest rate homes. **CONCLUSION:** Residents newly admitted to LTC homes with higher antipsychotic dispensing rates had increased risk of short-term mortality.

WITHDRAWN **PIH26**

PIH27

GENERIC SUBSTITUTION OF WARFARIN AMONG THE ELDERLY: AN EXAMINATION OF HOSPITAL AND EMERGENCY ROOM USE

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OBJECTIVE: The primary objective of this analysis was to determine whether generic switching of warfarin was related to increased hospitalization and emergency room use among elderly chronic warfarin users. **METHODS:** The "switchability" of narrow therapeutic index (NTI) drugs has been debated in the literature. The issue is not whether generic products can safely be substituted for brand products, but whether problems can result from switches among manufacturers during repeated refills. Medicare Part D and A records for 2006 were pulled for all non-ESRD, chronic warfarin users in California, Florida, and Mississippi age 65+. Chronic warfarin users were defined as patients with 3+ warfarin prescriptions covering 180+ days of therapy. Recipients' records were evaluated for hospital admissions or ER visits during the treatment period. The hospital services also were evaluated to determine if they resulted from bleeding episodes or potential prophylactic use of warfarin based on diagnosis codes. **RESULTS:** Data were available for 160,929 chronic warfarin users. After controlling for age, race, and gender, the odds ratio for patients with generic switches compared to those without was 1.61 for general hospital admissions and 1.47 for general ER visits. Similar ratios were found for hospital admissions related to bleeding episodes (1.51)/potential prophylactic use (1.53) and ER visits related to bleeding episodes (1.34)/potential prophylactic use (1.44). The average monthly cost for hospital and ER services was 38% higher for the patients with generic switches ($2121 vs. $1553). **CONCLUSION:** The results suggest that generic switching of NTI drugs, such as warfarin, can significantly increase the likelihood of hospitalization and ER visits and result in increased costs of care. To provide better therapy management for patients on NTI drugs, pharmacists should avoid generic switching between manufacturers and/or notify the appropriate providers when generic switches do occur.

PIH28

AN EXAMINATION OF LOW AVERAGE DOSE AS A QUALITY MEASURE OF THE NEED FOR ANTICOAGULATION MANAGEMENT AMONG THE ELDERLY

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OBJECTIVE: The objective was to evaluate the relationship between low dose warfarin therapy and hospital utilization. This information will help to evaluate this as a quality of care indicator in elderly patients. **METHODS:** An issue in chronic warfarin therapy is the availability of time and resources necessary to adequately manage patients on anticoagulation therapy. Providers may err on the side of under-dosing due to fears of bleeding episodes. Medicare Part D and A records for 2006 were pulled for all non-ESRD, chronic warfarin users in California, Florida, and Mississippi age 65+. Chronic warfarin users were defined as patients with 3+ warfarin prescriptions covering 180+ days of therapy. Average dose was computed by dividing the total mgs of warfarin dispensed from the first prescription to the next to last prescription and dividing by the number of days between the first and last prescription fills. Low average dose was defined as <=.5 mgs/day. Each recipient's records were evaluated for hospital admissions or ER visits during the treatment period. **RESULTS:** Data were available for 160,929 chronic warfarin users. After controlling for age, race, and gender, the odds ratios for patients on low average doses compared to higher average doses were 1.42 for general hospital admissions and 1.21 for general ER visits. The average monthly cost for hospital and ER services was 85% higher for the patients with low average doses ($2524 vs. $1364). **CONCLUSION:** The results indicate patients on average warfarin doses of 2.5 mgs/day or less have greater odds of hospital admissions or ER visits; and cost CMS more for these services. This suggests that low average dose warfarin therapy is a potential indicator that these patients are in need of better care; and that CMS should consider payment for anticoagulation management services that will maintain therapeutic INR levels while minimizing bleeding risks.

PIH29

ESTIMATION OF TYPE AND NUMBER OF MEDICATION ERRORS IN LONG-TERM CARE

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OBJECTIVE: Little is known about the quality of drug administration and safety in German nursing homes. In 2002 a group of health authority pharmacists in the federal state of North Rhine-Westphalia inspected the quality of drug supply in 120

nursing homes. As this study was not representative, it cannot be used to draw reliable conclusions. Therefore, the aim of the current study was to quantify the number of drug administration errors in German nursing homes. The focus was on checking the administration of regularly scheduled solid oral medication. **METHODS:** The prospective study was carried out in three nursing homes during a period of eight weeks. The drug administration errors were divided into seven categories: wrong time of administration, wrong dosage, wrong drug, missing drug, surplus drug, incorrect pill division and damaged drug. **RESULTS:** The study included 196 residents. In total, 8798 daily doses were screened. This equals a total number of 48,512 inspected single medications. On average, every nursing home resident received 5.4 solid oral drugs per day. In 53% of the nursing home residents one or more drug administration errors were detected. Based on the 8798 screened daily doses the error rate was 7.3%. The majority of all drug supply errors (50%) occurred in the category incorrect pill division. This is followed by the category missing drug with 22%, surplus drug with 10%, wrong time of administration with 8%, damaged drug with 6%, wrong dosage with 4% and wrong drug with 0%. **CONCLUSION:** The findings of the study show that there is still a need for action with regard to drug administration in German nursing homes.

PIH30

PRIVATE HEALTH INSURANCE VS. MEDICAID COVERAGE: DISPARITIES IN PROCESS OF CARE MEASURES

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OBJECTIVE: The opponents of the socialization of health care hypothesize that socialization of health care could lead to decrease quality of care. The aim of our study was to compare the quality of care delivered to a privately insured population compared to those covered by government subsidized Medicaid plan in the same region. **METHODS:** Administrative claims data from July 2004 through June 2005 were used from a private health plan and the Medicaid plan within the same state in the Southeastern US. Two quality indicators from the Health Plan Employer Data and Information Set (HEDIS) were adapted and used to compare compliance rates between the privately insured and Medicaid populations (Table 1). Based on the specifications of each indicator, children who met relevant criteria were identified as the denominator. Of those, children that received the indicated intervention were identified as the numerator. Population-level rates were calculated for each quality indicator for both plans. **RESULTS:** Children in the private health plan received the indicated quality care much more frequently than the Medicaid population, with nearly 3-fold differences in compliance rates. Varicella zoster virus (VZV) vaccines and measles, mumps and rubella (MMR) vaccines were included in the analysis for 2 year old children. The private plan had a denominator of 4222 children and the Medicaid plan had 15,653 children for both measures. Eighty-two percent of private plan children received a VZV vaccine compared to 29% of Medicaid children. Eighty-four percent of private plan children received an MMR vaccine compared to 29% of Medicaid children. **CONCLUSION:** Children covered by Medicaid plans are significantly less likely to receive quality health care than compared to those who have private insurance coverage. Further studies are needed to investigate to what degree this wide disparity is driven by socioeconomic factors and the socialization of health care.

MUSCULAR-SKELETAL DISORDERS— Clinical Outcomes Studies

PMS1

EFFECT OF BISPHOSPHONATES ON FRACTURES IN POSTMEOPAUSAL WOMEN: A SYSTEMATIC LITERATURE REVIEW

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OBJECTIVE: While bisphosphonates have been available for many years, new drugs in this class have recently become available. We sought to understand whether differences exist on fracture risk and adverse events among oral (i.e., alendronate, risedronate, ibandronate) and intravenous (i.e., ibandronate, pamidronate, and zoledronic acid) bisphosphonates available in the United States in postmenopausal women. **METHODS:** A search of the English-language literature in Medline and Cochrane databases was conducted from 1997 to 2007 using combinations of these search terms: bisphosphonates, alendronate, risedronate, zoledronic acid, pamidronate, ibandronate, fracture, adverse events, and osteoporosis. Articles were included if they were meta-analyses or randomized controlled trials (RCT) and provided information on fracture risk and adverse events. **RESULTS:** In the most recent meta-analysis, alendronate (n = 12,099 patients; 11 trials) and risedronate (n = 13,795 patients; 6 trials) reduced the risk of vertebral fractures (RR:0.55, 95%CI 0.45–0.67; RR:0.61, 95%CI 0.50–0.76) and non-vertebral fractures (RR:0.84, 95%CI 0.74–0.94; RR:0.80, 95%CI 0.72–0.90), including hip fractures (RR:0.61, 95%CI 0.40–0.92; RR:0.74, 95%CI 0.59–0.94). Similarly, in a RCT among 7765 women, the incidence of vertebral fractures, non-vertebral, and hip fractures was significantly reduced with zoledronic acid (RR:0.30, 95%CI 0.24–0.38; RR:0.75, 95%CI 0.64–0.87; RR:0.59, 95%CI 0.42–0.83). In contrast, oral ibandronate (n = 1952) lowered the risk of vertebral fractures (RR:0.62, 95%CI 0.41–0.75) but not nonvertebral fractures. Data on fracture risk with pamidronate were not identified. Adverse events were similar between bisphosphonates and placebo in all included studies, except with zoledronic acid where serious atrial fibrillation (1.3% vs. 0.5%; $p < 0.001$), an increase in Scr >0.5 mg/dL (1.2% vs. 0.4%; $p = 0.001$), and urinary protein >2+ (0.5% vs. 0.2%; $p = 0.06$) were higher with treatment compared to placebo. **CONCLUSION:** This evidenced-based literature review shows that clinical differences among bisphosphonates exist. This suggests that selection of bisphosphonates needs to be individualized to maximize the desired effect and minimize risks.

PMS2

COMPARATIVE EFFICACY OF BIOLOGICAL TREATMENTS IN PATIENTS WITH PSORIATIC ARTHRITIS; SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS

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OBJECTIVE: Three biological agents (adalimumab, etanercept and infliximab) are registered for psoriatic arthritis (PsA) by the EMEA or the FDA. Our objectives were to compare the efficacy of the available biologicals in PsA and to compare their effect sizes by standardized improvement criteria of signs and symp-

toms. **METHODS:** Randomized controlled trials (RCT) of adalimumab, etanercept and infliximab involving patients with PsA were searched in MEDLINE by Cochrane Highly Sensitive Search Strategy. The quality of selected studies was measured using the Jadad-score. Two clinical outcomes were analyzed: the rate of patients achieving at least 20% improvement by the American College of Rheumatology criteria (ACR20) and the Psoriatic Arthritis Response Criteria (PsARC). Review Manager 4.2 software was applied for the analysis, using the number needed to treat (NNT) and relative risk (RR) as statistical variables. Due to lack of face-to-face evidence on biologicals, indirect comparison was conducted applying Butcher's method. **RESULTS:** Six RCTs were identified involving altogether 982 patients on the active treatment arms: adalimumab (n = 413), etanercept (n = 265) and infliximab (n = 304). All trials were placebo controlled, the primary follow-up time was 12–16 weeks and the primary outcome was ACR20. The NNTs (95% confidence intervals) for adalimumab, etanercept and infliximab were 2.6 (2.1–3.2), 2.1 (1.7–2.7) and 2.0 (1.7–2.4) patients to achieve ACR20 outcome and 2.9 (2.3–4.0), 2.2 (1.8–2.8) and 2.0 (1.6–2.4) to fulfill PsARC outcome, respectively. Indirect pairwise comparisons of TNF-alpha inhibitors yielded the RR of 0.87 (0.50–1.51) for adalimumab vs. etanercept, of 1.37 (0.72–2.61) for infliximab vs. etanercept and of 1.57 (0.87–2.86) for infliximab vs. adalimumab. **CONCLUSION:** Adalimumab, etanercept and infliximab are effective for the treatment of PsA. Both the NNTs and the responsiveness of the three drugs at PsARC and ACR20 outcomes are similar. Indirect comparison did not reveal significant difference in the efficacy among the TNF-alpha inhibitors in PsA.

PMS3

EFFICACY OF COX-2 SELECTIVE NSAIDS, NON-SELECTIVE NSAIDS, AND ACETAMINOPHEN IN OSTEOARTHRITIS: A BAYESIAN MIXED TREATMENT COMPARISON

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OBJECTIVE: To compare the efficacy of etoricoxib, lumiracoxib, celecoxib, non-selective (ns) NSAIDs and acetaminophen in the treatment of osteoarthritis. **METHODS:** RCTs investigating the effects of acetaminophen 4000 mg, diclofenac 150 mg, naproxen 1000 mg, ibuprofen 2400 mg, celecoxib 100–400 mg, lumiracoxib 100–400 mg, and etoricoxib 60 mg with a treatment duration of at least two weeks were identified with a systematic literature search. Endpoints of interest were pain, physical function and patient global assessment of disease status (PGADS). Pain and physical function reported on VAS or LIKERT scales were translated into effect sizes (ES). PGADS was reported on a 0–100 mm VAS scale. An ES 0.2–0.5 was defined as a "small" treatment effect, whereas ES of 0.5–0.8 and >0.8 were defined as "moderate" and "large", respectively. Outcomes of all trials were analyzed simultaneously with a Bayesian mixed treatment comparison. A negative estimate indicates favourable outcomes. **RESULTS:** There is an 84% probability that etoricoxib 60 mg shows the greatest improvement in pain of all interventions compared, followed by diclofenac 150 mg (7% probability) and ibuprofen 2400 mg (4%). Etoricoxib 60 mg showed an ES of –0.62 (95% Credible Interval –0.78; –0.45) relative to placebo, an ES of –0.12 (–0.33; 0.07) relative to diclofenac 150 mg, and an ES of –0.21 (–0.50; 0.07) relative to ibuprofen. Regarding physical functioning, there is an 85% probability that etoricoxib 60 mg showed the greatest improvement, followed by diclofenac 150 mg (8% probability) and ibuprofen 2400 mg (4%). ESs of etoricoxib 60 mg relative to diclofenac 150 mg and ibuprofen 2400 mg were –0.12 (–0.34; 0.08), and –0.23 (–0.53; 0.06) respectively. The greatest improvements regarding PGADS were expected with diclofenac (29% probability) followed by etoricoxib (25%). **CONCLUSION:** The current study estimated the efficacy of acetaminophen, nsNSAIDs, and COX-2 selective NSAIDs in OA and demonstrated that etoricoxib 60 mg is likely to result in the greatest improvements in pain and physical function.

PMS4

THE EFFECT OF HOSPITAL VOLUME ON 30 DAYS MORTALITY FOLLOWING HIP FRACTURE

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OBJECTIVE: The aim of our study was to examine the relationship between volume (annual number of patients) and outcome (30 days mortality) in patients with femoral neck fracture. **METHODS:** Data derived from the nationwide dataset of the National Health Insurance Fund Administration. Patients aged over 60 years with femoral neck fracture admitted to acute care hospital were included into the study. 30 days mortality following the primary surgical treatment was analyzed. We examined the relationship between volume (annual number of patients) and outcome (30 days mortality). First quintiles with similar patient number was applied (method I), than the patient number itself was the variable (method II). Several other covariates were included into the analysis: sex, age, co-morbidities, type and location of fracture, type of surgery (ostheosynthesis, arthroplasty), within 30 days complications, hospital type, day of surgery and surgical delay. The association between covariates was evaluated with logistic regression analysis (OR: odds ratio, 95% CI: confidence interval, p value). **RESULTS:** Altogether 3783 patient from 65 different hospitals were included into the study. The average 30 days mortality was 8.99 %, ranging between 7.82–10.0 % (method I). Using the volume data itself as continuous variable (method II), the connection between volume and outcome could not be proven (ORunivariate = 0.998, CI: 0.9974–1.0005, p: 0.1779; ORmultivariate = 0.9987, CI: 0.9962–1.0013, p: 0.3378). We did not find any relationship between hospital volume and outcome in patients with femoral neck fracture. However it is important to highlight the role of hospital type, where treatment at medical university (medical school) is associated with significantly lower 30 days mortality. **CONCLUSION:** We would like to emphasize on the analysis of our nationwide dataset that initial treatment in high-volume hospitals was not associated with lower 30 days mortality. However, type of hospital (teaching status) seems to be more important predictor of 30 days mortality.

PMS5

WHAT HAPPENED TO VIOXX USERS?

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OBJECTIVE: To understand the impact of the October 2004 withdrawal of rofecoxib on prescription analgesic use for arthritis patients who had been taking this medication. **METHODS:** Patients were selected from the MarketScan databases who, during January-September 2004, had a diagnosis of osteoarthritis on a medical claim and who filled prescriptions for at least 90 days of therapy with rofecoxib, an alternative COX-2 inhibitor (celecoxib), or a branded, non-selective, nonsteroidal, anti-

inflammatory drug (NSAID) (meloxicam). For each cohort, use of prescription analgesics was tracked pre-withdrawal (January-September 2004) and post-withdrawal (2005–2006). The impact of the withdrawal on drug utilization by former rofecoxib users was assessed by comparing changes in their drug consumption with that of celecoxib or meloxicam users during the same time period. **RESULTS:** The study cohorts included: 29,438 rofecoxib, 34,937 celecoxib, and 7131 meloxicam users. The groups were demographically similar, except for a higher proportion of women in the meloxicam cohort. In 2005, former rofecoxib users primarily substituted other COX-2 inhibitors (22% celecoxib, 10% valdecoxib) or non-selective NSAIDS (which increased to 48% from 14% pre-withdrawal). There was no substantial change in use of opioid /other analgesics. The percentage of former rofecoxib users continuing to receive any prescription analgesic was 83% (2005) and 77% (2006). By comparison, overall utilization of celecoxib and meloxicam declined to 87% and 91% respectively in 2005 and 80% and 84% respectively in 2006. By 2006, 59% of celecoxib users and 53% of meloxicam users had discontinued these medications. **CONCLUSION:** By 2006, the proportion of former rofecoxib users who had discontinued prescription analgesics altogether was substantially higher than among patients who not previously receiving a COX-2 inhibitor. This suggests the potential harm from unsafe drugs may not be limited to side effects, but also includes the disruption of care due to withdrawal of effective treatment.

MUSCULAR-SKELETAL DISORDERS—Cost Studies

PMS6

BUDGET IMPACT ANALYSIS OF ABATACEPT INCLUSION FOR MODERATE TO SEVERE RHEUMATOID ARTHRITIS IN THE BRAZILIAN PUBLIC SYSTEM

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OBJECTIVE: Abatacept is a new biological DMARD with selective co-stimulation modulator mechanism of action that was recently approved in Brazil for the treatment of patients with moderate to severe RA. We aim to evaluate and describe the budget impact of the inclusion of abatacept in the National Program of Exceptional Medications (NPEM) with the tumor necrosis factor (TNF) antagonists currently in use and included. **METHODS:** Using data provided by Brazilian Ministry of Health, our study estimates the cost associated with the inclusion of Abatacept for inadequate responders to methotrexate and TNF antagonists compared with actual scenario (without Abatacept). Our model presumes: adequate doses and regimen of abatacept (10 mg/kg. 0, 2, 4, and each 4 weeks), infliximab (4.2 mg/kg each dose of infliximab, 0, 2, 6, and each 8 weeks), etanercept (25 mg each dose/twice a week) and adalimumab (40 mg each dose, twice a month), and we accept the actual distribution of TNF antagonists used by NPEM (with adoption of 20% of increase in the number of the RA patients each year—NPEM data). According to literature, 30% of the patients with inadequate response to methotrexate will be eligible to use abatacept, and we accept this percentage to introduce patients in the abatacept group. The initial population is 4978 patients currently in use of TNF antagonists in 2007. **RESULTS:** In the first year of inclusion there is an increase in costs of R$3,085,711 (US$1,763,263). In the second and third years there are significant savings on budgets, R$97,593,971 (US$55,767,983) and R$129,458,357 (US$73,976,204), respectively. **CONCLUSION:** The incorporation of abatacept into the NPEM is cost-saving to the Brazilian Public Health System, saving R$129,458,357.00 (US$73,976,204) after the third year.

PMS7

TREATMENT OF DISPLACED FEMORAL NECK FRACTURES IN THE ELDERLY: A COST BENEFIT ANALYSIS

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OBJECTIVE: To conduct a cost-benefit analysis to compare the hypothetical introduction of a new intervention, internal fixation (IF), with hemiarthroplasty (HA) for the treatment of displaced femoral neck fractures in patients greater than 60 years old. **METHODS:** We estimated the costs from a third party payer perspective after one year of two strategies (HA and IF) for the treatment of femoral neck fractures in patients over the age of 60. Using a decision board, we elicited patient preferences for the two operative approaches and calculated the net benefit using the willingness-to-pay technique. **RESULTS:** The 1-year projected cost of one IF was $18,100 and that of one HA was $15,843 (incremental cost of $2,257 for each IF). Of 108 participants, 61 (56.5%) chose IF as the preferred treatment option and were willing to pay an average of $3.33 per month to have this option available if needed. In Ontario, the total incremental cost of performing IF in patients that choose it was $64,714,103, and the total societal benefit was $289,263,600, yielding a net benefit of $224,549,497. **CONCLUSION:** The benefits of IF over HA outweigh the incremental costs from the perspective of a third party payer. Therefore, IF should be available to patients that choose it.

PMS8

HEALTH ECONOMICS MODEL FOR TOTAL HIP ARTHROPLASTY: COST SAVINGS ACHIEVED BY NEWER TECHNOLOGY

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OBJECTIVE: Total hip arthroplasty (THA) is a common and successful procedure with nearly 250,000 primary arthroplasties performed yearly in the United States. This number is estimated to increase by at least 5% annually over the next decade. The resulting growth in health care utilization and costs maybe offset by innovative implant technologies with increased survivorship. This study quantifies the economic cost savings to payers from improved survivorship. **METHODS:** A simulation model is developed to estimate the long-term cost implications of improvements in THA survivorship. The model considers costs associated with all primary hip replacements performed in the United States over a ten-year horizon. The analysis draws upon the literature to obtain information on long-term revision rates for hip replacement surgeries. Inpatient treatment costs associated with THA and incidence and costs of the major complications, deep vein thrombosis and infection are included in the model. **RESULTS:** Improved implant survivorship in THA is estimated to save $1.6 billion over a ten-year horizon. The majority of these savings accrues from lower revision rates ($1.3 billion) with fewer complications accounting for $300 million in additional savings. Sensitivity analyses reveal that cost savings varied by survivorship ($1.1 to $2.0 billion) and hospital cost for revision surgery ($1.3 to $3.1 billion). Other variations by physician costs, complications costs and discount rates are less pronounced. However, under every scenario, costs savings are in

excess of $1 billion. **CONCLUSION:** The economic value of newer technologies with longer term survivorship will play an important role in meeting the growing demand and financial burden of THA. Improved THA survivorship will also enhance patients' quality of life. Therefore, the longevity of these innovative implants will be an important factor in evidence based decision making and economic evaluation of THA.

PMS9

COST-EFFECTIVENESS OF ABATACEPT IN PATIENTS WITH ACTIVE RHEUMATOID ARTHRITIS (RA) AND INADEQUATE RESPONSE TO METHOTREXATE (MTX) OR TUMOR NECROSIS FACTOR-ALPHA INHIBITORS (ANTI-TNFS): A CANADIAN PERSPECTIVE

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OBJECTIVE: To estimate the life-time cost-effectiveness (CE) of abatacept in patients with active RA and inadequate response to MTX or anti-TNFs. **METHODS:** We developed a patient-level simulation model to depict progression of functional disability over time. Functional disability was expressed in terms of the Health Assessment Questionnaire Disability Index (HAQ-DI). Health-state utilities and medical-care costs were assumed to depend on HAQ DI scores. The model separately estimated CE using data from three phase III clinical trials: 1) abatacept in patients with inadequate response to MTX (AIM); 2) abatacept in patients with inadequate response to anti-TNFs (ATTAIN); and 3) abatacept or infliximab in patients with inadequate response to MTX (BMS-IM101043). Cost-effectiveness of abatacept was examined in terms of the incremental cost (2006 Canadian dollars) per quality-adjusted life-year (QALY). **RESULTS:** 1) AIM trial: On a lifetime basis, abatacept was estimated to yield an average of 1.4 additional QALYs per patient vs. MTX at a mean incremental cost of $54,331; the estimated CE of abatacept was $39,604 (95% CI: $38,746, $41,384) per QALY gained; 2) ATTAIN: abatacept yielded an average of 1.2 additional QALY vs. oral DMARDs alone at a mean incremental cost of $50,141; estimated CE of abatacept was $42,021 (95% CI: $40,954, $43,256) per QALY; 3) trial 043: Relative to placebo, abatacept yielded an average of 1.58 additional QALY at a mean incremental cost of $58,351; incremental CE of abatacept was $37,094 ($35,535, $38,727) per QALY; infliximab yielded an average of 1.24 additional QALY at a mean incremental cost of $53,305; incremental CE of infliximab was $43,247 ($40,845, $44,587) per QALY. Relative to infliximab, the incremental CE of abatacept was about $14,841 per QALY. **CONCLUSION:** Abatacept is cost-effective in patients with active RA and inadequate response to DMARD or anti-TNF therapy and also highly cost effective relative to infliximab.

PMS10

THE COST-EFFECTIVENESS OF ABATACEPT VERSUS RITUXIMAB IN PATIENTS WITH RHEUMATOID ARTHRITIS: A PERSPECTIVE OF THE CANADIAN PUBLICLY FUNDED HEALTH CARE SYSTEM

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OBJECTIVE: To estimate the life-time cost-effectiveness of abatacept relative to rituximab in patients with active rheumatoid arthritis (RA) and an inadequate response to anti-tumor necrosis factor (anti-TNF) therapy. **METHODS:** We used a previously published patient level simulation model to depict progression of functional disability over time in people with active RA. Health-state utilities and medical-care costs were projected based on the Health Assessment Questionnaire Disability Index (HAQ-DI) scores. RA patients who were inadequate responders to anti-TNF therapy were assumed to receive abatacept or rituximab in combination with MTX on a lifelong basis or until therapy discontinuation due to lack of efficacy or side effects. HAQ-DI improvement at 6 months (–25% versus –22%), after adjustments for control drug response, were derived from two comparable abatacept and rituximab Phase III trials. The cost of abatacept (or rituximab) treatment was estimated at $18,480 (or $20, 500) for the first year, and at $17,160 (or $20,500) for subsequent years. Costs and health effects were discounted at 5% annually. All costs were expressed in 2007 Canadian Dollars. First order and second order uncertainty were considered. **RESULTS:** The reference case in the analysis is women aged 55–64 years. Relative to placebo, abatacept therapy was estimated to yield an average of 1.07 (95% confidence interval [CI] = 1.00, 1.14) additional quality adjusted life years (QALY) per patient, at a mean incremental cost of $45,875 (95% CI = $42,795, $47,773); rituximab therapy was estimated to yield an average of 0.94 (95% CI = 0.82, 1.05) additional QALY per patient, at a mean incremental cost of $51,101 (95% CI = $45,835, $57,175). Life time treatment with abatacept was estimated to be a dominant strategy compared with rituximab, primarily due to lower treatment costs and better HAQ improvement. The study findings were robust under uncertainty analyses. **CONCLUSION:** Abatacept therapy would be economically attractive from a Canadian payer perspective.

PMS11

COST-EFFECTIVENESS ANALYSIS OF RITUXIMAB FOR RHEUMATOID ARTHRITIS IN TAIWAN

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OBJECTIVE: The objective of this study was to access the cost-effectiveness of rituximab (RTX) for the treatment of rheumatoid arthritis (RA) in Taiwan from a payer's (Bureau of National Health Insurance [BNHI]) perspective. **METHODS:** A cost-effectiveness model was developed to simulate the long-term clinical outcome and cost impact for a cohort of 10,000 RA patients over the lifetime. The main comparator was current treatment arm, which included etanercept +methotrexate (ETAN + MTX), adalimumab (ADAL) + MTX, leflunomide (LEFT) + MTX, and cyclosporine. Relative clinical effectiveness were estimated by an indirect comparison of published ACR response rates adjusting for different study populations and complemented with observational data. Quality adjusted life-years (QALYs) were mapped from a disease severity measure (Health Assessment Questionnaire [HAQ]) score. Average treatment duration for biological agents, LFT + MTX, and CSA were assumed to be 4.25, 4.10, and 1.70 years, respectively. Drug acquisition costs were based on Taiwan's National Health Insurance fee schedule for 2007. Costs associated with drug adminis-

tration and monitoring were estimated by an expert panel survey conducted among 10 rheumatologists. Both health benefits and future costs were discounted at annual rate of 3%. One-way sensitivity analyses were performed on key model parameters by varying the input values by ±10%. **RESULTS:** Compared to current treatment arm, adding RTX yielded an incremental cost-effectiveness ratio (ICER) of USD$18,152 (NTD$589,945) per QALY gained. RTX remained cost-effective under one-way sensitivity testing. Furthermore, applying RTX right after ETAN or ADAL inadequate response (IR) rather than switching between these two TNF inhibitors resulted in significant cost-savings of USD$14,922 (NTD$484,994) and USD$19,707 (NTD$640,481) respectively. **CONCLUSION:** From Taiwan BNHI perspective, this demonstrates that adding RTX to current treatment options for RA patients who respond inadequately to TNF inhibitor therapy is cost-effective, in addition, applying RTX right after one TNF inhibitor (ETAN or ADAL) IR is cost-saving.

PMS12

COST-EFFECTIVENESS ANALYSIS OF ZOLEDRONIC ACID VERSUS RISEDRONATE FOR THE PREVENTION OF OSTEOPOROTIC HIP FRACTURE IN THE PRIVATE HEALTH CARE SYSTEM IN BRAZIL

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OBJECTIVE: To assess cost-effectiveness of zoledronic acid compared to risedronate in the Brazilian private health care system, by health plan companies' perspective. **METHODS:** Decision analytic model (Markov) to estimate the incremental cost effectiveness ratio of zoledronic acid compared to risedronate for the treatment of osteoporosis in Brazil in 2007. The target population was a hypothetic cohort of women with osteoporosis aged 65 years in a time horizon of 5 years. The epidemiological data related to osteoporosis and drug's efficacy were obtained from critical appraisal of scientific literature. The costs were collected from electronic claims databases of patients enrolled in Brazilian health plans. The outcome analyzed was the cost per osteoporotic hip fracture avoided. Costs and clinical benefits related to the treatment were discounted at a rate of 3%. **RESULTS:** In the base case scenario, zoledronic acid reduced the incidence of fractures in comparison to risedronate (0.33 fractures against 0.46 fractures), with similar annual costs of osteoporosis treatment and its complications in both arms of the model (US$10,607.35 against US$10,606.22, incremental costs of US$1.13). **CONCLUSION:** The study demonstrated that the use of zoledronic acid compared to risedronate could prevent more hip fractures, with similar costs in the brazilian private health system. This study highlights the savings to health plan companies if an osteoporotic hip fracture can be avoided.

PMS13

COST EFFECTIVENESS OF BIOLOGICS FOR RHEUMATOID ARTHRITIS: A SYSTEMATIC REVIEW

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OBJECTIVE: To consolidate the cost-effectiveness (CE) data of biologics in Rheumathoid Arthritis (RA) and explore their local applicability. **METHODS:** Systematic review of CE studies (e.g., electronic databases searched to Nov. 2007) comparing biologics with conventional DMARDs for RA patients. Details regarding study characteristics were abstracted using a framework by Drummond et al. 2005 and study quality via Neuman et al. 2000 (score 1–7 higher better). ICER data was extracted, purchasing-power-parity converted and pro-rated to 2006 Canadian $. **RESULTS:** Nineteen CUA and 2 CEA studies published in 2002–2007 (UK = 7 studies, US 5, Canada = 3, Sweden = 4, Netherlands/Japan = 1 each; ETA = 10, INF = 8, ADA = 2, ANA = 1; payer perspective = 11, societal = 7 and not reported = 3 were identified via screening 337 citations and reviewing 50 full-text articles. Study methods varied (e.g., input efficacy data, time horizon, offset costs) but reporting quality was high (17/21). 20/21 study populations involved RA patients refractory to one or more DMARDs. The direct cost per QALY was $127–174 K for ETA third line in Canada (n = 2 studies), $60–104 K mid-sequence in the UK (n = 2), $60–176 K in Sweden (n = 3), and $256–483 K in The Netherlands (n = 1). For INF with methotrexate, the cost per QALY was $99–114 K in Canada (n = 1) and $62–289 K in the UK (n = 2). It was $62–293 K for ADA (n = 1) and $233–1290 K for ANA (n = 1). Other results from industry-funded studies varied (n = 7). Antibodies against TNF was showed to be cost effective at $50 K per QALY using data from the UK Rheumatology Biologics Registry (n = 1). Two sources of uncertainty frequently identified in sensitivity analyses: long-term disease progression (10/17) and associated QALY (7/17). **CONCLUSION:** For direct cost, the relative cost effectiveness of the biologics is consistent with their relative clinical effectiveness, especially the estimates of HAQ progression while on treatment.

PMS14

A COST-EFFECTIVENESS ANALYSIS OF BIOLOGICAL AGENTS FOR PATIENTS WITH MODERATE TO SEVERE RHEUMATOID ARTHRITIS FOLLOWING INADEQAUTE RESPONSE TO METHOTREXATE

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OBJECTIVE: To investigate the cost-effectiveness of biological response modifiers in patients with moderate to severe rheumatoid arthritis who have experienced an inadequate response to methotrexate **METHODS:** A decision analytic model was constructed to estimate the costs and effectiveness of adalimumab, anakinra, etanercept, and infliximab alone or in combination with methotrexate for 6 months. Effectiveness was measured by American College of Rheumatology response criteria (ACR20) as reported in published clinical trials. Costs included direct medical costs (including medication, monitoring, and adverse event costs) and indirect costs due to impaired work productivity. Extensive univariate and probabilistic sensitivity analyses were performed. **RESULTS:** In the base case, costs for 6 months of therapy were

lowest for etanercept monotherapy ($22,487) and highest with the combination of infliximab and methotrexate ($24,807). For monotherapy and combination therapy regimens, etanercept was the least expensive option and most effective option compared to other treatments, although differences in cost and effectiveness across treatments were relatively small. After eliminating dominated options, etanercept +MTX therapy increased the probability of achieving an ACR 20 by 7% points and increased total costs by $199 over etanercept monotherapy agent, resulting in an incremental cost-effectiveness ratio of $2843 per additional response. The incremental cost-effectiveness of combination therapy compared to monotherapy was not markedly altered in sensitivity analyses. **CONCLUSION:** Findings from this study suggest that there are relatively small differences in cost and effectiveness across biological response modifiers. Combination therapy with biological response modifiers appears to provide an increase in response compared to methotrexate alone, but at a cost. Whether combination therapy can be considered cost-effective depends on the value attached to achieving ACR response.

PMS15

COST-EFFECTIVENESS OF THE TREATMENT FOR EARLY RHEUMATOID ARTHRITIS IN MEXICO: INFLIXIMAB VS. ADALIMUMAB

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OBJECTIVE: Evaluate the cost-effectiveness of infliximab compared to adalimumab in early arthritis from an institutional perspective. **METHODS:** To compare the cost and effectiveness, a decision tree model was structured with a temporary horizon of 54 weeks. Only costs per drug were considered for this analysis, as the rest of the costs are similar for institutional buyers. Comparators: 3 mg/kg i.v. infliximab + 15 mg oral metotrexate (MTX) weekly. Infliximab is administered at weeks 0, 2 and 6, and every 8 weeks thereafter. Adalimumab subcutaneous injections of 40 mg every two weeks + 15 mg weekly of metotrexate (oral). The effectiveness measures considered were the percentage of patients achieving the ACR 50 and 70 response levels and were obtained from international literature. Percentage of patients achieving the ACR 50 and 70 levels with each treatment: 78% and 67% for infliximab + metotrexate and 62% and 49% respectively for the combination of adalimumab plus metotrexate. Costs were estimated using prices of 2007 and are expressed in United States dollars (exchange rate of 10.93 pesos/1 USD). **RESULTS:** The expected annual treatment cost is $15,720.80 for infliximab and $15,896.20 for adalimumab. The cost-effectiveness ratios for ACR 50 and 70 per drug type are: $20,154.80 and $23,463.90 respectively for infliximab; and $25,639 and $32,441.20 respectively for adalimumab. The incremental cost-effectiveness ratio for infliximab vs. adalimumab is -$1096.20 for ACR 50 and $974.40 for ACR 70. The sensitivity analysis showed that these results are sensitive to drug price variations. **CONCLUSION:** Infliximab is a cost-effective alternative compared to adalimumab for the treatment of early arthritis from an institutional perspective in Mexico.

PMS16

ECONOMIC EVALUATION OF MONTHLY IBANDRONATE VS WEEKLY ALENDRONATE TO PREVENT OSTEOPOROTIC HIP FRACTURES IN MEXICAN WOMEN AGED FIFTY AND OLDER

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OBJECTIVE: To evaluate from a Mexican public health care institution perspective, the efficiency for using monthly ibandronate for prevention of osteoporotic hip fractures in Mexican women aged fifty and older. **METHODS:** A hypothetical intervention to compare ibandrontate monthly versus alendronate weekly to prevent osteoporotic hip fractures in Mexican fifty years and older women was modeled. The model considers both efficacy reported to each drug and the effectiveness for their massive use based on the adherence to the therapy reported. Taking into account both groups of women, those that completed treatment and those that abandoned it, the model estimates the total number of hip fractures possibly avoided for each alternative and the investment required, only in terms of direct cost. Considering that in Mexico there is not a defined cost-effectiveness threshold, the attention cost for hip fracture was proposed like this. **RESULTS:** The attention cost for a hip fracture in Mexico is reported at approximately USD$5100. Although the model estimated a higher total direct cost for using ibandronate (due to it's higher rate of adherence) the estimated ICER was USD$4734; this means the cost for additional hip fracture avoided comparing to alendronate. **CONCLUSION:** The use of monthly ibandronate to treat osteoporosis and prevent osteoporotic hip fractures is a cost-effective alternative. Although the public health care institutions could be spending a maximum amount near to actual cost for hip attention, it is possible to obtain additional savings if the indirect costs of hip fractures and their associated deaths are considered.

PMS17

LONGITUDINAL ESTIMATES AND COST-EFFECTIVENESS ANALYSIS OF ANTI-RESORPTIVE AGENTS FOR GLUCOCORTICOID-INDUCED OSTEOPOROSIS AND FRACTURES BASED ON US NATIONAL SURVEYS

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OBJECTIVE: Long-term glucocorticoid use may lead to glucocorticoid-induced osteoporosis and fractures which require proper management. This study aims to aid decision-making on preventive use of anti-resorptive agents for female long-term oral glucocorticoid tablet users. **METHODS:** A retrospective analysis of 1996–2004 Medical Expenditure Panel Survey data was conducted to evaluate "actual use" outcomes. Direct medical costs (in 2006 dollars) including selected adverse events related to anti-resorptive agents were evaluated. Logistic analysis was performed to estimate odds ratios of new fractures and osteoporosis in treatment groups compared to the control group. Markov modeling with second-order Monte Carlo simulations was used to yield long-term estimates of these outcomes and address parameter uncertainty. **RESULTS:** Of 1692 qualified female long-term glucocorticoid users (representing 2.65% of the female non-institutionalized U.S. population; average age = 49.8 years; average prednisone-equivalent dose = 10.7 mg/day; average therapy length = 215 days; white = 85.6%), 29.9% reported use of any anti-resorptive agent; of those, 76.5% used hormone replacement therapy (HRT) only, 12.1% used bisphosphonates only, 2% used calcitonin only, 1.6% used raloxifene only and 7.8% used more than one anti-resorptive agent. Compared to the controls, the estimated 10-year/lifetime incremental cost-effectiveness ratios (ICERs; cost per fracture avoided) are $2,250/$7,776 for HRT, $10,149/$28,078 for bisphosphonates, $27,891/$46,102 for raloxifene and $60,862/$61,660 for calcitonin in hypothetical 50-year-old female glucocorticoid users. By using the cost-effectiveness acceptability curve, different decision makers may find the corresponding range of probabilities that remain cost-effective based on personalized willingness-to-pay.

CONCLUSION: HRT is the most cost-effective option, followed by bisphosphonates, for 50-year-old hypothetical females, but some assumptions and limitations apply (including small sample sizes for the calcitonin and raloxifene groups, and a likely selection bias in that bisphosphonate users are more likely to report longer duration of glucocorticoid therapy). Because few guidelines included cost-effectiveness information, consideration of these results may facilitate better management of glucocorticoid-induced osteoporosis.

PMS18

COST-EFFECTIVENESS OF ABATACEPT IN PATIENTS WITH MODERATELY TO SEVERELY ACTIVE RHEUMATOID ARTHRITIS AND INADEQUATE RESPONSE TO METHOTREXATE IN BRAZIL

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OBJECTIVE: Abatacept is a new selective co-stimulation modulator recently approved in Brazil for the treatment of patients with moderately to severely active rheumatoid arthritis (RA) and inadequate response to one or more disease-modifying anti-rheumatic drugs (DMARDs). We estimated the cost-effectiveness of Abatacept in patients with inadequate response to Methotrexate. **METHODS:** We developed a Markov simulation model to depict progression of functional disability over time in patients with moderately to severely active RA and inadequate response to MTX. Functional disability was expressed in terms of the Health Assessment Questionnaire Disability Index (HAQ-DI). Patients were assumed to receive weekly pulse MTX alone or weekly pulse MTX plus abatacept administered on days 1, 14, and 29, and every 4 weeks thereafter. Costs with drug acquisition, administration and monitoring were considered. Estimations used data from a Phase III clinical trial of abatacept in patients with inadequate response to MTX (AIM) plus secondary data sources. Cost-effectiveness of abatacept was expressed in terms of the incremental cost (2006 Brazil R$) per quality-adjusted life-year (QALY) gained versus MTX therapy alone; lifetime horizons was employed in the analyses. Costs and health effects were discounted at 3% annually. **RESULTS:** Over the lifetime, abatacept therapy was estimated to yield an average of 1.61 additional QALYs per patient (vs. MTX alone) at a mean incremental cost of R$146.095/QALY (US$83,483, US$1 = R$1.75). **CONCLUSION:** Abatacept presented the best cost-effectiveness ratio vis-à-vis etanercept, adalimumab, and infliximab, with its incremental costs of R$202.581/QALY, R$189.100/QALY and R$236.479/QALY, respectively vs. Methotrexate alone.

PMS19

COST MINIMIZATION AND BUDGET IMPACT ANALYSIS OF RITUXIMAB VERSUS INFLIXIMAB, ADALIMUMAB, ETANERCEPT AND ABATACEPT IN RHEUMATOID ARTHRITIS FROM A PAYER PERSPECTIVE IN BRAZIL

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OBJECTIVE: Rituximab is a monoclonal antibody with demonstrated efficacy (REFLEX trial) in rheumatoid arthritis patients who responded inadequately to anti-TNF drugs (Cohen et al. 2006). The study assessed the total cost of rituximab therapy in comparison with infliximab, adalimumab, etanercept and abatacept under a private payer perspective in Brazil. A budget impact analysis was performed. **METHODS:** This study assumed the same efficacy for all drugs, since there has not been any head-to-head trial available until now, although indirect comparisons show higher ACR response rates for rituximab. Direct annual medical costs for biological drugs, IV administration, weekly metotrexate (MTX) and routine exams were taken from a panel of Brazilian rheumatologists. Base case dosages considered were: rituximab (2 g every 8 months), abatacept (750 mg at weeks 0, 2, 4 and then every 4 weeks), infliximab (4 mg/kg at weeks 0, 2, 6 and every 8 weeks), adalimumab (40 mg every other week) and etanercept (50 mg every week). Local administration costs were obtained from Scheinberg et al. 2005. Costs were reported in 2007 Brazilian Reais and discounted at a 5% rate in the BIA. Therapies were evaluated using a 5-year horizon. In order to assess uncertainty, one and two-way sensitivity analyses were performed. **RESULTS:** In the base case scenario, rituximab therapy resulted in a total annual cost of R$46,388 per patient. Total annual costs per patient for the comparators were: R$79,394 for infliximab, R$90,831 for adalimumab, R$120,351 for etanercept and R$77,118 for abatacept. In the BIA, rituximab therapy resulted in total savings of R$94,201,413 in 5 years considering the population in the private health care system only. Results were sensitive to dosage schedule (rituximab, infliximab and abatacept) and drug costs. **CONCLUSION:** Results of this study suggest that therapy with rituximab is a dominant alternative for patients with rheumatoid arthritis in the Brazilian private health care system.

PMS20

THE ECONOMIC CONSEQUENCES OF RHEUMATOID ARTHRITIS: AN ANALYSIS OF THE MEDICAL EXPENDITURE PANEL SURVEY (MEPS)

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OBJECTIVE: To assess the direct and indirect economic consequences of rheumatoid arthritis (RA) using real-world data. **METHODS:** Medical Expenditure Panel Survey (MEPS) 2004 data was used to identify non-institutionalized U.S. persons with RA. MEPS is a comprehensive survey of approximately 35,000 individuals consisting of detailed health care resource use expenditures by payer, employment and income, insurance detail and quality of life (QoL) information. These data are novel because they are nationally representative, capture the elderly and their expenditure better than managed care databases, and contain direct and indirect costs and QoL measures in the same population. Multiple linear and semi-log regressions were applied to estimate the total annual health care expenditure and income loss associated with RA. Covariates in expenditure equations included demography, comorbidities and overall health status. Semi-log regression for income rendered the distribution of income symmetric. Covariates in the income equations included demography, comorbidities, education, occupation and health status. **RESULTS:** A total of 136 patients with RA were identified in the data; 76% were women, and 56% were 41–64 years of age. Total annual incremental expenditure associated with RA was $4422 ($P < 0.01$) with adjusted R^2 of 0.16 in the linear regression and 0.41 in the semi-log regression. 14% of those expenses were paid by the individual or their family, 28% by Medicare, 39% by private insurance and 14% by Medicaid. As expected, deterioration in overall health status increased health care expenditures monotonically. In the income equation (adjusted $R^2 = 0.39$), persons with RA earned $3526 less annually ($P = 0.03$) than the mean income of $26,594 consistent with the US Census Bureau, translating into a 13% decrease. Income increased with education and with improved overall health status. **CONCLUSION:** Even when controlling for other factors,

the economic impact of rheumatoid arthritis alone is substantial with the indirect productivity or income loss as large as the health care costs.

PMS21

THE RELATIONSHIP BETWEEN COST OF ILLNESS AND DISEASE SEVERITY IN RHEUMATOID ARTHRITIS: RESULTS OF A SYSTEMATIC REVIEW

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OBJECTIVE: To assess the relationship between economic burden and physical functioning or disease severity in rheumatoid arthritis (RA). **METHODS:** Medline, Embase, BIOSIS, Derwent Drug File, the Cochrane library and NHS-EED were searched on 12th March 2007 for cost-of-illness (COI) and cost-effectiveness studies in RA. **RESULTS:** A total of 909 unique citations were retrieved. Nine studies presented COI results; with seven studies presenting data on the relationship between direct and indirect costs and physical functioning or disease severity. The Health Assessment Questionnaire (HAQ) was used in three studies to assess functional ability. Higher HAQ scores at baseline were found to be significant predictors of higher future direct costs in two studies. A third study used both HAQ and the Hannover Functional Status Questionnaire (FFbH) to assess functional ability. For patients with an HAQ score <1.2 (or >70% of full FFbH function) the mean annual direct costs were €3225 and indirect costs were €8,811; for patients with an HAQ score between 1.2 and 1.7 (FFbH function of 50 to 70%) mean annual direct costs were €5,661 and indirect costs were €21,580; whilst for patients with an HAQ score higher than 1.7 (FFbH functional status of <50% of normal) mean annual direct costs were €8,403 and indirect costs were €34,915. A further two studies using the FFbH confirmed these findings of increased costs with decreasing functional ability. Finally, in two studies assessing the relationship between disease severity and costs, there was a statistically significant difference ($p < 0.001$) in both direct and indirect costs for each level increase in disease severity (based on ACR functional classes I, II, III and IV) and increases in costs with increasing disease severity categorised as no disability, mild, moderate and severe. **CONCLUSION:** The economic burden of RA appears highly dependent on both the level of functional disability and disease severity.

PMS22

ECONOMIC IMPACT OF ALLOPURINOL HYPERSENSITIVITY SYNDROME

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OBJECTIVE: The study is an assessment of the economic impact of allopurinol hypersensitivity syndrome (AHS) in a managed care population. **METHODS:** Due to absence of a specific ICD-9 CM code for AHS, an algorithm was developed using results of a modified Delphi process to identify an AHS episode, and assess its economic impact from claims data. Allopurinol users were identified as those who had a prescription during January 1, 2000 to June 30, 2006. Presence of an AHS episode was assessed during the continuous eligibility period after the first allopurinol prescription. The start date of an AHS episode was termed as the index AHS date, and overall health care costs were computed during a six month period before and after the index AHS date. Statistical differences in costs per patient per six month period pre- and post- AHS were assessed using paired t-tests; differences in proportion with non-zero costs were assessed using McNemar's test. All costs are expressed in 2007 US Dollars.

RESULTS: A total of 417 allopurinol users experienced at least one AHS episode during the period following their index allopurinol prescription compared to 124,546 users who did not. The average cost per patient in the six month period following the index AHS date was $8598 higher than the prior 6-month period ($14,338 vs. $5,740, $P < 0.001$). The cost increase was evident for both medical ($12,032 vs. $4,242, $P < 0.001$) and pharmacy components ($2,306 vs. $1,498, $P < 0.001$). The large difference in medical costs was primarily due to large differences in inpatient costs ($7497 vs. $2335, $P < 0.001$), as a significantly higher proportion had a hospitalization following the AHS episode compared to the pre-index AHS period (40.3% vs. 16.8%, $P < 0.001$). **CONCLUSION:** This study found AHS to have a significant economic impact contributing to an almost three fold increase in overall health care costs.

PMS23

MODELLING OF BURDEN OF FEMORAL NECK FRACTURE IN 2007 FROM PURCHASER'S POINT OF VIEW

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OBJECTIVE: The purpose of this study was to calculate the treatment cost of femoral neck fracture and financial burden of the annual fracture cases at 2007 financial level from health insurance point of view. **METHODS:** The costs of the treatment of femoral neck fractures are modeled according to the actually NHIFA (National Health Insurance Fund Administration) reimbursed types of care including acute inpatient care, chronic inpatient care, outpatient care, pharmaceuticals and medical devices, home care (nursing), cost of traveling or transport, and sick pay. Cases in which patients were healing following primary treatment (without complications) and cases with complications were examined separately. The financial burden was estimated by using data from international literature and Hungarian studies (number of fractures, mortality, ratio of further treatment, etc.) which were extrapolated for the average health insurance treatment cost of one patient. Yearly average in 2007: USD$1 = 183,83 HUF. **RESULTS:** The cost of patients in active age-groups cured by primary treatment can vary in a range of USD$5093–USD$7549 depending on cost level of individual care and utilization. The cost of patients with complication (primary treatment and complication) in active age-groups can reach USD$9317–USD$16049, depending on cost level of individual care and utilization. According to our model calculations, the cost of primary treatment of femoral neck fractures and essential further treatment represents an annual burden of USD$22,676,518–USD$32,194,335 for the health insurance system. **CONCLUSION:** In order to reduce the incidence of neck fractures, one should emphasize the importance of current and future interventions, which projects the possibility of reducing the financial burden at societal level. The real decrease of financial burden can be realized by reducing the risk increasing effect of risk factors of the whole primary treatment on further treatments, following the implementation of well-established and uniform professional decisions.

PMS24

RESOURCE UTILIZATION AMONG INPATIENTS WITH RHEUMATOID ARTHRITIS—AN ANALYSIS OF 2004 HEALTH CARE COST AND UTILIZATION PROJECT DATA

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OBJECTIVE: To estimate the length of stay (LOS) and total charges among inpatients with rheumatoid arthritis (RA) based on patient- and hospital- related characteristics. **METHODS:** A retrospective analysis was conducted using a 20% sample from the 2004 Nationwide Inpatient Sample (NIS) of the Healthcare Cost and Utilization Project (HCUP) data. NIS is an all-payer inpatient care database that contains hospital discharge data from a national sample of more than 1,000 hospitals. The 2004 NIS of the HCUP data was used to extract individuals with RA (primary diagnosis using ICD-9 code 714.0). Descriptive analysis was conducted to examine the differences in RA-related LOS and total charges by patient-related (age, race, gender, payer status, patient location, and median household income) and hospital-related (bed-size, geographic region, location, and teaching status) characteristics. Multiple regression was conducted to identify patient- and hospital-related predictors of LOS and charges among inpatients with RA. **RESULTS:** A total of 655 individuals with RA were extracted. The mean age was 61.92 years and the patients were predominantly female (79.3%) and white (68.8%). In addition, around 50% of these patients were located in large metro areas. A majority of hospitalizations occurred in the Southern region (34.8%) of the U.S in hospitals that had a large bed-size (57.3%). The mean LOS for patients with RA was 4.24 days and mean total charges were $25,852. The payer variable 'private insurance' was found to be a predictor of LOS while the predictors for charges included race (Hispanics), age (61–70 years), and geographic location (Western region). **CONCLUSION:** Inpatients LOS and charges are high in RA. Successful interventions that take into account important RA-related patient and hospital characteristics could result in improved health outcomes and substantial cost savings in this population.

PMS25

ASSOCIATION BETWEEN OUT-OF-POCKET EXPENSES AND CLINICAL OUTCOMES, AND QUALITY OF LIFE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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OBJECTIVE: To evaluate the relationship between out-of-pocket (OOP) expenses for medication and clinical outcomes in rheumatoid arthritis (RA) patients. **METHODS:** A 2006 Rheumatoid Arthritis Patient Survey data (wave 7) was analyzed. Adult RA patients completed an online questionnaire regarding their RA disease status, signs and symptoms, quality of life as measured by physical (PCS) mental component scores (MCS) of Short Form-8 (SF-8), and work productivity loss measured by Work Productivity and Activity Impairment (WPAI). Comparisons were made between two groups: patients reporting per-month OOP ≥ $100 and OOP < $00. Multivariate analyses were performed to control for confounding factors, including age, gender, duration and severity of RA, signs, and symptoms. **RESULTS:** Of the 2000 respondents, 77.4% were female and the average age was 51.6 years. The mean per-month OOP was $95.75 for all medications. Compared with patients reporting <$0 OOP (N = 1376, 68.8%), the OOP ≥ $100 group (N = 624, 31.2%) had significantly worse patient-reported clinical measures and outcomes (all P-values <0.0001), including pain scores (6.20 vs. 5.39), morning stiffness (6.32 vs. 5.53), fatigue (6.36 vs. 5.11), PCS (34.66 vs. 38.37), MCS (41.21 vs. 43.79), work productivity loss of WPAI (35.43% vs. 28.14%). After adjusting the confounding factors (age, gender, % of prescription by rheumatologist, severity and years with RA), higher OOP is positively related to pain, morning stiffness, fatigue, WPAI and negatively related to PCS score. **CONCLUSION:** In addition to safety and efficacy, cost or OOP is an important factor in the decision of the RA treatment. This study indicates that higher OOP is negatively related to the clinical outcomes (including signs and symptoms, quality of life and work and productivity loss). It is recommended that more research be conducted to evaluate the impact of co-payments and OOP on the economic, clinical, and humanistic outcomes in the treatment of RA.

PMS26

TRENDS IN HOSPITALIZATIONS AMONG INPATIENTS WITH RHEUMATOID ARTHRITIS—AN ANALYSIS OF 2002–2004 HEALTH CARE COST AND UTILIZATION PROJECT DATA

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OBJECTIVE: To investigate the trends in length of stay (LOS), total charges, and principal procedures for rheumatoid arthritis-related (RA) hospitalizations for 2002–2004. **METHODS:** A retrospective analysis was conducted using a 20% sample from 2004 Nationwide Inpatient Sample (NIS) of the Healthcare Cost and Utilization Project (HCUP) data. NIS is an all-payer inpatient care database that contains hospital discharge data from a national sample of more than 1000 hospitals. Inpatient data from 2002 through 2004 were obtained from the NIS datasets. Individuals with RA (primary diagnosis using ICD-9 code 714.0) were extracted from the datasets. A descriptive analysis was conducted to assess the trends in LOS, total charges, and principal procedures. **RESULTS:** A total number of 744 hospitalized RA cases were observed in 2002, 612 cases in 2003 and 655 cases in 2004. LOS as well as total charges showed an increasing trend from 2002 through 2004. The mean LOS was 3.99 days in 2002, 4.22 days in 2003, and 4.24 days in 2004; whereas the mean total charges were $19,712 in 2002, $24,724 in 2003, and $25,852 in 2004. Around 72%, 74%, and 73.4% patients had undergone some surgical procedures in years 2002, 2003 and 2004, respectively. Total knee replacement (TKR) and total hip replacement (THR) comprised the procedures conducted most often for all three years. TKR was conducted on 18.07% patients in 2002, 18.64% in 2003 and 21.29% in 2004. **CONCLUSION:** There is a dearth of data on trends in LOS and total charges for RA patients in the literature. Even though the number of hospitalizations for RA is decreasing, there is an increasing trend in the average LOS and total charges. The increase in surgical procedures over the time period could be a contributing factor to the longer LOS and higher total charges.

PMS27

DOES THE FUNDING SOURCE INFLUENCE THE RESULTS IN ECONOMIC EVALUATIONS? A CASE- STUDY IN BISPHOSPHONATES FOR THE TREATMENT OF OSTEOPOROSIS

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OBJECTIVE: Research sponsored by the pharmaceutical industry is often assumed to be more likely to report favorable cost-

effectiveness results. The objective of this study was to determine whether there was a relationship between the source of funding and the reporting of positive results. **METHODS:** We conducted a systematic review of the literature to identify economic evaluations of bisphosphonates for the treatment of osteoporosis. We extracted the source of funding, region of study, the journal name and impact factor and all reported incremental cost effectiveness ratios (ICERs). We identified which ICERs were under the thresholds of $20,000, $50,000 and $100,000 A quality score between 0 and 7 was also given to each of the studies. We used generalized estimating equations (GEE) for the analysis. **RESULTS:** The systematic review yielded 532 potential abstracts: Seventeen met our final eligibility criteria, 531 ICERs were analyzed, and ten studies (59%) were funded by industry. There was no significant difference between industry and non-industry funded studies reporting ICERs below the thresholds of $20,000 and $50,000. However industry sponsored studies were more likely to report ICERs below $100,000 [OR = 4.69, 95%CI (1.77–12.43)]. Studies of higher methodological quality (higher than 4.5) were less likely to report ICERs below $20,000 and $50,000 than studies of lower methodological quality (score under 4). Methodological quality was not significantly different between studies reporting ICERs under $100,000. **CONCLUSIONS:** Our study shows that funding source (industry vs. non-industry) did not significantly affect the reporting of ICERs below $20,000 and $50,000 thresholds. Methodological quality might be a more significant factor than source of funding in differentiating which studies are likely to report favorable ICERs, with the higher quality studies significantly less likely to report ICERs below $20,000/QALY and $50,000/QALY.

PMS28

REAL WORLD COSTS AND DOSING PATTERNS OF ABATACEPT AND INFLIXIMAB FOR THE TREATMENT OF RHEUMATOID ARTHRITIS

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OBJECTIVE: To determine the annual drug and administration costs and dosage patterns for patients with rheumatoid arthritis (RA) treated with infliximab or abatacept from a managed care perspective. **METHODS:** A retrospective analysis of medical claims was performed using the PharMetrics claims database. Patients with RA were identified from Janaury 1, 2003-December 31, 2005 for those prescribed infliximab and February 1, 2006-December 31, 2006 for those prescribed abatacept as first or subsequent biologic treatment. Patients were followed until medication switch, discontinuation, or end of study period. Primary outcomes of interest were annual drug and administration costs and dose escalation (increase in dose, dosing frequency or both). Patients' weight information required to calculate dose were unavailable, therefore paid amounts were used as proxy for dose. **RESULTS:** From first to last infusion, patients receiving infliximab (n = 1913) as first or subsequent biologic experienced an average dose increase of 17% and 39%, respectively. A total of 58% and 73% patients prescribed infliximab as first or second-plus biologic experienced dose escalation, respectively. For patients receiving abatacept (n = 184) as first or subsequent biologic, dose increase averaged 1.2% and 6.5%, respectively (no increase in number of vials for either). The dosing interval for patients receiving abatacept followed the recommended dosing regimen. Patients treated with infliximab experienced an increase in dosing frequency, averaging 49 days earlier in treatment (from 4th to 14th infusion) and 33 days later in treatment (15th to last infusion). The estimated annual drug plus infusion administration cost of first and subsequent biologic therapy was $13,354 and $14,465 for abatacept and $16,608 and $23,913 for infliximab, respectively. **CONCLUSION:** Patients treated with infliximab experienced an increase in dosage and/or dosing frequency, resulting in an increase in real world treatment costs. Patients treated with abatacept showed no considerable increase in dose or dosing frequency from first to last infusion.

PMS29

BAYESIAN COST-EFFECTIVENESS ANALYSIS OF TREATMENT OF ANKYLOSING SPONDYLITIS

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OBJECTIVE: To evaluate the cost-effectiveness of etoricoxib (90 mg), celecoxib (200/400 mg), and the non-selective NSAIDs naproxen (1000 mg) and diclofenac (150 mg) in the initial treatment of ankylosing spondylitis (AS) in the UK. **METHODS:** A Bayesian cost-effectiveness model was developed to estimate the costs and benefits associated with initiating AS treatment with etoricoxib, celecoxib, diclofenac, or naproxen. Efficacy, safety and medical resource and cost data were obtained from the literature. With mixed treatment comparison meta-analysis the obtained efficacy estimates were synthesized. Treatment benefit and degree of disease activity, as reflected with BASFI and BASDAI scores, were related to quality adjusted life years (QALYs) and disability related costs. Other cost outcomes related to drug acquisition, gastrointestinal and cardiovascular safety were taken into consideration. Uncertainty in the source data was translated into uncertainty in cost-effectiveness estimates and therefore decision uncertainty. **RESULTS:** There was more than 98% a probability that etoricoxib results in greater QALYs than the other interventions. Over a 30-year time horizon, etoricoxib is associated with about 0.5 more QALYs than the other interventions. At 2 years there is a 77% probability that etoricoxib shows the lowest cost. This increases to >99% at 30 years. At 30 years etoricoxib is expected to save ≤19,460 relative to celecoxib (200/400 mg) and ≤14,140 relative to naproxen and diclofenac. For a willingness-to-pay ceiling ratio of ≤20,000 per QALY there is a >97% probability that etoricoxib is the most-cost-effective treatment. Additional analysis with different assumptions, including celecoxib 200 mg, and ignoring cost-offsets associated with AS disability, supported these findings. **CONCLUSION:** This economic evaluation demonstrated that etoricoxib is the most cost-effective NSAID treatment for AS patients in the UK.

PMS30

EFFECTS OF 12-HOUR, EXTENDED-RELEASE HYDROCODONE/ACETAMINOPHEN ON PAIN-RELATED WORK PRODUCTIVITY: A SUBANALYSIS FROM A 56-WEEK OPEN-LABEL STUDY

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OBJECTIVE: Chronic pain conditions, such as osteoarthritis (OA) and mechanical chronic low back pain (CLBP), among active workers cost employers ~$61.2 billion/yr in lost productive time, which includes both reduced performance while at work and days of work missed (absenteeism). An analysis of lost productivity time from a 56-week, open-label study was con-

ducted to calculate the potential economic effects of treatment with HC/APAP CR to employers. **METHODS:** As part of a larger clinical trial reported elsewhere, the Work Productivity and Activity Impairment (WPAI) instrument was administered at baseline and weeks 24 and 56 to measure reduced productivity and overall work impairment due to health. Results are reported as percentage of lost productivity time and estimated economic impact to employers. Using the 2006 U.S. average weekly wage of $861, the mean costs of reduced productivity and overall work impairment due to health were calculated. The economic impact of improved work productivity and overall work impairment due to health after treatment with HC/APAP CR was calculated as the difference in cost from baseline to week 24 and week 56. **RESULTS:** Impairment while working due to health decreased from baseline by 17.4% at week 24 and 16.6% at week 56. This translates into an estimated cost-savings (per employee) to employers of $3527 at week 24, and $8019 at week 56. Similarly, overall work impairment due to health decreased from baseline by 17.5% at week 24 and 15.8% at week 56. This translates into an average potential savings to employers of $3614 at week 24 and $7596 at week 56. Absenteeism decreased by 1.1% at week 24 and by 0.04% at week 56. **CONCLUSION:** As assessed by WPAI instrument, this subanalysis demonstrated 12-hour, extended-release HC/APAP CR improved work productivity after 24 and 56 weeks of treatment in patients with OA and CLBP.

MUSCULAR-SKELETAL DISORDERS—
Patient-Reported Outcomes

PMS31

TWO-YEAR LONGITUDINAL STUDY OF PERSISTENCE TO ANTI-TUMOR NECROSIS FACTOR TREATMENT AMONG RHEUMATOID ARTHRITIS PATIENTS

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OBJECTIVE: To evaluate long-term persistence of anti-TNF treatment among rheumatoid arthritis (RA) patients. **METHODS:** A retrospective study utilizing managed-care claims from the PharMetrics database was conducted. The first anti-TNF (infliximab, etanercept, or adalimumab) encounter (index biologic date) among RA patients between January 1, 2000 and January 1, 2006 was identified. Patients were required to have a minimum of 30-months of continuous plan eligibility; 6 months prior to and 24 months following their index biologic date, as patients were followed-up for 24 months after the index biologic date. Anti-TNF persistence was defined as the number of days between first biologic prescription and their last biologic encounter, and the persistence rate was defined as the persistence days divided by 730 and multiplied by 100. Univariate and multivariate analyses were applied to determine if differences in persistence existed among three cohorts: patients who received methotrexate (MTX) and combined with infliximab; etanercept; and adalimumab. **RESULTS:** A total of 2155 patients were analyzed consisting of 605 (28.1%) in infliximab group; 1,121 (52.0%) in etanercept group; and 429 (19.9%) in adalimumab group, over two-thirds (75%) were female and the mean age was 49.5 years. Age, gender, Charlson Co-morbidity Index and disease staging were similar among three cohorts. The overall persistence with anti-TNF agents was 535.7 days in the two-year follow-up period (73.4%). The infliximab cohort was more persistent (580.1 days, 79.5%) than the other 2 cohorts (etanercept group 520.3 days, 71.3%); and adalimumab group 513.3 days, 70.3%) and was statistically significant ($p < 0.0001$). After controlling for demographic variables and disease severity, differences among the three cohorts were statistically significant ($p < 0.0001$). **CONCLUSION:** These results indicate that patients on infliximab plus MTX are more persistent with anti-TNF therapy than other anti-TNF cohorts. Further studies are needed to evaluate the impact of persistence on economic, clinical, and humanistic outcomes.

PMS32

RELATIONSHIP BETWEEN PATIENTS' COMPLIANCE TO RA SPECIALTY MEDICATIONS AND TOTAL HEALTH CARE COSTS

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OBJECTIVE: The primary purpose of this study was to evaluate the relationship between compliance to rheumatoid arthritis (RA) specialty medications and the total health care (pharmacy and medical) costs among RA patients. **METHODS:** Deidentified pharmacy claims and medical claims data from a large pharmacy benefit manager's database were used in this retrospective study. Members who were primarily diagnosed with RA (ICD-9 714.0) and who have had at least one prescription for specialty medications between July-December 2005 were identified for the analysis. Specialty medications included for this study were as follows: Enbrel, Humira, Kineret, Remidace, Orencia, Rituxan. Members' pharmacy and medical claims in 2006 were collected to measure their compliance and total health care cost. Member's compliance to specialty medications was assessed by Medication Possession Ratio (MPR). Members were categorized into three different groups as—compliant (MPR > 0.8), partially compliant (MPR 0.5–0.8), and non-compliant (MPR < 0.5). All pharmacy costs; all medical costs and their breakdown cost such as physician visit, hospitalization, and ER visit etc; as well as total health care costs were computed and compared across the three groups using independent t-tests. **RESULTS:** A total of 689 members were diagnosed as RA, but only 148 members using specialty RA medications were included for the analysis. Compliant group members had significantly high pharmacy cost ($19,615 vs. $10,050) and significantly low medical cost ($3041 vs. $9086) as compared to the non-compliant groups ($P < 0.01$). Compliant group members showed significant low physician visit cost ($1,451 vs. $2,386 $P < 0.01$) and hospitalization cost compared to non-compliant group ($236 vs. $3,206 $P < 0.05$). The total health care costs were found to be comparable and non-significant among the three groups. **CONCLUSION:** The study demonstrated patients with good compliance tend to have higher pharmacy cost and lower medical costs as compared to those non-compliant to their therapy.

PMS33

RELATIONSHIP BETWEEN PATIENTS' COMPLIANCE TO MS SPECIALTY MEDICATIONS AND TOTAL HEALTH CARE COSTS

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OBJECTIVE: The consequences of patient non-compliance have been well documented in the literature and have been associated with poor health conditions and increased health care costs. Several studies have shown that the overall health care costs were lower for compliant patients than for non-compliant patients despite an increase in the pharmaceutical costs. Although, plenty research has been done describing the relationship between compliance and total health care costs, none has been conducted on specialty medications that are used to treat

Multiple Sclerosis (MS). The primary purpose of this study was to examine the relationship between patients' compliance to MS specialty medications and the total health care (pharmacy and medical) costs. **METHODS:** The study was conducted using a retrospective study design utilizing all MS-related pharmacy and medical claims maintained by a large PBM. Patients who were diagnosed with MS and who have had at least one prescription for specialty medications between July-December 2005 were identified and selected for the analysis. Patient's compliance to specialty medications was assessed in terms of MPR. Patients were categorized into three different groups as—compliant (MPR > 0.8), partially compliant (MPR 0.5–0.8), and non-compliant (MPR < 0.5). All drug costs; all medical non drug costs as well as total health care costs were computed and compared across the three groups using independent t-tests. **RESULTS:** A total of 104 patients met the inclusion criteria and were included for the analysis. Compliant group patients had significantly high all drugs cost and significantly lower medical non-drug cost as compared to the non-compliant and partially compliant groups. The total health care costs were found to be comparable and non-significant among the three groups. **CONCLUSION:** Patients who were compliant to their specialty medications reported higher pharmacy cost and lower medical cost, thereby implying that there exists an inverse relationship between compliance and medical costs.

PMS34

A TWO-YEAR EVALUATION OF HEALTH OUTCOMES IN OSTEOARTHRITIS PATIENTS AFTER TOTAL KNEE REPLACEMENT

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OBJECTIVE: To evaluate pain, physical functioning, and health-related quality of life (HRQoL) in patients after total knee replacement (TKR) and to identify factors affecting these outcomes. **METHODS:** This was a two-year non-randomized prospective observational cohort study in knee osteoarthritis (OA) patients undergone who as TKR. Patients were interviewed one week before, six months after, and two years after surgery using a standardized questionnaire including the SF-36, the Oxford Knee Score (OKS), and the Knee Society Clinical Rating Scale. Repeated measures ANOVA was performed to determine which measurements significantly changed over time. Univariate and multiple linear regression analyses were used to identify factors significantly influencing the post-surgery outcomes. **RESULTS:** A total of 298 (at baseline), 176 (at 6-months), and 111 (at 2-years) eligible patients were included in the data analyses. The SF-36 physical functioning and role-physical scores, the OKS, and the Knee Society Clinical Rating Scale scores were significantly improved after the surgery. Being younger, of Chinese ethnicity and having a shorter duration of OA were associated with greater improvement in post-surgery outcomes. **CONCLUSION:** Physical functioning significantly improved after TKR, while other health domains remained stable after the surgery. In order to obtain optimal benefits from TKR, it is important to increase public awareness and knowledge on OA in Asian ethnic groups.

PMS35

QUALITY OF LIFE AMONG OUTPATIENTS WITH RHEUMATOID ARTHRITIS IN A REAL-LIFE SETTING IN GERMANY

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OBJECTIVE: To assess quality of life (QoL) of outpatients with rheumatoid arthritis (RA) in a real-life setting in Germany. **METHODS:** This is a retrospective study analyzing records of patients suffering from RA who were treated within an ambulatory rheumatology specialty. We assessed demographic data, information on medication and additional therapies. QoL was assessed using the Short Form-36 (SF-36). We performed a baseline analysis (t0) followed by an analysis after 3, 6, 12, 18, and 24 months (t3–t24). **RESULTS:** A total of 636 patients were included in the baseline analysis: 20.3% (n = 129) were male, mean age was 55 years and average disease duration was 5.2 years. 83.3% (n = 530) patients were diagnosed with RA at the first visit (t0), in 16.7% (n = 106) of the cases, the RA was diagnosed subsequently. Longitudinal data were available for 431 patients. On all SF-36 dimensions RA patients scored significantly lower than the general population matched for gender and age ($p = 0.05$): A sub-group analysis revealed the following significant differences: in bodily pain insurees of the statutory health insurance scored significantly worse than enrollees of private health insurance plans ($p < 0.01$). No significant differences were observed between female and male RA patients at baseline. QoL was higher at each assessment compared to baseline for all dimensions but Role Emotional and General Health. The longitudinal analysis showed QoL improved in all but one dimension (Role Emotional) over the observation period of 24 months. This analysis is based on the last observation carried forward method. **CONCLUSION:** RA patients have a significant reduction of QoL compared to the general population. Results indicate that specialist treatment may help to improve QoL.

PMS36

IMPROVEMENT IN SLEEP QUALITY FROM ABATACEPT TREATMENT IN RHEUMATOID ARTHRITIS PATIENTS

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OBJECTIVE: Patients with rheumatoid arthritis (RA) perceive sleep quality as an important component of their quality of life. Sleep is multi-dimensional and the objective is to investigate what aspects of sleep improve when patients are treated with abatacept. **METHODS:** We used data from two randomized, double-blind clinical trials of abatacept in patients with active RA in this study: AIM and ATTAIN, in methotrexate and anti-TNF failures respectively. Sleep quality was assessed using the validated Medical Outcomes Study sleep questionnaire (MOS-sleep). The treatment groups were compared on the seven derived MOS-sleep scales: awakened short of breath or with headache, snoring, sleep adequacy, sleep disturbance, somnolence, and sleep problems Index I and II. In addition, sleep duration (in hours) and optimal sleep (yes vs no) based on the MOS-sleep module were compared. Items are scored 0–100 with higher scores indicating more of the attribute under consideration. Since all the attributes for the scale scores are negative, a smaller number is better except for sleep adequacy which is a positive attribute. Optimal sleep is a binary variable with one indicating optimal sleep, so a higher proportion on this variable is better. **RESULTS:** There was no pertinent difference at baseline in the various items on the MOS

sleep questionnaire or on the derived MOS sleep scales. Significant improvement in the abatacept group compared to control on sleep adequacy, sleep disturbance, somnolence and both sleep problem indices I and II were found. For both studies, sleep quantity was not significantly difference between treatment groups, but optimal sleep significantly improved in the abatacept vs control group: ATTAIN (18% vs –12%, $p < 0.0001$) and AIM (16% vs 5%, $p = 0.0214$). **CONCLUSION:** Treatment with abatacept improves several different aspects of sleep in RA patients. In particular, sleep disturbance and sleep problems given by index II are reduced, and optimal sleep is improved.

PMS37

ASSESSING THE VALIDITY AND RELIABILITY OF A SIMPLE ACTIVITY PARTICIPATION MEASURE FOR RHEUMATOID ARTHRITIS CLINICAL TRIALS

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OBJECTIVE: To examine the validity, reliability, and sensitivity to change of a simple measure of activity participation for rheumatoid arthritis (RA) clinical trials. Joint damage from RA significantly limit patients' participation of daily work and non-work activities, however, few instruments were available to measure treatment effect on this aspect. **METHODS:** We measured activity participation in two randomized clinical trials of abatacept in active RA patients. Activity participation was assessed by two items: 1) the number of days in the past month a patient was unable to perform usual activities (paid or unpaid work, or any other daily activities), and 2) how often a patient was able to perform activities completely (scored 1–6, ranging from none to all of the time). For construct validity, correlations between the two activity items with clinical response and patient-reported outcomes were examined. Intraclass correlation coefficient (ICC) was used to assess test-retest reliability, and standardized effect sizes (SES) were calculated to evaluate sensitivity to change. **RESULTS:** In both studies at baseline, patients were limited for 15 days per month in usual activities and the score on activity completion was 3.7. After treatment, patients with EULAR clinical responses of good, moderate, none, gained back 11, 9, and 4 days of activity respectively, and patients who achieved minimal disease activity state gained 12 days vs. those who did not (7 days). Similar pattern was observed for the activity completion score. Moderate to strong correlations (0.5–0.6) between the two activity items with physical function, patient global, pain, and fatigue were found. The ICC for reliability was 0.6, and the SES was 0.5, indicating good response to change. **CONCLUSION:** The simple activity participation measure reflects true changes in patient clinical status and quality of life. It is valid, reliable, and sensitive to change, which suggests it is a suitable outcomes measure for clinical trials.

PMS38

ESTIMATING WORK PRODUCTIVITY: EFFECTS OF TRAMADOL EXTENDED-RELEASE TREATMENT

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OBJECTIVE: To estimate work productivity for patients treated with tramadol extended–release (ER) or placebo. **METHODS:** Intent-to-treat patients (18–65 years old) with chronic osteoarthritis pain from a 12-week, randomized, double-blind, placebo-controlled, fixed-dose study and treated with tramadol ER (100–400 mg) or placebo were compared. Work productivity was not assessed within the study, it was estimated using an imputation methodology. This imputation method cross-walks other health measures into Work Limitations Questionnaire (WLQ) scores. The WLQ is a validated questionnaire assessing health-related decrements in job performance and work productivity ("presenteeism"). According to this method, mean change in the Western Ontario and McMaster Universities (WOMAC) Osteoarthritis total index scores were multiplied by the regression coefficients established for the WLQ and WOMAC. Productivity gains were translated to annual US dollars inflated to 2007. **RESULTS:** Baseline characteristics of tramadol ER and placebo groups were comparable. After 12 weeks of treatment, the tramadol ER treated patients significantly improved than placebo (WOMAC score of 23 vs. 16 points, $p = 0.002$). This 23 points improvement in WOMAC when imputed to WLQ translated into improvement of WLQ time management (8.15%), physical demands (11.78%), mental-interpersonal (5.99%), overall output demands (6.95%) and improvement in work productivity (1.96%). The improvement observed in the tramadol ER patients when aggregated to annual dollars per employee in 2007 ranged from [$1201–$7218], was numerically higher than placebo treated patients [$882–$5098]. Sensitivity analyses using other health-measures resulted in similar findings. **CONCLUSION:** Treatment with tramadol ER resulted in significant improvement in pain and physical function, when imputed to WLQ corresponded to productivity improvement.

PMS39

LOSS OF EMPLOYABLE LIFE-YEARS IN PATIENTS WITH RHEUMATOID ARTHRITIS: A PRELIMINARY ANALYSIS USING MARKOV MODEL

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OBJECTIVE: To estimate loss of employable life-years over time in patients with rheumatoid arthritis (RA). **METHODS:** We used a Markov model to estimate employable life-years using data from ASPIRE, a randomized clinical trial comparing the efficacy and safety of infliximab + methotrexate (MTX) (IFX group) and placebo + MTX (MTX group) among early RA patients. Employability state was defined as 'unemployable' if patients were unemployed and felt unable to work even if a job was available or 'employable' if patients were employed or felt well enough to work if a job were available. The one-year transition probability of employability was estimated using a logistic regression model, and loss of employable life-years was estimated using a two-state Markov model. **RESULTS:** For a patient at age 45 years, 31.4 % of female and 29.7% of male were unemployable using the regression model. For patients starting at age 45 and employable, the probability of remaining employable after one-year of treatment was 0.928 in males and 0.905 in females in the IFX group, and 0.899 in males and 0.867 in females in the MTX groups, respectively. For patients unemployable, the probability to be employable after one-year treatment was 0.481 in males and 0.405 in females in the IFX groups, and 0.390 in males and 0.319 in females in the MTX groups, respectively. In the Markov model, after 10 years at age 55, 18.5% of females and 14.1% of males in the IFX groups, and 30.7% of females and 24.2% of males in the MTX groups will be unemployable. On average, 0.99 employable life-years will be saved per patient over 10 years in IFX-treated patients compared to MTX-treated patients. **CONCLUSION:** This analysis presents a new method to estimate employable life-years using a Markov model, and

demonstrated that IFX-treated patients could gain economic benefit by retaining employability over time.

MUSCULAR-SKELETAL DISORDERS—Health Care Use & Policy Studies

PMS40

ORAL VS INJECTABLE TREATMENTS: PATIENT PREFERENCE IN BRAZILIAN PATIENTS

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OBJECTIVE: To assess the preference of Brazilians for drugs with different dosing and methods of application to treat chronic diseases, such as osteoporosis. The assessed product types were: once-monthly oral, injection once every three months, and once-yearly injection. **METHODS:** Quantitative study performed through personal and individual interviews. A representative sample of the study population (N = 392 subjects) was used. Subjects over 45 years old were interviewed. A 14-item structured questionnaire was used. A card with the drug characteristics (dosing, cares of administration, side effects and annual treatment cost) was shown to the interviewed subjects. **RESULTS:** Fourty-four percent of the interviewed subjects were male and 56% were female. Sixty percent of the interviewed subjects were between 45 and 59 years old, and the other 40% were 60 years old or more. Fourteen percent of the interviewed subjects belonged to the Brazilian socioeconomic classification "A", followed by 39% in the classification "B", and 47% in the classification "C". Twenty-eight percent had higher education, followed by 29% with secondary education, and 42% with primary education. Ninety-three percent of the interviewed subjects do not usually take injection drugs. For treatment of chronic diseases, 72% of the patients prefer oral drugs, 16% prefer injection drugs diluted in serum, 9% prefer injection drugs, and 3% did not inform their preference. These percentages remained the same when dosing, side effects and prices were disclosed. 83% of the patients who chose oral drug did it so by convenience of the dosing, 21% of them also think that oral drugs have fewer side effects than injection drugs. Generically comparing (not considering the card with product profiles) oral and injection drugs, 78% of the population prefer oral treatments. **CONCLUSION:** If patients are given the chance to choose between oral or injection drugs to treat chronic diseases, 78% prefer oral drugs instead of injection ones.

PMS41

UTILIZATION AND COSTS OF DRUGS AND OFFICE SERVICES AMONG RECIPIENTS OF MEDICAID WITH RHEUMATOID ARTHRITIS WITH VERSUS WITHOUT COMORBID DEPRESSION

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OBJECTIVE: To determine the differences in the patterns and costs of health care utilization between recipients with Rheumatoid Arthritis (RA) with versus without comorbid depression enrolled in a state Medicaid program. **METHODS:** A retrospective cross-sectional analysis of a de-identified state Medicaid fee-for-service administrative claims dataset was conducted. The target population included recipients between 15–64 years old who were continuously eligible for benefits between January 1, 2002 and December 31, 2003. Recipients with at least one medical services claim with a primary diagnosis of RA in 2002 were selected. The sample was then dichotomized between those with versus without a medical claim with a primary diagnosis of depression during 2002. Data from calendar year 2003 was used to compare the patterns of RA-related office services and prescription medication utilization and related costs between the two groups. **RESULTS:** There were 763 recipients identified with RA, of whom 244 (31.9%) had comorbid depression. A significantly ($p < 0.05$) higher proportion of recipients 21–44 years of age (41.9%), females (34.4%), and whites (32.0%) with RA had comorbid depression. Negative binomial regression controlling for demographic variables and comorbidities showed the frequency of office visit utilization was significantly ($p < 0.05$) lower for recipients with comorbid depression than those without depression. A significantly ($p < 0.05$) higher proportion of recipients without depression than with depression had a claim for a DMARD (49.4% versus 31.9%) and a biologic agent (17.0% versus 10.0%). The average annual amount paid by Medicaid per recipient for the use of office services and prescription medications was significantly ($p < 0.05$) higher for recipients without depression ($2914) than with depression ($2049). **CONCLUSION:** Roughly one-third of the recipients with RA had comorbid depression. The use of primary care office services and prescription medications that can slow the progression of RA was lower among recipients with depression than without depression.

PMS42

A COMPARISON OF PROVINCIAL PRESCRIPTION-ONLY PHARMACEUTICAL DATABASE WITH SELF-REPORTED USAGE OF ACETAMINOPHEN AND NSAIDS ACCORDING TO OSTEOARTHRITIS STAGE IN BRITISH COLUMBIA

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OBJECTIVE: Acetaminophen (paracetamol) and non-steroidal anti-inflammatory drugs (NSAIDs) are common prescription and nonprescription medications for osteoarthritis (OA). British Columbia (BC) PharmaNet data contains one record for every prescription. The National Population Heath Survey (NPHS) includes prescription and nonprescription medications, but the BC sample is small. Our objective is to explore the utility of large prescription-only databases in studying drugs with nonprescription forms. We compare acetaminophen and NSAIDs according to OA and disease duration (OAD), and compare results from NPHS versus PharmaNet. **METHODS:** Medications in the 2002/2003 NPHS (Canada = 11717, BC = 1101) refer to the two days before the interview. Statistics Canada classified responses by ATC. OA was self-reported. In Medical Services Plan (MSP) data, ICD-9 codes determined OA. PharmaNet (n = 100,000) was linked to MSP, and weighted according to the 2003 BC population. Medication use from PharmaNet/NPHS was compared by age, sex and OAD. **RESULTS:** PharmaNet: acetaminophen ranged from 0.04% in ages 0–49 without OA to 6.7% in 50–59 with OAD > 6 years. OAD increased use. NSAID ranged from 0.43% in 0–49 without OA to 10.7% in 70+ with OAD > 6 years. OAD and older age increased use. NPHS: acetaminophen ranged from 5.1% to 15.8%. OA disease increased use. NSAID ranged from 8.9% in 0–49 without OA to 32.6% in 70+ with OAD > 6 years. OAD and older age increased use. The ratio of acetaminophen in NPHS/PharmaNet ranged from 1.25 (50–59 with OAD > 6 years) to 175.7 (0–49 without OA). The ratio of NSAID ranged from 3.04 to 20.6. **CONCLUSION:** In

self-reported and prescription-only data, acetaminophen was increased by OA, and unrelated to sex and age after controlling for OAD. In both datasets, NSAIDs were increased by OAD and older age, and unrelated to sex. Medication use is higher in self-reported versus prescription-only data. However, effects are similar, thus large prescription databases may be advantageous even for medications with nonprescription forms.

PMS43

CHARACTERISTICS OF PHARMACEUTICS HAVING NO ALTERNATIVES

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OBJECTIVE: Drugs used in severe status failed in previous treatment are necessary for small target patients even though they are expensive to cover. However, it's difficult to assess whether they should be listed on reimbursement, because most have little evidence including clinical trial and economic evaluation. Therefore we analyzed previous submissions to find out characteristics of those drugs. **METHODS:** We investigated characteristics of 13 submissions of no alternative drugs for reimbursement decision from 2003 to 2007 in Korea and those drugs' reimbursement decisions in other countries. **RESULTS:** Three drugs (23%) had high level evidence based on SR and RCT, and 11 drugs were recommended in clinical guidelines. Eight economic evaluations (62%) were submitted. Mean additional survival duration was 5.35 month (range 0.8 to 11.1) when life year gained is presented as outcome value (N = 7, 54%). Two of them compared with best supportive care or placebo showed ICER was 1.10 GDP/LYG (0.57 to 1.64) and the others compared with standard therapy showed lower value of ICER (0.86 GDP/LYG, –0.09 to 2.07). Average net amount of budget impact was 9 million USD (431 thousand to 44 million USD). Drugs compared with BSC were almost decided not to be reimbursed except for one drug having longer additional survival, less ICER and lower budget impact. On the contrary, those compared with standard therapy were reimbursed except for one drug having higher ICER(2.07 GDP/LYG) and budget impact. Some drug having low efficiency but low budget impact was listed in Korea. Decisions for reimbursement about those drugs were not consistent among countries (Austrailia, UK, Canada and Korea). **CONCLUSION:** Additional life year gained, efficiency and budget impact seemed to affect reimbursement decision in Korea. Further investigation is required for setting of criteria in reimbursement evaluation of no alternative drugs, especially having good cost-effectiveness and high budget impact or the opposite.

PMS44

PRESCRIPTION TREATMENT PATTERNS IN PATIENTS WITH CHRONIC OSTEOARTHRITIS PAIN

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OBJECTIVE: Describe current treatment patterns in patients (pts) with chronic osteoarthritis (OA) pain, with emphasis on their opioid therapy. **METHODS:** Using a large 2006 commercial claims database, continuously enrolled adult OA pts (ICD-9 CM code = 715.XX, ≥18 years old) with chronic non-malignant pain were identified. Those with at least 120 days supply (ds) of pain medication in 2006 were classified as having "chronic pain." Pts were grouped based on their use of controlled long acting opioids (LAO), controlled short acting opioids (SAO), and all other non-controlled analgesics. Pt demographics, comorbidities, and drug utilization were examined. **RESULTS:** Of the over 8 million pts in the claims database, 33,221 pts (mean age 54.4; 64.5% female) had "chronic OA pain." The most common comorbidities were hypertension (55.9%), hypercholesterolemia (51.2%), diabetes (19.7%), and GERD (17.5%). The most common pain-related medications used were NSAIDs (71.4%), controlled (CII-CIII) opioids (71.0%), antidepressants (42.5%), anti-ulcer drugs (39.7%), and musculoskeletal therapy agents (30.0%). Nearly half of pts (48.1%) had claims for ≥30 ds of a controlled opioid for pain, 40.3% with ≥60 ds, and 35.8% with ≥90 ds of controlled opioids for pain in 2006. Eleven percent (11%) were prescribed an LAO (CII-CIII), with 7.7% (2,559/33,221) used a SAO as monotherapy for pain with least a 120 ds in 2006. Stated differently, 12.8% (2,559/19,946) of SAO users and 34.3% (1,253/3,653) of LAO users did not have a claim for a non-controlled analgesic utilizing only opioids for prescription pain control. **CONCLUSION:** Almost half (48.1%) of chronic OA pain pts were treated with at least 30 days of controlled opioids annually with almost one in ten using SAOs as monotherapy for long term management of their OA pain. Further analyses are needed to better understand the appropriate and inappropriate use of opioids in OA patients.

PMS45

A TWO-YEAR LONGITUDINAL STUDY OF SWITCHING PATTERNS AMONG ANTI-TUMOR NECROSIS FACTORS IN THE TREATMENT OF RHEUMATOID ARTHRITIS

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OBJECTIVE: To evaluate long-term switching patterns among anti-TNFs in patients with rheumatoid arthritis (RA). **METHODS:** A retrospective study utilizing the PharMetrics managed-care claims database was conducted. RA patients' first anti-TNF encounter between January 1, 2000 and December 1, 2006 was identified. Patients were required to have ≥30 months of continuous plan eligibility; 6 months prior to and 24 months following their index date, as patients were followed-up for 24 months after the index biologic date. Rates of switching and days before switching were compared among three cohorts based on their index biologic agent (infliximab, etanercept and adalimumab) plus methotrexate (MTX). Univariate and multivariate statistical analyses were conducted to determine if differences existed among the three cohorts. **RESULTS:** Of 2155 patients analyzed, 605 (28.1%) received infliximab therapy, 1121 (52.0%) received etanercept therapy, and 429 (19.9%) received adalimumab therapy; 75% were female and the mean age was 49.5 years. Age, gender, Charlson Comorbidity Index and disease staging were similar among the three cohorts. During the 24 months follow-up, 376 patients (17.4%) switched to another anti-TNF: 88 patients (14.5%) in the infliximab cohort switched compared to 203 (18.1%) in etanercept group and 85 (19.8%) in the adalimumab group ($p = 0.0728$). The mean time to switch for all patients was 342.1 days. The infliximab group had an average time of 395.4 days, compared to 329.7 days in the etanercept group, and 321.0 days in the adalimumab group ($P = 0.0173$). After controlling for demographic variables and disease severity, differences among the three cohorts were statistically significant ($p < 0.05$). **CONCLUSION:** Switching among therapies is an important measure of the effectiveness of RA treatment. This study found that, in a two-year follow-up period, infliximab plus MTX is associated with a lower switching rate and longer time before switching, as compared to the other anti-TNFs.

PMS46

TREATMENTS FOR UPPER-LIMB POST-STROKE SPASTICITY: A CRITICAL EVALUATION

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OBJECTIVE: The purpose of this study was to conduct a critical analysis of the current treatments for upper-limb post-stroke spasticity. **METHODS:** Using search terms including spasticity, stroke, hemiplegia, phenol, baclofen, tizanidine, dantrolene, benzodiazepine, and botulinum toxin, the databases MEDLINE, EMBASE, and Cochrane Controlled Trials Register were used to identify studies in English published from 2004–December 2007. Citations of the extracted articles were reviewed to identify any further articles not captured through the database search. Articles were excluded for the following reasons: lower extremity treatments, pediatric studies, commentaries, duplicate studies, and those that focused on the use of treatments for spasticity secondary to a non-stroke etiology (e.g. multiple sclerosis, cerebral palsy, etc.). **RESULTS:** A total of 34 studies were reviewed and assessed using the Oxford Levels of Evidence quality scale. Fourteen clinical trials, two pooled analyses, two meta-analyses, one cost-effectiveness study, two retrospective cohort studies, three case reports/case-series, five systematic reviews, and five non-systematic reviews were identified. Thirty-one studies focused on botulinum toxin. All clinical trials compared botulinum toxin to either placebo or no treatment. Eleven studies followed patients through one treatment cycle (generally, 12–16 weeks) to determine the duration of treatment efficacy. Three clinical trials completed multiple treatment cycles which lasted 24–42 weeks. Most clinical trials measured spasticity in multiple locations of the arm, such as the fingers, wrist and shoulder. All studies used multiple outcome measures, including instruments that assessed spasticity, pain, quality of life, disability, and functional status. All clinical trials showed a significant difference in spasticity when botulinum toxin was used, as compared either to baseline measurements or placebo. **CONCLUSION:** This analysis showed that botulinum toxin effectively reduces upper-limb spasticity in post-stroke patients. Despite utilization of broad search criteria, no current trials demonstrating the efficacy of other treatments were identified.

RESPIRATORY-RELATED DISORDERS— Clinical Outcomes Studies

PRS1

COMPARISON OF THE EFFECTIVENESS OF ONE VERSUS TWO ANTIBIOTICS IN THE TREATMENT OF COMMUNITY ACQUIRED PNEUMONIA (CAP). AN ANALISYS USING PROPENSITY SCORE.

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OBJECTIVE: To compare the effectiveness of one versus two antibiotics in the treatment of community acquired pneumonia (CAP), related to mortality, inpatient stay and clinical outcomes. **METHODS:** Data from an observational study with CAP was collected during 2005–2007 in Santiago-Chile (sample = 321). One group was treated with one antibiotic (n = 115) and the other with two antibiotics (n = 202). Both were followed during their hospital stay, and clinical outcomes were collected. For each individual, the propensity score was estimated, which is the a priori probability of being assigned to receive treatment with two antibiotics. This was performed with the use of logistic regression, including significant co-variables that occurred before the actual treatment initiation. Analysis of confounder variables was also developed, in order to compare with Propensity Score approach. **RESULTS:** Univariate analysis showed significant positive association between two antibiotics and the progression to septic shock (RR = 4.15), acute renal failure (RR = 2.04), acute respiratory failure (RR = 3.02) and radiologic impairment (RR = 5.10). Combined treatment was also associated with lower probability to be discharged from hospital (HR = 0.56). However, when the analysis was adjusted by Propensity Score, these associations disappeared. No inversion of the association was observed. Additionally, when treatment with two antibiotics was adjusted by severity of the CAP (Fine Score), similar results were observed with the exception of acute respiratory failure and hospital stay. **CONCLUSION:** In adult patients with CAP, treatment with two antibiotics versus one was not associated with lower mortality, decreased inpatient stay or improved clinical evolution. Analysis using Propensity Score was a useful method, because it was able to explain all those associations observed in the univariate analysis. (Supported by FONDECYT 1050734)

PRS2

A MIXED TREATMENT COMPARISON META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS OF PHARMACOLOGIC TREATMENTS FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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OBJECTIVE: The comparative efficacy of commonly prescribed drugs for the treatment of chronic obstructive pulmonary disease (COPD) is under debate. Therefore, we conducted a mixed-treatment comparison meta-analysis (MTC) to assess the efficacy and tolerability of these agents. **METHODS:** A systematic literature search through October 2007 was performed to identify randomized controlled trials of long-acting beta-agonist (LABA), tiotropium, inhaled corticosteroid (ICS), and/or combination ICS/LABA therapy in patients with COPD. MTC methods were used to combine direct, within-trial and between-drug comparisons with indirect evidence from the other trials while maintaining randomization. Evaluated endpoints included the incidence of having ≥1 exacerbation, mortality and study withdrawals. Statistics are reported as odds ratios (ORs) with 95% credible intervals (CrIs). **RESULTS:** Fourty-three eligible trials including 31,020 COPD patients were identified. MTC demonstrated LABA (OR 0.84, 95%CrI, 0.76–0.92), tiotropium (OR 0.69, 95%CrI, 0.61–0.76), ICS (OR 0.85, 95%CrI, 0.75–0.97), and combination ICS/LABA (OR 0.76, 95%CrI, 0.67–0.85) therapies each decreased the odds of having an exacerbation compared to placebo. Moreover, tiotropium reduced the odds of having an exacerbation compared to both LABA (OR 0.82, 95%CrI, 0.72–0.93) or ICS (OR 0.81, 95% CrI, 0.69–0.94) therapies. Each of the 4 drug classes were asssociated with significantly fewer study withdrawals compared to placebo with odds reductions ranging from 26–41%. Additionally, both tiotropium and combination ICS/LABA therapy significantly decreased study withdrawals as compared to either LABA or ICS therapy alone. The only agent to demonstrate a mortality benefit was combination LABA/ICS therapy, which showed superiority to placebo (OR 0.71, 95%CrI, 0.49–0.96) and LABA therapy (OR 0.75, 95%CrI, 0.52–1.00). **CONCLUSION:** Combination ICS/LABA therapy appeared to have the greatest effect on outcomes, including exacerbations and mortality, while resulting in fewer study withdrawals. Upon comparing solo bronchodialator therapies, tiotropium was associated with a lesser odds of developing an exacerbation or study withdrawal compared to LABA therapy.

PRS3

A VALIDATION STUDY ON USING MORTALITY RISK STRATIFICATION TOOL TO STRATIFY ECONOMIC RISK IN PATIENTS WITH ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (AECOPD)

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OBJECTIVES: AECOPD is a leading cause of hospitalization. A valid and easy-to-use risk stratification tool applicable not only for clinical but also economic outcomes would facilitate population-based outcome studies. We sought to validate an AECOPD clinical risk stratification tool previously reported and determine its utility for economic outcomes. **METHODS:** We analyzed 57,791 AECOPD admissions in 2004–2005 across 191 USA hospitals. The AECOPD risk stratification tool identified three factors with the highest discrimination of mortality risk: BUN > 25 mg/dl, Altered mental status, and Pulse > 109 per minute (BAP). Based on the number of risk factors present on admission, the BAP classified patients into four risk categories, ranging from Low (0 risk factors) to High (3 factors). We examined mortality, length of stay (LOS), and cost outcomes using the BAP classification algorithm. The cost outcome was calculated using the Centers for Medicare and Medicaid Services (CMS) cost/charge ratio for each hospital for a given calendar year. **RESULTS:** Overall, median age was 72 (IQR: 63–79) and 55% were women. Crude mortality was 2.4%. The prevalence for each of the BAP risk categories was 51.6% (low), 39.7% (Intermediate I), 7.9% (Intermediate II), and 0.8% (High). The corresponding mortality was 1.0%, 2.7%, 8.2%, 17.6%; the mean LOS was 4.7, 5.4, 6.6, 6.8 days; the mean cost were $5,700, $6,900, $9,400, $11,400 respectively. The trend-analyses revealed a graded association between number of BAP risk factors and worsening outcomes. For every addition of BAP risk factors, there was an exponential increase in mortality risk (OR: 2.89, CI: 2.70–3.09), 0.81 day increase of LOS (CI: 0.76–0.87), and $1600 increase of cost (CI: $1500–$1700). P-values for all trends were <0.0001. **CONCLUSIONS:** The BAP classification tool accurately differentiates mortality risk. It may also be used to identify high risk cohorts for prolonged LOS and excess cost among hospitalized AECOPD patients.

PRS4

PROGNOSTIC FACTORS OF PATIENTS TRANSFERRED TO CHRONIC RESPIRATORY CARE WARD

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OBJECTIVE: To determine factors predictive to survival for patients transferred to respiratory care ward after prolonged mechanical ventilation. **METHODS:** We reviewed medical records in a hospital in southern Taiwan between January 1, 2003 and December 31, 2006 to collect clinical data while transferred to respiratory care ward. The National death certification database of Taiwan was linked to ascertain the date of death. Kaplan-Meier estimation was performed for survival analysis; Cox proportional hazards model was constructed based on various patient characteristics, including age, gender, education, co-morbidity with diabetes, stroke, chronic obstructive pulmonary disease, end stage renal disease and blood platelet. A strategy of backward selection was taken. **RESULTS:** Two hundred and eighty-seven patients who required chronic mechanical ventilation in intensive care unit were included in this study. Their median age was 77 years, 56% were male. Survival rate of 90 days and 180 days following transfer to respiratory care ward were 70 and 50%, respectively. After taking age, gender, and various co-morbidity into consideration, the adjusted hazard ratios for end stage renal disease and abnormal blood platelet count were 1.56 (95% confidence interval (CI), 1.12–2.15) and 1.40 (95%CI, 1.04–1.90), respectively. **CONCLUSION:** Overall survival of patients with prolonged mechanical ventilation was poor, especially for patients with end stage renal disease or/and abnormal blood platelet count.

PRS5

IMPACT OF TOBACCO SMOKE EXPOSURE ON EXACERBATION FREQUENCY, SEVERITY, AND INHALER USE IN ASTHMATIC CHILDREN

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OBJECTIVE: Each year, asthma accounts for 3 million clinic visits, 550,000 emergency room visits, 150,000 hospitalizations, and 150 deaths in children under fifteen. Literature suggests that asthmatic children exposed to tobacco smoke experience complications of greater frequency and severity than those unexposed. This study proposes to test the hypotheses that asthmatic children exposed to household tobacco smoke experience more frequent and severe exacerbations and have greater inhaler use than those unexposed. **METHODS:** NHANES' 2003–2004 database was queried to identify a cohort of 421 asthmatic children (ages 0–17) with current diagnosis of asthma and complete demographic, examination, and questionnaire data. The cohort was analyzed based on exposure to household tobacco smoke. Logistic regression was used to examine emergency room (ER) visit, wheezing frequency, and recent inhaler use. **RESULTS:** Results revealed no significantly greater frequency or severity of asthma outcomes in children exposed to tobacco smoke. Household smoke exposure was only significantly associated with inhaler use. Oddly, asthmatic children living in smoking households were highly unlikely to have used an inhaler in the past month (Odds Ratio = 0.493, p = 0.0406). Tobacco smoke exposure was associated with higher odds of wheezing attacks, but lower odds of ER visit (though neither was significant). **CONCLUSION:** Despite results, opportunities to improve asthma outcomes exist. In the sample, children in smoking households were more likely to be African American, female, live below the poverty level, and be exposed to other indoor pollutants that trigger asthma exacerbations. Initiatives targeted to this group may improve asthma outcomes through education on reduction/elimination of unnecessary indoor allergens. Study limitations include small sample size, potential recall bias due to self or parental-report, lack of data related to family smoking and asthma history and other exposures, and time variation in data collection.

RESPIRATORY-RELATED DISORDERS—Cost Studies

PRS6

A COST-EFFECTIVENESS MODEL FOR SMOKING CESSATION THERAPY USING VARENICLINE

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OBJECTIVE: Smoking, a leading cause of morbidity and mortality in the US, results in approximately 440,000 deaths, economic costs of $96.8 billion, and losses of more than 5.6 million years of potential life each year. The aim of this study was to compare the costs and effectiveness of the new drug varenicline

against the existing therapy buproprion SR. **METHODS:** A decision analytic model was developed using DATA Treeage software to compare the cost-effectiveness of varenicline with buproprion SR. The costs and probabilities of success were reported for 12 weeks for 1 mg varenicline and 150 mg buproprion SR. The drug acquisition costs were obtained from the Drug Topics Red Book and published clinical trials. The model also included costs and effectiveness values for placebo. Costs for physician visits and counseling were obtained from clinical trials and other published sources. The probabilities of success were reported as the continuous abstinence rate (CAR) in all the studies. Treatment effects were compared using head-to-head clinical trials. Incremental cost effectiveness ratios (ICERs) were calculated for additional cost/CAR and were estimated relative to placebo. One- way sensitivity analysis was performed to determine the robustness of the results. **RESULTS:** The ICER for varenicline compared to placebo was $3688/CAR, and the ICER for buproprion SR compared to placebo was $5915/CAR. The total costs of varenicline and buproprion SR were $1696.2 and $1833.6 respectively. Varenicline was found to be more effective than buproprion SR and placebo with a CAR of 0.46, compared to CARs of 0.31 and 0.17 respectively. Sensitivity analysis indicated that the results were affected by the model assumptions for cost and effectiveness treatment options. **CONCLUSION:** Based on the results from the decision analytic model, smoking cessation therapy with varenicline should result in lower costs, and higher CARs as compared to buproprion SR.

PRS7

COST-EFFECTIVENESS OF CICLESONIDE VERSUS FLUTICASONE IN THE TREATMENT OF PATIENTS WITH MILD, MODERATE, AND SEVERE ASTHMA

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OBJECTIVE: The objective of this study was to assess the cost-effectiveness of ciclesonide versus fluticasone in adult patients with mild, moderate, and severe asthma. **METHODS:** A decision tree model was developed to simulate the health consequences and costs associated with daily asthma medication use. Patients were assumed to receive either ciclesonide or fluticasone. Potential health consequences for patients in the model included an adverse drug event (ADE) and symptom-free (SF) day. Costs included those associated with drug acquisition, the use of rescue medication, and medical resource utilization due to ADEs or non-SF days. The efficacy of ciclesonide and fluticasone was estimated using data from multiple clinical trials and data on file at Sanofi-Aventis. Data on medical resource utilization following ADEs and costs were estimated from published literature. Parity in the cost of ciclesonide and fluticasone was assumed. The model was used to calculate total daily costs, probability of an ADE-free (ADEF)/SF day, and the incremental cost per ADEF/SF day for ciclesonide versus fluticasone. **RESULTS:** The use of ciclesonide is associated with lower costs ($2.01 vs. $2.02) and higher probability of an ADEF/SF day (0.254 vs. 0.247) than fluticasone, indicating that ciclesonide dominates fluticasone in the treatment of patients with varying asthma severity. Results of a one-way sensitivity analysis of all model parameters suggest that the model is most sensitive to changes in the probability of a symptom-free day on treatment with fluticasone. A two-fold increase in the cost of ciclesonide yields an ICER of $88.38 per ADEF/SF day. **CONCLUSION:** Ciclesonide produces more ADEF/SF days than fluticasone and therefore dominates fluticasone when drug prices are equal.

PRS8

HEALTH ECONOMICS OF ASTHMA: ASSESSING THE VALUE OF ASTHMA INTERVENTIONS

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OBJECTIVE: We undertook a systematic review of asthma intervention health economic studies from 2002 through 2007, evaluated how well the current health economic recommendations in asthma have been followed, assessed the implications of health economics research by comparing findings to coverage and reimbursement patterns and, suggested avenues for future improvement. **METHODS:** We performed a state-of-the-art review using multiple search databases. We used past health economic asthma reviews to assess whether current studies have complied with previous recommendations. We compared the pharmaceutical value-for-money conclusions with their formulary coverage from a large payer in the US and the British reimbursement recommendations. **RESULTS:** We included 39 of the 176 studies that met our initial criteria. Data sources used to inform the economic analyses ranged in duration from 12 weeks (8) to three years (2). Uncertainty was reported by 19 studies. The most common benefit outcome was symptom free days (14). Seven studies reported quality-adjusted life years. Thirty-four of 39 reported that the intervention of interest was cost-effective or dominant. **CONCLUSION:** Previous recommendations for longer-term pragmatic trials are still germane. Using the Global Initiative for Asthma guidelines, the reviewed pharmaceutical interventions assumed relevant comparators but few studies compared combination products to their collective components. Care should be taken in the interpretation of incremental cost-effectiveness ratios that use asthma specific event avoided outcomes because these outcomes may not capture the complete effects of treatment and may be biased due to double counting. We recommend the use of generic measures sensitive to asthma patients and standardized across diseases. Willingness-to-pay must be assumed to conclude cost-effectiveness and must be justified. The overall findings from this health technology assessment review are consistent with the coverage and reimbursement recommendations in the UK (British Thoracic Society and Scottish Intercollegiate Guidelines Network) and US (Aetna's 2007 preferred drug guide).

PRS9

THE COST-EFFECTIVENESS OF TARGETED PRESCRIBING OF ANTIMICROBIALS IN CANADA FOR COMMUNITY-ACQUIRED PNEUMONIA IN AN ERA OF ANTIMICROBIAL RESISTANCE

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OBJECTIVE: To assess the cost-effectiveness of empirical outpatient treatment options in Canada for community-acquired pneumonia (CAP) in the presence of antimicrobial resistance. **METHODS:** A multi-country decision analytic model to assess the clinical and economic consequences of antimicrobial resistance, developed for mild-to-moderate empirical CAP outpatient treatment, was adapted to Canada. Treatment algorithms involved first- and second-line treatment in the community, and incorporated follow-up after treatment failure due to resistance or other reasons and resulting hospitalizations. Comparators included (1) first-line treatment with azithromycin, a generic macrolide prescribed in Canada, followed by moxifloxacin, a fluoroquinolone, and (2) first-line treatment with moxifloxacin followed by azithromycin upon failure. Clinical failure rates with

antimicrobial-susceptible and -resistant pathogens were obtained from the literature or estimated. Resistance and co-resistance prevalence to first- and second-line therapy for the major CAP pathogens were also derived from local surveillance studies. Resource use was obtained from Canadian published sources. Total costs were estimated using standard Ontario sources and a third-party payer perspective. Outcome measures included first-line clinical failure, second-line treatment and hospitalizations avoided. **RESULTS:** The base case incremental cost-effectiveness ratios (ICERs) comparing moxifloxacin/azithromycin with azithromycin/moxifloxacin were CDN$96.04 per clinical failure avoided, CDN$118.71 per second-line treatment avoided, and CDN$502.47 per hospitalization avoided. One-way sensitivity analyses demonstrated that the model is robust to change. The probabilistic sensitivity analysis reported a mean ICER of CDN$133 (Sd601.47) per clinical failure avoided and a 22% probability of a moxifloxacin/azithromycin strategy being cost-saving compared to azithromycin/moxifloxacin. **CONCLUSION:** Antimicrobial failure significantly affected outcomes and costs in empirical outpatient CAP treatment. Despite the higher costs of proprietary antimicrobial treatments in Canada compared to generic treatments, first-line treatment with a fluoroquinolone effective against the major CAP pathogens, including strains resistant to other antimicrobials, produces significantly better clinical outcomes and relatively low total treatment costs compared to generic drugs.

PRS10

ECONOMIC AND CLINICAL OUTCOMES OF OMALIZUMAB USE FOR TREATING ASTHMA IN A MANAGED CARE POPULATION

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OBJECTIVE: The objectives of this analysis were to: 1)Identify a population of asthma patients new to treatment with omalizumab; 2)measure asthma-specific treatment costs and utilization for patients initiating treatment with omalizumab; and compare and quantify, on an annual basis, differences in economics and other measurable outcomes following initiation of treatment with omalizumab. **METHODS:** Using integrated medical and pharmacy claims data (obtained from the IMS/Pharmetrics Patient-centric Database), patients were included in the analysis based on the presence of a diagnosis of asthma (ICD-9 code 493.*) during calendar years 2004 through 2005. Additional requirements included incident (new) use of omalizumab in 2004. Clinical and economic information related to the treatment of asthma were captured using Episode Treatment Group (ETG) episode-building software. **RESULTS:** In 2004, 542 patients (representing 0.1% of the overall asthma population) were identified as being newly treated with omalizumab. Within this group, 66% were diagnosed with extrinsic asthma and 78% with rhinitis. Total annual costs related to the care of asthma for this group was $16,643 with $5,926 in medical expenditures. Following these patients into the next calendar year (2005), pharmacy costs increased by 33% but medical costs decreased by 42% (to $3411), driven primarily by lower inpatient utilization, admission rates (from 6.1% to 3.8%), and emergency room utilization. Additionally, there was decreased use of oral corticosteroids and overall use of asthma controllers. **CONCLUSION:** Treatment with omalizumab represents a significant pharmacy investment, and measurable benefits were observed with respect to medical expenditures and asthma-specific outcomes. However, these observations are limited to a very specific patient population and further study may be necessary to determine applicability to other patient groups.

PRS11

LONG TERM COST-EFFECTIVENESS AND COST-UTILITY ANALYSIS FOR SMOKING CESSATION IN CZECH REPUBLIC

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OBJECTIVE: To compare cost-effectiveness (CE) and cost-utility (CU) for varenicline vs. other interventions used for smoking cessation in Czech Republic. **METHODS:** The Benefit of Smoking Cessation on Outcomes (BENESCO) Markov simulation model was employed to compare different approaches. The model simulates morbidity and mortality for the Czech population of smokers. In our model a 20-years time horizon was used to calculate costs and benefits from the payer's perspective under current conditions (smoking cessation interventions are not reimbursed). Five co-morbidities were considered: chronic obstructive pulmonary disease, coronary heart disease, stroke, lung cancer and asthma exacerbations. Calculations were performed in 2007 costs and prices, assuming that 25% of smokers in each age group make one attempt to quit smoking. Abstinence rates were extrapolated from literature sources. Local costs and data were obtained either from literature or expert panels. Assessed interventions included varenicline, bupropion, nicotine replacement therapy (NRT) and unaided cessation. **RESULTS:** Varenicline dominated all other interventions both in QALY and LYG, and was cost-saving over the assessed period of 20 years. Benefit of varenicline was most significant in comparison with unaided cessation (QALY gained 18,186, LYG 12,243, deaths avoided 2004, costs saved €35.5 million—data for all smokers exposed to intervention). Varenicline was also dominant in comparison to the most frequently used approach—NRT (QALY gained 7358, LYG 4953, deaths avoided 811, costs saved €13 million). Bupropion showed similar results to NRT. Varenicline dominated all other interventions already after five years. **CONCLUSION:** Varenicline is the most effective and cost-effective smoking cessation intervention in Czech Republic from the health care payer's perspective. As the prevalence of smokers is high; health care providers should consider smoking cessation support, including reimbursement strategies. Further scenarios to confirm CE and CU also under these conditions are needed.

PRS12

INCREMENTAL COST-EFFECTIVENESS OF COMBINATION INHALER THERAPY IN MODERATE TO SEVERE COPD

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OBJECTIVE: To assess the incremental cost-effectiveness of combining tiotropium (TIO) with salmeterol (SAL) or salmeterol-fluticasone (SFC) in moderate to severe COPD compared with TIO alone. **METHODS:** A Markov model was constructed to estimate the incremental quality-adjusted life-years (QALYs) of the three treatment arms. Efficacy data were obtained from a recently published large randomized controlled study (Canadian Optimal Therapy of COPD trial). Cost data were obtained from publicly available data. The cycle length for the model was set to 3 months and the maximum time horizon was set to 3 years. The cost-effective analysis was conducted from a third-party payer's perspective in the US health care system. Future costs and effects were discounted at 3%. All costs are reported in 2007 dollars. Multiple one-way sensitivity analyses and a Monte Carlo simulation were performed to handle uncertainty. **RESULTS:** Incremental cost-effectiveness ratios compared with TIO alone were $152,743/QALY in the TIO + SAL group, and $51,610/QALY in the TIO + SFC group. An acceptability curve revealed TIO + SAL was more cost-

effective when a willingness to pay (WTP) was $33,000/QALY or less and TIO + SFC was more cost-effective when a WTP exceeded that threshold. The cost-effectiveness was also sensitive to changes in several variables including the mortality rates and utilities associated with TIO + SAL and TIO + SFC, as well as the hospitalization rate associated with TIO + SAL. **CONCLUSION:** When monotherapy with TIO is not effective to control moderate to severe COPD, adding SFC rather than SAL appears to be a more reasonable approach from a cost-effectiveness standpoint in the US health care system. However, the results were sensitive to changes in several key variables.

PRS13

PEDIATRIC ASTHMA: AN EMPLOYER PERSPECTIVE ON ANNUAL EMPLOYEE AND DEPENDENT COSTS FOR MEDICAL CARE AND PRESCRIPTION DRUGS

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OBJECTIVE: Management of pediatric asthma is known to be very costly. However, little is known about the costs to the parent. We aimed to objectively assess employee and dependent costs for employees with children with asthma (EWCWA) compared with employees with children without asthma (EWCWOA). **METHODS:** A retrospective analysis was conducted using multiple US-based employers' data from 2001 to 2007. Data included medical claims, pharmacy claims, payroll, work absence, and demographics. Asthma diagnosis (ICD-9 codes 493.xx) or pharmacy claims for an asthma controller medication were used to identify employees with asthmatic dependents aged <12 years for the EWCWA cohort. Employees in the EWCWOA cohort were identified based on dependent age and lack of an asthma diagnosis (ICD-9 code) or pharmacy claim for a controller medication. The index date in the EWCWA cohort was defined as the date of first asthma diagnosis during 2001 or later; the first pediatric medical or pharmacy claim date was used in the EWCWOA cohort. All costs were adjusted to 2007 dollars and incremental costs (EWCWA—EWCWOA) were calculated using two-part regression models and presented for health care and prescriptions. Regression models controlled for demographics, job information, Charlson Co-morbidity Index, and geographic region. **RESULTS:** Data were available for the EWCWA (dependent age <4 yr: n = 4577; 4–7 yr: n = 4343; 8–11 yr: n = 3954; total <12 yr: n = 11,794) and EWCWOA (dependent age <4 yr: n = 32,558; 4–7 yr: n = 28,017; 8–11 yr: n = 27,863; total <12 yr: n = 64,812) cohorts. The incremental annual costs (EWCWA—EWCWOA) for employees and dependents (health care/prescriptions), respectively, were: dependent age <4 years: -$56/$73† and $663†/$568†; 4–7 years: $199*/$109† and $904†/$555†; 8–11 years: $364*/$116† and $1081†/$586†; <12 years: $154†/$95 and $862/$534 ($^{*}P < 0.05$, $^{\dagger}P < 0.01$). **CONCLUSION:** Pediatric asthma results in significant additional costs for both employees and dependents.

PRS14

BENEFITS FROM IMPROVED ASTHMA CARE IN FINLAND 1987–2005 ASSESSED WITH ANALYSIS OF COMPREHENSIVE SOCIETAL COST AND BEHAVIOUR OF COST DRIVERS

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OBJECTIVE: The prevalence of chronic asthma has tripled during last two decades in Finland, but overall costs of disease management have not increased and patient level costs have decreased significantly. We analyzed with comprehensive time series all expenditures as well as the effectiveness of interventions such as the national action program (1994–2004) and development of pharmacotherapy. **METHODS:** Finnish registry based data from 1987 to 2005 was combined to evaluate all costs of asthma. These included comprehensive health care costs, sick-leave compensations, disability pensions, and loss of productivity; all converted to 2004 euros. Several scenarios were constructed to identify the important changes in care processes and cost drivers during this period. **RESULTS:** The number of patients with valid special reimbursement for asthma medication increased significantly (83,000 to 216,000) during the observation period yet the overall expenditure of care remained at the level of 1987, at €240 million. Cost of medications doubled during study period, but savings were achieved as other expenditures, mainly hospitalizations, and loss of productivity decreased by 50 to 75%. Treatment effectiveness increased as asthma related deaths, disability pensions, sick-leave payments and institutional care decreased significantly (50 to 70%). The cost-saving scenarios showed that a significant part (40%) of positive effects was attained by launch of new asthma drugs and asthma pipes from 1989 to 1994. The initiation of the national care programme with its focus on anti-inflammatory treatment from disease onset, improved diagnostics and more active self care further increased this positive trend. **CONCLUSION:** Comprehensive assessment of large patient cohorts and long term economical outcomes is a useful method for evaluation of outcomes in chronic diseases. Identification of different cost drivers is needed as the cost of new interventions is increasing and their benefits should ideally be assessed in relation to their broader societal influence.

PRS15

THE BURDEN OF NASAL CONGESTION IN THE UNITED STATES

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OBJECTIVE: The prevalence and costs of allergic rhinitis (AR) in the United States are estimated to be very high. Recently, research has reported that not all AR symptoms are of equal importance to patients. In particular, evidence is mounting that nasal congestion is the most bothersome symptom of AR and thus may account for most of the burden of illness. However, unlike AR which has an ICD-9-CM code thus facilitating estimates of burden of illness, the cost of nasal congestion must be obtained indirectly. The purpose of the present analysis is to estimate the national costs of AR that are attributable to nasal congestion. **METHODS:** Data come from a recent national study of the effect of AR symptoms on patients' lives (e.g., sleep, daytime somnolence, mood, and work and school productivity). These relative effects of nasal congestion were then applied to U.S. cost estimates derived from the literature and a national employer claims database to estimate some of the economic burden of AR that could be attributed to nasal congestion. **RESULTS:** Results suggest that almost three-fourths of the cost associated with burden of illness related to AR is attributable to nasal congestion. Thus, approximately $3.4 billion of the $4.8 billion in direct costs for AR and approximately $3.1 billion of the $4.3 billion in indirect costs for AR can be attributed to nasal congestion. **CONCLUSION:** The direct and indirect costs attrib-

utable to nasal congestion are substantial. These high costs emphasize the importance of diagnosing and treating nasal congestion.

PRS16

INCREMENTAL DIRECT MEDICAL EXPENDITURES ASSOCIATED WITH ADULT ASTHMA IN THE UNITED STATES

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OBJECTIVE: To determine the incremental direct medical expenditures of treating adult asthma in the United States. **METHODS:** Retrospective analysis was conducted using the 2004 Medical Expenditure Panel Survey (MEPS) data. Adult asthma respondents (age ≥18 years; n = 1552) were identified as those with International Classification of Diseases (ICD)-9 diagnosis codes for asthma or those that self-reported as having asthma in 2004. Incremental total expenditures and expenditures for various categories of resource use, i.e., physician office visits, emergency room visits, outpatient visits, inpatient visits, medications and other medical expenses associated with asthma, were estimated using separate multivariate regression models. The models were adjusted for age, gender, race, ethnicity, education, marital status, geographic region, insurance status and comorbidities (using the Charlson comorbidity index). Given the skewed distribution of expenditure variables, multiple model specifications including ordinary least squares regression, generalized linear model (GLM) with Poisson, gamma and negative binomial variance functions were evaluated. **RESULTS:** The prevalence of current asthma among adults in 2004 was estimated at 6.84%, i.e., 14.9 million persons (95% CI: 6.43% to 7.26%) in the United States. Individuals with asthma had 68% higher total expenditures than non-asthmatics after controlling for covariates (RR: 1.68; $p < 0.0001$). The annual adjusted mean incremental total expenditure associated with asthma was $1953.7 (SE: $500.1; $p < 0.0001$) per person. Medications accounted for the largest proportion of the total expenditures estimated at $609.4 (SE: $52.0; $p < 0.0001$), followed by physician office visits at $364.3 (SE: $86.9; $p < 0.0001$) and inpatient visits at $297.3 (SE: $191.2; $p = 0.074$). **CONCLUSION:** Given the prevalence of adult asthma and its associated incremental expenditures, the annual direct medical expenditure for treating adult asthma is estimated at $29.2 billion in 2005 USD. This estimated incremental expenditure associated with asthma is more than twice the cost of asthma reported in previous studies.

PRS17

ECONOMIC OUTCOMES IN PATIENTS WITH CYSTIC FIBROSIS: A REVIEW OF THE LITERATURE

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OBJECTIVE: To review up-to-date economic outcomes data in patients with cystic fibrosis (CF), especially costs related to respiratory infection by Pseudomonas aeruginosa (Pa), the leading cause of morbidity and mortality in CF patients. **METHODS:** A systematic search of the MEDLINE database from 1990–2007 was conducted, using the terms "cystic fibrosis" and "cost." Selected conference abstracts were also searched. Recent articles that contained economic data on antibiotic and mucolytic therapies were selected for in-depth review. **RESULTS:** In-depth review was performed on 27 articles that examined the economic impact of inhaled tobramycin (2 articles), the effect of home- vs. hospital-based antibiotic therapies for pulmonary exacerbations (4), economic impact of recombinant human deoxyribonuclease (rhDNase) (10), and cost-of-illness for CF (11). Inhaled tobramycin led to reductions in health care costs that offset 37%–57% of the drug cost. Home-based antibiotic therapy for exacerbations generally resulted in lower health care costs than hospital-based administration. Use of rhDNase led to reductions in health care costs that offset 17%-38% of the drug cost. Cost-of-illness studies have been conducted in 7 countries; the economic estimates varied widely ($9,000 to $64,000/patient/year; 2006 US dollars) due to differences in treatment patterns, health systems, methodologies, and subjects. Most cost-of-illness studies were retrospective observational studies of direct costs from the perspective of a hospital or third-party payer. The largest cost categories included hospitalizations, out-patient visits, rhDNase and antibiotics. Disease severity and Pa infection were major determinants of cost. **CONCLUSION:** Studies show that inhaled tobramycin and rhDNase partially offset medical costs; home-based antibiotic therapy likely reduces costs; and direct costs can be high but vary widely across countries and analytical methodologies. Areas for future research include direct comparisons of inhaled antibiotic therapies, examination of the relationship between treatment adherence and economic outcomes, and estimation of societal cost-of-illness.

PRS18

COST-UTILITY ANALYSIS OF VARENICLINE, AN ORAL SMOKING CESSATION DRUG, IN JAPAN

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OBJECTIVE: To conduct a cost-utility analysis by comparing two scenarios in Japan: smoking cessation counseling by a physician versus use of varenicline, an oral smoking cessation drug, in addition to counseling. **METHODS:** A Markov model was constructed to analyse life-time medical costs and Quality-Adjusted Life Years (QALYs) from the perspective of health care payers. In the Markov model, five years were set as one cycle. Both cost and utility were discounted at 3% annually. The cohort of smokers was classified by gender and age, and we assumed that smokers started smoking aged 20 years and received smoking cessation therapy aged 30, 40, 50, 60, or 70 years. The health care cost and QALYs were calculated throughout the term until 90 years. We chose three parameters for sensitivity analyses—success rate of varenicline, unit price of varenicline and discount rate. In the base-case analysis, success rates of varenicline and placebo were assumed to be 37.9% and 25.5%, respectively, in male smokers, and 22.2% and 16.1%, respectively, in female smokers, based on a randomized controlled trial conducted in Japan. We chose QALY for outcome measurement. Quality weight for each tobacco-associated disease was derived from the literature. **RESULTS:** It was shown that the scenario where varenicline was prescribed is more effective and less costly than giving smoking cessation counseling alone. Varenicline would save direct medical costs of JPY 26,000 (USD226, USD1 = JPY115) and increase 0.094 QALY in male smokers. Regarding the budget impact, varenicline is estimated to save JPY 23.7 billion (USD 206 million) of the medical costs for tobacco-associated diseases for the whole population. Sensitivity analyses suggested the robustness of the results. **CONCLUSION:** Varenicline, the first oral treatment for smoking cessation in Japan, is cost-effective and will contribute to the reduction of medical costs.

PRS19

SMOKING-CESSATION THERAPY USING VARENICLINE—THE COST-UTILITY OF AN ADDITIONAL 12-WEEK COURSE OF VARENICLINE FOR THE MAINTENANCE OF SMOKING ABSTINENCE

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OBJECTIVE: To calculate incremental cost-utility ratios for an additional 12-weeks varenicline treatment as compared to the initial 12 weeks (successful) varenicline treatment for a 50-year follow-up period. **METHODS:** The Benefits of Smoking Cessation on Outcomes (BENESCO) model was used to simulate costs and benefits accruing from smoking cessation for a Swedish male (168,844 males) and female cohort (208,737 females), respectively. The smokers made one quit attempt at the outset of the simulated period. The model was extended in order to include indirect effects of smoking cessation on production and consumption due to increased survival. Smoking cessation benefits were modelled through lower incidence rates of chronic obstructive pulmonary disorder, coronary heart disease, stroke, and lung cancer in those who quit. All calculations were performed in 2003 Swedish prices, and transformed into Euros. **RESULTS:** Varenicline used for 12 weeks in smoking cessation therapy in comparison to bupropion has been shown to be a very cost-effective treatment. A recent study showed that 12 weeks of additional varenicline treatment in successful quitters will help to maintain smoking bstinence. Including only health care costs, the estimated incremental cost per QALY gained was €7066 and €7108, respectively, for men and women. Taking also indirect effects on production and consumption of increased survival into account, the corresponding figure was about €24,000 for both men and women. Performed simulations over a 50 year follow-up period imply that about 19,176 life years are saved. This corresponds to €8945 QALYs. Sensitivity analyses indicated that the results are robust. **CONCLUSION:** An additional 12-weeks course of varenicline provided to successful quitters produces low incremental cost-utility ratios in the spectrum of life-saving medical treatments.

PRS20

A LONG TERM COST-EFFECTIVENESS ANALYSIS MODEL FOR SMOKING CESSATION IN KOREA

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OBJECTIVE: Smoking influences several acute and chronic diseases within a population which might generate high medical costs in Korean health care. The aim of this study is to evaluate the cost-effectiveness of Varenicline compared with other smoking cessation interventions: bupropion, NRT(Nicotine Replacement Therapy), and unaided cessation (willpower) in smokers who attempt to quit. **METHODS:** A Markov model was developed from a societal perspective to estimate long-term health benefit, smoking cessation cost, and co-morbidity-related cost. The model simulates cost and outcomes in a hypothetical cohort of current smokers attempting to quit during their lifetime with a 5% discount rate. The Markov cycle length is one year. The model includes six-potential co-morbidities: chronic obstructive pulmonary disease, ischemic heart disease, stroke, lung cancer, liver cancer, and gastric cancer. Transition probabilities were obtained from Korean epidemiologic data, whereas non-smoking rates after treatment, smoking relapses rates, and relative risk of above diseases were based on the published literature. Quality-adjusted life years (QALYs) were estimated as an effectiveness measure. Resource utilization and costs were calculated with public institutional data. One-way sensitivity analyses were performed on crucial parameters (discount rate, time horizons, mortality rate, costs, and utility weight). **RESULTS:** As incremental cost-effectiveness ratio (ICER) for varenicline & bupropion is lower than that of bupropion & NRT, bupropion is subject to extended dominance. With the exclusion of bupropion, ICER for vareniciline vs. NRT was analyzed as US$5096 per quality-adjusted life year (QALY) during the life time. The results of sensitivity analysis showed quite stable across most of the included parameters. **CONCLUSION:** Varenicline costs US$5096 more to gain an additional QALY compared to NRT. Even though the threshold for ICER is not yet decided in Korea, varenicline can be regarded as a cost-effective alternative in the long term for the management of smoking cessation based on the UK & Australian experience.

RESPIRATORY-RELATED DISORDERS—Patient-Reported Outcomes

PRS21

MEDICATION ADHERENCE AND PERSISTENCE IN THE LAST YEAR OF LIFE IN COPD PATIENTS

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OBJECTIVE: Patterns of medication use and adherence towards the end of life in chronic obstructive pulmonary disease (COPD) patients is poorly understood. This study aimed to examine medication adherence and persistence among COPD patients during their last year of life. **METHODS:** From national VA databases, we identified newly diagnosed COPD patients between 1999 and 2003 who died during follow-up. We examined use of inhaled corticosteroids (ICS), long-acting â2 agonists (LABA), methylxanthines (MTX), and anticholinergics (AC), alone and in combination. Medication possession ratios (MPR) were compared between regimens by quarterly periods using General Estimating Equations (GEE). Medication persistence, calculated as the time from index date to an occurrence of at least 30 days between refills, was examined in monotherapy users with Kaplan-Meier survival analysis and extended Cox proportional hazard models. **RESULTS:** Among 5913 patients who received medications and died during follow-up, overall mean (SD) MPR was 0.44 (0.32) during the last year of life, being highest among MTX users (mean MPR = 0.52, SD = 0.32). ICS-only users had lower MPRs than the AC reference group ($\hat{a} = -0.0311$, $p = 0.03$). A positive linear trend in MPR was observed across quarterly periods in AC users ($\hat{a} = 0.014$, $p < 0.0001$), and was highest for MTX users ($\hat{a} = 0.11$, $p < 0.0001$). MPRs for MTX or multiple medication users were significantly higher than the reference group. Of 3436 on monotherapy only, approximately 40% discontinued medication within 30 days and 70% discontinued within 90 days. Days to discontinuation ranged from mean (SD) of 79 (91) for LABA to 126 (129) for MTX. MTX users were less likely to discontinue (HR = 0.714, $p = 0.012$) than reference (AC) group. African-Americans had a higher risk of discontinuation than Caucasians. **CONCLUSION:** More severe COPD patients, e.g. methylxanthine and multiple medications users, were more adherent and/or persistent with their regimens. Future research needs to link compliance to outcomes towards end-of-life.

PRS22

EFFECT OF PATIENTS' OUT-OF-POCKET COST ON ADHERENCE AND PERSISTENCE WITH OMALIZUMAB (XOLAIR) THERAPY FOR ALLERGIC ASTHMA

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OBJECTIVE: Assess the effect of patients' out-of-pocket expenditures (OOPE) on adherence and persistence with omalizumab treatment for allergic asthma. **METHODS:** An incidence cohort of asthma patients age ≥12 with ≥1 claim for omalizumab during 2003–2006 and 6 months of prior insurance eligibility was selected from a managed care claims database. Persistence was determined using a survival analysis of the elapsed time between first omalizumab claim and omalizumab discontinuation date (30 days after last omalizumab claim). Discontinuation was defined when >90 days elapsed between omalizumab claims. Adherence was assessed in patients with ≥1 year of insurance eligibility following first omalizumab claim. Adherence was defined as the total "days supply" of omalizumab during the one-year follow-up period. Proportional hazards models of persistence and general linear regression models (log-linked gamma distribution) of adherence estimated the impact of OOPE. **RESULTS:** In the persistence cohort (N = 677), OOPE per omalizumab claim was skewed to the right: average $105 (±$175), 33rd percentile $25, median $40, 66th percentile $100. The hazard ratio (HR) for discontinuing was 1.29 (95% CI: 1.05–1.59) comparing patients with OOPE ≥$100 vs <$00. Using the bottom tertile as a reference, the HR for the top tertile was 1.31 (95% CI: 1.03–1.68) and the middle tertile was 1.03 (95% CI: 0.81–1.31). In the adherence cohort (N = 413), average OOPE was $110 (±$19), median $125 and average therapy days per year was 216 (±119). Adherence decreased with increasing OOPE. Overall, the coefficient on $1 of OOPE was –0.0004 (95% CI: –0.0007 to –0.0001), implying that an increase of $25 per claim would cause 1% therapy days lost for each patient. **CONCLUSION:** Increasing patients' OOPE may decrease adherence and persistence with omalizumab. The effect on persistence was significant at higher levels of OOPE but not at lower levels. The effect on adherence was small at the OOPE levels in this insured population.

PRS23

PARTICIPANTS' EXPERIENCE OF ASTHMA: RESULTS FROM A FOCUS GROUP STUDY

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OBJECTIVE: Three focus groups were conducted as a preliminary step in a broader initiative to develop a single comprehensive ASTHMA-CAT assessment that combines asthma impact, asthma control, and generic health-related quality of life (HRQOL) measures in one "seamless" administration, and displays results in tandem in a real-time patient feedback report. **METHODS:** The sample included 22 English-speaking, nonsmoking adults (24–59 years) from the Boston area self-reporting asthma (36% controlled, 27% somewhat controlled, 36% uncontrolled). Participants (64% women; 77% Caucasian, 18% African American, 5% Asian; 14% Hispanic) identified areas of HRQOL impacted by asthma, and suggested content and format revisions to a survey and feedback report. Focus groups were taped and transcribed, and thematic content analyses were conducted. **RESULTS:** Participants identified physical (e.g., difficulty staying physically active, increased susceptibility to secondary infection), social (e.g., avoiding places where there may be environmental triggers), and emotional (e.g., anxiety or worry; feeling a loss of control) aspects of health most impacted by asthma. While participants generally reported that items were clear and easy to understand, they noted content redundancy, identified potential improvements to examples contained within item stems, and indicated difficulty attributing health impact solely to asthma. Participants were interested in feedback reports that showed their progress over time, with sufficient score interpretation, and saw value in sharing results with their doctor. **CONCLUSION:** Focus group participants identified core areas of HRQOL affected by asthma and provided useful recommendations for improvements to survey content and reporting features of the ASTHMA-CAT assessment. New and revised item content will be evaluated in future quantitative studies, and final design features will be evaluated in usability testing.

PRS24

CEILING EFFECTS AND DISCRIMINATION OF TREATMENT BENEFIT FOR PATIENTS WITH LOWER SYMPTOM SEVERITY: MEASUREMENT OF HEALTH UTILITIES IN ALLERGIC RHINITIS

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OBJECTIVES: Uncertainty exists about the most meaningful measure of health utilities for treatment comparisons, especially for conditions with lower severity. This study explores these issues for patients with allergic rhinitis (AR), which is a bothersome and costly condition, but is not highly morbid. Inclusion criteria for trials may select only patients with mild or moderate symptom severity; furthermore, these patients often have access to symptomatic medications. Consequently, discrimination of treatment benefit may be difficult. **METHODS:** The study reviews and compares the measurement properties of the EQ-5D and SF-6D, with particular focus on their ability to discriminate at lower levels of severity, a circumstance of AR. Data from several studies of patients with AR demonstrate that a subset of patients have severity of symptoms that can be meaningfully captured with the EQ-5D (i.e., they are not at the ceiling), while a large subset of patients have lower severity and may be better assessed by the SF-6D. **RESULTS:** Several published studies of patients with AR and data from this research team indicate that the EQ-5D values are often at or near the ceiling (mean values ≥ 0.94), reflecting low symptom severity. Consequently, the ability to discriminate and make meaningful resource allocations may be compromised. Data from our naturalistic study found that half of the patients with AR reported low symptom severity (mean score of 1.3 on a scale from 0 to 3), suggesting that EQ-5D values would be close to 1.0. **CONCLUSIONS:** For conditions with lower overall severity and morbidity, such as AR, using more than one utility measure may be informative. The EQ-5D would provide more international comparability, since it is the more generally accepted utility measure. However, inclusion of another utility measure that can capture the lower end of symptom severity may be a useful strategy for patients with AR.

PRS25

VALIDATION OF CLAIMS-BASED PERSISTENT ASTHMA SEVERITY CLASSIFICATION

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OBJECTIVE: This study was designed to validate an established claims-based persistent asthma severity classification using clinical parameters abstracted from medical charts. **METHODS:** Patients with asthma, aged 6–64 years, were selected from a claims database (1999–2005) of a medical group practice organization located in central Massachusetts. Patients had persistent asthma defined using an established algorithm; no chronic obstructive pulmonary disease; and at least one procedure code for spirometry. All recorded pre-broncodilator values of FEV1 or PEF, height, and weight were extracted from medical charts. Patients' asthma severity was categorized based on two methods: an established claims-based algorithm and guidelines classification algorithm based on clinical parameters. Gamma rank correlation index was used to measure the association between the two severity categorization methods. One year total and asthma-related costs for each severity category were also compared between the two different approaches. **RESULTS:** Based on claims-based severity classification, 41% of 368 patients in the study sample had mild persistent asthma, 33.7% had moderate, and 25% had severe. Using clinical parameters (% predicted FEV1 or PEF value), 68.2% of patients had mild, 23.9% had moderate, and 7.9% had severe persistent asthma. The correlation between the two classification approaches was statistically significant ($P = 0.0002$). Patients with higher severity generally had higher costs. Comparing the two classification approaches, patients with moderate persistent asthma using the clinical parameters approach had significantly higher asthma-related direct costs ($2395) than those classified as having moderate persistent asthma using the claims-based approach ($1604). There were no significant asthma-related cost differences in mild and severe asthma categories. **CONCLUSION:** While more patients were classified into higher severity level using a claims-based classification approach than clinical parameters, the two classification methods exhibited significant association. The claims-based algorithm can be helpful in economic studies in asthma patients where classifying asthma severity using claims is needed.

PRS26

PREFERENCES FOR ONSET OF EFFECT OF COMBINATION MAINTENANCE MEDICATION AMONG ASTHMA PATIENTS

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OBJECTIVE: To estimate patient preferences for improvements in onset of effect of asthma combination maintenance medications. **METHODS:** The Onset-of-Effect Questionnaire (OEQ) is a self-administered instrument used to assess patient satisfaction with how quickly asthma maintenance medications begin to work. The OEQ elicits subject ratings for five statements: "I could tell the medication was working" (Medication Works), "I could feel the medication begin to work right away" (Works Right Away), "I felt physical sensations shortly after taking the medication that reassured me it was working" (Physical Sensations), "The medication worked as quickly as my rescue medication" (Rescue), and "I was satisfied with how quickly I felt the medication begin to work" (Satisfied). Asthma patients,18 years and older, currently using combination maintenance therapy, completed an online survey instrument that included 10 stated-choice trade-off tasks. Subjects chose among pairs of hypothetical medication alternatives, each defined by responses by "people like you" to the five OEQ statements and monthly out-of-pocket cost, or their current treatment. We used mixed-logit methods to estimate dollar value-to-patient (VTP) per month for various improvements in maintenance-medication onset of effect. **RESULTS:** A total of 509 subjects completed the survey. Responses demonstrated a high level of internal validity. "Satisfied" was the most important attribute and "Physical Sensations" the least important attribute. Improvement from "Strongly Disagree" to "Strongly Agree" on Works Right Away was preferred by 62% (95%CI: 57–67%) of patients. Improvement from "Strongly Disagree" to "Strongly Agree" on Satisfied was preferred by, 80% (95% CI: 75–85%) of patients with a mean VTP (95% CI) of $20 ($17–$24). **CONCLUSION:** The results of this study demonstrate that onset of effect, particularly patients' ability to feel the medication begin to work right away and patients' satisfaction with how quickly they feel the medication being to work, are of significant value to asthma patients.

PRS27

INTERPRETING CLINICAL TRIALS RESULTS FOR THE ONSET OF EFFECT QUESTIONNAIRE: METHODS AND RESULTS OF A DELPHI PANEL

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OBJECTIVE: To determine if differences in perceived onset of effect (OE) in asthma patients were clinically meaningful from the perspective of clinicians. **METHODS:** Data from two clinical trials (SD-039-0716 and SD-039-0717) of asthmatic patients randomized to either budesonide/formoterol pMDI or placebo were utilized in a Delphi consensus approach to identify a threshold for clinically important differences in patient-perceived OE within the context of the trials. Twelve community-based clinicians, including 3 allergists, 3 pulmonologists, 3 general practitioners, and 3 nurses, who spent at least 50% of their time in clinical practice and treated at least 3 patients with asthma per week, were recruited to participate on the Delphi panel. Panelists were asked to determine: 1) whether results of patient-perceived OE were clinically meaningful; 2) the minimum acceptable difference between active and placebo response, assuming a 25% placebo response; and 3) the maximum acceptable placebo effect. The panel participated in two rounds of the Delphi process. **RESULTS:** There was unanimity from panelists that results from the clinical trials whereby a significantly larger percentage of patients (69% and 75% for moderate-to-severe and mild-to-moderate asthma patients, respectively) treated with budesonide/formoterol pMDI reported that they could feel their medication begin to work right away compared to placebo (23% and 26% for moderate-to-severe and mild-to-moderate asthma patients, respectively) were clinically meaningful. The consensus results for minimum active treatment response with a 25% placebo effect ranged from 50% to 70%, while the consensus for maximum placebo effect ranged from 30% to 40% for patient-perceived OE. **CONCLUSION:** Differences in perceived OE between asthma patients taking budesonide/formoterol pMDI and those taking placebo were considered clinically meaningful by the panel.

PRS28

ADHERENCE TO INHALED CORTICOSTEROID USE AND LOCAL ADVERSE EVENTS IN PERSISTENT ASTHMA

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OBJECTIVE: This study was designed to 1) measure adherence to inhaled corticosteroid (ICS) therapy using both prescription claims and a patient survey; 2) identify local adverse events (LAEs) from the patient perspective and from reports in the medical chart; and 3) evaluate the association between LAEs and adherence to ICS therapy. **METHODS:** Patients aged 6–64 years with persistent asthma, defined using an established algorithm, and at least 2 ICS prescriptions were selected from a claims database (1999–2005) of a central Massachusetts medical group practice organization. Prescription claims were used to calculate the ICS medication possession ratio (MPR) as the sum of ICS medication days supply over the year after index medication divided by 365. A survey obtained information on patient-reported adherence to ICS therapy by using the Morisky scale and assessed patient-reported LAEs using the validated Inhaled Corticosteroid Questionnaire (ICQ). Medical charts of survey respondents were abstracted for LAEs. **RESULTS:** The study sample included 372 survey respondents. Only 2.7% met the claims-based measure of good adherence (a MPR $\geq$ 80%). Patient-reported adherence was much higher; 20.7% of patients were highly adherent based on Morisky scale (score = 0). Medical chart review identified 27.2% of patients with at least one LAE within a year after ICS index date, but only in 5.6% of patients were LAEs related to ICS use. However, the responses to the ICQ showed that 47% of patients reported being bothered at least "quite a lot" by at least one LAE. Multivariate analyses indicated that unpleasant taste was significantly related to lower adherence based on the Morisky scale ($P = 0.0175$). **CONCLUSION:** Patient-reported adherence was higher than claims-based. Patients reported being bothered by LAEs more often than recorded in medical charts. Unpleasant taste appears to be associated with lower adherence based on the Morisky scale.

PRS29

PATIENT, CAREGIVER, AND PHYSICIAN PERCEPTIONS OF MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE: FINDINGS FROM QUALITATIVE RESEARCH

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OBJECTIVE: Chronic obstructive pulmonary disease (COPD) is a major burden to patients, caregivers, and physicians. The purpose of this focus group research was to identify and describe patients' and caregivers' perceptions on abilities to perform daily living activities, satisfaction with COPD management, and economic burden of the disease. Also, focus groups of physicians elicited similar information. **METHODS:** Focus groups of patient/caregiver pairs, patients, caregivers, primary care physicians (PCPs) and pulmonologists were conducted in two states. Patients recruited had a live-in caregiver and had been diagnosed with COPD for $\geq$1 year, caregivers attended to their patients for $\geq$1 year, and PCPs and pulmonologists saw at least 10 COPD patients per week. Focus groups were 90–120 minutes and were conducted by trained focus group moderators. **RESULTS:** Seventeen patients, 17 caregivers, 12 PCPs, and 8 pulmonologists participated in the focus groups. COPD patients in New Jersey (NJ) reported receiving better care, seeing specialists more often, and having better access to pulmonary rehabilitation than patients in Florida (FL). Only one-third of FL patients had a spirometry test during their last physician visit, compared to half of NJ patients. Patients treated by PCPs reported having inadequate appointment time and feeling like a burden to their physician. Patients and caregivers described difficulties in the daily lives of patients including social interactions, household chores, and bathing. Economic burden identified included inability to work and high co-pays. PCPs reported that depression and anxiety are commonly observed in COPD patients. Awareness of COPD treatment guidelines was greater among pulmonologists than PCPs. **CONCLUSION:** Patient and caregiver perceptions of COPD care demonstrate the need for improvement in the management of COPD. Medical care differences among physicians suggest a need for better dissemination of treatment guidelines. A national survey will generate quantitative findings regarding the evolving treatment of COPD.

PRS30

USE OF INTERACTIVE VOICE RESPONSE (IVR) TO COLLECT DAILY PATIENT DIARY DATA IN A CLINICAL TRIAL OF SEASONAL RHINITIS

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OBJECTIVE: Automated IVR telephone-based systems are widely used in many aspects of clinical trials, but there is relatively little empirical data to support the use of IVR for collecting patient reported outcomes (PROs) such as daily symptom diaries. We have evaluated IVR in a placebo-controlled study of seasonal rhinitis. **METHODS:** Patients were allocated at random to receive either 200ìg budesonide or placebo for three weeks. All patients received up to 120 mg per day terfenadine as required. Patients dialled into an IVR system each evening. Blocked nose, stuffy nose, runny nose, and eye symptoms were rated by pressing a button on the phone keypad to record severity on the scale 0 = absent; 1 = mild; 2 = moderate; 3 = severe. Patients also recorded the number of terfenadine tablets taken. **RESULTS:** Data were collected from 32 patients (15 male) aged 19–65 years. Patients were able to use the IVR system without difficulty. All four symptoms showed lower average severity over the study period for the budesonide group than for placebo. This was significant for blocked nose (Wilcoxon $S = 237$, $p < 0.01$); eye symptoms ($S = 218$; $p < 0.05$); overall symptoms ($S = 229$, $p < 0.05$). The number of terfenadine tablets taken was also lower in the budesonide group than for placebo ($S = 225$, $p < 0.05$). **CONCLUSION:** These data demonstrate the effects of an established treatment, and thus suggest that IVR is a valid method for collecting PRO data in an unsupervised environment. The application was relatively simple, involving familiar and easily understood symptoms, and response options that were the same for all symptoms. Further research to investigate more complex PRO applications is warranted.

PRS31

IMPACT OF UNCONTROLLED PEDIATRIC ASTHMA ON CHILD AND CAREGIVER PRODUCTIVITY

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OBJECTIVE: To assess productivity among children with uncontrolled asthma (UA) and their caregivers. **METHODS:** An internet-based survey was administered to caregivers of children aged 6–12 years with moderate to severe asthma (severity and control based on NAEPP guidelines). The caregiver questionnaire assessed pediatric asthma symptoms, activity limitation, social functioning, and school attendance. Caregiver productivity was assessed using the Work Productivity and Activity Impairment (WPAI) Questionnaire. WPAI measures were calculated with higher scores representing greater percent reduction in productivity. The chi-square test was used to assess differences in proportions for school impairment between children with UA versus controlled asthma (CA), and the two-sample t-test was used to assess differences in the child's absenteeism and caregiver's WPAI measures. **RESULTS:** A total of 473 caregivers completed the survey; 360 were caregivers of children with UA and 113 for children with CA. Compared with CA, children with UA had significantly greater absenteeism (5.5 days vs. 2.2 days, $P < 0.001$) during the previous year and were significantly more likely to miss school-related activities or visit the health office/school nurse ($P < 0.001$ for both). Caregivers of children with UA reported significantly more absenteeism (15.4% vs. 7.8%, $P = 0.03$), impairment while working (20.8% vs. 13.4%, $P = 0.0001$), greater overall work productivity loss (25.5% vs. 16.0%, $P = 0.0001$), and significantly greater activity impairment (23.6% vs. 11.2%, $P = 0.0001$). **CONCLUSION:** Uncontrolled asthma was associated with significant reduction in school attendance and increased need for health services while at school and impacted the caregiver's work productivity. Funded by Genentech, Inc. and Novartis Pharmaceuticals Corporation.

PRS32

IMPACT OF UNCONTROLLED ASTHMA ON PRODUCTIVITY AND ACTIVITY IMPAIRMENT

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OBJECTIVE: Asthma is a chronic debilitating condition. The lack of asthma control may impact patients' daily activities including work productivity. The current study evaluated the impact of uncontrolled asthma, as measured by the Asthma Control Test (ACT), on work productivity/activity impairment in a sample of US asthma patients. **METHODS:** Data from United States 2006 National Health and Wellness Survey (NHWS), a nationally representative Internet survey of patients' ($\geq$18 years) self-reported health status, health care attitudes, resource utilization, work productivity and activity impairment were used. The current analysis included subjects with self-reported diagnosis of asthma. Asthma control was categorized by ACT score: uncontrolled, $\leq$19; controlled, $\geq$20. The Work Productivity and Activity Impairment (WPAI) Questionnaire, a validated scale was used to measure absenteeism (ie, work time missed) and presenteeism (ie, impairment at work or reduced on-the-job effectiveness). Analyses of work productivity loss were limited to those who were employed full-time. Linear regression models were used to control for potential confounders and determine the impact of asthma control on productivity. **RESULTS:** Of 62,833 NHWS respondents, 4.42% had uncontrolled asthma and 4.65% had controlled asthma. In bivariate analyses, significant differences were noted for demographic variables, as well as for measures of work productivity and activity impairment between those with controlled asthma and those with uncontrolled asthma Those with uncontrolled asthma were significantly more likely to be older, less educated and not married ($p < .001$) vs. those with controlled asthma. After controlling for confounders, those with controlled asthma reported lower levels of absenteeism ($B = -4.055$, $p < 0.001$), presenteeism ($B = -13.287$, $p < 0.001$) overall work productivity loss ($B = -10.818$, $p < 0.001$), and activity impairment ($B = -16.423$, $p < 0.001$). **CONCLUSION:** The extent of asthma control can have a significant impact on work productivity, including presenteeism and absenteeism. Improvement in the level of asthma control is likely to reduce the burden of asthma to employers.

PRS33

TREATMENT SATISFACTION QUESTIONNAIRES IN ASTHMA AND OTHER CHRONIC DISEASES

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OBJECTIVE: To have a better understanding of the concept of treatment satisfaction in the context of asthma and other chronic diseases. To identify and review the content of existing treatment satisfaction questionnaires and search for any evidence of a link between satisfaction and other outcomes. **METHODS:** A literature review was conducted using MEDLINE (1996–2006), EMBASE (1996–2006), abstracts from scientific conferences (ERS since 2003, ISOQOL since 2004) and the Mapi Research Trust databases. Articles on the concept of treatment satisfaction were reviewed. Studies and randomized clinical trials describing the development or use of instruments assessing treatment satisfaction were selected for analysis. **RESULTS:** Treatment satisfaction is a well-defined concept that applies to the evaluation of health care and treatment. Treatment satisfaction questionnaires specific to asthma ($n = 14$), different chronic diseases ($n = 13$) and generic satisfaction questionnaires ($n = 3$) were identified. Asthma specific questionnaires included 1 to 40 items and covered 24 specific domains. The domain on "treatment characteristics and inhaler features" was the most widely covered with 51 items, followed by the domains on "effectiveness" and "discomfort" of treatment with 24 and 16 items, respectively. The analysis of clinical trials suggested potential links between 1) satisfaction and compliance, and 2) satisfaction and intention to continue the treatment. Empirical data showed that a satisfaction assessment could be used to differentiate products when used appropriately. **CONCLUSION:** Future objectives of clinical studies could include the 1) identification of the features of treatment that contribute most to treatment satisfaction; 2) comparison of satisfaction levels between treatments; and 3) investigation of the relationship between satisfaction and compliance or between multi-health outcomes such as Health-Related Quality of Life, symptoms and satisfaction. The information obtained from such studies could then be used to differentiate between products, to adapt treatment strategies and to therefore improve the overall management of asthma patients.

RESPIRATORY-RELATED DISORDERS—Health Care Use & Policy Studies

PRS34

NICOTINE REPLACEMENT THERAPY AND THE MAINE TOBACCO HELPLINE: KNOWLEDGE, UTILIZATION PATTERNS, SHORT-TERM OUTCOMES, AND SATISFACTION AMONG SMOKERS

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OBJECTIVE: In 2002, Maine's Tobacco HelpLine began offering free nicotine replacement therapy (NRT), including patch and/or gum, to adult smokers who were uninsured without NRT benefits. A study was conducted in 2005 to assess knowledge, utilization patterns, short-term outcomes, and satisfaction among a sample of Maine Tobacco HelpLine callers who received this free NRT from any Maine pharmacy. **METHODS:** Telephone surveys were conducted in June-July 2005 among 541 eligible HelpLine callers authorized for NRT between February-March 2005. There were 393 completed interviews, for a 73% response rate. Descriptive analyses and Chi-Square tests were conducted using SPSS and SAS, including tests for significant differences by demographic variables and NRT utilization patterns. **RESULTS:** Half of study respondents were aware of available free NRT prior to calling the HelpLine, and among them 95% indicated that NRT at least somewhat influenced their decision to contact the HelpLine. Most callers were very satisfied (88%) and reported that this process was 'very helpful' in their quit attempt (66%). Almost all respondents picked up NRT (99%), had no problems obtaining it (91%), and quit for at least 24 hours since calling the HelpLine (92%). Among those who quit for at least 24 hours, 95% used NRT; but, 28% reported stopping and starting NRT use and almost 40% reported side effects, most commonly skin reactions or abnormal dreams. Chi-square tests reported a significant difference in side effects by age, with more side effects among younger respondents. When surveyed, 50% of respondents reported abstinence from smoking, which significantly differed by NRT duration; smoking during NRT use; and timing of NRT use. **CONCLUSION:** Providing free NRT through this state-supported program encouraged smokers to contact the Maine Tobacco HelpLine and use available NRT, demonstrating a valuable opportunity for quit lines to provide NRT access and increase demand among motivated smokers.

PRS35

A STATISTICAL LOOK AT COPD

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OBJECTIVE: The purpose of this paper is to take an analytical view of the diagnosis and procedures that most frequently occur with Chronic Obstructive Pulmonary Disease (COPD) patients when they are admitted to the hospital. **METHODS:** The data was collected from the National Inpatient Sample (NIS); they were analyzed using the SAS Program Enterprise Guide 4. The data were from over 32,000 patients that were diagnosed with some type of COPD using a 10% sample from 2004. Some of the variables examined were: the age, the length of stay, mortality rates, total charges, and the diagnostic, and procedure codes for the patients. In analyzing the data, codes were compressed to filter the top 20 principle diagnosis codes, the top 20 procedure codes, and the top twenty DRG codes. **RESULTS:** The results of the data analysis show that there are many different principal diagnoses, procedures, and DRG's used when patients come to the hospital with COPD. The highest principal diagnosis is COPD and bronchiectasis, the top procedure is classified as other vascular catheterization, and the top DRG in effect on the discharge date is COPD. The results also show that 5% of the patients died while they were in the hospital. The total charges for the patients show that the majority of the patients' total charges were less than $10,000. Logistic regression showed that mortality is directly related to these diagnostic and procedure codes. **CONCLUSION:** More research on COPD is necessary. COPD is the fourth leading cause of death in the US, but there is virtually no research on the disease. The analysis of this dataset shows that the knowledge of this disease is limited and more research must be conducted.

PRS36

FACTORS ASSOCIATED WITH ANTIHISTAMINE PRESCRIBING IN ASTHMA IN THE UNITED STATES IN 2005

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OBJECTIVE: Although antihistamines do not have an on-label indication for asthma, previous study showed increased prescribing in asthma by physicians. This study examined patient and physician predictors of obtaining an antihistamine for asthma in the absence of allergic diseases in 2005. **METHODS:** Office-based physician visits or outpatient visits by patients with asthma were selected from the 2005 National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey. Asthma was defined by either a diagnosis code of asthma (ICD-9-CM: 493.xx), a reason-for-visit code of asthma (2625.0), or affirmative answer to a question asking if patients have asthma irrespective of the diagnosis. Visits with concomitant allergic diseases indicated for antihistamines were excluded. The study applied multivariate logistic regression analysis in Stata 9 to take into account of the complex survey design. **RESULTS:** In 2005, 11% of the 54.3 millions asthma visits had an antihistamine prescribed. During office-based physician visits, females (OR: 1.25; 95%-CI: 1.07–2.02), patients prescribed leukotriene receptor antagonists (LRTA) (OR: 2.94; 95%-CI: 1.33–6.50), or short acting beta agonists (SABA) (OR: 2.37; 95%-CI: 1.24–4.53), were more likely to receive an antihistamine prescription. Physicians in Metropolitan Status Area (MSA) (OR: 2.23; 95%-CI: 1.03- 4.85) were more likely to prescribe antihistamine in asthma. But those with access to electronic medical records (EMR) (OR: 0.36; CI: 0.15–0.88) were less likely to do so. Only LRTA (OR: 5.27; 95%-CI: 2.49–11.12), MSA (OR 9.01; 95%-CI: 2.13–38.03) and EMR (OR: 0.27; 95%-CI: 0.08–0.88) were significant predictors for antihistamine prescribing in outpatient department. However, asthma patients treated by their primary care physicians were more likely to receive an antihistamine (OR: 2.9; 95%-CI: 1.45–5.80). **CONCLUSION:** Significant disparities in patient and physician characteristics were identified for antihistamine prescribing in asthma. Results also indicate that antihistamines were used as a complement for long-term asthma management.

PRS37

CONCURRENT ASTHMA CONTROLLER MEDICATION POSSESSION PROFILES IN AN ADULT MANAGED CARE POPULATION

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OBJECTIVE: Medication possession ratios (MPRs) can be misleading as an indicator of adherence, especially where several

medications for the same indication are used concurrently. We investigated whether concurrent utilization of controller asthma medications in patients switching therapies differs between controller medication classes and whether it may lead to significant biases in observed patterns of medication possession and inappropriate claims for long-term patient adherence. **METHODS:** We used MPRs as a proxy measure of adherence to asthma controller medications. Asthma controller utilization patterns were investigated using the Pharmetrics Managed Care database for the period April 2003 to March 2006. Asthma patients who were exclusively on two of three major controller groups were identified: inhaled corticosteroids (ICSs), fluticasone/salmeterol (FS), and leukotriene modifiers (LTMs). MPRs were calculated for days of concurrent possession (DCPs) between last and first prescription recorded, as well as the proportion of days that were covered by concurrent controller possession (CCPs). **RESULTS:** Overall for the study population (n = 7260), 1328 patients had prescriptions for LTMs and ICSs; 4871 for LTMs and FS; and 1061 for ICSs and FS. The mean CCPs were highest for persons reporting prescriptions for both LTMs and FS (0.224). Lowest CCP was for ICS and FS (0.023). DCP over the 3-year observation period was highest for persons with LTMs and FS (0.152 or 166 days) and lowest for those with ICSs and FS (0.009 or 10 days). **CONCLUSION:** The analysis points to a significant number of asthma patients using LTMs concurrently with another controller medication. This occurs despite the lack of clinical evidential support for concurrent utilization over an extended period. Estimates of MPRs for controller therapies based on prescription counts need to be corrected for concurrent medication usage to avoid overstating therapy adherence.

PRS38

HEALTH CARE UTILIZATION CORRELATED WITH CONTROLLER DURATION DURING THE FIRST YEAR AFTER DIAGNOSIS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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OBJECTIVE: To assess the correlation between health care utilization after diagnosis of chronic obstructive pulmonary disease (COPD) and controller therapies prescribed during the first year after diagnosis. **METHODS:** A cohort of 991 patients with initial diagnosis of COPD between January 1, 2003 and December 31, 2004 were constructed from the Lovelace Patient Database. Inclusion criteria included: first diagnosis of COPD (ICD-9CM 491, 492, or 496), >1 year of pre and post-diagnosis observation, and >1 pharmacy claim. Ethnicity was estimated using the GUESS (Generally Useful Ethnicity Search System) program. Use of controller therapy: fluticasone propionate (FP), salmeterol (SAL), ipratropium (IPR), ipratropium + albuterol (IPA), and fluticasone/salmeterol combination (FSC) was calculated for each patient using Medication Possession Ratios (MPR), the mean number of prescription fills in the year following diagnosis. Correlations between controller therapy and albuterol use, outpatient, and inpatient visits were assessed using Pearson correlation coefficients and Negative Binomial regression models controlling for age, sex, and Hispanic ethnicity. **RESULTS:** The sample of 991 patients included 6.6% FP, 8.8% IPA, 3.6% IPR, 2.5% SAL, 8.1% FSC, and 77.5% non-controller. The sample was 51.9% female, 24.9% estimated Hispanic ethnicity, and mean age was 68 years. Albuterol MPR was correlated with FP ($r = 0.42$, $p < 0.0001$), IPA ($r = 0.08$, $p = 0.007$), IPR ($r = 0.37$, $p < 0.0001$), SAL ($r = 0.12$, $p < 0.0001$), and FSC ($r = 0.33$, $p < 0.0001$). No controllers were significantly correlated with outpatient visit use. No controllers were significantly correlated with albuterol MPR when controlling for sex, ethnicity, and age. FSC MPR was the only controller that was negatively correlated with hospitalizations (–2.05, $p = 0.04$). **CONCLUSION:** Patients with an initial diagnosis of COPD experienced less hospitalizations with more FSC use during the first year, suggesting a duration-response relationship. Controller use was not significantly correlated with albuterol MPR or count of outpatient visits after adjustment.

PRS39

THE IMPACT OF FORMULARY POLICIES ON THE USE OF MEDICATION FOR RESPIRATORY DISEASE: A COMPARISON OF DRUG UTILIZATION IN THE PROVINCES OF ONTARIO AND ALBERTA

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OBJECTIVE: The 2007 Canadian Respiratory Disease Guidelines recommend that treatment be initiated with inhaled corticosteroids (ICS). An analysis of provincial drug claims data was undertaken to determine the impact of Ontario's restricted drug access system relative to Alberta's open public formulary on the use of four types of medication to treat respiratory disease. These consisted of low cost ICS and higher cost long-acting β2 agonists (LABA), combination therapy ICS plus LABA (COMBO) and leukotrienes (LTRA). **METHODS:** A retrospective 12-month review of patients aged < 55 years who were treated under the public and private payer systems in Ontario and Alberta were analyzed for "first use" of inhaled respiratory therapies. "First use" was defined as a patient who had no prior record in the previous three years of any controller agent. Inter and intra provincial utilization comparisons were undertaken and reported as likelihood ratios (LR). **RESULTS:** Under the restricted Ontario public formulary, first use ICS was significantly more likely over LABA, COMBO and LTRA (LR = 1.9; 3.0 and 16.9: $p < 0.001$) relative to private drug plans in the province. In contrast, there was significantly less ICS use over the more costly LABA in the open Alberta public system (LR = 0.37; $p < 0.001$). Furthermore, there was almost identical usage of ICS vs. COMBO and LTRA between the Alberta public and private drug plans (LR = 0.91; $p = 0.057$ and 1.56; $p = 0.001$). **CONCLUSION:** Formulary restrictions that are in keeping with clinical practice guidelines appear to be an effective method for promoting appropriate drug use and containing formulary expenditures. However, the impact of such restrictions on other health care resources such as hospital admissions for poorly controlled respiratory disease is unknown. Patient level research is needed to evaluate the total impact of formulary restrictions on all aspects of the health care system.

PRS40

ABSENCE OF CONTROLLER DRUG USE AMONG ASTHMATIC PATIENTS AT RISK OF ASTHMA ATTACK

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OBJECTIVE: Despite the recommendations from national guidelines, under-use of controller medications and overuse of quick relief medications persists amongst asthmatics. The main objective of this study was to determine the effects of health insurance, prescription drug insurance and availability of peak flow meter on controller drug therapy not being used by asthmatic patients. **METHODS:** Data for this study came from 2004 Medical Expenditure Panel Survey (MEPS).Study population included all

asthma patients that reported occurrences of at least one asthma attack in twelve months. Multiple logistic regression was used to determine what factors are associated with the risk of absent controller drug therapy despite the frequent use of quick relief drugs, i.e., zero use of controllers in 12 months despite the use of 3 or more quick relief canisters in three months. **RESULTS:** A total of 1164 patients reported at least one asthma attack in past 12 months. Among these patients, 434 (37%) reported no use of controller drugs despite the frequent use of quick relief canisters. The patients that did not have peak flow meter at home were more likely to report no use of controller drugs despite the frequent use of quick relief drugs (OR = 1.93; 95% CI:1.92, 1.93). Health insurance (OR = 1.44; 95% CI: 1.43, 1.45) and prescription drug benefits (OR = 1.21; 95% CI: 1.21, 1.21) also increased the risk of absent controller drug therapy. **CONCLUSION:** Having peak flow meter increased the likelihood of controller drug use indicating the usefulness of peak flow meter in asthma treatment and management. Health insurance and prescription drug benefit improved the likelihood of using controller drugs because of improved access. In order to improve the controller drug utilization amongst asthma patients, attention should be focused on patients lacking health insurance, prescription drug benefits and peak flow meters.

PRS41

AVAILABILITY AND PRICE OF TWO INHALATION MEDICINES FOR TREATMENT OF ASTHMA IN DIFFERENT STATES OF INDIA

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OBJECTIVE: Rational treatment of bronchial asthma is a serious problem in developing countries mainly because of access to medicines. This paper reports the availability and price of two inhalers in different states of India. **METHODS:** The data collected for essential medicines at five sites utilizing a standardized methodology on medicine prices and availability was used to collate data for secondary analysis. The surveys were conducted in public (20–60) and private (20–60) facilities. Anti-asthma medicines, beclomethasone (50µg/dose) and salbutamol (0.1 mg/dose) inhalers represented both as innovator brand (IB) and generic equivalent, were included in the analysis. Medicine prices were expressed as median price ratio (MPR) to an international reference price. The surveys were conducted in four states, Haryana, Karnataka, Maharashtra, Rajasthan and Chennai, capital TamilNadu, state. Surveys were conducted from October–December 2004 except Rajasthan survey (April-June 2003). **RESULTS:** Public sector: Availability—Generic version of both the inhalers was found only in the Rajasthan state. Availability of beclomethasone inhaler was 25% and 30% for salbutamol. Procurement price –Beclomethasone inhaler was 0.74 and salbutamol inhaler was 0.56 times the international reference price. Private sector: Availability—Beclomethasone inhaler was available as innovator brand (55%) and generic version (90%) in Chennai. In other states only generic version was available, in the range of 10% to 65%. Salbutamol inhaler was available in all states and in both the versions, availability ranging between 20%–95% as innovator brand and 83 –100% as generic equivalent. Price—MPR for generic beclomethasone was in the range of 0.87–1.49 at all sites, IB was available in Chennai and the MPR was 1.08. MPRs for IB and generic salbutamol range between 0.86–1.12 and 0.82–0.96 respectively. **CONCLUSION:** Policy interventions are required to improve access of affordable essential asthma medicines. Asthma needs to be recognized as a health priority chronic disease in India.

PRS42

ASTHMA DISEASE BURDEN, EVIDENTIARY REQUIREMENTS, AND FORMULARY CONSIDERATIONS AMONG MANAGED CARE AND EMPLOYER DECISION MAKERS REGARDING INHALED CORTICOSTEROIDS (ICS)

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OBJECTIVE: To gather information from managed care organization (MCO) decision makers and employers about asthma burden, evidentiary requirements, and product attributes that may influence formulary decision making for an emerging once-daily ICS asthma therapy. **METHODS:** Telephone interviews were conducted among 10 MCO decision makers and 8 employers representing more than 51 million covered lives. Research focused on asthma burden, disease management strategies, and formulary decision making. Mean ratings on a scale from 1 (no effect; not at all important) to 10 (very large effect; very important). **RESULTS:** Both MCOs and employers recognized the prevalence of asthma and challenges associated with management, including patient compliance with ICS. MCOs reported the economic impact of asthma was most notable in terms of hospitalizations (7.3), emergency department visits (7.2), and pharmaceutical costs (7.0). Employers identified burden of illness with employee absenteeism (6.0), presenteeism (5.3), workplace productivity (5.4), and employer health care costs stemming from both employee asthma and dependent children with asthma (5.3). ICS product efficacy, safety, compliance, and cost-effectiveness/value were the most important product attributes driving formulary decision making among MCOs. Both MCOs and employers had a favorable overall opinion of the product (6.9 and 6.8, respectively) and felt that compliance (8.4 and 8.9, respectively) would have a considerable impact on decision making. Majority of MCOs (7 of 10) reported once-daily dosing to be the most important product attribute (6.9). MCO interviewees emphasized that the product will need to be priced competitively to secure favorable positioning in a crowded ICS market. Post-launch evidentiary requirements may include the need for "real world" head-to-head comparative effectiveness studies. **CONCLUSION:** Efficacy, safety, compliance, and cost are primary factors driving formulary decision making when evaluating emerging ICS asthma therapies in a crowded market. MCO and employer organizations have similar priorities with respect to asthma management and formulary decision making.

PRS43

ECONOMIC BURDEN OF ASTHMA AMONG CHILDREN IN THE UNITED STATES

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OBJECTIVE: Recent estimates of cost of asthma among children in the USA are not available. The objective of this study was to estimate the incremental direct medical expenditures of treating asthma among children in the USA. **METHODS:** Retrospective analysis was conducted using the 2004 Medical Expenditure Panel Survey (MEPS) data. Asthmatic children (age < 18 years; n = 968) were identified as those with International Classification of Diseases (ICD)-9 diagnosis codes for asthma or those that had a self-report of having asthma in 2004. Separate regression models were developed for total expenditures and expenditures for various categories of resource use adjusting for age, gender, race, ethnicity, education, geographic region, insurance status and number of medications

used (proxy for comorbidity). Given the skewed distribution of expenditure variables, multiple model specifications including ordinary least squares regression, generalized linear model (GLM) with Poisson, gamma and negative binomial variance functions were evaluated. **RESULTS:** The prevalence of current asthma among children in 2004 was estimated at 9.09%, i.e., 6.7 million persons (95% CI: 8.27% to 9.99%) in the U.S. A majority of children with asthma were male (61.6%), white (68.1%), and insured (95.2%) with mean age of 8.9 ± 0.25 years and education of 2.4 ± 0.17 years. Children with asthma had 69% higher total expenditures than non-asthmatics after controlling for covariates (RR: 1.69; $p < 0.0001$). The annual adjusted mean incremental total expenditure associated with asthma was $661.7 (SE: $159.3; $p < 0.0001$) per person. Medications accounted for the largest proportion of the total expenditures estimated at $197.9 (SE: $28.8; $p < 0.0001$), followed by physician office visits at $162.3 (SE: $57.7; $p = 0.005$) and inpatient visits at $105.0 (SE: $75.9; $p = 0.0167$). **CONCLUSION:** Given the prevalence of asthma in children and its associated incremental expenditures, the annual direct medical expenditure for treating asthma in children is estimated at approximately $4.4 billion in 2005 USD.

PRS44

ANALYSIS OF THE COSTS RELATED TO SMOKING HABITS OF BENEFICIARIES OF A BRAZILIAN HEALTH PLAN, WITH THE PURPOSE TO DEFINE TREATMENT STRATEGIES TO REIMBURSE FIRST LINE MEDICATIONS

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OBJECTIVE: Cigarette smoking is one of the leading avoidable causes of death in the world. However, in many countries, such as Brazil, medications used during pharmacological treatments are not supported by private or public health systems. The purpose of this study is to analyze and to compare the financial impact of the costs related to adult smokers beneficiaries of a health plan and define the best strategies to stimulate smoking cessation programs. **METHODS:** We analyzed smoking habits, based on an epidemiologic investigation of 46,407 beneficiaries of a private health plan in Brazil. Expenses with hospitalization and use of medical services during a period of 12 months, of beneficiaries who report a daily smoking habit were compared with those of non-smokers. Simulated analysis were performed with the estimate costs of treatments with anti nicotin drugs a potential decrease of the costs of the heath plan was estimated. **RESULTS:** Among the beneficiaries, 29.0% ($n = 10,270$) were smokers and 61.8% of those were male. The majority (86.7%) of the smokers informed to consume 20 cigarettes per day; 9.5% consumed 20 to 40 cigarettes per day and the rest of the group (3.8%) consumed more than this amount. 43.3% smoked for less than 10 years; 25.0% from 10 to 20 years and 31.6% for more than 20 years. The prevalence of chronic diseases was higher among the smokers, compared to non-smokers, as well as average per capita cost expenditures (29% more than the non-smokers). **CONCLUSION:** Starting from reported efficiency of the nicotine replacement therapies added to psychological support, applied to the group of smokers of the health plan and comparing the costs of this strategy with the effective costs of those beneficiaries, evidences demonstrate the importance of considering financial support systems to smoking cessation interventions, by the health plan.

PRS45

THE DEVELOPMENT AND VALIDATION OF A CONTEMPORARY ASTHMA POLICY MODEL

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OBJECTIVES: Asthma treatment guidelines and recent cost-effectiveness models have shifted away from lung function outcomes and moved toward emphasizing control. We developed and validated a flexible and transparent adult asthma policy model that represents disease progression though levels of asthma control and projects lifetime mortality, morbidity, and costs. **METHODS:** We estimated uncertainty and point estimates of model inputs for non-death transition state probabilities and health state specific utilities and health care resource utilization based on a rigorous analyses of a 3-year, multicenter, observational study of 4756 patients with difficult-to-treat or severe asthma receiving standard-of-care. We used statistical regression models to test and account for population heterogeneity. We validated the model following the ISPOR Task Force recommendations. Three hypothetical scenarios were compared to standard-of-care that resulted in different target product profile and pricing bands: A) a 30% relative reduction in exacerbation rates with a $2000 per annum treatment cost; B) A plus a threefold increased risk of asthma related death for the sub-optimally controlled; C) B plus an absolute improvement in utility by 0.02 for each health state. **RESULTS:** Simulation cohorts, stratified by age and severity, transitioned through three mutually exclusive levels of control until reaching death. Nine health states were modeled because one cycle of control history was predictive of present cost and utility. Compared to standard-of-care, the three hypothetical scenarios resulted in societal perspective incremental cost-effectiveness ratios of $284,000 per QALY gained (95% interval: $193,000, $463,000), $263,000/QALY (95% interval: $179,000, $422,000), and $62,000/QALY (95% interval: $52,000, $72,000) respectively. **CONCLUSIONS:** This policy model adds to past asthma models because its structure and inputs were based on current clinical guidelines and a large long-term patient-level registry. This versatile model can forecast: lifelong burden of disease, value of current and emerging interventions, and parameters that yield the highest return from further study.

PRS46

HOW PROCESS INFLUENCES SCIENTIFIC EVIDENCE FOR HEALTH CARE POLICYMAKERS, THE CASE OF ECONOMICS AND MEDICAL DECISION-MAKING PROCESSES

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OBJECTIVE: This paper contributes to the debate on how process affects reliability of scientific evidence in health care. It discusses the use of different types of study designs in medicine and biology versus social sciences to raise scientific international evidence. **METHODS:** A comparison of study designs used in clinical research (RCT and bridges studies (e.g. Hsiao CF et als, 2007)) and in social sciences. Examples from clinical sciences are on environmental medicine and bridging studies. Examples from social sciences are presented on two characteristics of six European hypertensive patient surveys on cost of medicines (ENDEP-Lux, 2000): exemption criteria and classification of medicines for reimbursement. **RESULTS:** The comparison of case studies shows similar problems for both clinical and financing study designs: imbalance of sample sizes between new and original sites for clinical bridges studies, and between national sampled patients with different access to health benefits for financing

studies; the comparison also shows common recent development of bayesian decision models and choices of appropriate weighting of prior information (e.g. use of mixture prior information for judging similarity by the "positive treatment effect" in clinical research or use of different weighting between individual and population level for the financing studies). Moreover, selection of appropriate weighting in both types of studies face regulators and financing agencies that need to have confidence in the transferability of their results between regions. **CONCLUSIONS:** New developments of statistical analysis especially Bayesian evaluation both in global clinical research and social sciences can lead to a better integration of types of research designs. They can improve scientific evidence for health care policy decision processes. Context free research is not sufficient to integrate the effect of environmental modifiers (like in asthma) or variations in social and political processes (e.g. variation in exemption criteria especially during health reforms or systems in transition).

PRS47

ASTHMA PHARMACOTHERAPY AND AT RISK NON-AFRICAN AMERICAN MINORITY POPULATIONS: EVIDENCE OF SUB-OPTIMAL CARE FROM THE NATIONAL AMBULATORY MEDICAL SURVEY 1998–2004

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OBJECTIVE: This study attempted to determine if select patient and physician demographic variables are predictors of the prescribing of asthma pharmacotherapy in the ambulatory patient population of the United States, with particular emphasis on the non-African American minority population. Recent research suggests that these populations may be at-risk for receiving sub-optimal asthma care due to cultural and/or linguistic barriers to obtaining proper care, cultural beliefs about asthma treatment, low socio-economic status and even genetic polymorphisms that lead to poor responses to asthma medications. **METHODS:** This study was a retrospective cross-sectional study that used data from the National Ambulatory Medical Care Survey (NAMCS) from 1998 through 2004. The weighted population sample size of the study was 82,020,318 patients and there were 1,540 observations in this study (pre-weighted sample size). Specific patient demographic variables, physician demographic variables and asthma medications prescribed were extracted from the dataset and analyzed. **RESULTS:** A major finding from this study was the fact that non-African American minority populations were receiving sub-optimal asthma pharmacotherapy. Non-African American minorities (Asians, Native Americans, Pacific Islanders, Alaskan Natives and other minorities) were less likely to be prescribed controller medications (OR = 0.405), combinations of ICS and LABA agents (OR = 0.267) and more likely to be prescribed SABA agents (OR = 1.769) when compared to the overall population [all $p < 0.05$]. Additionally, our research also indicates that these minority patients are generally younger, more likely to see primary care physicians, and are also likely to have insurance coverage (public & private). They are also more likely to reside in an urban area and live in the Western United. States. **CONCLUSION:** It appears that a more concerted effort needs to be undertaken to study the factors that may explain the sub-optimal patterns of asthma care provided to these at-risk minority populations.

SENSORY SYSTEMS DISORDERS— Clinical Outcomes Studies

PSS1

CO-MORBIDITIES INCREASE IN THE YEAR FOLLOWING A DIAGNOSIS OF PSORIASIS

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OBJECTIVE: To evaluate the impact of psoriasis (PsO) on the presence of co-morbidities in the first year after the diagnosis. **METHODS:** A retrospective study of the PharMetrics database, compiled from managed care plans throughout the United States, from January 1, 2000 through December 31, 2006 was conducted. Patients between the ages of 18 to 80 years, who had a minimum of 12 months of continuous enrollment before and after their index diagnosis with PsO, were included. The index diagnosis date was derived from the first claim for PsO during the study period. The presence of co-morbidities was determined by frequency counts and as a percentage of total claims generated during the study period. **RESULTS:** The study cohort included 48,068 patients; 52.3% were females, and the mean age was 46.3 years. Multiple co-morbidities were identified in the years prior to and subsequent to the diagnosis of PsO. The five most frequently observed co-morbidities were: hypertensive disease (increased from 24.45% to 26.65%), hyperlipidemia (from 15.72% to 18.06%), pure hypercholesterolemia, pure hyperglyceridemia, and mixed hyperlipidemia (from 14.65% to 16.18%), diabetes mellitus (from 8.36% to 9.57%), depressive disorder, episodic mood disorder, and dysthemic disorder (from 6.88% to 7.12%). Additionally, the five highest percentage increases in co-morbidities in the years prior to and subsequent to the diagnosis of PsO were: 1) Malignant neoplasm of uterus and cervix uteri (60%, pre-n = 26, post-n = 38); 2) Malignant neoplasm of trachea, bronchus and lung (57.1%, pre-n = 33, post-n = 54); 3) Malignant neoplasm of ovary and other uterine adnexa (44.4%, pre-n = 42, post-n = 63); 4) Psoriatic Arthropathy (44.0%, pre-n = 1357, post-n = 1950); and 5) Atherosclerosis (33.3%, pre-n = 142, post-n = 193). **CONCLUSION:** This study indicates that co-morbidities increase significantly in the year subsequent to a diagnosis of PsO. The large increases noted in malignancies may be due to the small numbers of cases observed.

PSS2

EFFICACY OF BIOLOGICAL TREATMENT IN PATIENTS WITH PSORIASIS; META-ANALYSIS

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OBJECTIVE: Five biological treatments are registered for psoriasis, the tumor necrosis alpha (TNF-alpha) inhibitor adalimumab, etanercept and infliximab and the T-cell modulator alefacept, efalizumab. Our objectives were to analyse the efficacy of registered biological drugs in psoriasis and also to compare their efficacy on a pharmacological group level. **METHODS:** Cochrane Highly Sensitive Search Strategy was used to identify RCTs in MEDLINE. Inclusion criteria were: a) treatment of psoriasis b) outcome data on the proportions of patients achieving at least 75% improvement in Psoriasis Area and Severity Index (PASI) from baseline. The quality of selected studies was measured using the Jadad-score. Data were entered into Review Manager 4.2 software. The chosen summary statistic variable

was the number needed to treat (NNT). Due to lack of face-to-face evidence on biologics, an indirect comparison of the trials was conducted, applying the method proposed by Butcher. **RESULTS:** Sixteen RCTs involving 7339 patients were identified. The active treatment was adalimumab in 1 trial (n = 147), alefacept in three trials (n = 1289), efalizumab in four trials (n = 2444), etanercept in four trials (n = 1964) and infliximab in four trials (n = 1495). All trials were placebo controlled and the primary follow-up time was 12 weeks. The primary outcome was PASI75 criteria in all trials. To achieve PASI75, the number of patients needed to treat (95% confidence intervals) with adalimumab 40 mg/eow, alefacept 15 mg, efalizumab 1 mg/kg, etanercept 2 × 50 mg/week and infliximab 5 mg/kg were 2.04 (1.54–2.94), 5.00 (3.57–7.69), 3.85 (3.13–5.26), 2.27 (2.08–2.50) and 1.32 (1.25–1.39), respectively. Indirect comparisons of TNF-alpha inhibitors and T-cell modulators yielded the odds ratios of 5.54 (3.65–8.42). **CONCLUSION:** All biologicals were superior to placebo, alefacept with the highest and infliximab with the lowest NNT. TNF-alpha inhibitors were significantly superior to T-cell modulators.

PSS3

COMPARING THE EFFECTIVENESS OF CORTISPORIN VS. CIPRODEX FOR ACUTE OTITIS EXTERNA IN THE LOUISIANA MEDICAID POPULATION

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OBJECTIVE: To compare the effectiveness of Cortisporin and Ciprodex therapies in the treatment of acute otitis externa (AOE) in the Louisiana Medicaid population. **METHODS:** A retrospective analysis of Louisiana Medicaid data using paid claims from January 1, 2004, to December 31, 2005, was conducted for recipients aged 1–64 years. Recipients with an AOE medical claim (index diagnosis) followed within five days by a claim for Ciprodex or Cortisporin were identified. Any recipients with dual therapy (defined as greater than one antibiotic or otic agent), concomitant infection, AOE diagnosis within 30 days prior to index diagnosis, or other diagnosis warranting antibiotic therapy within 30 days post index claim were excluded. Each recipient's medical and pharmacy claims for 30 days after the index diagnosis were identified and evaluated for treatment failure. Treatment failure was defined as presence of an additional prescription claim for an antibiotic (oral or otic) or an antibiotic-steroid combination with or without another medical AOE claim. The two drug cohorts (Ciprodex and Cortisporin) were matched using the greedy match technique. Effectiveness, defined as the proportion of failure patients in each cohort, was analyzed using the binomial proportion test. **RESULTS:** The population consisted predominately of females (55.66%), Caucasians (63.49%), and recipients from the New Orleans region (34.02%). Forty-eight percent of the prescription claims were written by pediatricians. Each matched cohort had 901 recipients with average age 10.01 (SD = 6.50) years (Ciprodex), and 10.45 (SD = 7.27) years (Cortisporin). Before propensity score matching, the respective failure rates for Cortisporin and Ciprodex were 7.47% and 4.69% (p = 0.0009). Within the matched cohorts, respective failure rates for Cortisporin and Ciprodex were 6.88% and 4.77% (p = 0.056). **CONCLUSION:** In the Louisiana Medicaid population, Cortisporin had a higher failure rate than Ciprodex for AOE; after propensity score matching the difference approached statistical significance at the 0.05 alpha level.

PSS4

THE RCT EVIDENCE OF COMPARATIVE EFFECTIVENESS AND SAFETY OF TOPICAL GLAUCOMA MEDICATION

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OBJECTIVE: To classify published randomised controlled trials (RCTs) regarding the comparative efficacy and safety of topical glaucoma treatment to identify where the evidence lies and the gaps for future research. **METHODS:** A systematic search of MEDLINE, EMBASE, Cochrane Central and conference proceedings for RCTs recruiting adults with primary open-angle glaucoma (POAG) and/or ocular hypertension (OH) receiving any topical medication or placebo. After double-data entry, the characteristics were analysed with a focus on prostaglandin-containing trials. **RESULTS:** We identified 510 RCTs. Mean study duration was 15.2 weeks (SD 19.9), with 78% of studies lasting less than three months. Grouping of studies by duration and treatment showed that short-term efficacy was available for all treatments, but RCT evidence of longer-term safety (>12 months) was confined to latanoprost (three trials) and timolol maleate (two trials) in the monotherapy group and dorzolamide and timolol in fixed combination (one trial). The majority of the study population (79.6%) was Caucasian. The data on co-morbidity was sparse. Of prostaglandins, only latanoprost reported hypertension as a sub-group. Latanoprost monotherapy and latanoprost/timolol fixed combination therapy had been compared with the broadest range of alternative therapies. Latanoprost alone had been compared with all other classes of treatments. **CONCLUSION:** There are extensive RCT data available for glaucoma treatment. Latanoprost has the most RCTs and is the only prostaglandin analogue with RCTs over 12 months. Other research methodologies (i.e. observational studies) have to be considered alongside RCTs to address important clinical issues like long-term safety and disease progression. There is a lack of RCT evidence to explore differential treatment-effects among subgroups.

SENSORY SYSTEMS DISORDERS—Cost Studies

PSS5

MEDICAL COST OF GLAUCOMA IN SWEDEN

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OBJECTIVE: Glaucoma has been estimated to affect 2.1% of the population aged 40 years and over and given the clinical impact of glaucoma, it is important to evaluate the potential economic burden of the disease. The aims were to estimate the direct medical costs of glaucoma in Sweden and also to investigate the hypothesized cost drivers; intraocular pressure (IOP), amount of visual field damage estimated by the MD, change of MD (ÄMD) and pseudoexfoliation syndrome (PEX). **METHODS:** The study was based on 583 Swedish patients with open-angle glaucoma and manifest field loss followed between 4.5 and 9.25 years. Data on MD, IOP, PEX, medical resources, and low-vision centre visits were collected and organized in three-month periods. The average baseline MD was −11.7 dB and initial values of average IOP, age were 22.5 mmHg, and 71 years, respectively. All used resources were multiplied with its respective unit costs to calculate the medical costs for each patient. Cost regressions were estimated with a multivariate population-averaged panel data model. **RESULTS:** Average annual medical cost/patient of glau-

coma was estimated at €627/year. Independent cost drivers were IOP ($p < 0.001$), MD ($p < 0.001$), ÄMD ($p = 0.03$) and PEX ($p < 0.001$). Prevalence of PEX was associated with 21% higher costs. Each one-unit increase in mmHg (IOP), decrease in dB (MD) or ÄdB/year (ÄMD) increased costs by 2.9 %, 1.2% and 5.7%, respectively. Patients that had visited a low-vision centre at least once had 46% higher annual costs than the average patient. **CONCLUSION:** MD, ÄMD, IOP, and PEX are all drivers of medical cost of glaucoma in Sweden. Further, the variables are predicting cost independently of each other.

PSS6

COST-EFFECTIVENESS OF INTERMITTENT VS. CONTINUOUS ANTI-TNF ALPHA THERAPY IN PLAQUE PSORIASIS

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OBJECTIVE: To assess the cost-effectiveness of intermittent vs. continuous anti-TNF alpha therapies in chronic plaque psoriasis. **METHODS:** An economic model was constructed to estimate the cost per month in remission for intermittent etanercept 25 mg twice weekly (biw) or 50 mg biw, continuous adalimumab or continuous infliximab compared with no systemic therapy (NST). Patients considered had chronic plaque psoriasis with both Psoriasis Area and Severity Index (PASI) and Dermatology Life Quality Index (DLQI) > = 10 at baseline, and so would be eligible for anti-TNF alpha treatment under UK guidelines. Remission was defined at patients experiencing an improvement of at least 75% of their baseline PASI. Response rates were taken from registration studies for each agent: maintenance of response with continuous therapy and likelihood of response to intermittent therapy were extrapolated from published studies to a time horizon of ten years using a Markov process. Costs were estimated from a UK payer perspective including drug cost, administration visits and hospital stay for treatment failures. **RESULTS:** Cost per month in remission for each therapy compared with NST was estimated to be: GBP162 (95% CI: 93–287) for etanercept 25 mg biw; GBP418 (337–531) for etanercept 50 mg biw; GBP1,867 (1,643–2,136) for infliximab and GBP588 (452–804) for adalimumab. The cost-effectiveness ratios for continuous therapies were sensitive to the criteria used for withdrawal from treatment. The cost-effectiveness ratios for intermittent therapy were sensitive to the duration of treatment interruption achieved and response rate after therapy re-introduction. All regimens were found to be particularly appropriate in psoriasis patients with severe disease at baseline. **CONCLUSION:** The model found intermittent treatment with etanercept to be more efficient than continuous treatment with other anti-TNF alpha therapies, as it allows patients to be maintained in response at lower drug cost.

PSS7

THE COST-EFFECTIVENESS OF RANIBIZUMAB COMPARED TO PDT-V AND BSC FOR THE TREATMENT OF AGE-RELATED MACULAR DEGENERATION IN CANADA

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OBJECTIVE: To evaluate the cost-effectiveness of ranibizumab versus photodynamic therapy with verteporfin (PDT-V) and best standard care (BSC) for the treatment of all wet age-related macular degeneration (AMD) lesion subtypes (predominantly classic (PC), minimally classic (MC) and occult lesions (OC)) in Canada. **METHODS:** A ten-year Markov model with three-month cycles was adapted to the Canadian setting to simulate the evolution of visual acuity (VA) levels in subfoveal wet AMD patients according to Canadian guidelines. Analyses were performed from the perspective of the Ontario Ministry of Health with each AMD subtype modeled separately. The initial distribution of patients across VA levels followed the distribution observed in MARINA and ANCHOR (sham controlled phase III randomized multicentre clinical trials) at randomization. Transition probabilities were based on data from the same trials. Treatment with 0.5 mg ranibizumab was assumed, with nine injections in year 1 and six injections in year 2. Treatment duration was assumed to be one year for PC and two years for MC and OC lesions. Five clinicians completed a resource use questionnaire from which therapy and adverse event costs were estimated (2007 CDN$). Quality-of-life estimates were obtained from a time trade-off study carried out in a sample of the UK general population. Outcomes were measured in terms of quality-adjusted-life-years (QALY) and discounted (along with costs) at 5% annually. One-way and probabilistic sensitivity analyses were performed to estimate uncertainty around incremental cost-effectiveness ratios (ICER). **RESULTS:** Ranibizumab demonstrated cost-effectiveness relative to PDT-V and BSC in all lesion types assuming a $50,000 threshold. The ICER for PC lesions was $4,167/QALY and $21,857/QALY relative to PDT-V and BSC respectively. For MC and OC lesions the ICER was $37,363/QALY and $38,151/QALY respectively relative to BSC. **CONCLUSION:** Ranibizumab offers good value for money compared to current standard treatments for all wet AMD lesion types.

PSS8

ESTIMATING COST-EFFECTIVENESS OF TOPICAL OCULAR HYPOTENSIVES FOR MAINTAINING PERSISTENT THERAPY USING AREA UNDER THE SURVIVAL CURVE

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OBJECTIVE: To compare cost-effectiveness of topical prostaglandins for maintaining persistency during the first 2 years after initiating therapy. **METHODS:** Data derived from Ingenix managed care database. Patients with latanoprost (LAT), bimatoprost (BIM), travoprost (TRAV) dispensed between Janaury 1, 2004–December 31, 2004 screened for inclusion. Index agent = first agent filled; index date = fill date. Patients excluded if: < 40 years old; not continuously enrolled for 180 days before index date; had any ocular hypotensive dispensed or no glaucoma diagnosis within 180 days before index date. Data censored at the earliest of end of enrollment; end of study (December 31, 2005); or upon adding/switching to a new agent. Cox regression (adjusted for age, gender, recent diagnosis of preglaucoma/ocular hypertension) used to compare relative risk of discontinuation of initial prostaglandin and produce survival (on therapy) plot over first 720 treatment days for each prostaglandin. Area under survival curve used to estimate expected days on therapy. **RESULTS:** A total of 9124 patients met inclusion criteria (LAT, n = 5816; BIM, n = 1665; TRAV, n = 1643). Relative risk of discontinuing index prostaglandin over first 2 years was 8.3% higher for BIM ($p = 0.016$) and 24.4% higher for TRAV ($p < 0.001$). Within the first 720 days, expected days of uninterrupted, continuous therapy were estimated as 245 for LAT, 226

for BIM, and 203 for TRAV. The mean drug cost (AWP) was estimated from actual claims as LAT, $301 (95% CI: $293-$309); BIM: $364 (95% CI: $344-$384); TRAV: $278 (95% CI: $263-$294). Compared to TRAV, incremental cost effectiveness ratio of LAT was $0.56 and of BIM was $3.91 per additional day of uninterrupted therapy. **CONCLUSION:** Patients do not remain on ocular prostaglandins longer than six to seven months before therapy interruption/discontinuation. Patients using LAT stayed on therapy longer than those using BIM or TRAV and at a lower cost per additional day of therapy than BIM.

PSS9

A COST-EFFECTIVENESS ANALYSIS OF TNF-ALPHA INHIBITORS IN COMPARISON TO OTHER STRATEGIES IN THE TREATMENT OF MODERATE-TO-SEVERE PSORIASIS: A DECISION ANALYSIS MODEL

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OBJECTIVE: In comparison to traditional treatment options, TNF-á inhibitors have shown promise in increasing the clearance of psoriatic lesions and improving the quality-of-life of patients with moderate-to-severe psoriasis. They are however associated with higher costs and side-effects. The study objective was to compare the cost-effectiveness of TNF-á inhibitors to other psoriasis treatment strategies. **METHODS:** The cost-effectiveness of ten treatment options from three drug classes- TNF- á inhibitors, systemic therapies and phototherapy- were evaluated using a decision analysis model constructed using DATA Treeage. The probabilities of success were obtained from PASI-75 scores from published clinical trials. The annual drug costs were obtained from the Drug Topics Red Book and published clinical trials. Additional costs associated with treatment, which included annual pharmacy costs and costs for professional and institutional services, were obtained from published reports. Incremental cost effectiveness ratios (ICERs) were calculated for additional cost divided by incremental PASI-75 values, and were estimated relative to the drug with the lowest cost. Multiple sensitivity analyses were performed to determine the robustness of the findings. **RESULTS:** Phototherapy was found to be the most cost-effective treatment option with an ICER of $16,435.89/PASI-75, relative to systemic therapy. The most cost-effective TNF-á inhibitor was infliximab, with an ICER of $15,733/PASI-75, relative to adalimumab. Infliximab had the highest drug acquisition cost ($21,250) among the 10 treatment strategies. While Goekerman therapy with a PASI-75 score of 100 had the highest clinical effectiveness among all the treatment strategies examined, the more effective TNF-á inhibitor was infliximab, with a PASI-75 score of 82.3. Sensitivity analysis indicated that the results were affected by the model assumptions. **CONCLUSION:** Thus, phototherapy was found to be the more cost-effective treatment option in this analysis. It is expected that the cost of TNF-á inhibitors will be lower in the future.

PSS10

COST-EFFECTIVENESS OF ANTI VEGF THERAPIES FOR WET AGE-RELATED MACULAR DEGENERATION—AMD IN BRAZIL: THE PRIVATE PAYER PERSPECTIVE

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OBJECTIVE: To determine the cost-effectiveness ratio for quarterly injections of Ranizumab in the treatment of Wet AMD, in Brazilian HMOs scenario. **METHODS:** A cost-effectiveness analysis from the private payers perspective, with a time horizon of five years were conducted. A decision tree with a Markov chain considering the probabilities of increasing, decreasing or maintaining visual acuity (VA) through five health states based on VA from 20/40 to 20/400, were performed. Study comparators examined were Ranibizumab (RAN), and Pegaptanib Sodium (PEG). The clinical aspects regarding benefits (Vision Year Gained) and probabilities of transition data were extract from a meta-analysis of randomized clinical trials for the alternatives. Treatment costs including adverse events were collected from private payers reimbursement reference list for professional, procedures and diagnostics fees and the drugs costs were collected from manufactures price list. Costs and benefits were validated by a panel of Brazilian specialists through the Delphi technique. The discounting rate was 3% for costs and benefits, the results were converted in US Dollars (R$ 1.8/USD 1.00). A one-way sensitivity analysis was performed. **RESULTS:** Patients using Ranibizumab get more benefits (RAN = 2.66 per vision year gained; PEG = 2.00 per vision year gained), with the lowest total cost per treatment (RAN = $29,653 USD; PEG = $30,093 USD) and the lowest cost per QALY (RAN = $11,148 USD/vision year gained; PEG = $15,046.5 USD/per vision year gained). Incremental analysis showed Ranibizumab to be the dominant alternative. Net benefits are greater with Ranibizumab independent of willingness to pay. The sensitivity analysis on efficiency and costs of Ranibizumab results show that the results are sensitive to the type of lesion treated. **CONCLUSION:** Ranibizumab is the dominant therapy; it offers better benefits in vision years gained at the lowest cost. The results are sensitive to the type of lesion treated, showing the need of guidelines to assure the best resource allocation.

PSS11

A COST-EFFECTIVENESS ANALYSIS OF BRIMONIDINE/TIMOLOL

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OBJECTIVE: To determine the incremental cost-effectiveness of brimonidine/timolol versus dorzolamide/timolol for lowering intraocular pressure (IOP). **METHODS:** A cost-effectiveness analysis was performed using clinical data from 2 investigator-masked, randomized, 3-month, parallel-comparison studies performed at 10 sites. In a post-hoc analysis of those patients receiving monotherapy treatment for IOP lowering (either brimonidine/timolol or dorzolamide/timolol) for three months, the proportion of patients at various IOP levels were calculated and statistically compared. A three month supply of each drug was calculated based on their respective WAC price and bottle size (5 ML brimonidine/timolol and 10 ML dorzolamide/timolol). The incremental cost-effectiveness ratio (ICER) was calculated as the difference in drug cost divided by the difference in the percentage of patients meeting the IOP threshold at three months between brimonidine/timolol and dorzolamide/timolol. **RESULTS:** A 3-month supply of brimonidine/timolol and dorzolamide/timolol were $169.83 and $154.40, respectively yielding a cost difference of $15.44. The proportion of patients at lower IOP thresholds was consistantly higher with brimonidine/timolol compared to dorzolamide/timolol resulting in a statistically significant incremental benefit for the thresholds from less than 17mmHg to less than 12mmHg. The associated ICER s for those thresholds range from $55.12–$85.75 per the percentage of patients reaching the IOP threshold. **CONCLUSION:** We calculated brimondine/timolol to be more cost-effective than dorzolamide/timolol. Given the importance of achieving target IOP, both cost and effectiveness should be considered when evaluating combination therapies for glaucoma.

PSS12

COST-EFFECTIVENESS ANALYSIS OF BEVACIZUMAB AND RANIBIZUMAB IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION (AMD): A CLINICAL AND ECONOMIC COMPARISON OF TWO VASCULAR ENDOTHELIAL GROWTH FACTOR INHIBITOR TREATMENTS

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OBJECTIVE: To evaluate the cost-effectiveness of intravitreal bevacizumab to ranibizumab in patients with neovascular AMD. **METHODS:** A Markov Model was constructed to evaluate incremental cost-effectiveness ratios (ICER, $/quality-adjusted life years (QALY)) between bevacizumab and ranibizumab. Transitional probabilities for ranibizumab were extrapolated from two published trials, while bevacizumab probabilities were derived using a weighted mean average of institutional clinical outcome data as well as published studies. Utility values were obtained from a published source. Mortality rates were determined from the Centers for Disease Control (CDC) 2003 Life Tables. A payer perspective was taken with resource utilization and total direct costs estimated using the Centers for Medicare and Medicaid Services and VASDHS Decision Support System cost data. One-thousand patients with a baseline age of 65 and AMD diagnosis were simulated through the model for 20 years. Sensitivity analyses were performed using univariate and probabilistic sensitivity analysis (PSA) on all costs, transition probabilities and utility scores. Utilities and transitional probabilities were subject to a sensitivity analysis using beta distribution and cost by gamma distribution. An acceptability curve was calculated to determine the probability of cost-effectiveness of bevacizumab to ranibizumab. **RESULTS:** The average cost-effectiveness ratio (CER) for bevacizumab was $2,454 per QALY compared to $12,327 per QALY for ranibizumab. The ICER for ranibizumab was $258,355 for each additional QALY gained. The univariate analysis determined the two treatments were sensitive to drug cost. The break even point for equivalent CER was $208 for ranibizumab (varying drug costs) and $2399 for bevacizumab (varying drug costs). The PSA revealed an 89.8% probability of bevacizumab being more cost-effective with a Willingness-to-Pay (WTP). **CONCLUSION:** Based on a WTP defined at $50,000 per QALY, bevacizumab was more cost-effective than ranibizumab 89.8% of the time due to lower acquisition costs.

PSS13

COST–EFFECTIVE ANALYSIS OF PEGAPTANIB (MACUGEN®) AS COMPARED WITH RANIBIZUMAB (LUCENTIS®) FOR TREATING IN AGE–RELATED MACULAR DEGENERATION (AMD)

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OBJECTIVE: The purpose of the research was to conduct a cost-effectiveness model in order to analyze the value of Pegaptanib and Ranibizumab on the basis of the information and resources from the previous studies. **METHODS:** The costs of these modalities of AMD were calculated from published sources. The total costs included consumptions of medical resources and non-medical resources for AMD treatment. The annual unit drug costs were collected from the Red Book 2007 and were multiplied by administrations per year. The efficacy was defined as the loss of fewer than 15 letters from baseline visual acuity within a year with recommendation dosage. The analysis model was compared with placebo. We calculated Incremental Cost Effectiveness Ratio (ICER) and plotted the cost-effectiveness result. **RESULTS:** With a basic decision analysis, considering the probability and costs of the three treatment options, the base estimate of one year of total cost was $13,066 per person from the pegaptanib treatment, and $31,564 for ranibizumab. The total expected cost for placebo was $3152. The result in the ICER model shows that pegaptanib costs $10,746 per year to get only about 12% improvement in effectiveness compared to placebo, while ranibizumab costs $29,244 to gain about 37% improvement over placebo. Thus, compared to placebo, the ICER is $934,433 per unit increase in effectiveness when patients are treated by pegaptanib, and $80,121 in ranibizumab. **CONCLUSION:** Based on this cost-effectiveness model, both anti-VEGF agents are costly. Ranibizumab has higher probability of success versus in pegaptanib therapy (0.7 for pegaptanib vs. 0.95 for ranibizumab). However, the price of ranibizumab is much higher than pegaptanib. The ICER model suggests that ranibizumab maybe the first consideration of anti-VEGF drugs because based on this model, the ICER of ranibizumab is lower than pegaptanib. In future studies, there should be more investigations of quality-of-life factors.

PSS14

COST-EFFECTIVENESS OF THE TREATMENT FOR MODERATE TO SEVERE PSORIASIS IN MEXICO: INFLIXIMAB, ETANERCEPT AND EFALIZUMAB

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OBJECTIVE: Psoriasis is a dermatological disease with major consequences on the quality of life of patients. Biological treatments for this disease have an effectiveness which is equivalent to that of conventional drugs with fewer side effects. The objective of this analysis was to evaluate the cost-effectiveness of the treatment for moderate to severe psoriasis from an institutional perspective in Mexico. **METHODS:** To compare the cost and the effectiveness, a decision tree model was structured with a temporary horizon of 12 weeks. Only costs per drug were considered for this analysis, as the rest of the costs are similar for institutional buyers. Comparators: infliximab 5mg/kg given at weeks 0, 2, and 6; etanercept 25 mg twice weekly, etanercept 50 mg twice weekly and efalizumab 1mg/kg weekly. Effectiveness measure: percentage of patients with a PASI 75 (Psoriasis Area and Severity Index) response. Costs were estimated using prices of 2007, and an exchange rate of x pesos/dollar was used. Costs were estimated using 2007 prices and are expressed in USD (exchange rate of 10.93 pesos per USD). **RESULTS:** Costs expected per treatment type are: $6987 infliximab, $6422.70 efalizumab, $5555.40 etanercept 50 mg and $2777.70 etanercept 25 mg. The percentage of patients achieving a PASI 75 response per treatment type is: 84% for infliximab, 49% for etanercept 50 mg, 33% for etanercept 25 mg and 28% for efalizumab. The following ICERs were obtained for infliximab: $1007.70 vs. efalizumab, $8253.50 vs. etanercept 25 mg and $4090.50 vs. etanercept 50 mg. In the three cases, ICERs are less than three times the GDP per capita in Mexico. **CONCLUSION:** Infliximab is a cost-effective drug for the treatment of moderate to severe psoriasis.

PSS15

THE COST-EFFECTIVENESS OF RANIBIZUMAB (LUCENTIS®) IN TREATING PATIENTS WITH PREDOMINANTLY CLASSIC, MINIMALLY CLASSIC, AND OCCULT NEOVASCULAR AGE-RELATED MACULAR DEGENERATION (AMD)

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OBJECTIVE: Using a societal perspective, to evaluate the cost-effectiveness of Lucentis compared to Visudyne Photodynamic

Therapy (PDT) and best supportive care in treating patients with AMD. **METHODS:** A cost-effectiveness model was created using outcome data from the ANCHOR and MARINA clinical trials. The model operates on quarterly cycles and a 10-year time horizon. At baseline, Early Treatment Diabetic Retinopathy Study (ETDRS) visual acuity was 55 and average age was 77 in the base case. Cost of services were obtained from the CMS website, drug costs were obtained from ASP prices, and visual impairment costs were based on a prospective study by Schmier and colleagues. All costs were inflated to 2007 dollars using the Health Services CPI. Utility values were based on a time-tradeoff analysis conducted by Brown and colleagues. A 3% discount rate was used for both costs and QALYs. **RESULTS:** For predominantly classic AMD, Lucentis 0.5 mg was a dominant strategy compared to PDT and the Incremental Cost-Effectiveness Ratio (ICER) for Lucentis 0.5 mg relative to Lucentis 0.3 mg was $62,905/QALY. For patients with minimally classic or occult AMD, Lucentis 0.5 mg was a dominant strategy compared to best supportive care and the ICER for Lucentis 0.5 mg relative to Lucentis 0.3 mg was $322,367/QALY. Influential variables driving the results in this analysis include a patient's baseline visual acuity, costs associated with visual impairment, and the price of Lucentis. **CONCLUSION:** Despite its high treatment costs, Lucentis is a dominant strategy compared to PDT and best supportive care primarily because it prevents patients from reaching the highly expensive state of blindness. Treating AMD patients with Lucentis before they reach a legal blindness state can generate considerable cost-savings to society.

PSS16

A COST-EFFECTIVENESS ANALYSIS OF TWO TOPICAL OPHTHALMIC ANTIBIOTIC SOLUTIONS INDICATED FOR THE TREATMENT OF BACTERIAL CONJUNCTIVITIS

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OBJECTIVE: The objective of this study was to compare the cost-effectiveness of moxifloxacin 5 mg/ml ophthalmic solution (MF) to polymyxin B 10,000 units/trimethoprim 1mg/ml ophthalmic solution (PT) for the treatment of bacterial conjunctivitis (BC). **METHODS:** Physician-assessed BC early clinical cure rates were taken on day-2 of 7 day therapy from a multi-site, randomized, double-masked study comparing MF to PT. The clinical cure rates were used to calculate a number-needed-to-treat (NNT) estimate for the most efficacious alternative. NNT was then used as the measure of effect in an incremental cost-effectiveness analysis. Only the direct costs of drug therapy were considered in the economic analysis. The drug costs were derived from a standard reference source. The economic perspective was that of the payer. No cost discounting was performed due to the short time horizon of BC therapy. **RESULTS:** Thirty-two subjects (47 eyes) received MF and 30 subjects (43 eyes) received PT. At baseline there were no statistical differences in BC severity or duration, patient age, gender or ethnicity between the two treatment groups. After 2 days of topical ophthalmic antibiotic therapy, 83.3% of the MF patients were deemed clinically cured compared to 43.2% of the PT patients. The NTT for the MF group was estimated at 2.5. The MF incremental cost-effectiveness ratio (ICER), the cost of curing one more BC patient earlier, was estimated at $37.28. **CONCLUSION:** MF cures BC sooner than PT thus reducing the duration of illness experienced by BC patients. Since MF is a newer and more potent antibiotic than PT, it incurs additional costs. The incremental cost to obtain the additional benefit of an earlier cure from MF therapy is relatively small (< $0). Further research may demonstrate a lower cost-effectiveness ratio from MF therapy if the indirect costs of BC are considered.

PSS17

ECONOMIC EVALUATION OF MELOXICAM SOLUTION 0.030% RESPECT AN OPHTHALMIC SODIUM DICLOFENAC SOLUTION 0.1% ON THE EYES OF PATIENTS WHO UNDERWENT TO LASIK LASER EYE SURGERY AT THE IMMEDIATELY POST-OPERATIVE TIME

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OBJECTIVE: Compare the effectiveness and costs of the administration of an ophthalmic Meloxicam solution 0.030% with a sodium Diclofenac solution 0.1% on the eyes of patients who underwent to Lasik laser eye surgery at the immediately post-operative time. **METHODS:** Adopting the perspective of a health care payer, we developed a cost-effectiveness analysis. Temporary horizon was three months. A discounting rate was not used. The source of information of cost and effectiveness was a randomized clinical trial. The perspective was from Mexican Institute of social Security. The method used for cost was microcosting and case mix. The effectiveness was measured with different end points. The cost-effectiveness analysis was made for those variables with statistically significant differences. The evaluation was made with incremental analysis and net benefits approach. The sensitivity analyses was of one way, two ways and probabilistic. **RESULTS:** The highest cost was with Diclofenac solution (USD$9.29) that was 5.9% higher than Meloxicam ($8.74) the measured efficacy named Flare and ciliary injection was superior with Meloxicam compared with Diclofenac 148 vs. 149 for Flare and 150 vs 153 respectively ($p < 0.0001$) for ciliary injection, the cost for success obtained with Meloxicam was of USD$8.74 and USD$9.29 with Diclofenac, the incremental analysis show that Meloxicam is dominant over Diclofenac. Health Net Benefits, Monetary Net Benefits and the Acceptability curves were favourable for Meloxicam independent the willingness to pay. **CONCLUSION:** The Meloxicam solution was dominant over Diclofenac in the application on the ocular surface in patients who underwent to Lasik laser eye surgery in the immediate postoperative period. The sensitivity analysis was a robust basis for the study.

PSS18

COST-EFFECTIVENESS OF THE BIOLOGIC AGENTS UTILIZED IN THE TREATMENT OF CHRONIC PLAQUE PSORIASIS: A MARKOV MODEL

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OBJECTIVE: It is the objective of this study to estimate the cost per treatment success over a one-year timeframe of the five biologic therapies used to treat patients with moderate to severe psoriasis in the United States. **METHODS:** A Markov model was developed to compare the relative cost components in psoriasis treatment with biologics. Drug costs were based on wholesale acquisition cost with consideration of net contractual discounts and patient co-share or co-payment. Clinical efficacy, for both short-term (12 weeks) and longer-term (24+ weeks) treatment, was based on the published peer-reviewed literature. The primary economic endpoint was the cost of therapy (defined as the cost of drugs, laboratory, infusion, and professional services) per 75% improvement from baseline in the Psoriasis Area and Severity Index score (PASI 75) achieved. Analysis was conducted for each

of the biologic agents currently utilized in the United States for this indication (adalimumab, alefacept, efalizumab, etanercept and infliximab). Model results were displayed for a time horizon of one year based on a switch to an appropriate alternate biologic agent in the event of suboptimal clinical response. Multiple one-way sensitivity analyses were conducted. **RESULTS:** Across all the biologics evaluated there are significant differences in PASI 75 response at 12 weeks versus longer term (ranging from 59% to 20% across the agents at the end of one quarter of treatment and at the end of four quarters of treatment, respectively). The cost per PASI 75 was observed to be $26,460, $31,191, $28,217, $30,544 and $30,983 for therapy initiated with adalimumab, alefacept, efalizumab, etanercept and infliximab, respectively. **CONCLUSION:** While there are significant differences in the cost of the studied biologic agents initially, the CE results tend to converge over the first year of treatment. Further research needs to be conducted to evaluate the CE of treatment beyond a one-year period.

PSS19

A PHARMACOECONOMIC EVALUATION OF PEGAPTANIB FOR THE MANAGEMENT OF AGE-RELATED MACULAR DEGENERATION (AMD) IN MEXICO

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OBJECTIVE: In western countries AMD is considered one of the most important causes of blindness among persons over 65 years old. The purpose of this study was to determine the cost-effectiveness of pegaptanib vs verteporfin in the treatment of AMD from the health care payer's perspective. **METHODS:** A seven-stage stochastic Markov model based on visual acuity (VA) in the better seeing-eye (stages: with clinical benefit, VA>20/40; VA:20/40–20/; VA:20/100–20/160; VA:20/200–20/500; VA < 20/500 and legal blindness) was performed during a five-year period. Effectiveness measure used in the assessment was the probability to gain at least one-level of VA at the end of the follow up period. Effectiveness data was obtained from international published literature. Comparators used in the model were pegaptanib 0.3 mg (8 sessions) and verteporfin 15 mg (10 sessions). Resource use and cost data were obtained from hospital records and official institutional databases from the Social Security Mexican Institute (IMSS). Costs and health outcomes were discounted with a 3% annual rate. The model was calibrated. Probabilistic sensitivity analyses were performed to determine the results robustness. **RESULTS:** Patients who received pegaptanib experienced a higher probability to gain at least one level of VA(57.4%; CI95%:52.26%–62.54%) compared with patients treated with verteporfin (13.8%; IC95%:10.61%–16.99%) considering an initial VA state of ">20/40"($p < 0.001$). Mean total costs per patient were higher in patients who received pegaptanib compared to those who received verteporfin (US$6749; CI95%:US$6401–US$7096 vs. US$6311 CI95%:US$5948–US$6674; respectively). The ICER in patients receiving pegaptanib compared to those receiving verteporfin was US$1004 (CI95% US$926–US$1090). Sensitivity analyses found that pegaptanib is a cost-saving strategy when the numbers of sessions given to the patients are less than three. **CONCLUSION:** The results show that in Mexico, pegaptanib is a cost-effective therapy for AMD when is compared with verteporfin. These results should be taken into account by Mexican decision makers in the management of patients with AMD.

PSS20

COST-EFFECTIVENESS OF TOBRADEX VERSUS ZYLET FOR THE TREATMENT OF BLEPHAROKERATOCONJUNCTIVITIS

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OBJECTIVE: Blepharokeratoconjunctivitis (BKC) is a disease characterized by inflammation of the eye lid, conjunctiva and cornea and is typically treated empirically with topical antibiotic/anti-inflammatory agents. The purpose of this study was to compare the cost-effectiveness of tobramycin 0.3%/loteprednol 0.5%, (Zylet) to tobramycin 0.3%/dexamethasone 0.1%, (Tobradex) for the rapid control of BKC. **METHODS:** Effectiveness data for this analysis came from a randomized, double-masked, parallel-group study of forty patients with BKC. Patients were treated with either Zylet™ or Tobradex® administered twice daily in the test eye. The measure of effectiveness used was the change in a clinical composite score of four BKC components: blepharitis, ocular discharge, conjunctivitis, and corneal punctuate epithelial keratopathy (PEK). Each clinical component was graded on a scale of 0 (minimum) to three (extensive) and assessed at baseline and on day 4 (±1) of therapy. Five different pharmacy chains were surveyed as to their prices for a 5ml bottle of both Tobradex and Zylet. The average price of each agent was used as the cost measure in the analysis. A probabilistic sensitivity analysis evaluated the robustness of the economic outcomes. The economic perspective was that of the payer. Due to the short time span no cost discounting was performed. **RESULTS:** Reductions in the BKC clinical composite scores at the day-4 assessment were calculated at 4.5 (SD ± 1.7) versus 7.1 (SD ± 1.2) for the Zylet and Tobradex groups, respectively. The average retail costs for Zylet and Tobradex were $96.45 (SD ± $5.26) and $71.75 (SD ± $5.48) respectively. The cost-effectiveness ratios for Zylet and Tobradex therapy were $21.43 and $10.10, respectively. The cost-effectiveness results remained consistent using the probabilistic sensitivity distributions tested. **CONCLUSION:** Tobradex economically dominated Zylet for the rapid control of BKC because it was both less costly and more effective.

PSS21

COST OF ILLNESS OF WORK-RELATED CHRONIC HAND ECZEMA IN GERMANY

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OBJECTIVE: In Germany, 26% of reported and 36% (= 8'460) of confirmed work-related diseases are skin-related, in over 90% of these cases hands are affected. However, there is a lack on comprehensive information on costs associated with chronic hand eczema (CHE). The objective of this study was to assess the direct and indirect costs of CHE. **METHODS:** Data on 151 Patients with occupational skin diseases entering a special rehabilitation program were assessed for the preceding 12 months. Data were derived from patient records and direct patient information. Descriptive analyses from a societal perspective was performed for all patients and by physician-rated severity (severity group 1: no/mild; group 2: moderate/severe). DGUV (German Statutory Accident Insurance) was the payer for all patients. **RESULTS:** Mean age was 44.9 years, 64.9% of patients were male. Total mean annual costs amounted to €8.160 (95% CI: 6.395–9.925) per patient. Indirect costs represented 75% of total costs, in-patient-rehabilitation 14%. Each other factor (out-patient services, diagnostics, drugs, complementary therapies, out-of-pocket expenses) contributed < 3% to overall costs. Disease severity influenced QoL significantly (DLQI-score of severity group 1: 7.9,

95% CI 6.5–9.3; group 2: 12.9, CI 11.3–14.4) but not direct treatment costs (€2.033 vs. €1.991 respectively). There was a trend for higher indirect costs in patients in severity group 2 (€5.120, CI €2.717–€7.523 vs. €6.796, CI €3997–€9596). **CONCLUSION:** Total annual costs of new cases covered by DGUV with confirmed occupational etiology is estimated to amount to €55 million, considering also patients with suspected occupational etiology increases costs to €96 million. Total costs of prevalent cases can be expected to amount to multiples of this figure. Disease severity, although impacting patient's QoL, has little influence on treatment patterns and costs. Indirect costs, by far the most important cost factor, tend to increase with severity.

PSS22

THE ANNUAL COST OF BACTERIAL CONJUNCTIVITIS IN THE UNITED STATES: EVIDENCE FROM AN ECONOMIC MODELLING APPROACH

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OBJECTIVE: The aim of this study was to determine the annual direct costs of treating bacterial conjunctivitis (BC) in the United States. **METHODS:** A systematic review of the medical literature was supplemented with information from detailed physician interviews on resource utilization associated with bacterial conjunctivitis therapy in the United States. Data on the annual incidence of BC was obtained from an analysis of the National Ambulatory Medical Care Survey (NAMCS) database for the year 2005. Cost estimates for resource utilization such as physician visits and prescription drugs were taken from standard cost reference sources. Due to the acute nature of BC no cost discounting was performed. The economic perspective presented is that of the payer. All costs are expressed in 2007 USD. **RESULTS:** The number of BC cases in the United States for 2005 was estimated at 4,016,544, yielding an estimated annual incidence rate of 135.46 per 10,000. Base-case analysis estimated the direct cost of treating patients with bacterial conjunctivitis in the United States at US$765,063,696. One-way sensitivity analysis assuming either a 20% variation in the annual incidence of bacterial conjunctivitis or treatment costs generated a cost range of US$612,050,957 to US$918,076,435. Two-way sensitivity analysis assuming a 20% variation in both the annual incidence of bacterial conjunctivitis and treatment costs occurring simultaneously resulted in an estimate cost range of US$489,627,912 to US$1,101,711,002. **CONCLUSION:** This study reports the first known estimate of the direct costs of treating and managing patients with bacterial conjunctivitis in the United States. The economic burden of this condition is substantial. Our estimates represent conservative amounts because indirect costs were not considered in the analysis. This information may prove useful to decision makers with respect to the adequate allocation of health care resources necessary to address the economic burden of BC in the United States.

PSS23

PROACTIVE USE OF TACROLIMUS 0.03% OINTMENT IN CHILDREN WITH MODERATE OR SEVERE ATOPIC DERMATITIS—OUTCOMES AND COST

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OBJECTIVE: To describe treatment outcomes and to evaluate resource utilization and associated cost of proactive use of tacrolimus ointment (PU) versus standard use of tacrolimus ointment (SU) in children with moderate or severe atopic dermatitis (AD) over a period of 12 months. **METHODS:** A pan-European, phase III multicentre randomized clinical trial FG-506-06-41 'CONTROL' was conducted. After randomization patients (2–15 years old) applied tacrolimus 0.03% ointment (PU) or vehicle ointment (SU) at the usually affected areas twice per week for 12 months. Disease exacerbations were treated using open-label tacrolimus 0.03% ointment twice daily. Resource utilization data (e.g. for ointments, drugs, doctor consultations, out-of-pocket-expenses, absence from school) were collected alongside the clinical trial by caregiver questionnaires, prospectively. Costs of pooled resource data were determined using German unit cost data. Direct and indirect costs were considered from third party payer (TPP), caregiver, and societal perspectives. **RESULTS:** 146 patients were included in the analysis, 75 PU patients (53% moderately affected) and 71 SU patients (51% moderately affected). Mean age of patients was 7 years (SD 3.9/4.5) in both treatment groups. Mean + SD body surface area in both groups was 1.0 + 0.4 m2. The mean number of disease exacerbations requiring substantial therapeutic intervention in the PU and SU arms was 1.7 + 2.2 and 3.4 + 3.2 ($p < 0.001$), respectively. In patients with severe AD the mean total annual cost per patient was higher in the standard regimen €2,002 + 2,315 compared to PU €1,571 + 1,122. In the subgroup of severely affected 2–6 year-old patients these cost differences were larger in favour of tacrolimus ointment: €1,465 + 837 (PU) versus €2,253 + 2,855 (SU). In moderately affected patients there were no cost differences: €1,233 + 1,507 (PU) and €1,136 + 1,494 (SU). **CONCLUSION:** Proactive treatment with tacrolimus 0.03% ointment is more effective and leads to cost savings in comparison to standard treatment with tacrolimus 0.03% ointment, especially in children with severe AD.

PSS24

TRENDS IN EPISODE OF TREATMENT COSTS OF ACNE ACROSS THE UNITED STATES

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OBJECTIVE: Acne is a common dermatological condition and impacts millions of adolescent and adult lives in the United States (US). The purpose of this study was to accurately quantify the cost per episode for the treatment of acne in the US and to examine disparities in treatment costs. **METHODS:** Information was collected from the PharMetrics Integrated Patient-centric Database, a large collection of administrative claims in the year 2004. The database included more than 80 public and private health care plans included in the database, representing approximately 9.6 million unique patients. Analysis was performed using the Total Resource Utilization (TRU) Benchmarks process, a descriptive methodology which organizes and separates information from the third-party database, into accessible benchmarks for comparison. **RESULTS:** There are many different drug treatment therapies that can be used to treat acne which can range in price dramatically. The average acne episode cost $777.19, with pharmacy costs representing 59.5% and outpatient costs representing 39.1%. Inpatient services were reported in only 0.1% of acne episodes and were associated with $9,297.56 in costs. For patients diagnosed with acne, pharmacy visits represented 85.5% of all episodes. Average outpatient costs were $303.99, attributable to 3.73 outpatient services with 2.18 of these services were physician visits. The lowest average total episode costs were found in the South-central region and were $624.05. The highest

average total episode costs were found in the Northeast region and were $856.50. Average outpatient costs in the Northeast region were the highest in the country at $377.64—the range for other regions was $240.70-$285.93. **CONCLUSION:** Much diversity exists in the cost of treating acne across different segments of the United States. Future research should be done to determine what the underlying factors are when accounting for the discrepancies in cost per episode of acne.

PSS25

PHARMACOECONOMIC STUDY OF WET AGE-RELATED MACULAR DEGENERATION (AND)TREATMENT IN MEXICO

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OBJECTIVE: To determine the most cost-effective Wet AMD treatment alternative in Mexico. **METHODS:** A decision tree with Bayesian approach and a Markov chain considering the probabilities of increasing, decreasing or maintaining visual acuity (VA) through eight health states based on VA from 20/20 to 20/400 due to the use of a pharmacological alternative, with a time horizon of 5 years and institutional perspective, were performed. The discounting rate was three percent for costs and benefits. Adverse events and their treatment costs, for every alternative were considered; costs, benefits and probabilities of transition data were estimated from the meta-analysis with available published literature, including the MARINA and ANCHOR studies, validated by a panel of Mexican experts through the Delphi technique. Study comparators examined were Ranibizumab (RAN), photodynamic therapy with Verteporfin (PDTV), pegaptanib sodium (PEG) and standard care (STD). Sensitivity analysis was one-way and probabilistic (acceptability curve, analysis of components for the ellipse method). **RESULTS:** Patients using Ranibizumab get more benefits (RAN = 2.71 QALY; PDTV = 2.03 QALY; PEG = 1.89 QALY; STD = 1.78 QALY), with the lowest total cost per treatment (RAN = $43,984 USD; STD = $63,531 USD; PDTV = $83,546 USD; PEG = $92,247 USD) and the lowest cost per QALY (RAN = $16,257 USD/QALY; STD = $35,749 USD/QALY; PDTV = $41,074 USD/QALY; PEG = $48,263 USD/QALY). Incremental analysis showed Ranibizumab to be the dominant alternative. Net benefits are greater with Ranibizumab independent of willingness to pay. Acceptability curves showed absolute superiority for Ranibizumab. The confidence interval of 95% with the ellipse method showed Ranibizumab to be dominant in 95% of the cases with a willingness to pay of $924USD. The sensitivity analysis on efficiency and costs of Ranibizumab in an interval of ±50%, was robust with the base analysis. **CONCLUSION:** Ranibizumab is the most cost-effective Wet AMD treatment alternative; it offers the greatest benefits with the lowest cost. Sensitivity analyses showed the robustness of the base study.

PSS26

USING COST-UTILITY ANALYSIS TO ASSESS THE BUDGET IMPACT OF BIOLOGICS FOR THE TREATMENT OF PSORIASIS (PSO)

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OBJECTIVE: Measure incremental cost-utility and budget impact of etanercept vs. infliximab in moderate-to-severe PSO with >10% body surface area involvement. **METHODS:** We used a Markov decision analysis to compare 2 strategies for PSO: etanercept label dose (50 mg BIW x12 wks, then 25 mg BIW); and infliximab label dose (5 mg/kg IV at wks 0, 2, and 6, then 5mg/kg Q8W). We derived 60 probability estimates through systematic review of the literature and labels, varying each of these estimates in each sensitivity analysis. We adopted an MCO payer's perspective, and included cost estimates for a comprehensive list of related resources as determined by Medicare and the Red Book. Qulaity-adjusted life-years (QALYs) were estimated by applying utilities from the literature to reported efficacy as measured by PASI scores. We calculated the incremental cost per QALY gained and incremental per-member per month (PMPM) budget impact in a hypothetical MCO of 1 million lives (assuming a 1% prevalence of moderate-to-severe PSO). We discounted costs and effects at 3% per year over a 2-year time horizon. **RESULTS:** In the base-case analysis, etanercept yielded 1.68 QALYs at a total cost of $28,442 over the 2-year horizon, and infliximab yielded 1.78 QALYs at a cost of $49,906. Compared to etanercept, infliximab cost an incremental $214,640/QALY-gained. In sensitivity analysis, infliximab dominated etanercept when the cost of infliximab fell by 55% (from $691 to $312 per 100 mg vial), or when the cost of etanercept increased 83% (from $187 to $342 per 25 mg vial). In budget impact modeling, infliximab cost an incremental $8.94 PMPM vs. etanercept. **CONCLUSION:** Decision analysis was used to model relative cost-utility and budget impact of biologic therapies in PSO—a chronic health condition. The incremental cost and budget impact of infliximab vs etanercept exceeds standard benchmarks in the absence of comparative effectiveness from head to head trials.

SENSORY SYSTEMS DISORDERS—
Patient-Reported Outcomes

PSS27

USING MEDICATION POSSESSION AND DAYS OF COVERAGE ON THERAPY TO ASSESS PERSISTENCE WITH PROSTAGLANDIN OCULAR HYPOTENSIVE THERAPY

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OBJECTIVE: To evaluate persistence among glaucoma patients with prostaglandin therapy during the first therapy year. **METHODS:** Patients with latanoprost (LAT), bimatoprost (BIM), or travoprost (TRAV) dispensed during January 1, 2004–December 31, 2004 were screened for inclusion (Ingenix managed care database). Index agent = first agent filled; index date = fill date; follow-up = 358 days. Patients excluded if: age < 40 years; not continuously enrolled for 180 days before/358 days after index date; had ocular hypotensive dispensed or had no glaucoma diagnosis within 180 days before index date. First year persistence measures: whether last fill had sufficient days supply to achieve medication possession at year's end; number of days for which index agent was available (days covered). Possible inconsistencies between quantity dispensed and reported days supply addressed by multiplying claimed days supply with alternative measures from the literature. Models of associations between index agent and medication possession (logistic regression) and days covered (linear regression) were adjusted for gender, age, and previous ocular hypertension diagnosis. **RESULTS:** A total of 7783 patients met inclusion criteria (LAT, n = 4994; BIM, n = 1464; TRAV, n = 1415). Overall medi-

cation possession was 28% and number of days covered was 131 using unadjusted days supply estimate. Compared to LAT, odds of achieving medication possession at year's end were 26%–34% lower for BIM and 34%–36% lower for TRAV ($p \leq 0.001$ for all comparisons for each imputation). Days covered were 21–29 days lower for BIM and 33–42 days lower for TRAV ($p \leq 0.001$ for all comparisons). Failure to refill a 2.5 mL size bottle within the first 90 days had 90%–99% specificity for predicting < 75% days covered. **CONCLUSION:** Persistence with ocular prostaglandins remains a concern. LAT users were more likely to achieve medication possession and had more days covered during the first therapy year than those treated with BIM or TRAV. Failure to refill the index agent within the initial 90 days predicted poor persistence.

PSS28

DISTANCE VISUAL ACUITY AS A MEASURE OF VISION FUNCTION—INSIGHT INTO THE ASSOCIATION OF ETDRS LETTERS AND SELF-REPORT IN SUBJECTS WITH NEOVASCULAR AGE-RELATED MACULAR DEGENERATION (NV-AMD)

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OBJECTIVE: To examine the relationship between distance visual acuity (DVA) and self-reported vision-related quality of life in NV-AMD subjects. **METHODS:** Baseline data from 113 subjects completing 30 weeks in the PERSPECTIVES study, a multicenter, multi-national 102-week clinical trial for the treatment of NV-AMD, were reviewed. Vision function of the better-seeing eye based on DVA (ETDRS letters at 2m), near vision (Bailey-Lovie logMAR scores at 25cm), reading speed (words/minute at 25cm), and contrast sensitivity (Pelli-Robson logMAR score at 1m) were all measured. Vision-related quality of life (VR-QOL) was collected using the National Eye Institute Visual Functioning Questionnaire 25 (NEI-VFQ). Correlations were tested using Pearson's R, $\alpha = 0.05$. **RESULTS:** Subject mean age was 74.0 years (±8.0); 67 (59%) were female; and 109 (97%) were white. DVA was significantly correlated with the three clinical measures of vision function ($p < 0.001$). DVA was also correlated with the NEI-VFQ Distance Vision domain ($p = 0.011$) but not significantly associated with the Near Vision domain ($p = 0.057$). With the exception of driving and color vision ($p = 0.426$ and $p = 0.135$), the remaining domain scores were significantly correlated with the DVA measure (range $p = 0.029$ to $p = 0.001$). **CONCLUSION:** Some differences in self-reported VR-QOL can be explained by DVA, while other effects on vision functioning are less clear. Therefore, it may be preferable to use more than one measure of vision function when assessing treatment effects.

PSS29

USTEKINUMAB IMPROVES DISEASE SPECIFIC HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH MODERATE TO SEVERE PSORIASIS: RESULTS WITH THE DERMATOLOGY LIFE QUALITY INDEX

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OBJECTIVE: To evaluate the effects of ustekinumab on disease specific HRQoL in psoriasis patients. **METHODS:** A total of 765 patients were enrolled in the PHOENIX I study. Patients were randomized 1:1:1 to receive placebo, ustekinumab 45 mg, or ustekinumab 90 mg. In the ustekinumab groups,patients received treatment at weeks 0,4,16, and every 12 weeks thereafter. Patients randomized to placebo at baseline crossed-over to receive either 45 mg or 90 mg of ustekinumab at week 12. Disease specific HRQoL was assessed using the Dermatology Life Quality Index (DLQI). **RESULTS:** Baseline DLQI scores were similar among treatment groups. The baseline mean (median) total DLQI score was 11.5 (10.0). At week 2, the combined ustekinumab group had significantly greater improvements ($p < 0.001$) from baseline in DLQI scores compared to the placebo group. All placebo-treated patients crossed over to receive ustekinumab at Week 12 and had comparable DLQI improvements to the groups originally randomized to receive ustekinumab. The mean (median) change from baseline score to week 12 was –8.0 (–6.0) for the 45 mg group and –8.7 (–7.0) for the 90 mg group, compared with –0.6 (0.0) for the placebo group. At week 12, the proportion of patients who achieved a clinically meaningful improvement (decrease of 5 or more points; Kimball et al, 2004) was 64.6% in the 45 mg group and 71.1% in the 90 mg group, compared to 17.9% in the placebo group. Improvements were also demonstrated by the statistically significant proportion of patients in the 45 and 90 mg ustekinumab groups who achieved a DLQI of 0 (32.7% and 34.0%, respectively), as compared to the proportion of patients in the placebo group (0.8%). **CONCLUSION:** Treatment with ustekinumab 45 mg or 90 mg resulted in significantly improved disease specific HRQoL compared with placebo in patients with moderate to severe psoriasis, as measured by the DLQI.

PSS30

USTEKINUMAB SIGNIFICANTLY IMPROVES QUALITY OF LIFE IN PATIENTS WITH PSORIASIS: RESULTS FROM A PHASE III STUDY

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OBJECTIVE: To report the impact of ustekinumab on quality of life(QOL)in psoriasis. **METHODS:** PHOENIX 2 was a multicenter,randomized, double-blind, placebo-controlled, trial in which 1230 psoriasis patients were randomized to receive subcutaneously administered ustekinumab (45or 90 mg 4 weeks apart, then q12 weeks thereafter) or placebo. Patients changed to receive 45 or 90 mg ustekinumab at Weeks 12 and 16. Impact on QOL, anxiety, depression, job performance, and work productivity were assessed using the Dermatology Life Quality Index (DLQI), Hospital Anxiety and Depression Scale (HADS), and Work Limitations Questionnaire(WLQ). **RESULTS:** DLQI improvements from baseline were apparent by Week 4 (6.9 for 45 mg and 7.0 for 90 mg versus 1.4 for placebo; each $p < 0.001$ versus placebo). At Week 12, improvement in DLQI was 9.3 and 10.0 in the 45 and 90 mg groups, compared to 0.5 for placebo(each $p < 0.001$ versus placebo). DLQI improvement was maintained through Week 24 (9.5 in 45 mg group and 10.3 in 90 mg group). Patients randomized to placebo experienced improvements in DLQI 12 weeks after changing to ustekinumab. At Week 12, 36.7%, and 39.1% of patients receiving 45 and 90mg, achieved a DLQI score of 0, indicating no impact of the disease on patients' QOL, compared with 1.0% receiving placebo(each $p < 0.001$ versus placebo). At Week 12, 71.8% of

patients receiving 45 mg and 76.9% of those receiving 90 mg experienced a reduction of 5 points in DLQI score, signifying an important difference, compared with 21.4% for placebo (each $p < 0.001$ versus placebo). All DLQI scores improved from baseline to Week 12 in each active treatment group compared with placebo (each $p < 0.001$ versus placebo). Improvements were observed in clinical parameters, HADS, and WLQ. **CONCLUSION:** Ustekinumab resulted in significant and clinically meaningful improvements in QOL within 1 month after starting treatment; improvements at Week 12 were maintained through Week 24. Improvements were also observed in anxiety, depression, and work limitations.

PSS31

ASSESSMENT OF QUALITY OF LIFE IN DAILY CLINICAL DERMATOLOGICAL ROUTINE: QUESTIONNAIRES AND CHECKLIST

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OBJECTIVE: Patient–reported outcome measures, in particular those evaluating health-related quality of life (HrQoL) , have been proposed as a mean of facilitating doctor-patient communication. While these measures are commonly included in clinical research studies, their use in clinical practice is still quite limited. Our objective is to assess HrQoL in a dermatological clinic daily routine and to develop an appropriate and effective reporting tool for health personnel. **METHODS:** First phase: patients were invited to complete the Skindex-29, GHQ-12, and SF-36 questionnaires. Scores were returned to the clinical staff. Second phase: the patients' medical records were reviewed to verify which issues (e.g., pain, itch, bleeding, sleep loss, functional limitations, fatigue) highlighted by the questionnaires were recorded/neglected by physicians. Third phase: we developed a check list (presence/absence) of symptoms, emotions or functional problems to be filled by health personnel to complete the routine clinical records. **RESULTS:** For 170 participants (63% males, 35% age > 64 years), feedback forms were provided within three hours from data collection. We analyzed data for 126 patients with the most common conditions: psoriasis (n = 40), dermatitis (n = 30), leg ulcers (n = 13), pemphigus (n = 22), cutaneous lymphoma (n = 21). Overall, sensitivity of medical records in identifying patients' problems ranged from zero for most issues (including sleep loss, sex life, bleeding), to 3% for burning, 10% for depression, 15% for pain, and 35% for itching. A 30-item checklist (a synthesis of the three questionnaires) was developed and tested in 100 patients who completed their Skindex-29 questionnaire. The sensitivity and specificity of physicians' records increased for each issue, ranging from 7% (humiliation) to 81% (itching). **CONCLUSION:** The routine assessment of HrQoL in dermatology is feasible. The checklist induced the staff to report on medical records often-neglected patients' problems. The checklist increased substantially the sensitivity of physicians in identifying patients' problems.

PSS32

QUALITY OF LIFE AND PSYCOLOGICAL DISTRESS IN PATIENT WITH CUTANEUOS LYMPHOMA

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OBJECTIVE: Cutaneous lymphomas may have a profound impact on patients' health-related quality of life (HRQoL) and psychological well-being. A detailed investigation of HRQoL, analyzing its correlation with clinical variables and biological parameters, has not been done before. **METHODS:** The study population consisted of patients with cutaneous T- cell (CTCL) or B-cell lymphoma (CBCL), consecutively recruited in the outpatient and the inpatient clinics of an Italian hospital. Data was collected using a dermatology-specific questionnaire, the Skindex-29 (symptoms, emotions, and functioning scales), and an oncology-specific questionnaire, the EORTC QLQ-C30 (15 scales, concerning physical and emotional aspects). **RESULTS:** Of 95 patients, there were 24 patients with CBCL, 59 with mycosis fungoides (MF), and 12 with Sézary syndrome (SS). The most frequent problems appearing from the EORTC QLQ-C30 analysis were fatigue, pain, and insomnia. The differences among hystotypes were particularly high in the global health status and emotional functioning scales, with a worse HRQoL in patients with SS, followed by MF, and CBCL. HRQoL impairment in all hystotypes was higher in women than in men, in patients with probable anxiety or depression, and when the disease worsened. The multivariate analysis of the independent role of each variable confirmed these results. The highest prevalence of probable anxiety or depression was observed in patients treated with systemic steroids (60%) and interferon (50%). **CONCLUSION:** The detailed evaluation of HRQoL and psychological problems in patients with cutaneous lymphomas, and their relationship with clinical variables, may give important information on the course of the disease as well as the possible effect of treatment.

PSS33

INTERNATIONAL DEVELOPMENT OF THE FIRST QUALITY OF LIFE INSTRUMENT SPECIFIC TO COSMETOLOGY AND PHYSICAL APPEARANCE: THE BEAUTYQOL INITIATIVE

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OBJECTIVE: To develop an internationally validated Quality of Life (QoL) instrument specific to cosmetology and personal appearance. This instrument will allow to measure the impact of the use of cosmetic products in various QoL dimensions. **METHODS:** Several studies have demonstrated the positive impact of cosmetic products in dimensions. However, no specific instrument exists to assess the main QoL dimensions in the general population of cosmetic users. The BeautQol questionnaire is designed to be a multi-dimensional, self-administered QoL questionnaire developed simultaneously in 13 countries. The questionnaire focuses on concerns identified by users using cosmetic products or cosmetic techniques. Semi directive interviews were carried out simultaneously in 10 countries with a total of 309 users by clinical psychologists in France (32), UK (18), Germany (46), Spain (27), Sweden (19), Russia (16), USA (53), Brazil (32), Japan (48), and China (18). Interviews have been audio or video recorded and reported in a standard format report. Interviews were analyzed both semantically and using text-mining techniques (Alceste software). **RESULTS:** From the analysis of the 10 interview country reports, 61 items were selected leading to 61 questions in the prototype questionnaire describing major domains such as well being, self esteem, social life, love life, sexual life, confidence, happiness, image, status, emotion, seduction, success, vitality, charisma, motivation, joy, fun, dignity, etc. Three additional countries joined the project (India, South Africa and Italy). The acceptability study is currently in progress with 650 users. The planned validation study

will include a minimum of 2600 users worldwide. **CONCLUSION:** BeautyQol is the first and, to date, the only user centered instrument specific in cosmetology that is being developed simultaneously in 13 countries. BeautyQol is going to be a very valuable tool for national and international assessment of various cosmetic strategies.

PSS34

QUALITY OF LIFE IN PATIENTS WITH VITILIGO. USE OF SINGLE ITEM ANALYSIS

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Quality of life (QoL) in patients with dermatological conditions is evaluated using generic and specific instruments. Even though these instruments are created to give as a result one or more total scores, the analysis of the answers to the single items may give important information on QoL impairment of patients. **OBJECTIVES:** To investigate the QoL of patients with vitiligo, also analyzing single questions from a QoL instrument. **METHODS:** Single items from the Skindex-29 questionnaire, a QoL dermatology-specific instrument, were analyzed in 181 patients with vitiligo. Answers to the Skindex-29 items were given on a 5-point scale, from "never" to "all the time". **RESULTS:** The QoL problems more frequently experienced often or all the time were: worry of the disease getting worse (60%) or being a serious condition (40%), anger (37%), embarrassment (34%), depression (31%), affect on having social life affected (28%), and shame (28%). The association of QoL impairment with the probable presence of depression or anxiety, evaluated using the 12-item General Health Questionnaire (GHQ-12), was very strong for all the items, and remained significant also when taking into account simultaneously gender, age, clinical severity, family history, and localization of vitiligo. **CONCLUSION:** The answers to single items from a dermatology-specific quality of life questionnaire may provide clinicians with relevant additional information on the physical and mental health status of patients.

PSS35

THE IMPACT OF GLAUCOMA ON QUALITY OF LIFE: COMPARISON WITH THE CHRONIC DISEASES OSTEOPOROSIS, TYPE 2 DIABETES MELLITUS, AND DEMENTIA

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OBJECTIVE: Chronic diseases have a long-term negative impact on quality of life (QoL). Few studies have investigated the impact of glaucoma on patients' QoL in comparison to other chronic diseases observed in patients with similar demographics. We performed a systematic literature search to assess QoL in glaucoma, osteoporosis, type 2 diabetes mellitus, and dementia. **METHODS:** We searched MEDLINE, BIOSIS, EMBASE, and Cochrane databases. **RESULTS:** A total of 146 QoL publications were identified (some reported >1 instrument): Short-Form Health Survey [SF]-36 was used in 77 (glaucoma = 8; osteoporosis = 25; diabetes = 40; dementia = 4), SF-12 in 19 (glaucoma = 1, osteoporosis = 5, diabetes = 9, dementia = 4), SF-20 in 7 (glaucoma = 1, diabetes = 6), EuroQol EQ-5D in 29 (glaucoma = 2; osteoporosis = 9; diabetes = 9; dementia = 9), Sickness Impact Profile (SIP) in 6 (glaucoma = 2; osteoporosis = 1; diabetes = 3, dementia = 0), and Health Utilities Index-Mark III (HUI-III) in 17 (glaucoma + diabetes = 1; diabetes only = 11; osteoporosis = 3; dementia = 2). Similar trends were observed across studies using SF-36, -12 or -20: social functioning domains were affected least, and physical domains affected most in glaucoma. In general, QoL was affected to a similar degree in all diseases. By EQ-5D, in glaucoma, utility decreased with increasing glaucomatous damage. The highest mean values using EQ-5D were similar across all four diseases; mean overall utility scores were generally slightly lower (QoL impacted more) in osteoporosis, diabetes and dementia than glaucoma. Mean SIP scores increased (QoL decreased) with increasing severity of glaucoma. Total SIP scores for glaucoma were similar to those for diabetes. By HUI-III, QoL impact also was similar in glaucoma and diabetes. **CONCLUSION:** QoL in glaucoma decreases with increasing disease severity; physical domains are affected more than social domains. Although there are limited published QoL studies in glaucoma, its impact on QoL appears to be broadly consistent with other serious chronic diseases. Further efforts towards diagnosing and treating glaucoma, to reduce financial burden on health care systems and society, are warranted.

PSS36

COMPARISON OF THE QUALITY OF LIFE IMPACT OF PERIPHERAL VISION LOSS VERSUS CENTRAL VISION LOSS

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OBJECTIVE: Vision disorders have a negative impact on quality of life (QoL). While the impairment of QoL in central-vision loss (CVL) disorders, e.g. age-related macular degeneration (ARMD), is widely acknowledged, the QoL impact of peripheral-vision loss (PVL) disorders, e.g. glaucoma, is less well-known. We performed a systematic literature search to assess the effect on QoL of PVL versus CVL. **METHODS:** We searched MEDLINE, BIOSIS, EMBASE, and Cochrane databases. **RESULTS:** A total of 87 publications were identified (some reported >1 instrument): Short-Form Health Survey (SF)-36 was used in 23 (PVL = 2; CVL = 21), SF-12 in 6 (PVL = 1; CVL = 5), National Eye Institute Visual Function Questionnaire (NEI-VFQ)-51 in 11 (PVL = 4; CVL = 7), NEI-VFQ-39 in 9 (PVL = 1; CVL = 8), NEI-VFQ-25 in 36 (PVL = 11; CVL = 25), EuroQol EQ-5D in 3 (PVL = 1; CVL = 2), Visual Function-14 (VF-14) in 20 (PVL = 1; CVL = 19), Sickness Impact Profile (SIP) in 4 (PVL = 2 [1 study]; CVL = 2), and Impact of Vision Impairment (IVI) in 1 (including 3 diseases: glaucoma, retinopathy [PVL] and ARMD [CVL]). By SF-36, vitality was impacted most in PVL. By SF-36 and SF-12, generally, mental health domains were affected more in PVL than CVL; physical domains were affected most in CVL. Mental aspects of QoL were affected more in PVL than CVL in all NEI-VFQ studies; ARMD and glaucoma impacted different domains. QoL was generally lower in glaucoma than ARMD, although results varied amongst studies. By EQ-5D, QoL in PVL and CVL were similarly affected. By VF-14 and SIP, CVL impacted QoL slightly more than PVL. By SIP, psychosocial and physical domains were affected equally in PVL. In the IVI study, PVL affected QoL slightly more than CVL (except glaucoma on the social scale). **CONCLUSION:** Results showed in general, PVL and CVL disorders have a significant impact on QoL. More QoL research towards better understanding patients' concerns with their PVL and CVL disorders are warranted.

PSS37

MAPPING THE DERMATOLOGY QUALITY OF LIFE INDEX (DLQI) TO HEALTH-RELATED UTILITY VIA THE SF-12 IN SUBJECTS WITH ECZEMA

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OBJECTIVE: The purpose of this study was to conduct a statistical mapping between patient reported disease-specific quality of

life in atopic dermatitis (AD) and a generic quality of life measure and from this use optimised algorithms to estimate health utility. **METHODS:** Multinomial logistic regression was used to estimate response probabilities to the SF-12 health survey from responses to the Dermatology Life Quality Index (DLQI) in patients enrolled into a clinical trial studying the long-term use of tacrolimus ointment. A random sample of 70% of patient responses was used for the regression analysis, with the remaining 30% used to test the predictive ability of the response mapping. Predicted and actual SF-12 responses were converted to SF-6D and EQ-5D health utilities using published algorithms (Brazier 2004 and Gray 2006) by Monte Carlo simulation. **RESULTS:** Evaluable data were available for 255 patients, 40% of whom were male, and for which the median age at screening was 28 years (IQR 22 to 38). The percentage of variance in item response attributable to predictor variable change ranged 15.6% (SFCALM) to 33.3% (SFLESS). The mean predicted utility in the test dataset was 0.797 (sd 0.092) by the SF-6D method and 0.787 (0.210) by EQ-5D. The mean squared error (MSE) between the actual and predicted utilities were 0.013 for SF-6D and 0.068 for EQ-5D. Predicted SF-6D utility was within 10% of the actual utility in 62.7% of cases while for predicted EQ-5D utility this fell to 39.8%. **CONCLUSION:** Response mapping of disease-specific quality of life in AD to generic quality of life SF-12 produced more reliable estimates of SF-6D utility than EQ-5D utility, and correlated closely with similar estimates made from a standard assessment of disease severity in eczema.

PSS38

PATIENTS' PERCEPTION OF LIFE FREE OF GLASSES AFTER CATARACT SURGERY: DEVELOPMENT OF THE FREEDOM FROM GLASSES VALUE SCALE (FGVS©)

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OBJECTIVE: To develop a patient self-administered questionnaire assessing the added value of complete independence from glasses in patients after multifocal intraocular lens surgery. **METHODS:** A qualitative study was performed to develop the questionnaire. Exploratory interviews with five cataract patients and six presbyopia patients with ReSTOR® implanted in both eyes for at least 6 months were conducted. After interview analysis, a conceptual model was developed. Items were generated simultaneously in French and Spanish based on the identified concepts and using patients' own words. Six patients completed the French test questionnaire and provided comments regarding questionnaire's structure and content. The questionnaire was refined. The Spanish test questionnaire then underwent a clinician review and was tested with four patients. Test versions were refined and the French and Spanish pilot versions of the questionnaire were subsequently produced. **RESULTS:** Nine global concepts were included in the conceptual model: global vision, practical constraints related to wearing glasses, impact of eye surgery on patient's life, improvement of the practical issues without glasses, improvement of the psychological constraints without glasses, physical appearance / aesthetic aspect (self-image and in the eyes of the others), surgery left behind, recommendation of surgery to others. The first version of the test questionnaire contained 26 items. After the test with French patients, two items were deleted. The Spanish test questionnaire was modified accordingly. Minor additional changes were brought after clinician review and patient tests of the Spanish version. The final questionnaire named 'Freedom from Glasses Value Scale (FGVS©)' contained 21 items and four general additional questions. **CONCLUSION:** Beyond functional aspects, this qualitative study identified additional benefits in cataract and presbyopic patients' living free of glasses after receiving ReSTOR®. The FGVS© will allow these benefits to be assessed. It is available in French and Spanish. UK English and Danish linguistically validated versions are also available.

PSS39

ESTIMATING HEALTH RELATED UTILITY FROM SYMPTOM SEVERITY IN ATOPIC DERMATITIS (ECZEMA)

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OBJECTIVE: The purpose of this study was to conduct a statistical mapping between standard assessments of disease severity in atopic dermatitis (AD) and a generic quality of life measure and use optimised algorithms to estimate health utility. **METHODS:** Multinomial logistic regression was used to estimate response probabilities to the SF-12 health survey from assessment of AD severity using the modified Eczema Area & Severity Index (mEASI) in patients enrolled into a clinical trial studying the long-term use of tacrolimus ointment. A random sample of 70% of patient responses was used for the regression analysis, with the remaining 30% used to test the predictive ability of the response mapping. Predicted and actual SF-12 responses were converted to SF-6D and EQ-5D health utilities using published algorithms (Brazier 2004 and Gray 2006) by Monte Carlo simulation. **RESULTS:** Evaluable data were available for 255 patients, 40% of whom were male, and for which the median age at screening was 28 years (IQR 22 to 38). The percentage of variance in item response attributable to predictor variable change ranged from 19.8% (SFCALM) to 37.5% (SFENER). The mean predicted utility in the test dataset was 0.799 (sd 0.083) by the SF-6D method and 0.778 (0.203) by EQ-5D. The mean squared error (MSE) between the actual and predicted utilities were 0.012 for SF-6D and 0.075 for EQ-5D. Predicted SF-6D utility was within 10% of the actual utility in 64.8% of cases while for predicted EQ-5D utility this fell to 39.9%. **CONCLUSION:** In this study response mapping of AD symptom severity to SF-12 produced more reliable estimates of SF-6D utility than EQ-5D utility. In young adults with low co-morbidity the sensitivity of SF-6D at higher utilities make it be a more appropriate choice than EQ-5D where cases would otherwise be classified in perfect health.

PSS40

QUALITY OF LIFE AND PSYCHOLOGICAL PROBLEMS IN PATIENTS WITH ORAL MUCOSAL DISEASES

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OBJECTIVE: The measurement of oral health related QoL (OHRQoL) is generally limited to dental diseases. Our objective was to evaluate patients with oral mucosal diseases using an oral health-specific questionnaire (OHIP-14), a generic health status questionnaire (SF-12) and a general psychological health questionnaire (GHQ-12) to identify the possible presence of conditions such as depression or anxiety. **METHODS:** Consecutive patients coming to the oral health care unit of IDI-IRCCS in Rome were asked to complete the OHIP-14, the SF-12, and the GHQ-12 questionnaires. Both physicians and patients gave a global assessment of severity of disease (PhGA and PtGA, respectively) on a 5-point scale. Agreement between physiscians and patients was assessed using Cohen's K statistic. **RESULTS:** Of 218 patients contacted, 206 participated in the study. Oral ulcer-

ations were the condition with the highest impact on OHRQoL. Women had poorer OHRQoL and higher GHQ-12 scores than males. There was a very strong correlation between questionnaires scores and PtGA, but none or very scarce between questionnaire scores and PhGA. The overall K between PtGA and PhGA was 0.14, i.e., only slight, and for some conditions it was even negative (e.g., –0.23 for non-malignant lesions). Patients whose condition was "underestimated" by the physicians (i.e., PtGA>PhGA) had the worst OHRQoL and psychological status among all patients in the study. **CONCLUSION:** The administration of specific and generic questionnaires provides a complete and clinically useful picture of the impact of oral diseases on quality of life and on psychological well-being. The combined use of PhGA and PtGA allows to define a group of patients with particularly high levels of quality of life impairment and psychological distress. This may be relevant since these patient characteristics have been linked to dissatisfaction with care, poorer treatment adherence, and possibly higher probability of legal litigation.

PSS41

APPLES AND ORANGES? ASSESSING THE RELATIONSHIP BETWEEN HEALTH AND VISION RELATED QUALITY OF LIFE

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OBJECTIVE: Cost-utility analysis is the preferred method of economic evaluation to support health policy decision-making in most developed nations. Utility estimation is based upon the untested assumption that a single universal construct, "health related quality of life" (HRQoL), is measured. We hypothesize that this is the case with vision related diseases. We test whether vision-related quality of life (VRQoL) is a distinct construct from HRQoL using two instruments: the SF-36 to measure HRQoL, and the NEI Vision Function Questionnaire (NEI-VFQ) to measure VRQoL. **METHODS:** Over 16 months, 443 patients from 18 ophthalmic practices were interviewed. The relationship among item responses from the SF-36 and NEI-VFQ was assessed using exploratory factor analysis (EFA) and variable cluster analysis (VCA). **RESULTS:** The results suggest that vision and non-vision related quality of life are indeed two distinct constructs. In EFA, no items from the NEI-VFQ loaded on constructs formed by the SF-36 items, or vice-versa. Variable cluster analysis confirms the EFA, with the SF-36 and NEI-VFQ items showing moderate correlation with items from their "home" instrument, but weak correlation with items from the other instrument. **CONCLUSIONS:** Our preliminary results provide evidence that VRQoL and HRQoL are two distinct constructs that have modest association. While these analyses are based upon use of functional based measures as opposed to preference based measures such as the standard gamble (SG) or time tradeoff (TTO), the results may have important implications for the validity of preference based measures for assessment of effectiveness. If the SG or TTO (or similar instruments) do not adequately measure all aspects of health, interventions addressing poorly measured problems (vision-related problems in this case) may be substantially underestimated. If this is the case, health policy makers relying on cost-effectiveness studies using these instruments might incorrectly reject health programs for treatment of important medical conditions.

PSS42

MAPPING THE NATIONAL EYE INSTITUTE VISUAL FUNCTION QUESTIONNAIRE (NEI-VFQ 25) TO THE INDEX VALUES FOR THE EQ-5D: A COMPARISON OF MODELS

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OBJECTIVES: To date, no model has explained the relationship between the NEI-VFQ and health state utilities such as those measured by the EQ-5D. Ordinary Least Square (OLS) is most commonly used to identify association but it may not be appropriate in low vision. In this study, we evaluate different model specifications to identify which better predicts the relative importance of the NEI-VFQ 25 dimensions on the EQ-5D index. **METHODS:** We compare OLS and Tobit approach using cross-sectional data (n = 155) at screening from a phase I/II clinical trial in patients with neovascular age-related macular degeneration (NV-AMD). We validate the models using a split-sample technique and calculate each model's mean predicted error and standard error. Correlations between the predicted EQ-5D index values derived from the NEI-VFQ 25 dimensions and the observed EQ-5D index score are compared across models. **RESULTS:** Mean prediction error from the Tobit model is lower than the OLS approach (26 vs. 39 percent). The standard errors of prediction of the Tobit and OLS models are 0.0263 and 0.0234, respectively. The predicted EQ-5D index value from the Tobit model provides better correlation with the observed EQ-5D index score compared to the OLS approach [Pearson Correlation Coefficients are 0.57 and 0.47, respectively]. **CONCLUSION:** In this situation, the Tobit model provides better predictive accuracy than OLS for explaining the relationship between the EQ-5D index and the NEI-VFQ 25. Tobit produces consistent estimates of the relationship between the EQ-5D index and the dimensions of the NEI-VFQ 25 by accounting for censoring and ceiling effect problems. Although it is sensitive to model misspecification, adjusting for heteroscedasticity nevertheless allows it to perform better than OLS. Verification of these results using the model and a second dataset is warranted.

PSS43

WORK RELATED LOST PRODUCTIVITY AND ITS ECONOMIC IMPACT IN CANADIAN PATIENTS WITH MODERATE TO SEVERE PSORIASIS

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OBJECTIVE: To determine the lost productivity of Canadian patients with moderate to severe psoriasis. **METHODS:** Seventy-nine consecutive Canadian dermatology patients were interviewed and completed the Work Productivity and Activity Impairment Questionnaire. The inclusion criteria were diagnosis with moderate to severe psoriasis by the treating dermatologist; 19 year of age or older and currently receiving treatment for psoriasis with either a biologic or alternative therapy such as phototherapy, systemic or topical treatments. Patient interviews and data collection occurred between September 21st, 2005 and November 8th, 2005. **RESULTS:** Eighty-one percent of patients reported working full-time. On average, 2.6 hours (±6.8) (about 6% of total work hours) were lost from work per week due to psoriasis-related events. When asked how much psoriasis affected their productivity while working, individuals on average

reported approximately 20% impairment in productivity due to psoriasis. Twenty-six percent of the patients indicated psoriasis was the reason for altering their job type, description, or work responsibilities. Thirty-four percent of patients believed that their condition affected their choice of career or ability to find a job. Assuming patients were not paid during their absenteeism, absence from work resulted in lost mean patient wages of CDN$2580.97 per person per year. With an estimated 330,000 Canadians suffering from moderate to severe psoriasis, total lost wages due to moderate to severe psoriasis may cost up to approximately CDN$852 million for all moderate to severe psoriasis patients in Canada. **CONCLUSION:** The results of this study indicate that moderate to severe psoriasis may have a substantial impact on the work productivity of patients with this disease. Further studies on lost productivity as well as societal impact of moderate to severe psoriasis are needed.

PSS44

USTEKINUMAB IMPROVES WORK PRODUCTIVITY AND DECREASES WORKDAYS MISSED DUE TO PSORIASIS IN PATIENTS WITH MODERATE TO SEVERE PSORIASIS

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OBJECTIVE: To examine the effect of ustekinumab on work productivity and the number of workdays missed due to psoriasis. **METHODS:** A total of 1995 patients were enrolled in the PHOENIX I and II trials. Patients were randomized 1:1:1 to one of three groups:placebo,ustekinumab 45mg,or ustekinumab 90mg.In the ustekinumab groups, patients received treatment at weeks 0, 4, and every 12 weeks thereafter. Patients randomized to placebo at baseline crossed-over to receive either 45 mg or 90 mg of ustekinumab at weeks 12, 16, and every 12 weeks thereafter.Productivity was assessed using a 10cm Visual Analog Scale (VAS), and change in productivity was recorded in cm units. Productivity and number of workdays missed due to psoriasis in the last 4 weeks was evaluated at weeks 0 and 12 in both trials. **RESULTS:** Mean and median baseline productivity scores and number of workdays missed due to psoriasis were similar between treatment groups at baseline. At week 12, the ustekinumab 45 mg and 90 mg groups had significantly greater improvements($p < 0.001$ for both comparisons)from baseline in productivity scores than the placebo group.The mean (median) change in productivity from baseline score at week 12 was –2.2 (–1.1) for the 45 mg group and –2.4 (–1.4) for the 90 mg group, compared with 0.0(0.0) for the placebo group. The mean(median)change from baseline to week 12 in the number of workdays missed due to psoriasis in the last 4 weeks was 0.0 (0.0) in the placebo group, –0.2 (0.0) in the 45 mg group ($p < 0.002$), and –0.3 (0.0) in the 90 mg group ($p < 0.002$).This could translate to an annualized average reduction of missed workdays due to psoriasis of 2.6 days for the 45 mg group and 3.9 days for the 90 mg group. **CONCLUSION:** Ustekinumab 45 mg and 90 mg resulted in significantly improved productivity compared with placebo in moderate-to-severe psoriasis patients, as measured by the productivity VAS and workdays missed due to psoriasis.

PSS45

VALUE OF DRIVING FOR PATIENTS WITH GLAUCOMA: WILLINGNESS TO PAY

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OBJECTIVE: The loss of driving privileges in glaucoma patients has a significant impact on personal, social, and economic well-being. As a result, glaucoma patients are believed to highly value any intervention or pharmaceutical agent that can either preserve or extend visual acuity. The objective of this study was to assess the willingness to pay to maintain driving privileges in patients with glaucoma. **METHODS:** A mailed survey assessing glaucoma severity, current driving status and willingness to pay for additional years of driving privileges was sent to a random sample of 5,000 individuals. A contingent valuation scenario was posed to individuals as "Your physician tells you that there is a treatment available for glaucoma that will increase your chances to see for a longer period of time, and thus maintain your ability to drive independently. However, the treatment is not covered by your insurer. If you had to make a decision today, what is the maximum amount you would be willing to pay for the treatment in order to maintain driving privileges for one more year?" **RESULTS:** A total of 2,009 individuals completed the survey for a 40% response rate. The majority of the responders were women (70%) and the mean age of the population was 60.5 (SD = 16.5) years. Over 60% of individuals rated their glaucoma as mild and 73% of individuals reported that they still drive. Approximately 43% of responders replied that they would pay up to $50,000 for one additional year of driving privileges. **CONCLUSION:** Driving privileges and personal independence are highly valued by older individuals. In order to maintain their driving privileges and personal independence, older individuals are willing to pay a substantial amount of money to improve visual acuity.

SENSORY SYSTEMS DISORDERS—Health Care Use & Policy Studies

PSS46

PROSTAGLANDIN ANALOG USE WITH AND WITHOUT ADJUNCTIVE THERAPY FOR THE TREATMENT OF GLAUCOMA: A NETHERLANDS POPULATION BASED ANALYSIS

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OBJECTIVES: Glaucoma is an optic neuropathy associated with visual field loss. Currently, treatment for glaucoma is focused on controlling intraocular pressure. First-line treatment typically involves â-blockers or prostaglandin analogs (PAs). â-blockers and other intraocular pressure lowering agents (IOPLAs) may be used as adjunctive therapy to prostaglandins. We quantified the use of adjunctive therapy in association with prostaglandins. **METHODS:** We conducted a cohort study using pharmacy dispensing data from The Netherlands using the PHARMO database. We identified all patients with a first dispensing for bimatoprost, latanoprost or travoprost between January 2, 1998 and July 1, 2006, and determined the proportions of patients who received adjunctive therapy in the first 12 months of prostaglandin use. Use of adjunctive therapy was identified by at least

one intermittent dispensing of any IOPLA other than PAs in the 12-month follow-up period from their first prostaglandin dispensing. Rates were compared across the three prostaglandin analogs using chi-square tests. Statistical and descriptive analyses were performed using SAS 9.1. **RESULTS:** In total, 9402 patients were included, aged 70 (±SD = 12) years, 56% were female. The proportions of patients requiring adjunctive therapy were 31%, 42%, and 31% for bimatoprost, latanoprost and travoprost, respectively. A significantly higher proportion of adjunctive therapy was associated with latanoprost users (bimatoprost vs. latanoprost: Chi-square = 26.59, $p < 0.001$; travoprost vs. latanoprost: Chi-square = 19.82, $p < 0.001$). Bimatoprost and travoprost did not differ Chi-square = 0.01, $p = 0.94$). **CONCLUSIONS:** Approximately 40% of continuous prostaglandin users required adjunctive therapy in the first 12 months. The latanoprost cohort had the highest rate of adjunctive therapy. Higher rates of adjunctive therapy use may result in higher overall patient care costs.

PSS47

AN OBSERVATIONAL DATABASE ANALYSIS OF TREATMENT PATTERNS OF PATIENTS WITH PSORIASIS

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OBJECTIVE: The objective of this retrospective cohort study is to understand current treatment patterns of patients with psoriasis. **METHODS:** A total of 56,871patients diagnosed with psoriasis (ICD 9: 696.0, 696.1) between index month of June 2005 and March 2007 were selected from the Pharmetrics® database. Patients with comorbid psoriatic arthritis and/or rheumatoid arthritis were excluded leaving a sample of 50,075 psoriasis only patients. Patients included had at least 12-month follow-up as well as a minimum 2-year history. Treatments included biologic agents (Amevive, Enbrel, Remicade, Raptiva and Humira), systemic therapies (methotrexate, acitrecin, PUVA, cyclosporine and other systemic therapies), topicals, and light UVB therapy. Patients were classified as "biologic naïve" or "biologic experienced" based on their exposure to the biologic therapies. Patient treatment dynamics (switching, drop-off therapy, intermittent and continuous use etc.) were analyzed based on a 12-month follow up period. **RESULTS:** A total of 34.6% of the cohort was newly diagnosed with psoriasis (after the index month of June 2005). About 28% of all patients with psoriasis only were currently on treatment. Topical therapy only was dominant accounting for 72% of all currently treated patients. Biologic use was observed in <10% of currently treated patients with Enbrel as the clear market leader accounting for >80% of all biologic usage. Raptiva was a distant second at 12%. Analysis of treatment dynamics over a 12-month follow up period revealed a 35% growth in the biologic exposed population primarily due to the flow of "biologic naïve" patients to their first biologic therapy. The persistency of Enbrel (67%)and Raptiva (64%) were lower than that of Remicade (80%). Switching patterns showed limited sequential use of biologics over a 12-month period. **CONCLUSION:** Use of biologic therapies is currently limited but growing at a rate of 35%. Enbrel is the market leader and Humira is the fastest growing biologic in this market.

PSS48

HEALTH CARE COSTS INCREASE IN THE YEAR FOLLOWING A DIAGNOSIS OF PSORIASIS

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OBJECTIVE: To evaluate the impact of psoriasis (PsO) on health care costs in the first year after diagnosis. **METHODS:** A retrospective study of the PharMetrics database, compiled from managed care plans throughout the United States, from January 1, 2000 through December 31, 2006 was conducted. Patients between the ages of 18 to 80 years, who had a minimum of 12 months of continuous enrollment before and after their index diagnosis with PsO, were included. The index diagnosis date was derived from the first claim for PsO during the study period. Health care costs in the years prior to and subsequent to the diagnosis of PsO were compared. Wilcoxon Signed-Rank Tests were used to test for significant differences between pre- and post-index periods. The cost of adverse events could not be identified separately in this study. **RESULTS:** The study cohort included 48,068 patients; 52.3% were females and the mean age was 46.3 years. The total health care costs increased by 32.73% ($4,834.22 to $6,416.52). The largest cost increase was for inpatient care (31.8%), followed by pharmacy costs (25.6%), physician visits (19.7%), out-patient care (11.1%), other services (8.9%), emergency room (1.5%) and laboratory services (1.4%). About 75% of the cost increase was for non-pharmacy related services. All the changes in costs were statistically significant ($p < 0.001$) after the adjustment for inflation. **CONCLUSION:** This study indicates that following a diagnosis of PsO, health care costs in the first year after such a diagnosis increases significantly. The greatest increase in costs was for inpatient care, and it is notable that 75% of the increased costs were for non-pharmacy related services. Additional studies are needed to further explore the reasons for this large increase in the cost of treating patients in the first year after a diagnosis of PsO.

PSS49

HEALTH CARE UTILIZATION INCREASES IN THE YEAR FOLLOWING A DIAGNOSIS OF PSORIASIS

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OBJECTIVE: To evaluate the impact of psoriasis (PsO) on health care utilization and average costs in the first year after diagnosis. **METHODS:** A retrospective study of the PharMetrics database, compiled from managed care plans throughout the United States, from January 1, 2000 through December 31, 2006 was conducted. Patients between the ages of 18 to 80 years, who had a minimum of 12 months of continuous enrollment before and after their initial diagnosis with PsO, were included. The index diagnosis date was derived from the first claim for PsO during the study period. **RESULTS:** The study cohort included 48,068 patients; 52.3% were female, and the mean age was 46.3 years. Compared with one year prior to the diagnosis, the average cost of treating patients in the year after the diagnosis of PsO was 33% greater ($p < 0.0001$). Post-diagnosis utilizations increased by 2.77 physician visits (mean of 8.44 to 11.21), 1.92 prescriptions (mean of 9.56 to 11.48), 0.34 outpatient visit (mean of 1.39 to 1.73), 0.22 laboratory service (mean of 0.94 to 1.16), 0.02 inpatient stay (mean of 0.13 to 0.15), and 0.02 emergency room visit (mean of 0.18 to 0.20). Also, the inpatient length of stay increased by 0.34 day (mean of 1.39 to 1.73). All changes were statically significant with Wilcoxon Signed-Rank Tests ($p < 0.001$). **CONCLUSION:** This study indicates that following a diagnosis of PsO, health care utilization and average costs in the first year after such a diagnosis increases significantly. While we found that the greatest increase occurred in the number of physician office visits, additional studies are needed to further explore the reasons for the large increase (33%) in the cost of treating patients in the first year after a diagnosis of PsO.

PSS50

TRENDS IN MEDICATION PRESCRIBING FOR ACNE IN THE UNITED STATES ACCORDING TO PATIENT AGE

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OBJECTIVE: The purpose of this descriptive study was to examine the most common treatment classes based on drug class and the describe the differences in prescribing methods across age groups. **METHODS:** Information was collected from the PharMetrics Integrated Patient-centric Database, a large collection of administrative claims. At the time of this analysis in 2004, there were more than 80 public and private health care plans included in the database, representing approximately 9.6 million unique patients. Analysis was performed using the Total Resource Utilization (TRU) Benchmarks process, a descriptive methodology organizes and separates information, from a third-party database, into accessible benchmarks for comparison. These results were then factored against age groups. The age group break down is as follows: 12–14, 15–17, 18–24, and 24–35. **RESULTS:** The most commonly prescribed medications in the United States for acne were: New generation retinoid products, benzoyl peroxide-based combo products , topical corticosteroids by Rx only, Topical antibiotics, common topical retinoid products, oral anti-biotics, as well as antidepressants and benzodiazepines in some age categories. The age breakdown was as follows: Ages 12–14: Oral antibiotics (38.8%), Benzoyl peroxide-based products (32.7%), New generation retinoid products (30.1%), Topical antibiotics (21.7%), Common topical retinoid products (20.7%) Ages 15–17: Oral antibiotics (55.0%) Benzoyl peroxide-based products (32.0%) New generation retinoid products (31.3%) Topical antibiotics (21.3%), Common topical retinoid products (21.1%) Ages 18–24: Oral antibiotics (52.6%), New generation retinoid products (28.3%), Benzoyl peroxide-based products (26.8%), Oral contraceptives (24.8%), Topical antibiotics (20.4%) Ages 25–35: Oral antibiotics (44.2%), Oral contraceptives (33.0%), Topical antibiotics (22.1%), Benzoyl peroxide-based products (21.5%), New generation retinoid products (20.1%). **CONCLUSION:** It was determined that significant differences by medication type do in fact occur in all the different age groups. The discrepancies can be clearly observed and on physician to physician bases, one can determine if their own particular prescribing method is appropriate.

URINARY/KIDNEY DISORDERS— Clinical Outcomes Studies

PUK1

CHRONIC KIDNEY DISEASE (CKD) AMONG INPATIENTS WITH REDUCED KIDNEY FUNCTION (RKF) ON HOSPITAL ADMISSION

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OBJECTIVE: To evaluate the prevalence of chronic kidney disease (CKD) in hospitalized patients and determine the proportion of these patients with/without a diagnosis of CKD based on estimated glomerular filtration rates (eGFR). **METHODS:** A retrospective analysis of US hospital data in the Cerner *Health Facts*® database during January 2000 and March 2007 was conducted. Inclusion criteria were age 18 years, a SCr measurement 3–18 months before hospital admission and seven days before or three days after hospital admission. Patients who had dialysis, acute renal failure and/or mixed inpatient eGFR (some values <60 and others =60 mL/min/1.73m^2) were excluded. To minimize bias and misclassification due to hospitalization circumstances, 2 eGFR values <60 mL/min/1.73m^2 were used to designate patients with CKD. The first eGFR was determined from the closest SCr measurement within 3–18 months before hospitalization and the second eGFR was determined using a SCr seven days before or three days of hospital admission. The MDRD-4 equation was used to calculate eGFR. **RESULTS:** Of the 1,265,014 patients hospitalized over the seven years evaluation, 193,221 met the inclusion criteria. Approximately 21% of patients were subsequently excluded for dialysis, acute renal failure, and/or mixed eGFR (n = 40,937). Overall, 27% of patients (n = 41,495) had an eGFR < 60 mL/min/1.73m^2 at admission. Of these, 81% (n = 33,443) had an eGFR < 60 mL/min/1.73m^2 prior to admission. Of this subset likely to have CKD based on chronically low eGFR, only 26% (n = 8,560) had a diagnosis of CKD at admission based on ICD-9-CM diagnosis. **CONCLUSION:** Our findings suggest that most patients with RKF upon hospital admission may have CKD. Of these, few seem to have supportive CKD diagnosis codes. Identification and diagnosis of this patient population during hospitalization may provide a unique opportunity to improve disease management during the inpatient stay or after discharge, and may result in earlier nephrology referrals if appropriate.

PUK2

LONGITUDINAL DECLINE OF RENAL FUNCTION IN HYPERTENSIVE VETERANS

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OBJECTIVE: To determine the association of blood pressure (BP) control and trajectory of renal function over seven years in a cohort of hypertensive veterans; and to determine the association between different classes of antihypertensive medications and renal function quantified by glomerular filtration rate (GFR). **METHODS:** Data were obtained from Southern Arizona Veterans' Affairs Health Care System from January 1, 2000 through December 31, 2006. Inclusion criteria consisted of veterans ≥ 21 and < 90 years of age with at least two systolic BP measurements, and two serum creatinine measurements at least 90 days apart who had an ICD-9 hypertension diagnosis. Veterans were divided into time-varying controlled or uncontrolled hypertension groups based upon JNC-7 definitions. Factors examined included age, sex, race/ethnicity membership, and antihypertensive medication use. Medication categories included angiotensin converting enzyme inhibitor (ACE), beta-blocker (BB), or calcium channel blocker (CCB) monotherapy, or combinations of ACE, BB, and CCB. GFR was estimated using serum creatinine level, age, sex, and race/ethnicity. Analysis was performed using a generalized linear mixed model with patient as random effect. **RESULTS:** A total of 25,819 subjects met inclusion/exclusion criteria: 12,411 with controlled and 13,406 with uncontrolled BP. Males comprised 11,669 of controlled and 12,864 of uncontrolled groups. Mean age (SD) at index was 64.9(11.9) and 66.6(11.6) years in the controlled and uncontrolled groups respectively. Annual decline in GFR was 0.32 ml/–/1.73m2 after adjusting for covariates and medication use. There was a significant interaction between BP control and age ($p < 0.001$). ACE, BB, CCB use was associated with higher GFR (1.1, 95% CI 0.7–1.4; 0.5, 95% CI 0.1–0.8; and 0.8, 95% CI 0.2–1.3 ml/

minute/1.73m2, respectively). **CONCLUSION:** This analysis identified a significant decrease in GFR over time. Persons with controlled BP taking antihypertensive therapy had higher GFR than those taking no medication suggesting that antihypertensive medication use preserves kidney function.

PUK3

EPIDEMIOLOGY AND OUTCOMES OF PATIENTS WITH CHANGES IN RENAL FUNCTION DURING HOSPITALIZATION THAT MAY REQUIRE DRUG DOSAGE ADJUSTMENT

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OBJECTIVE: Failure to dose adjust for renal insufficiency during hospitalization can be a common cause for medication errors and are an important function for clinicians. We examined the prevalence, mortality and length of stay (LOS) for cases that exhibited changes in renal function during hospitalization. **METHODS:** We retrospectively analyzed 1,011,055 non-dialysis admissions who had at least two serum creatinine values during hospital stay across 74 hospitals that provided electronic laboratory results from 2003–2006. We used a modified Cockcroft-Gault (140-age)/SCr (x 0.85 for females) to determine baseline and changing creatinine clearance (eCrCl, ml/min). Cases were stratified based on eCrCl as normal (≥ 81 ml/min), mild (50–80 ml/min), moderate (16–49 ml/min), and advanced (≤15 ml/min). Worsening or improvement was defined as cases that moved one or more eCrCl strata to another during hospitalization. Unadjusted hospital mortality (95% CI) and median LOS were evaluated. **RESULTS:** On admission 29.6% had normal, 34.4% had mild, 34.1% had moderate, and 1.9% had advanced eCrCl. Of these cases the eCrCl remained the same in 79.2%, worsened in 11.6% and improved in 9.2%. Mortality and median LOS was highest for worsening eCrCl (7.9 [CI:7.8–8.1] and 6 days) followed by those remaining the same (2.8 [CI:2.8–2.9] and 4 days) and those with improving eCrCl (1.8 [CI:1.7–1.9] and 4 days). Cases with ≥ 2 strata worsening in eCrCl (0.5% of cases) had higher mortality and LOS (25.9 [CI:24.7–27.1] and 10 days) than those with moderate (5.0 [CI:4.9–5.1] and 5 days, 28.8% of cases) or advanced (13.3 [CI:12.7–13.8] and 5 days, 1.5% of cases) eCrCl that remained the same. **CONCLUSION:** Both improvement and worsening renal function necessitating potential dosage adjustment are common during hospitalization. Mortality and LOS is higher for cases that had worsening renal function. Comprehensive renal dosing programs have the potential of improving medication safety and related outcomes.

URINARY/KIDNEY DISORDERS—Cost Studies

PUK4

COST-EFFECTIVENESS OF SEVELAMER IN THE TREATMENT OF HYPERPHOSPHATEMIA ASSOCIATED WITH CHRONIC KIDNEY DISEASE IN MEXICO

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OBJECTIVE: The treatment of chronic kidney disease (CKD) with dialysis is associated with the appearance of hyperphosphatemia, which contributes to the presence of vascular calcifications, thus increasing the probability of the occurrence of cardiovascular events and death in these patients. The objective of this analysis was to evaluate the incremental cost-effectiveness of the use of sevelamer to manage hyperphosphatemia secondary to CKD from an institutional perspective. **METHODS:** A Markov model was created in TreeAge to estimate the costs and benefits of the treatment with sevelamer or calcium tablets in patients with renal failure considering a temporary horizon of 60 months. The transition probabilities were taken from clinical trials identified through a systematic review of literature. The effectiveness measure considered was an increase in patient survival. Data related to the use of resources were obtained from a nominal group and cost information was obtained from price lists and rates published by health institutions. In addition a univariate sensitivity analysis was performed on the probability of death for sevelamer group. Costs were estimated using 2007 prices and are expressed in US dollars (exchange rate of 10.93 pesos per US dollar). **RESULTS:** Survival of patients with CKD increased in 18.4% in the sevelamer group, compared to the calcium group (83.12% vs. 64.72%). The expected average monthly cost was $639 for calcium and $989.50 for sevelamer. The Cost-Effectiveness Ratio of sevelamer and calcium was $1068 and $777.70, respectively, and the Incremental Cost-Effectiveness Ratio for the implementation of sevelamer vs. calcium was $3343.50. **CONCLUSION:** Sevelamer is a cost-effective drug for the treatment of hyperphosphatemia in patients with chronic kidney disease in the Mexican context.

PUK5

COST-EFFECTIVENESS OF CINECALCET IN THE TREATMENT OF SECONDARY HYPERPARATIROIDISM (SHPT)

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OBJECTIVE: To determine the incremental cost-effectiveness ratio (ICER) of cinacalcet as an adjuvant therapy for SHPT from the perspective of the Portuguese NHS. **METHODS:** A probabilistic Markov model was used to compare best standard care (BSC) with BSC plus cinacalcet. The model was developed in cycles of six months until the death of all patients. Patients were distributed according to the risk of hospital admission due to cardiovascular events, major or minor fractures and parathyroidectomies. The absence of events and/or death was also considered. The probabilities of SHPT's complications were obtained from the literature. Portuguese official mortality rates were weighted by the presence of renal insufficiency and by the PTH levels. Due to lack of alternative, the resources used (only direct medical costs) were estimated by a Delphi panel of eight nephrologists and by a physical medicine and rehabilitation specialist. Unit costs were obtained from Portuguese official sources. Market shares of medicines prescribed in outpatient services were selected from the IMS. **RESULTS:** Cinacalcet increases 0.4 life years (LY) per patient with SHPT. The use of cinacalcet saves hospital admissions and follow-up costs of secondary events, but is associated with an ICER of €53,682 per LY gained. However, if dialysis costs are not considered, the ICER is €32,374 per LY gained and the probability of being cost-effective increases from 61% to 83% if acceptability for reimbursement is limited at €50.000 per LY gained. **CONCLUSION:** Using a €50,000 WTP threshold, cinacalcet was found cost-effective if the increased cost of dialysis was excluded. The inclusion of this cost (induced by a longer life expectancy) leads to an ICER of €53,682 per LY gained. A clear paradox arises here as the alternative becomes less cost-effective by increasing dialysis patients' longevity.

PUK6

FESOTERODINE FOR THE TREATMENT OF OVERACTIVE BLADDER—A COST-EFFECTIVENESS CASE STUDY OF SWEDEN

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OBJECTIVE: Fesoterodine is an effective, safe, and well-tolerated treatment indicated for patients with overactive bladder (OAB). The aim of this study was to assess, from a societal perspective, the cost-effectiveness of one-year treatment with fesoterodine 4 mg and 8 mg compared with tolterodine ER 4mg. **METHODS:** We developed a health economic model simulating the treatment outcomes of OAB patients initiating therapy. Discontinuation, efficacy, and health-related quality of life (HRQL) were based on the results of a 12-week multinational randomised clinical trial extrapolated to one year. Probabilities and costs of OAB-related co-morbidities, medical and incontinence pad costs, and cost of lost time from work were also included in the model and taken from published literature. Prices of fesoterodine 4 and 8 mg and tolterodine are taken from the public data-base; $1.98, $2.35 and $2.10, respectively ($1 = 6.42kr). Treatment response is defined as resolution of incontinence measured by self-reported diary entries. Responders and non-responders were assigned a gain in quality-adjusted life years (QALYs) based on the results of the King's Health Questionnaire, a HRQL instrument validated in patients with OAB collected during the trial. Treatment discontinuers are assigned no QALY-gain. Sensitivity analysis of key parameters was also performed. All costs are expressed in 2007 Swedish Kr. **RESULTS:** In the base case, fesoterodine 4 mg and 8 mg are more effective than tolterodine with QALY gains of 0.01008 and 0.01116 versus 0.00947, and have lower overall costs ($6.918 and $6.549 versus $7.255). These results indicate that treatment with fesoterodine 4 mg or 8 mg is a cost-saving treatment strategy compared with tolterodine. Results were robust to changes in treatment responder rates and OAB-related co-morbidity rates. As most models, results were more sensitive to treatment-associated utility values. **CONCLUSION:** Our results suggest that at the current prices, fesoterodine 4 mg and fesoterodine 8 mg provide additional health benefits at lower costs compared to tolterodine.

PUK7

COST-EFFECTIVENESS OF IMMUNOSUPPRESSIVE REGIMENS IN RENAL TRANSPLANT RECIPIENTS IN GERMANY

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OBJECTIVE: To investigate the cost-effectiveness of immunosuppressive regimens in renal transplant recipients in Germany. **METHODS:** A micro-simulation model was built comparing immunosuppressive regimens based on cyclosporine, everolimus, sirolimus, and tacrolimus in renal transplants. Within the model, mean costs per patient as well as incremental costs per life year gained and per year with functioning graft were assessed from the perspective of the German statutory health insurance (SHI). The evaluation was performed for a two and a ten year time horizon. Effectiveness data up to two years was derived from a meta-analysis. Starting from year three, the model was populated with extrapolated clinical data, mainly originating from a patient register, which was equally implemented for all regimens considered. Cost data was estimated based on relevant tariff works and literature. Base year for costing was 2007. To test the robustness of the model, probabilistic sensitivity analyses were conducted. **RESULTS:** Over the 2-year period, mean total costs per patient amount to €25,248, €29,444, €33,482, and €49,985 for sirolimus, cyclosporine, everolimus, and tacrolimus, respectively. Focusing on the costs per life year gained, sirolimus dominates everolimus. The incremental cost-effectiveness ratio of cyclosporine and tacrolimus compared to sirolimus is €209,800 and €1,902,846, respectively. Regarding the costs per year with functioning graft gained, sirolimus dominates all other regimens considered by showing better effects at lower costs. Over the 10-year time frame, mean total costs per patient were €97,678, €108,647, €120,694, and €183,936 for sirolimus, cyclosporine, everolimus, and tacrolimus, respectively. Sirolimus also shows the best results in survival and time with functioning graft, thus dominating the three alternatives. The model is robust to variations of all parameters. **CONCLUSION:** Over both the 2-year and the 10-year time horizon, sirolimus-based immunosuppression represents a cost-effective option in renal transplant recipients in Germany.

PUK8

A REVIEW: DIFFERING COSTS AND EFFECTS IN ECONOMIC EVALUATIONS OF TOLTERODINE FOR THE TREATMENT OF OVERACTIVE BLADDER

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OBJECTIVE: To review the methodologies of published articles describing full economic evaluations of tolterodine, an antimuscarinic agent used to treat overactive bladder (OAB). **METHODS:** A search of MEDLINE and EMBASE using the search terms "tolterodine" and "cost" or "economic" was conducted (1990–December 2007). English-language citations with abstracts were reviewed. Publications reporting an original formal economic evaluation of tolterodine compared with ≥1 alternative were selected for inclusion. **RESULTS:** Of the 172 citations identified from the search, only 12 met the inclusion criteria. All studies adopted a payor and/or patient perspective. Two were cost analyses based on retrospective databases. Ten used modeling, including 6 cost-effectiveness, 2 cost utility, and 2 cost minimization. Five of the 8 cost-effectiveness/utility studies modeled treatment outcomes using patient-level clinical trial data, whereas the remaining 3 used published clinical trial data and/or expert opinion. 4 of the modeling studies employed Markov methods, 5 used a decision-analytic method, and 1 was a probabilistic disease model based on the expected distribution of patient symptoms. All studies compared different formulations of tolterodine and oxybutynin, sometimes alongside other comparators. Only three of the modeling studies included the possibility of drug switching or titration. With respect to health care resource utilization, all modeling studies included antimuscarinic drug costs, and most included costs of physician visits and incontinence pads. Costs of laundry, surgical procedures, staff and direct overhead, behavioral therapy, laboratory procedures or diagnostic tests, OAB-related comorbidities, and absenteeism were not consistently considered. Primary effect measures varied; incontinence was the most commonly used. **CONCLUSIONS:** Important differences in design, modeling methodology, assumptions, and selection of cost and effects can be found across published economic analyses of tolterodine. Future analyses of new antimuscarinics should comprehensively assess direct medical and indirect productivity costs, including OAB-related comorbidities and the benefits of therapy in terms of quality-adjusted life-years gained.

PUK9

HEALTH ECONOMIC EVALUATION OF PARICALCITOL COMPARED TO NON-SELECTIVE VITAMIN D RECEPTOR ACTIVATOR FOR THE TREATMENT OF SECONDARY HYPERPARATHYROIDISM IN CHRONIC KIDNEY DISEASE PATIENTS: US PERSPECTIVE

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OBJECTIVE: The objective of this study was to determine the health economic impact of paricalcitol versus standard non-selective vitamin D receptor activators (VDRA) treatment for secondary hyperparathyroidism in patients with chronic kidney disease (CKD) in the US. **METHODS:** A Markov process model was developed employing data sources from the published literature, paricalcitol clinical trials, and national population statistics. The comparator was calcitriol, a non-selective VDRA medication. The primary perspective of the study was that of the third party payor. The outcomes in the paricalcitol clinical trials and observational studies (reduction SHPT, reduction proteinuria, complications and mortality) were extrapolated to number of life years gained (LYG) and number of quality-adjusted life-years (QALYs). Clinical and economic outcomes were discounted at 3.5%. **RESULTS:** The base case analysis is based on a 10-years time horizon and is based on a comparison of paricalcitol with a non-selective VDRA, which is started in CKD 3 and continued in CKD 4 and CKD 5. The use of paricalcitol leads to a reduction in medical cost of $2528 and an increase in LYG (0.47 years) and a gain in QALYs (0.43). Consequently the use of paricalcitol result is a dominant strategy, costing less and more effective, from the primary perspective of the US third party payor. The incremental cost-effectiveness ratio remained dominant from the perspective of the society after inclusion of indirect costs. One-way sensitivity analyses and probabilistic sensitivity analyses confirmed the robustness of the model. **CONCLUSION:** The results showed that the favorable clinical benefit of paricalcitol results in positive health economic benefits in CKD Stages 3, 4, & 5. This study suggests that the use of paricalcitol in patients with early CKD may be cost-effective from a third party payor perspective when compared to standard non-selective VDRA medication.

PUK10

ECONOMIC EVALUATION OF POLYCLONAL ANTIBODIES FOR THE MANAGEMENT OF HIGH RISK PATIENTS WITH ACUTE REJECTION IN RENAL TRANSPLANTATION AT THE SOCIAL SECURITY MEXICAN INSTITUTE (IMSS)

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OBJECTIVE: Renal transplantation is recognized as the preferred approach to the management of end-stage renal disease, from both the clinical and economic perspective. In Mexico, approximately 20% of patients show acute rejection in renal transplantation (ARRT) during the first year. The purpose of this study was to estimate the cost-effectiveness of three different antibodies for the management of patients with ARRT at the Social Security Mexican Institute (IMSS). **METHODS:** A one-year decision tree model was performed to simulate costs and health outcomes from an institutional perspective. Effectiveness measure was the rate of survival graft's rescued at the end of the follow-up period. Efficacy data and transition probabilities were taken from published literature. Comparators were horse anti-human thymocyte globulin (10mg/kg); rabbit anti-human thymocyte globulin ATG(1.5mg/kg) and Mono-OKT3(5mg). Resource use was obtained from local experts and direct costs were calculated through case-mix methodology (all unit costs were taken from official databases). The model was calibrated according to international pharmacoeconomics guidelines. One-way and probabilistic sensitivity analyses were performed using Monte Carlo Simulation second-order approach. **RESULTS:** The higher effectiveness was obtained by horse-ATG (87.93%) followed by the rabbit-ATG (84.13%) and OKT3 therapy (82.13%). OKT3 therapy showed the lowest costs per patient (US$91,719) followed by horse-ATG (US$95,875) and rabbit-ATG (US$97,400). The horse-ATG showed the lowest cost per case rescued. ICERs showed that rabbit-ATG is dominated by horse-ATG and OKT3 and the horse-ATG obtained an ICER of US$75,994 vs. OKT3 (baseline). One-way analyses showed that variation in price and effects don't change these results ($p < 0.05$). Probabilistic sensitivity analyses employing acceptability curves and component analyses showed that the horse-ATG therapy was the most cost-effective treatment. **CONCLUSION:** In Mexico, horse-ATG demonstrated to be a cost-effective polyclonal antibody for high risk patients with ARRT. These results should be taken into account by Mexican decision makers in future cost-containment policies.

PUK11

URETEROSCOPY AND SHOCK WAVE LITHOTRIPSY FOR TREATMENT OF URETERAL STONES IN TAIWAN: ECONOMIC EVALUATION

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OBJECTIVE: To assess the direct medical cost of three therapeutic alternatives for ureteral calculi using a decision tree model from the payer perspective. **METHODS:** Taiwan National Health Insurance (NHI) claim databases were used to identify new ureteral stones subjects who initially underwent three treatment modalities: observation, ureteroscopy (URS), and shock wave lithotripsy (SWL) between January 1, 2004-September 30, 2006. A subject identification period spanned from July 1, 2004-June 30, 2006. URS subjects were matched to SWL subjects on the propensity score to avoid possible selection bias. The single treatment cost per patient of each of strategies was obtained from the cumulative sum of various pay procedures according to NHI reimbursement fee schedules. The decision tree model was used to compute the expected total treatment costs per patient. Sensitivity analysis was done to evaluate the effects of various success rates and costs. **RESULTS:** Of 13,594 eligible subjects, there were 3426 (25.2%) with observation, 2738 (20.1%) with URS and 7430 (54.7%) with SWL. A total of 1467 subject pairs were obtained after propensity score matching. Observation was the least costly pathway at all ureteral sites when observation failed. URS was less costly than SWL for stones at mid and distal ureteral locations and a cost difference of T$3535 and T$3072 was noted between the two modalities. Likewise, URS was more costly than SWL for proximal stones by T$2321. One-way sensitivity analysis showed the cost of URS could be increased by more than T$4166 and T$3559, and the success rate could be decreased by 11% and 10% for middle and distal stones before attaining cost equivalence with SWL. **CONCLUSION:** URS was less costly than SWL for treatment of middle and distal ureteral stones. However, the cost of URS would exceed the cost of SWL for the treatment of proximal stones. Observation was the least costly pathway.

PUK12

COST-MINIMIZATION ANALYSIS OF EVEROLIMUS FOR KIDNEY TRANSPLANTATION IN BRAZIL

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OBJECTIVE: To analyse the cost-minimization of Everolimus in comparison with Sirolimus for immunosuppression in kidney transplantation. **METHODS:** A cost-minimization analysis from the Brazilian National Health system perspective, with a time horizon of seven years were conducted. A decision tree with a Markov chain considering the probabilities of graft loss or maintenance through health states related to presence or absence of any relevant health event, were performed. Study comparators examined were Everolimus (EVE) and Sirolimus (SLR). The clinical aspects regarding benefits and probabilities of transition data were extract from meta-analysis of published randomized clinical trials for the alternatives. The analysis is based on Brazilian current clinical practice. Treatment costs were collected from public reimbursement list. Costs and benefits were validated by a panel of Brazilian specialists from Ministry of Health through the Delphi technique. The discounting rate was 5% for costs and benefits, the results were converted in US Dollars (R$1.8/USD$1.00). A one-way sensitivity analysis was performed. **RESULTS:** Patients using Everolimus get the lowest total cost per treatment (EVE = $15,347.58USD; SLR = $29,959.6USD). The sensitivity analysis on costs variables in an interval of ±80%, was robust with the base analysis. **CONCLUSION:** Everolimus is a cost-saving alternative for immunossuppresion in kidney transplantation compared to Sirolimus in the perspective of Brazilian Public Health System.

PUK13

A COST MINIMIZATION ANALYSIS OF EPOETIN ZETA FOR THE TREATMENT OF ANEMIA ASSOCIATED WITH CHRONIC KIDNEY DISEASE

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OBJECTIVE: Current National Institute for Health and Clinical Excellence (NICE) Clinical Guidelines on managing anemia in patients with chronic kidney disease (CKD) state that there is no evidence to differentiate between erythropoiesis-stimulating agents in terms of efficacy. Cost minimization analysis (CMA) is, therefore, an appropriate health economic approach in this therapy area. This CMA of epoetin zeta (Retacrit®), a biosimilar agent of epoetin alfa, versus current standard treatments was conducted from the perspective of NHS Scotland. **METHODS:** A CMA of intravenous and subcutaneous epoetin, published in the full NICE Clinical Guidelines, was used as a framework for this cost analysis of epoetin zeta, the reference product epoetin alfa, epoetin beta and darbepoetin alfa. In both the NICE and this analysis, it was assumed that the cost difference of epoetin and iron administration would be negligible. Licensed epoetin doses were incorporated in this analysis. **RESULTS:** This analysis demonstrates that epoetin zeta minimizes costs for treating anemia associated with CKD when compared with the reference product, epoetin alfa. The cost of epoetin zeta for a hemodialysis patient is £59.39/week (hemoglobin correction phase) and £29.70–£118.79/week (hemoglobin maintenance phase), based on a 70 kg patient. The corresponding cost for a patient treated with epoetin alfa is £67.32/week and £33.66–£134.64/week. The low drug acquisition cost for epoetin zeta could lead to potential cost savings. **CONCLUSION:** CMA is an appropriate approach for managing anemia in people with CKD. This analysis demonstrates that the biosimilar product, epoetin zeta, minimizes treatment costs and would be of benefit to patients and NHS Scotland.

PUK14

INPATIENT COSTS AND CLINICAL OUTCOMES OF S. AUREUS BLOODSTREAM AND NON-BLOODSTREAM INFECTION IN PATIENTS WITH END-STAGE RENAL DISEASE: FINDINGS FROM A MULTI-CENTER TRIAL

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OBJECTIVE: Using data from a large, multicenter, double-blind, phase III clinical trial designed to evaluate the efficacy and safety of a vaccine intended to reduce the incidence of S. aureus infection in adults with ESRD receiving hemodialysis, we examined inpatient costs, inpatient days, and mortality associated with S. aureus bloodstream and non-bloodstream infections. **METHODS:** Inpatient bills were obtained for patients hospitalized with S. aureus infection. Clinical and laboratory data were recorded in the report form. Hospital charges were converted to costs using department-level cost-to-charge ratios derived from each hospital's Annual Medicare Cost Report. Statistics were used to report 12-week economic and clinical outcomes. Among patients with S. aureus bacteremia, those with additional sites of S. aureus infection were compared to those without using generalized linear regression models adjusting for confounders. **RESULTS:** Among 89 patients hospitalized with S. aureus bacteremia, the mean inpatient cost was $19,454 (median: $13,011) over 12 weeks, representing an average of 11.9 inpatient days. Among 70 patients hospitalized with non-bloodstream S. aureus infections, the mean 12-week cost was $19,222 (median: $13,106) across a mean of 11.3 inpatient days. Twelve-week mortality was 20.2% for patients with S. aureus bacteremia and 15.7% for patients with non-bloodstream S.aureus infections. When adjusting for baseline demographics and medical history among patients with S. aureus bacteremia, those who experienced additional sites of S. aureus infection (n = 33) incurred 1.43-fold higher 12-week inpatients costs compared to those without sites of S. aureus infection (p = 0.0497). Inpatient days (13.5 vs. 11.0; P = 0.3154) and 12-week mortality (15.15% vs. 23.21%; P = 0.6569) did not significantly differ between S. aureus bacteremia patients with and without additional sites of S. aureus infection. **CONCLUSION:** S. aureus infections impose considerable economic burden in ESRD patients undergoing hemodialysis. The existence of additional sites of S. aureus infection among patients with S. aureus bacteremia increases inpatient costs.

PUK15

COST IMPLICATIONS OF INTRAVENOUS (IV) BEVACIZUMAB TREATMENT IN PATIENTS WITH RENAL CELL CARCINOMA (RCC)

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OBJECTIVE: Angiogenesis inhibitor therapies (oral sunitinib or sorafenib, or IV bevacizumab off-label) are currently available as treatments for RCC patients. However, IV therapy may impose additional burdens for patients such as time lost in travel to treatment facilities, infection risk from IV catheters and increased costs. The potential incremental cost by resource use category associated with IV vs. oral administration of selected angiogenesis inhibitor therapies for the treatment of RCC was evaluated.

METHODS: Patients with ≥ 2RCC claims (ICD-9 189.0, 198.0) receiving sunitinib (n = 244), sorafenib (n = 234) or bevacizumab (n = 106) were identified from a large US commercial health insurance claims database covering over 39 million people between January 2002–December 2006. Patients were observed from their first angiogenesis inhibitor therapy claim until the last treatment date. Inpatient, outpatient and pharmacy costs (actual payments made by health plans) were calculated on a per-patient per-month (PPPM) basis over the treatment period with costs for the study drugs reported separately. **RESULTS:** PPPM costs for bevacizumab were $5130 higher than PPPM costs for sorafenib and $3,261 higher than PPPM costs for sunitinib. Additionally, bevacizumab drug and IV administration costs accounted for 51% of the outpatient costs for those patients. Excluding drug and administration costs, bevacizumab patients still incurred higher PPPM outpatient services costs of $3956, compared with patients receiving sunitinib or sorafenib at $2913 and $2230 respectively. Monthly costs for inpatient services were also higher for bevacizumab patients ($2467) vs. sunitinib ($1716) and sorafenib ($1082) patients. **CONCLUSION:** RCC patients treated with bevacizumab incur an additional $39,132–$61,560 total medical cost increase per patient per year compared to those treated with sunitinib or sorafenib. The development of more tolerable and efficacious oral angiogenesis inhibitor therapies may result in additional cost savings to patients and health care payers over IV therapies.

PUK16

COMPARATIVE ECONOMIC EVALUATION OF DUTASTERIDE VERSUS FINASTERIDE FOR MEDICARE-AGED MEN WITH BENIGN PROSTATIC HYPERPLASIA

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OBJECTIVE: Evidence has shown important therapeutic outcome differences between dutasteride and finasteride. The objective of this study was to assess the differences in economic costs between these two pharmacologic treatment options within the first year of initiating therapy for Medicare-aged men with benign prostatic hyperplasia (BPH) from a managed care perspective. **METHODS:** A retrospective analysis of medical and pharmacy claims was conducted using the Ingenix Lab Rx proprietary research database within a 3-year period from July 1, 2003 to June 30, 2006. Male patients aged ≥ 65 years with a diagnosis of BPH treated with either dutasteride or finasteride were identified. To minimize potential biases that arose from differential treatment selection, propensity-score-matching methods were used to identify finasteride and dutasteride patients who were similar in terms of their Charlson Comorbidity Index score, Thomson Medstat staging and other background covariates. Average monthly medical costs were defined as the total amount charged for BPH-specific physician visits, inpatient hospitalizations, outpatient hospital care, emergency department visits and other ancillary medical services during the follow-up period for each patient. **RESULTS:** The matched sample included a total of 4498 patients. Demographics were comparable between the two treatment groups with a mean age of 73.6 years. Patients taking dutasteride had significantly lower medical resource utilization costs per month compared to finasteride-treated patients ($122 vs. $173, P < 0.001). The absolute difference in cost is $51 less per month with dutasteride use. The lower costs associated with dutasteride appears to be due to the lower inpatient hospitalization costs ($35.78 vs. $72.29 per month with finasteride). **CONCLUSION:** Medicare-aged patients treated with dutasteride consumed significantly lower medical resources due to lower inpatient hospitalization expenditure, showing cost savings of $51 per month per treated patient. This study supports the growing body of real-world evidence indicating the clinical and economic benefits associated with dutasteride.

PUK17

ECONOMIC EVALUATION OF SEVELAMER VERSUS CALCIUM-BASED PHOSPHATE BINDERS IN PATIENTS ON DIALYSIS IN THE UNITED KINGDOM SETTING

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OBJECTIVE: To evaluate cost-utility of sevelamer versus calcium-based phosphate binders (CaPB) in different patient cohorts and for different dialysis modalities. **METHODS:** Systematic literature review was conducted with only studies reporting mortality considered. Subgroup analyses were carried out based on results from one trial (DCOR). Costs of dialysis were obtained from a recent UK-based study; dosage of drugs was taken from the DCOR trial, and unit prices from the British National Formulary; costs were expressed in ≤2007; utilities were sourced from the literature. Markov model was developed for analysis. **RESULTS:** Six RCTs of sevelamer versus CaPB reporting all-cause mortality were identified. No significance was found in meta-analysis: RR = 0.83 [95%CI:0.56–1.17]; difference in cardiovascular mortality was not significant, based on three RCTs: 0.94 [0.76–1.17]. In the general haemodialysed population sevelamer cost ≤6491 more than CaPB after ten years of treatment, regardless of dialysis modality. In the 65 and older population, cost of sevelamer was ≤30,293 higher, while efficacy was 0.52 QALYs greater; ICER = ≤58,405. In patients on peritoneal dialysis, sevelamer cost ≤17,837 more than CaPB, with identical efficacy; ICER = ≤34,389. In patients treated for at least two years, sevelamer cost ≤27,266 more, while its efficacy was 0.41 QALYs higher; ICER = ≤65,782. In the 65 + population treated for at least two years, cost of sevelamer was ≤38,378 higher, while efficacy was 0.70 QALYs greater; ICER = ≤55,182. Acceptability curves revealed that probability of sevelamer being cost-effective at ≤20,000/QALY ranged 1.2–13.4%; EVPI was ≤17–194. With the costs of dialysis excluded, ICER ranged from ≤11,944 to ≤22,543; for all scenarios ICER diminished with longer time horizons. **CONCLUSION:** Sevelamer is not likely cost-effective, but in the older population it is more cost-effective in patients on peritoneal dialysis than on haemodialysis. ICER is relatively high for subgroups, mainly due to the high cost of dialysis of patients who live longer due to sevelamer.

PUK18

STAFF TIME AND COSTS FOR ANEMIA MANAGEMENT WITH ERYTHROPOIETIC STIMULATING AGENTS IN PATIENTS ON HEMODIALYSIS: CASE STUDY OF A BRAZILIAN DIALYSIS CENTER

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OBJECTIVE: This study assessed costs related to anemia management in a reference dialysis center. The study also explored the potential benefit of efficiency improvement and costs reduction with the use of C.E.R.A., a novel continuous erythropoietin receptor activator that is effective for treating anemia with a once monthly injection. **METHODS:** This study was conducted at the

Hospital do Rim from Universidade Federal de São Paulo (dialysis center) where 208 patients make use of human recombinant erythropoietin (ESA) for anemia management. Structured interviews with personnel were arranged to identify workflow for anemia management. Time spent in each activity was registered using a stop watch by a trained professional. Time spent in less frequent activities or in activities were the direct relation with anemia management could not be done were not taken into consideration for this study. For valuing time and supplies the dialysis center's costs data was considered. **RESULTS:** Total time spent for ESA administration by the dialysis center for the treatment of 208 patients was 75 days or R$19,758. Assuming the usage of C.E.R.A. in 100% patients of the center, the time spent by the staff would be 10 days or R$2683, representing an 86% reduction versus current practice. Costs of supplies needed for the administration were R$28,863 for those patients receiving conventional ESA and R$774 if patients would have received C.E.R.A. As a result, potential total savings generated with the use of C.E.R.A. was R$ 45,165 per year in this dialysis center or R$ 217/patient/year. **CONCLUSION:** The study suggests that the adoption of once-monthly C.E.R.A. can bring substantial savings for the dialysis center: R$44,847 per year or R$216 per patient per year. Once-monthly C.E.R.A. could also improve resource utilization and enable health care staff to focus more time on other aspects of patient care.

URINARY/KIDNEY DISORDERS—Patient-Reported Outcomes

PUK19

COMPARISON OF THE HEALTH-RELATED QUALITY OF LIFE BETWEEN PATIENTS UNDERGOING PERITONEAL DIALYSIS AND HAEMODIALYSIS

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OBJECTIVE: To compare the health-related quality of life (HRQOL) between patients undergoing continuous ambulatory peritoneal dialysis (CAPD), automated peritoneal dialysis (APD) and haemodialysis (HD) in the "IMSS" (Mexican Institute of Social Security) in Guadalajara. **METHODS:** Transverse analytic study included 131 patients, in peritoneal dialysis, ≥18 years, any gender, or time under dialysis. Patients with acute technique-related complications, in terminal phase of illness, or with physical or mental disability were excluded. An interview, clinical history and detailed physical examination were carried out. Using the Kidney Disease Quality of Life Short Form (KDQOL-SFTM), we measured HRQOL.Analysis of variance was used to examine differences. **RESULTS:** Patients were studied (50 undergoing CAPD, 34 APD and 47 HD). The average age was 46.2 ± 18.3 years, 53% were females, and 49% were males. The time in CAPD was 23.4 ± 17.2, APD 23.9 ± 14.2 and HD 37 ± 34 months. Physical functioning (37 ± 28), pain (69 ± 25), emotional well-being (52 ± 26), social function (57 ± 30), and energy/fatigue (37 ± 27) were significantly lower scores in CAPD in comparison with APD (65 ± 31, 93 ± 12, 75 ± 28, 91 ± 15, 60 ± 28) and HD (57 ± 29, 82 ± 17, 69 ± 23, 80 ± 21, 53 ± 28). The Effects of Kidney Disease (86 ± 15) and Burden of Kidney Disease (58 ± 36) subscales were lower in APD in comparison with CAPD (76 ± 16 and 24 ± 29, respectively); no differences between CAPD and HD. The physical component summary was significantly higher in APD (58 ± 22) in comparison with CAPD (46 ± 15) and HD (34 ± 15). Mental component summary was less in CAPD (36 ± 15) in comparison with APD (60 ± 22) and HD (46 ± 15). **CONCLUSION:** The HRQL in patients undergoing CAPD was less in comparison with patients with APD and HD. The physical dimension was higher in patients with APD in comparison with CAPD and HD, whereas the mental dimension was less in the CAPD group. There was no significant difference between the APD and HD groups.

PUK20

IMPROVEMENTS IN HEALTH-RELATED QUALITY OF LIFE WITH FESOTERODINE: KING'S HEALTH QUESTIONNAIRE ITEM ANALYSIS

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OBJECTIVE: Subjects with overactive bladder (OAB) have decreased health-related quality of life (HRQL). The positive effects of fesoterodine (FESO) and tolterodine extended release (TER) have been established in subjects with OAB using patient-reported outcomes. This analysis assessed the effects of FESO and TER on individual items of the King's Health Questionnaire (KHQ). **METHODS:** This is a post hoc analysis of data from a multicenter, double-blind, placebo (PBO)–controlled trial. Eligible subjects with frequency and urgency or urgency urinary incontinence were randomized to PBO, FESO 4 mg, FESO 8 mg, or TER 4 mg for 12 weeks. Subjects completed the KHQ at baseline and end of treatment. The KHQ includes 9 domains with 21 items and a Symptom Severity scale; lower scores indicate better HRQL. Analysis of covariance was used to assess treatment-related effects on the 21 individual items of the 9 KHQ domains, with treatment and region as factors and baseline value as a covariate. **RESULTS:** By the end of the study, FESO 8 mg significantly improved responses to 13 items vs. PBO; in comparison, FESO 4 mg and TER improved responses to 9 and 8 items, respectively (all $P < 0.01$). There were no significant differences between treatment groups. Seven items did not improve with any treatment; most of these items were part of the Personal Relationships and General Health Perception domains. In general, items that improved the most with treatment had higher baseline values (ie, worse HRQL) compared with those that did not improve. **CONCLUSION:** Both doses of FESO (4 and 8 mg) significantly improved HRQL in subjects with OAB as evidenced by significantly better scores for 9 and 13 items of the KHQ vs PBO, respectively. The domains showing improvement were those for which improvement with OAB treatment would be expected.

PUK21

THE PSYCHOMETRIC VALIDATION OF AN US ENGLISH SATISFACTION MEASURE IN PATIENTS WITH BENIGN PROSTATIC HYPERPLASIA

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OBJECTIVE: Measuring the treatment effectiveness from the patients' perspectives is recommended in managing benign prostatic hyperplasia (BPH). The purpose of this study was to validate the US English Patient Perception of Study Medication Questionnaire (PPSMQ) administered to BPH patients in a randomized clinical trial. **METHODS:** Patients with moderate-

to-severe BPH completed three disease-specific instruments at baseline and at follow-up visits: the International Prostate Symptom Score (IPSS, a 7-item urinary symptom severity scale), the BPH Impact Index (BII, a 4-item well-being scale associated with BPH) and the PPSMQ (a 12-item instrument measuring patient satisfaction in control of urinary symptoms, strength of urinary stream, pain of urination and effect on usual activities due to the pharmacotherapy). The psychometric performance, including reliability, validity and responsiveness, of the PPSMQ was analyzed. **RESULTS:** The mean age of the study sample was 66.7 years (n = 879). The PPSMQ demonstrated good internal consistency (Cronbach's alpha = 0.88 to 0.96) and reliability (intraclass coefficient = 0.37 to 0.40). Convergent validity of the PPSMQ subscale and total scores measured by the Pearson coefficient ranged from 0.48 to 0.58 for the IPSS and 0.31 to 0.45 for the BII, suggesting correlations between the PPSMQ and another two logically-related instruments. The PPSMQ also demonstrated discriminant validity against the IPSS, IPSS QoL item and BII (F = 52.5, 42.3, and 26.9, respectively, p-values < 0.001). The PPSMQ detected treatment differences between the monotherapy and combination therapy arms: total scores at baseline for the combination therapy, dutasteride and tamsulosin treatment groups were 25.6, 25.8, and 25.7 (higher scores indicating lower satisfaction), respectively; at two years, the scores were 17.8, 20.3, and 20.4, respectively. **CONCLUSION:** The PPSMQ demonstrated good reliability, validity and responsiveness in measuring patient satisfaction with the pharmacology treatments for BPH. The PPSMQ may be an important addition to the existing outcome measures used to assess BPH symptoms and their treatments.

PUK22

ASSESSING PATIENT DESCRIPTIONS OF LOWER URINARY TRACT SYMPTOMS (LUTS) AND PERSPECTIVES ON TREATMENT OUTCOMES FOR THE DEVELOPMENT OF A NEW LUTS PATIENT REPORTED OUTCOME TOOL

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OBJECTIVE: Although various instruments have been used to assess the prevalence of LUTS, the interpretability of questions from a patient perspective has not been assessed. There is a need for qualitative research to inform the development of a patient reported outcome (PRO) tool that assesses all LUTS. **METHODS:** A series of eight focus groups and 66 cognitive debriefing interviews were conducted to elicit patient descriptions of urinary symptoms and to assess treatment-seeking behavior and treatment outcomes. Participants with a range of LUTS were recruited from urology clinics and community settings in different USA geographic regions. Trained interviewers conducted each session following semi-structured interview guides. Content and descriptive analyses were performed. **RESULTS:** A total of 129 people (66 men, 63 women) participated. Mean age was 54 (26–80 y); 71% were white. Mean symptom duration was 7 years for men; 15 years for women. A wide range of LUTS were reported with participants generally understanding and agreeing on the words used to describe most LUTS. There were no differences in terminology used by clinical and community participants. Some difficulty describing bladder area pain, split stream, terminal dribble and post-micturition dribble was noted. Most participants identified with the word "bother" and thought it was important to assess both the frequency and bother of each symptom. Reasons for seeking care included symptom bother and fears about cancer and bladder infections. When asked to describe a positive treatment outcome, 64% of participants responded that a 50% improvement in at least one LUTS would be meaningful. A draft LUTS tool was developed based on patient feedback. **CONCLUSION:** There is a need for a new PRO tool to assess the frequency and bother of all LUTS in terms understood by patients. A new LUTS PRO tool was developed to include the patient perspective and is undergoing validation.

PUK23

EVALUATION OF FACE AND CONTENT VALIDITY OF NOCTURIA QUALITY OF LIFE QUESTIONNAIRE (N-QOL)

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OBJECTIVE: Nocturia Quality of Life (N-QOL) questionnaire is a self-administered, nocturia-specific, QoL instrument developed to examine QoL impact of nocturia in male patients. This study was designed to evaluate content and face validity of the N-QOL in female patients. **METHODS:** Twenty women (mean age 59 years; range 27–83) diagnosed with nocturia (≥2 voids/night) were recruited through U.S. urology clinics. To establish content and face validity, the items and response options in the questionnaire must be considered relevant and comprehensive. The N-QOL questionnaire was evaluated using 2 methodologies. First, 15 patients provided information on their experiences of the impact of nocturia on their QoL and reported the most bothersome consequences of nocturia in a focus group format. Patient responses were thereafter compared with N-QOL items to evaluate how well they reflected the N-QOL concepts being measured. Second, five patients directly evaluated the N-QOL in an interview format using standardized cognitive debriefing methodology. **RESULTS:** Of the 20 participants (80% Caucasian, 10% African-American, 10% Hispanic), 45% had their condition for more than 5 years (45% had 3 voids/night and 25% ≥4 voids/night). Seventy percent had nocturia secondary to OAB, and 30% were currently taking prescription medication for the underlying cause of their nocturia. Disrupted sleep was the most bothersome consequence of nocturia, which resulted in sleeping longer into the daytime hours, being too tired to exercise, eating at night, weight gain, difficulty concentrating, and reduced productivity during daytime. This corresponded well with N-QOL concepts. Directly evaluated the N-QOL was found simple, clear, easy to complete, and comprehensive. **CONCLUSION:** The N-QOL has face and content validity in female nocturia patients, with sleep disruption causing severe impact on daytime activities, as the most bothersome consequence. The N-QOL items and response options are relevant and comprehensive for assessing the impact of nocturia on QoL of female patients.

URINARY/KIDNEY DISORDERS—Health Care Use & Policy Studies

PUK24

POLYPHARMACY TREND IN WOMEN WITH CHRONIC KIDNEY DISEASE IN UNITED STATES OUTPATIENT SETTINGS

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OBJECTIVE: Women with chronic kidney disease (CKD) are often at risk of experiencing polypharmacy. Polypharmacy is defined as the excessive use of drugs. This study examined variations in numbers of medications used by women with CKD in outpatient settings in the United States. **METHODS:** This cross-sectional study used data from the National Ambulatory Medical Care Survey (NAMCS) from 1996–2003. Women aged 18 years and older with CKD were included in the study sample based on clinical diagnoses and the reason for the visit. Polypharmacy was determined by retrieving number of medications used ($\geq$5 medications) during the time of visit (retrieved using the NAMCS drug codes). All analyses were weighted to make national estimates. **RESULTS:** There were approximately 58 million weighted outpatient visits for women with CKD from 1996 to 2003. The mean age for this population is 62. Nearly 14% of these visits were by Hispanic women. Nephrologists accounted for only 15% of CKD patient visits. Just over 4% of women reported having 8 medications at the time of their visits. Furthermore, 32% of patients were using $\geq$5 medications. Multivariate analysis showed that women seen by nephrologists were about two times more likely (OR:1.9;95% CI: (1.19–3.30) ($p \leq 0.05$) to receive a prescription for $\geq$5 medications than those not seeing a nephrologist. Hispanic women were 54% less likely (OR:0.46;95% CI: (0.23–0.94) ($p \leq 0.05$) to receive a prescription for $\geq$5 medications than non Hispanic patients. Additionally, this study also identified significant regional and time variations ($p \leq 0.05$) in polypharmacy trends within this population in U. S. outpatient settings. **CONCLUSION:** The findings of this study suggest that polypharmacy is prevalent in this population within U.S. outpatient settings. Increased awareness among clinicians is needed regarding the impact of polypharmacy on women with CKD in outpatient settings in the U.S.

PUK25

DIALYSIS FACILITY CHARACTERISTICS INFLUENCE THE USE OF HOME DIALYSIS IN THE U.S.

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OBJECTIVE: Use of home dialysis (HomD) therapies, home hemodialysis and peritoneal dialysis (PD), comprise approximately 8% of total dialysis utilization in the United States. The remainder being hemodialysis (HD) performed in-center. Recent work suggests 50% or more dialysis patients could receive HomD. The objective of this study is to evaluate whether dialysis facility characteristics affect HomD use. **METHODS:** The number of facility point prevalent (December 31, 2006) dialysis patients on HomD and facility HD was extracted from end-stage renal disease (ESRD) network annual reports. Data on ownership status (profit/not-for-profit), chain status (independent or managed/owned by a chain organization), night shift for dialysis, and the number of HD stations were obtained from Medicare's Dialysis Facility Compare (DFC) database. A regression model was used to estimate the impact of these factors on utilization of HomD (e.g., percent of total dialysis patients on HomD). Additional risk adjusters included a rural/urban indicator, percent of dialysis patients employed, and percent of dialysis population 18 to 54 years of age. **RESULTS:** There were 3480 facilities in the analysis. As the number of HD patients per HD station increases the percent of patients on HomD significantly decreases at an increasing rate. If the facility has a late shift, the percent of patients on HomD is 6 percent higher than in facilities without a late shift ($p < 0.001$). If a facility is for-profit, a chain organization, or is located in a more rural area, the percent of patients on HomD significantly decreases. Finally, a facility with the median of 62 or more dialysis patients has a significantly greater use of HomD. **CONCLUSION:** HomD was more common in not-for-profit and independently managed/owned facilities. The financial implications of these findings may be significant as in-center HD is 37% more costly than a home option in the Medicare population.

HEALTH CARE DECISION-MAKER'S CASE STUDY POSTER SESSION

PCASE1

GCSF: SAVING COSTS WITHOUT SAVING QUALITY OF CARE. A UNIMED VITORIA HEALTH INSURANCE EXPERIENCE

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Organization: Unimed Vitoria health insurance Company. Work Medicine Cooperative.
Problem or Issue Addressed: Increased costs and utilization of GCSF for the treatment of oncology patients within Unimed Vitoria, without any change in the ASCO indication criteria and cancer incidence.
Goals: 20% cost reduction of GCSF treatment of oncology patients through strict compliance of ASCO guidelines.
Outcomes items used in the decision: Cost-effective study on GCSF indication in different tumors and actual clinical application (interest conflicting prescription medicine).
Implementation Strategy: Single-observer evaluation of all GCSF requests and consequent release by the health insurance company only if the indication met ASCO guideline.
Results: Significant GCSF cost and utilization reduction from December 2005 to December 2007. The utilization reduction in 2006 was 25% followed by another 10% in 2007. The cost reduction was even greater as a result of direct purchase of the drug by the health insurance company.
Lessons Learned: Direct purchase of medications by the health care professional that is responsible for the prescription and drug distribution may increase drug prescription without scientific support.

PCASE2

THE ROLE OF ECONOMIC EVALUATION IN CHANGING DECISION-MAKER BEHAVIOURS : A CASE STUDY FROM TRINIDAD AND TOBAGO

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Organization: The Health Economics Unit of the University of the West Indies conducted an investigation into diffusion of laparoscopic general surgery in Trinidad and Tobago.
Problem or Issue Addressed: The adoption of new health technologies increasingly requires evidence of effectiveness (and cost-effectiveness). However, even where such evidence is available, its influence in modifying clinician behaviour is variable. Where current clinical practice resists the adoption of new technologies with demonstrable cost-effectiveness, then this is likely to lead to a) sub-optimal health outcomes for patients, and (b) inefficient and wasteful use of scarce health care resources. Minimally inva-

sive surgical techniques have been available for over 20 years. By the late 1990's laparoscopy was seen internationally as the future of general surgery. The first laparoscopic cholecystecomy (LC) in Trinidad had been performed in 1991. However, by 2003 this procedure was still not being performed at public hospitals in Trinidad and Tobago. Even in private hospitals only 7% of cholecystectomies were being performed laparoscopically. This was seen as a problem because LC is recognized as the 'first step' towards more widespread use of laparoscopic procedures in general surgery. A failure of the health system to adopt LC would translate to a failure to develop general laparoscopic surgery. Further, the population was being denied the well-documented patient benefits of LC in terms of reduced pain and shorter recovery time.

Goals: The objective of the study was to gain an understanding of the reasons for the failure to adopt laparoscopic cholecystectomy more widely despite the presence of surgeons who were able to perform the procedure and the availability of the required equipment in private hospitals. Recommendations for action were to be made based on these findings.

Outcomes items used in the decision: Surgeon and Administrator opinions on the clinical and cost-effectiveness of LC compared to Open Cholecystectomy (OC) and Minilap Cholecystectomy (MC). A cost-effectiveness analysis was carried out comparing these three procedures. Implementation Strategy: The views of consultant surgeons about the clinical and economic impact of LC versus other approaches, and their reasons for not performing were obtained by interview. Administrators in the Regional Health Authorities were also interviewed to obtain information about why LC had not been adopted in their hospitals. A meta-analysis based cost-effectiveness analysis was conducted that compared costs and benefits measured at (a) the level of the individual hospital and (b) the societal level for three procedures: OC, MC and LC for public hospitals in Trinidad and Tobago.

Results: Investigations revealed widespread belief among surgeons and administrators that LC substantially increased cost to the health care system. Over 60% of surgeons believed that MC was the lowest cost approach. The cost-effectiveness analysis showed that for Trinidad and Tobago, an LC programme would result in substantial savings over OC and MC programmes both at hospital level for society. Results of the cost-effectiveness analysis along with the clinical potential of a laparoscopic surgery programme (for example the potential for other minimally invasive procedures that could be adopted) were presented to physicians, administrators and policy makers in 2003–4. The presentations were well received. Several hospitals were performing LC by 2005, and by 2007 all of the major hospitals had acquired the necessary equipment and were performing LC. Post-implementation data shows that LC is being performed well within the limits of the key cost drivers in the CEA model, so that cost savings are at least at predicted level.

Lessons Learned: Policy makers and clinicians responded to a locally conducted cost-effectiveness analysis (albeit one using published data from overseas). The diffusion-failure of LC appeared largely to result from a failure to access relevant information on cost-effectiveness and this represented a misallocation of resources. The project pointed to the potential role for economic evaluation methods in health resource allocation decision-making in Trinidad and Tobago. A general framework for the prioritization of health interventions is currently being developed for Trinidad and Tobago. The aim is to develop a single framework which can be used to inform resource allocation decisions at various levels and which can be easily deployed in other Caribbean islands. A review of criteria to guide explicit prioritization concluded with a recommendation that EuroQol EQ-5D be used to obtain local values for health states which can in turn be used to quantify the benefits of health care interventions for economic evaluations.

PCASE3

PHARMACOECONOMIC APPLICATIONS IN FORMULARY MANAGEMENT: A CASE STUDY OF BORTEZOMIB AT A MAJOR CANCER CENTER

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Problem or Issue Addressed: Pharmacy budgets for cancer treatment are ever increasing and are contributed to by the addition of targeted therapies to standard cancer treatment regimens. As part of our formulary management process, we conducted and presented an pre formulary admission and post admission economic analysis of bortezomib in combination with standard chemotherapy for refractory or relapsed multiple myeloma.

Goals: The purpose of this project was to incorporate budget impact and cost-effectiveness considerations into the Pharmacy and Therapeutics Committee's deliberations about the approval for addition of a new product to the standard of care chemotherapy in the institution. A pre-approval economic model for bortezomib was built, which included annual budget impact and cost-effectiveness, and was presented to the Pharmacy and Therapeutics Committee in 2003. In 2007, a post-approval economic analysis was presented again to the Pharmacy and Therapeutics Committee in order to assess the actual annual budget impact of bortezomib and compare it to the pre-approval economic model.

Outcomes items used in the decision: The institutional annual budget impact analysis was done using direct medical costs, in 2007 United States Dollars. A cost per life year saved was also calculated for the initial Pharmacy and Therapeutics consideration.

Implementation Strategy: A model was built based on the indication of treatment of relapsed and refractory multiple myeloma as third line treatment. Assumptions regarding bortezomib's number of doses per cycle, per patient and median number of cycles per patient were based on information from published clinical trials. Annual budget impact for the expected MD Anderson population of 25 multiple myeloma patients, adjusted for 2007, was calculated to be $414,974 and a cost per life year saved was calculated as $14,592. This model, along with a clinical monograph, was presented to the P&T Committee at the same time as the vote for bortezomib's inclusion onto formulary. Subsequently, bortezomib was added to the formulary as an add-on drug for refractory or relapsed multiple myeloma patients with two prior therapies, and with the recommendation that physicians use discretion for use outside the FDA-indication.

Results: We reviewed non-investigational usage of bortezomib in MDACC from June 2006 to May 2007, after allowing ample time since its addition to the formulary to penetrate the institution. We had a total of 161 patients on bortezomib. Of these, 140 (87%) were refractory or relapsed multiple myeloma patients who had prior therapies, 7 (4%) were mantle cell lymphoma patients with prior treatments, and 14 (9%) patients received bortezomib for non FDA-approved indications. Refractory or relapsed multiple myeloma was FDA-approved in March, 2005 for second line therapy, whereas mantle cell lymphoma was

FDA-approved in December 2006, during our study period. We also reviewed charges and reimbursement data collected for the drug from June 2006 to December 2006. For the duration of the study period, we had a positive margin and our reimbursement to charge rate for multiple myeloma patients was close to MDACC goal of 55%, with 53.3% rate overall. Based on this analysis, there were some differences between the model assumptions and our findings from actual data. Our model had predicted 100% usage for the FDA approved indication of multiple myeloma in the expected patient population of 25 patients. Actual data collected showed that not only did we have more than expected number of patients on bortezomib, potentially due to the change in labeling to an earlier stage of disease, but our model had assumed 4 cycles of bortezomib therapy per patient whereas the actual average number of cycles per patient was only 2 at our institution. We did not have data to determine whether the patients had obtained more cycles of therapy from other providers.
Lessons Learned: Annual budget impact analysis helped estimate the cost to the institution for adding bortezomib to the formulary. Performing an annual budget impact before the addition of a drug to an institution's formulary, and comparing it with the annual budget impact after a few years of the drug being on the formulary, is an essential process in determining the best use of scarcely available, expensive resources for the most appropriate use. Cost effectiveness studies, that take costs of treatments and their outcomes in patients into account, are as important in allocating resources to best possible use in this era of rising costs and future research will focus on calculating cost-effectiveness specifically for the institution's patient population.

PCASE4

HEALTH PLAN AND INDUSTRY: NEW PARTNERSHIP TO ASSESS NEW TECHNOLOGY OUTCOMES AND ECONOMIC IMPACT

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Problem or Issue Addressed: With the fast pace of new medical technologies launched into the market, it is imperative to develop a formal and methodical approach to assess and evaluate outcomes and impacts; one that goes beyond the short-term vision of price and volume negotiation. Although there are several agencies across the globe that evaluate technologies, not always the market can count on their results because 1) either these reports are based on scenarios that don't reflect the real situation (for instance, a health plan in Africa considering a report about the U.S. medical system), or 2) there is not enough time to wait for a conclusion.
Goals: Effective coverage and Reimbursement decisions must reflect the local scenarios where they happen, and new methods to evaluate medical technologies must be in place to allow distant markets to reach their own conclusions about health care. One proposed answer to this problem is to bring different market stakeholders to teamwork and develop an approach that combines everyone's expertise into an effective methodology reflecting the local market scenario and population. In summary, to develop a Health Technology Assessment that reflects the local health care scenario and that is agile enough for a Health Plan.
Outcomes items used in the decision: Cost-effectiveness data (literature and local), local prevalence and incidence disease rates.
Implementation Strategy: Presentation and validation of methodology to Cassi and J&J Executive Board. Communication of new HTA process to all Cassi's franchises and J&J divisions in Brazil.
Results: Work in Progress. One technology assessed, another in evaluation. Cassi hopes to decrease medical costs and improve health care outcomes in 2008. J&J hopes to improve negotiations with Cassi.
Lessons Learned: Developing nations cannot count solely on studies performed in developed countries; they must develop analyses that reflect local scenarios and markets. To improve value for patients, one stakeholder cannot act alone. All participants must take action to improve the health care system's efficiency.

PCASE5

INFORMING DECISION MAKERS IN GERMANY: THE IQWIG APPROACH

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Problem or Issue Addressed: Development of methods for economic assessment of (mostly) new drugs and other interventions.
Goals: Provide clear, useful information to the German Federal Joint Committee for use in the setting of ceiling prices. Meet the special requirements of the German context, while remaining consistent with international standards of health economic assessment.
Outcomes items used in the decision: Plotting of the efficiency frontier within a specific therapeutic area to display the position of existing therapies and provide guidance for decisions through demarcation of various zones for new therapies. Horizontal axis consisting of the expected total cost per patient in Germany. Vertical axis consisting of a cardinal scal of value tha reflects the benefit assessed beforehand by IQWiG.
Implementation Strategy: International Expert Panel convened to develop the Methods. Draft Recommendations presented to broadening circle of German experts and constituencies culminating in Public consultation in January 2008.
Results: The core Recommendations will be presented along with their rationale, interpretation and use in guiding decision makers. A worked out example will be used to illustrate the implications.
Lessons Learned: It is possible to develop Methods that provide for economic evaluation within the constraints posed in Germany. This is done by focusing on the narrower objective of efficiency within a therapeutic area rather than the much loftier goal of relative valuation across the health care system.

PCASE6

HOW SHOULD NEW TECHNOLOGIES AND NEW DEVICES BE ASSESSED IN A HOSPITAL SYSTEM?

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Organization: Mercy Health Partners, Southwest Ohio. The regional office consists of 5 acute care hospitals and 6 Long Term Care Nursing Homes with over 8000 employees and 2000 physicians on staff.
Problem or Issue Addressed: There currently exists a lack of sufficient long-term cost-effectiveness data on new technologies and new devices, in order to allow health care decision makers to make good decisions. At the same time, the costs associated with many of these technologies and devices have out-paced the level of reimbursement given to the providers.

Goals: The primary goal of our health system is to provide the appropriate information to the executives on making the right decisions, which will improve the quality of care, guard against harm to patients from the new technologies and devices, and preserve the financial well-being of our health care system.
Outcomes items used in the decision: The case will use two recent examples (orthopedic implants and artificial disc implants) to illustrate the requirements for evaluating economic (costs, reimbursement) and clinical outcomes data for a cost-consequences analysis. In addition, our team has developed a model which evaluates costs, reimbursements, and incremental benefits for implementing the new technologies.
Implementation Strategy: In an effort to control costs and improve quality and patient safety, our hospital system recently formed an Advisory Panel on New Technologies, New Procedures, and New Devices. The function of the Advisory Panel is to evaluate new technology in the form of programs, procedures, products, and devices. Panel members receive research and information about new technology proposed by groups or individuals for use or implementation within the organization. The information is compiled by the requesting groups or individuals in conjunction with Sourcing and other departments as appropriate. The compiled information is presented to the Advisory Panel members prior to each meeting. The Advisory Panel reviews the information and provides, to senior administration, an analysis of the new technology to facilitate executive decision-making. This analysis will include recommendations regarding identified needs of the organization prior to implementation or use of the new technology. The panel is staffed with a Pharmacoeconomist and Outcomes Researcher, in order to provide the analysis for each new item.
Results: This case study demonstrates the current deficiencies in evaluating the long-term effects of newly approved technologies, and the data that are required, in order to conduct this type of analysis. One might argue that more data will incur more costs to the manufacture, which will eventually be passed on to the providers. It also illustrates the tactics that are employed to contain costs in today's dynamic health care environment.
Lessons Learned: There currently are very few studies available which assess the societal costs of inappropriate use of new technologies and devices, and as demonstrated during this session, this will need to change.

WITHDRAWN **PCASE7**