Assessing Clinical Reasoning ……

The Clinical Judgement Test (CJT)

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Acknowledgements

- The Community Term Academics at the University of Sydney
- Deborah O’Mara and the Assessment Unit team.
- eLearning team

Overview

- To describe a curriculum framework and programmatic assessment context for developing a CJT
- To illustrate a theory of clinical reasoning underpinning the CJT
- To describe an evaluation of an implementing pilot of the CJT
- To describe the CJT scoring system
- To provide some preliminary validity data of the summative CJT within a programmatic assessment
- To report on next steps.

Background

- Clinical reasoning and clinical judgement are essential clinical skills
- Clinical teaching in general practice aims to facilitate and strengthen medical student's clinical reasoning skills by providing experience with numerous and varied clinical cases
- Assessment drives learning – so its important that the assessment processes we use drive the students to practice and use the skills we want them to acquire
- Is this achieved by a SBA style test?
- How do we assess workplace based skills like clinical reasoning in a reliable, valid but importantly feasible way

1. Schuwirth L. Is assessment of clinical reasoning skills still the holy grail? Medical Education 2009;43(4):298-300

- MCQs focus on testing knowledge recall and do not adequately assess higher order thinking processes such as analysis, synthesis and evaluation or ‘Attitude’ that should be integrated with Knowledge and Skills…….AND therefore they drive students to learn in the library rather than the workplace
- The development of a valid and reliable measure of clinical reasoning ability is still seen as the ‘Holy Grail’ of assessment (1)

What is clinical reasoning and how does it apply in the general practice setting?

- Consultations in general practice are frequently complex due to many contextual factors including:
  - Uncertainty
  - Undifferentiated illness
  - Diverse backgrounds
  - Multisystem disease
- Clinical reasoning is integrated with patient goals, ethical values and professional attributes to inform clinical judgements and decisions
- Frequently there are a number of options regarding approach, investigation and management available
- GPs make a judgement as to the ‘best’ course of action according to patient’s preference and clinical context
- Importantly – there may not be only ONE correct approach

Teaching clinical reasoning is essential in general practice

- Student will see and need to understand the diagnostic problem solving approach used general practice……..
  - The pattern of illness
    - a high incidence of acute, short term illnesses, chronic illness and psychological problems.
    - Presentations tend to be mixed and complex.
    - Hence the need to separate the common from the dangerous
    - The spectrum of illness is different to the ED or the specialist office
  - Undifferentiated illness
    - Not been assessed by anyone else
    - The symptoms of several illnesses may be presented at once
    - The patient hasn’t learned the important symptoms
    - The most sensitive problems may be expressed in indirect or metaphorical language
    - The ‘problem’ may not be the same as the disease

A diagnostic model for a presenting problem – the Murtagh model

- What is the probability diagnosis
- What serious disorders must not be missed
- What conditions are often missed / what are the mascarades
- What else is the patient trying to tell me
- What does the patient think the problem is or what does the patient fear.

How can we assist students to start to think and reason in this complex way?

- Its not a simple question – like “what is the most common causative pathogen in otitis media?”

But…

- In this patient
- In this population
- In this place
- With these preferences and access issues ……..

…….. What is the most important thing, what is the most dangerous thing, what should I do next, what else could be going on

AND …. There’s likely to be more than one correct answer

Background - SJT

- The Situational Judgement Test (SJT) has been used successfully to assess professional behaviour for the selection of candidates for post-graduate medical training (2)
- SJTs measure an individual's judgement about what is effective behaviour in an authentic and challenging work situation
- But can the SJTs also assess clinical reasoning, problem solving, professional behaviour and effective communication
- SJT format has the potential to assess medical student's clinical reasoning in in a way that a MCQ cannot

Patterson F, Ashworth V, Good D. Stituational Judgement Tests A guide for applicants to the UK Foundation Programme: Medical Schools Council 2013; August, 2013 [Edition 2].

Background to teaching and learning in the Community Specialty Block

A programmatic approach to assessment

- *‘**Programmatic assessment** is an integral approach to the design of an **assessment** program with the intent to optimise its learning function, its decision-making function and its curriculum quality-assurance function.’*

Assessment task	% of term mark or contribution to the programmatic assessment
Making Decisions in General Practice	15
Assessing the Health of communities	15
GP supervisor assessment	10 Placement 1 10 Placement 2
PCAP presentation	15
End of term written SBA/EMQ Clinical Judgement test	 20 15

Primary Care Areas of Priority Cases

- Complex chronic disease prevention, risk assessment and management in the Community
  - Diabetes
  - Mental Health
  - Musculo-skeletal and falls
  - Respiratory – COPD and Asthma
  - Cancer
  - Cardiovascular disease and Obesity
- Case based, using the clinical reasoning model, student led teaching,

The Clinical Judgement test pilot project

- We use the CJT to enhance the teaching and learning about chronic disease
- We have developed and piloted a CJT with 100 students over three rotations in the Community Term attachment
- The pilot study identified a high degree of acceptability of the CJT format as an authentic assessment of clinical reasoning in primary care education.
- Students maintained that using practice questions for group discussion deepened their understanding of complex clinical reasoning.

Clinical Judgement Test (CJT)

- Used the SJT format to develop CJT questions for the PCAP assessment task to complement the MCQs already used
- Questions written and reviewed by GP academics, scoring key arrived by a consensus of a concordance panel
- 2 types of CJT:
  - **Ranking**: assesses the ability to differentiate between responses to clinical scenarios that range in appropriateness for the situation
  - **Multiple Choice:** choose 3 best options of response to clinical situation when it is necessary to do more than one thing

A 60 year old male patient with Type 2 Diabetes who has been on maximum Metformin dosage for 3 years presents with the recent development of urinary frequency and lethargy. His blood glucose measurement at home this morning was 12mmol/l. His BP is 140/80 and BMI is 34. Urine dipstick is negative.

What are the next steps in managing this patient?

Rank in order the following actions (first most appropriate next step, last least appropriate next step):

A. Discuss bariatric surgery
B. Add a Sulphonylurea to Metformin
C. Reinforce the need for lifestyle measures
D. Add long acting Insulin
E. Review his adherence to current management

Answer: E, C, B, D, A

Scoring of ranking type questions

- There may be no definitive correct answer, as the scenarios assess judgement
- The ‘scoring key’ is determined by academic review, analysis and piloting
- Up to 20 marks are available for each item
- Up to 4 marks for each response
- Points given for ‘near misses’

Scoring Multiple Choice Type Questions

A 23 year old woman who is in her first year of university presents to the GP complaining of headaches. She says that they come on in the afternoon on most days and never wake her at night. On further questioning you note that she is away from her family who are interstate, has few friends and is increasingly declining invitations to go out, and is struggling to submit university work.

Which 3 things are most important to do in this consultation:

A. Ask about suicidal ideation

B. Perform a full physical examination

C. Request pathology including FBC and thyroid function

D. Ask about previous history of depression and anxiety

E. Ask about previous suicide attempts

F. Request a CT brain scan

G. Ask about family history

H. Suggest calling her mother for further history

- Correct answers receive 4 points each
- Total correct score 12 for questions

Evaluation Methods (Phase 1)

Evaluation data from:

- Initial focus group discussion regarding CJT pilot questions with Community Term students Term C and D 2016

- 12 practice ‘Quiz’ questions sent out in week 6 of Term C and D using CANVAS LMS
    - Likert scale evaluation questionnaire
    - Qualitative written comments

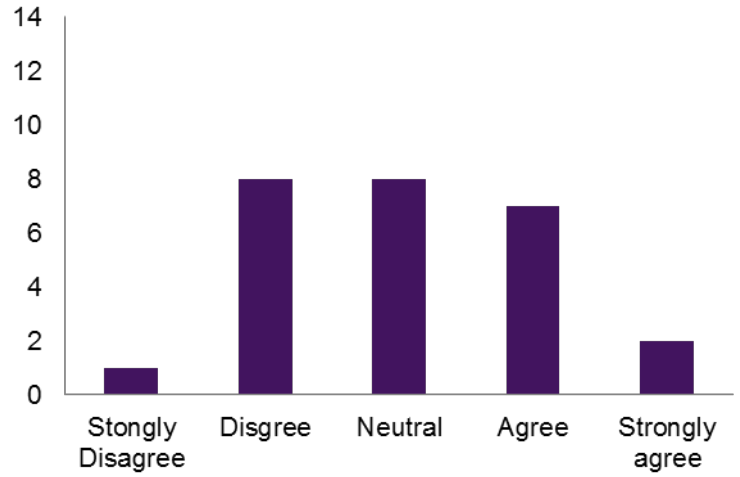
Preliminary results - Feasibility

Using CJT questions for assessment has been shown to be feasible:

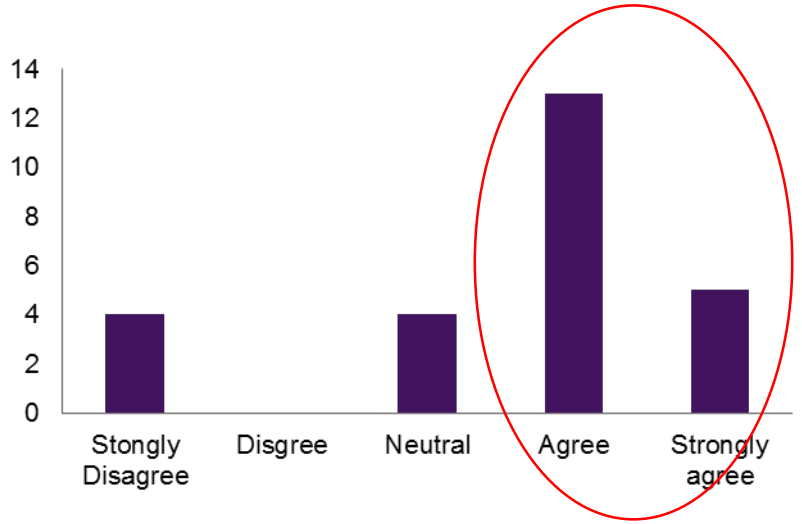
- CANVAS Learning Management System has been used successfully for the ‘Quiz’ in Term C and D 2016
- CJTs were implemented in the new academic year – that is Term E 2016

Preliminary results - Acceptability

A SBA question is a good method to assess my clinical reasoning:



A CJT questions is a good way to assess my clinical reasoning:



The majority of the students indicated that a CJT question:

- ✓ was a good method to assess the application of their knowledge
- ✓ was a good method to assess their clinical judgement
- ✓ was a good method to assess their ability to solve complex clinical problems
- ✓ was a good method to assess their decision making skills
- ✓ reflected authentic general practice

Student comments about the benefits of using a CJT question to test the application of knowledge when using clinical reasoning and judgement skills:

- ‘CJT overcomes many of the design flaws in SBAs’
- ‘easy to understand and do’
- ‘allowed me to get some reward for my knowledge rather than nothing’
- ‘I really enjoyed this quiz and would love to see CJT questions in all parts of the USyd examinations’
- ‘Interesting and otherwise good revision – they opened me up to the flaws of my current knowledge’

- ‘more thought provoking, more like clinical practice’
- ‘Most interventions are multifactorial and often there is no one single answer for patient management. The CJT method of testing allows contextual and lateral thinking’
- ‘CJT questions allowed assessment of my entire clinical knowledge rather than just part of the clinical picture presented’

Suggestions for improvement/concerns:

- Provision of more in depth feedback regarding the answers
- Some options were equally as bad, so it is difficult to know how to rank them
- The multiple choice questions (choose 3 options) were easier to answer than the ranking questions
- Concern regarding marking the ranking questions - if one answer is incorrect then the order of the other answers is thrown off
- The need to practice with this type of question and not see it for the first time in an exam

Scoring of ranking type questions

- Scoring is based on how close the response is to the item's 'scoring key'
- If a candidate chooses the correct rank for a response, then they will receive 4 points for that response

Ideal rank	Candidate's rank choice				
	1	2	3	4	5
1	**4**				
2		**4**			
3			**4**		
4				**4**	
5					**4**

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Scoring ranking item

- The next closest response will get 3 points etc
- There are only 2 options that are associated with no points

Ideal rank	Candidate's rank choice				
	1	2	3	4	5
1	**4**	3	2	1	0
2	3	**4**	3	2	1
3	2	3	**4**	3	2
4	1	2	3	**4**	3
5	0	1	2	3	**4**

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- If the ideal rank for an option is ‘1’ and the candidate chooses ‘1’, they will receive 4 points, if they rank it ‘2’, they will receive 3 points etc

Ideal rank	Candidate’s rank choice				
	1	2	3	4	5
1	**4**	3	2	1	0
2	3	**4**	3	2	1
3	2	3	**4**	3	2
4	1	2	3	**4**	3
5	0	1	2	3	**4**

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Ideal rank	Candidate's rank: C, D, B, E, A				
	1	2	3	4	5
1 **C**	**4**	3	2	1	0
2 **D**	3	**4**	3	2	1
3 **B**	2	3	**4**	3	2
4 **E**	1	2	3	**4**	3
5 **A**	0	1	2	3	**4**

20

Ideal rank	Candidate's rank: C, B, D, E, A				
	1	2	3	4	5
1 **C**	**4**	3	2	1	0
2 **D**	3	**4**	3	2	1
3 **B**	2	3	**4**	3	2
4 **E**	1	2	3	**4**	3
5 **A**	0	1	2	3	**4**

18

Ideal rank	Candidate's rank: C, E, D, B, A				
	1	2	3	4	5
1 **C**	**4**	3	2	1	0
2 **D**	3	**4**	3	2	1
3 **B**	2	3	**4**	3	2
4 **E**	1	2	3	**4**	3
5 **A**	0	1	2	3	**4**

16

Ideal rank	Candidate's rank: A, E, B, D, C				
	1	2	3	4	5
1 **C**	1	3	2	1	0
2 **D**	3	**4**	3	2	1
3 **B**	2	3	**4**	3	2
4 **E**	1	2	3	**4**	3
5 **A**	0	1	2	3	**4**

8

Correlations of CJT with other assessments

Programmatic assessment item.	1	2	3	4	5	6	7	8	9
Shared Decision Making essay	1.00	.38**	.19**	.22**	0.13	.16*	.24**	**0.13**	.70**
Observed case based presentation		1.00	.36**	.29**	0.05	0.13	.17**	**.18****	.63**
Student produced MCQs			1.00	-0.02	0.05	0.07	.15*	**.17***	.275**
CommunityPublic Health essay				1.00	0.10	.15*	.15*	**-0.03**	.502**
GP Supervisor Observation of competence 1					1.00	.18**	0.03	**-0.01**	.375**
GP Supervisor Observation of competence 2						1.00	0.13	**0.02**	.405**
Written - MCQ							1.00	**.38****	.615**
Written - CJT								1.00	.352**
Total (100)									1.00

Factor Analysis of Program Assessment

Programmatic assessment item.	Component		
	Clinical Reasoning	Written problem solving	General Practice
Observed casebased presentation	0.83		
Student produced MCQs	0.70		
Shared Decision Making essay	0.57		
Written -CJT		0.83	
Written - MCQ		0.79	
GP Supervisor Observation of competence 2			0.67
GP Supervisor Observation of competence 1			0.63
Community Health Essay			0.56

Reliability

Overall reliability of program assessment = 0.49

However reliability of 10 item CJT is low, requires more items.

BUT reliability is not a useful concept in developing profiles of student performance.

However current predicitve validity of CJT needs addressing

Predictors of CJT of final program assessment score.

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients B	T	Sig.
Shared Decision Making essay	0.30	0.00	0.37	101.69	0.00
Written - MCQ	0.44	0.00	0.36	99.30	0.00
Observed casebased presentation	0.37	0.01	0.31	79.36	0.00
GP Supervisor Observation of competence 1	0.20	0.00	0.25	74.23	0.00
Community Health Essay	0.49	0.01	0.23	65.38	0.00
GP Supervisor Observation of competence 2	0.11	0.00	0.18	52.40	0.00
Written - CJT	1.00	0.03	0.12	32.79	0.00
Student produced MCQs	0.01	0.02	0.00	0.48	0.64

Summarising Validity Evidence for the CJT

- Face validity in terms
- Correlates with written MCQ tests suggesting testing integration of knowledge and problem solving
- Does not predict final program assessment score
- Problems with scoring system underlie reliability issues.

Conclusion

The preliminary findings indicate that:

- ✓CJT questions are a feasible and acceptable method for the summative assessment of a student's clinical reasoning and judgement
- ✓Psychometric performance of the CJT requires fine tuning of the scoring key
- ✓ answering CJT questions:
  - ✓ is a driver for further learning
  - ✓facilitates the development of the student's clinical reasoning and judgement skills
  - ✓enables students to integrate their clinical knowledge, attitudes and skills in authentic general practice scenarios which students enjoy doing?

Next Steps

- Await complete cohort data
- Model different scoring systems.
- Model different item analysis systems.
- Continue CJT item bank development
- Faculty development around question writing and review
- Consider replacing MCQs with CJTs

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