THE UNIVERSITY of York
Centre for Reviews and Dissemination

NHS
National Institute for
Health Research

Evidence briefing on urgent care systems

- This briefing represents a broad overview of the available evidence. We anticipate examining some of this evidence in more detail once the topics of most interest to local decision-makers are defined.
- In the emergency department setting, there is limited evidence to suggest that GPs order fewer tests, admit fewer patients and make fewer referrals than emergency care professionals.
- Other workforce models that have been implemented successfully include emergency care practitioners and emergency department nurse practitioners.
- We found no evidence evaluating models in which GPs are more closely integrated with the emergency department. These are known to exist but formal published evaluations are lacking.
- Several of the systematic reviews included in this briefing provide some cost information but overall reliable evidence on cost effectiveness is lacking.
- The limited evidence base for many interventions reinforces the need for careful evaluation of any new or modified services

This evidence briefing has been produced for West and South Yorkshire and Bassetlaw Commissioning Support Unit by the Centre for Reviews and Dissemination (CRD). Full details of methods are available on request (paul.wilson@york.ac.uk or duncan.chambers@york.ac.uk). The content of this briefing was judged to be up to date as of November 2013.

The briefing has been produced as part of independent research funded by the by the National Institute for Health Research (NIHR) through the Leeds, York and Bradford Collaboration for Leadership in Applied Health Research and Care. The views expressed in this publication are those of the authors alone and do not necessarily reflect those of the NIHR or the Department of Health.

Background

West and South Yorkshire and Bassetlaw CSU have requested an evidence briefing/ briefings to support an event with the overall theme 'How can the 111 service support effective urgent care?' Under this broad heading, three specific topics of interest were identified:

- Components of effective urgent care systems
- Effectiveness of unified triage systems
- Sustainable workforce delivery to support 7-day working.

It was recognised that there is some potential overlap between the topics and that the first two may be more likely to be covered by existing research evidence. The scope of the briefing is defined as:

Population: General population in the UK or other developed countries

Intervention: Systems or services to provide urgent (i.e. not pre-planned) care as required, including advice to patients and assessment of the urgency of their needs (triage). Examples include telephone services (NHS Direct, NHS111) and 'walk-in' or minor injuries centres. Emergency care is not the main focus, although it is recognised that the division between urgent and emergency care is not clear-cut.

Comparator: Comparisons between different ways of providing services (including staffing).

Outcomes: Including but not limited to: A&E attendances; unplanned hospital admissions; any measures of patient safety; patient satisfaction; any measures of costs or cost-effectiveness.

Given the general nature of the question, at this stage we have excluded interventions directed at urgent care use by patients with specific conditions.

Methods

This briefing is a rapid appraisal and summary based mainly on existing sources of synthesised and quality-assessed evidence, primarily systematic reviews and economic evaluations. It is not a systematic review and we have not carried out exhaustive literature searches.

Systematic reviews and economic evaluations have been identified by searching the following sources:

- DARE (quality-assessed systematic reviews of interventions)
- Cochrane Database of Systematic Reviews
- NHS EED
- CRD HTA database.
- Health Systems Evidence (Canadian database which includes reports and policy documents as well as systematic reviews)

The scope of the above search was relatively broad and included any synthesised evidence that addresses models of provision of urgent/ care and its interface with emergency care that could be relevant to the UK NHS.

Summary of included evidence

This briefing represents a broad overview of the available evidence. We have included evidence from 23 unique sources, comprising 17 systematic reviews, 1 HTA report, 2 non-systematic reviews, 2 economic evaluations and 1 report (including a rapid literature review). We anticipate examining some of this evidence and that relating to implementation and equity in more detail once the topics of most interest to local decision-makers are defined.

Components of urgent care systems

Telephone consultation/triage

By definition, effective telephone consultation/triage is integral to the success of the 111 service. The key synthesised evidence source for telephone consultation/triage is a Cochrane systematic review by Bunn et al.[1] This review is up-to-date to 2008. The review included nine studies of which five were randomised trials, one a non-randomised controlled trial and three were interrupted time series studies. It should be noted that the objective of most studies was to show that telephone consultation or triage was as safe and effective as systems involving more face-to-face contact. The studies essentially evaluated telephone consultation rather than formal triage.

In summary, the review found little evidence to suggest that telephone consultation is less safe than standard care. However, effects on service use were mixed and the authors recommended further rigorous evaluations. The evidence relates mainly to services delivered by doctors or nurses rather than by less qualified staff. Although the review is not completely up-to-date, a more recent review found similar results (no difference between groups) for the effects of telephone consultation on emergency department visits.[2]

Telephone consultation and patient compliance

Telephone consultation will only be effective if patients both receive appropriate advice and follow that advice. A systematic review looked at the extent to which patients followed advice from nurse-led telephone consultation/triage.[3] The main finding was that patients were more likely to follow advice to use emergency services or perform self-care than to seek non-urgent care, for example by seeing their GP. The authors highlighted the high overall rate of compliance with advice to use self-care (79%) and suggested that telephone services were successful in diverting patients with less severe symptoms from using emergency services or visiting a GP. However, the lack of a control group in most studies and the absence of cost-effectiveness evidence limit the usefulness of the review for informing decision-making.

Three studies included in the review reported on reasons for non-compliance. The most common reason was that patients reported hearing a different recommendation from that recorded by the service. The review authors suggested that compliance with telephone advice was influenced by the quality of provider communication as well as patient perceptions, with access to health services as a moderating factor. A specific issue raised by the authors was the potential value of communication skills training for people providing telephone advice. Evidence for the effectiveness of such training in improving outcomes was outside the scope of the review. A systematic review of qualitative studies by the same authors identified nurses' perceived need for clinical and communication skills training as a theme across a number of studies.[4] However, this was primarily in the context of specific communication issues such as handling calls from non-native speakers.

Access to urgent primary care

Effective urgent care depends on patients being able to access appropriate and timely primary care. A number of different models of care have been developed to facilitate this, most notably walk-in centres and minor injury units. These may be sited near to accident and emergency units or in locations with easy access for the local population. Out-of-hours systems are discussed separately below.

A systematic review published as long ago as 1997 examined whether primary care based 'emergency' (broadly defined as first contact urgent care) services can substitute for hospital accident and emergency services.[5] The authors concluded that access to primary care is an important influence on demand for emergency care but argued that a focus on substitution of hospital-based by primary care-based services may not be particularly helpful. Like most other authors, they stressed the need for further evaluations and their review is by definition out-of-date.

A 2004 systematic scoping review reviewed evidence for interventions to improve access to primary care.[6] These included telephone consultations, walk-in centres and NHS Direct. These authors also found the evidence insufficient to make clear recommendations and stated that rigorous evaluations should be planned and conducted alongside introduction of new service models. Another systematic scoping review looked specifically at walk-in centres and reached similar conclusions.[7]

Given current pressures on accident and emergency services, an important objective or urgent care services is to reduce inappropriate visits to emergency departments. A more recent systematic review by Flores-Mateo et al. assessed the effectiveness of a range of interventions designed to achieve this.[2]

The main interventions of relevance to the NHS were those designed to improve access to primary care. The authors appropriately concluded that such interventions are effective in reducing emergency department use. However, only three of the included studies were from the UK. All of these examined out-of-hours primary care services (no further details reported) and none of them found a significant reduction in emergency department use. Thus, the generalisability of this finding to the UK setting appears uncertain. It should also be noted that the review only looked at emergency department visits and related outcomes; other outcomes important to the patient or the healthcare system were not evaluated.

Out-of-hours systems

Only one systematic review specifically evaluated effects of different models of out-of-hours primary care.[8] However, the review was poorly conducted even by 2003 standards and the included evidence is now out-of-date.

A Spanish HTA report[9] used a combination of primary research and literature review to propose improvements to urgent and emergency health services in the Basque Autonomous Community. The English summary suggests that the authors are proposing an integrated system but this paper has not been evaluated in depth because of the language barrier.

Although not based on systematic reviews, Giesen and colleagues in the Netherlands have provided an overview of models of out-of-hours care used in different western developed countries.[10] They have also conducted a non-systematic (but likely to be thorough) review of research evaluating the integrated out-of-hours system used in the Netherlands.[11] This evidence is included here because the Dutch healthcare system, although insurance-based, in many ways resembles the UK NHS.

The Dutch out-of-hours system is organised around large co-operatives in which 40 to 250 GPs cover populations ranging from 100,000 to 500,000 people. The service is accessed by telephone with consultation/triage by nurses supervised by GPs. Co-operatives are based in or near a hospital, allowing patients who attend the emergency department to be directed to the co-operative if appropriate. GP co-operatives also undertake home visits.

Research using quality indicators suggested that patients generally received treatment in accordance with relevant guidelines. A prospective study of 1145 patient records found a patient safety incident rate of 2.4%, most of which did not result in harm to the patient. In terms of safety, telephone consultation/triage was considered to be the most complex and vulnerable part of out-of-hours care. The use of a 'telephone physician' to support nurse triage was associated with an increase in consultations handled by telephone alone and a decrease in home visits. Patients were more satisfied with the calls although no evaluation of actual patient outcomes was available. Giesen et al. stated that future developments in the Netherlands would include greater integration and collaboration with hospital emergency departments, in which GPs would take care of self-referring patients.[11] This issue is discussed further under 'triage systems' below and in the 'cost-effectiveness section.

GPs in emergency departments

A recent Cochrane review evaluated the effects of embedding primary care professionals in hospital emergency departments to provide care for patients presenting with less urgent problems. The comparator was usual care provided by emergency physicians. The review included three studies and found limited evidence that GPs ordered fewer tests and X-rays, admitted fewer patients and made fewer referrals than emergency professionals.[12]

However, these positive effects highlight the need for accuracy in the initial triage process, which in the two studies that showed beneficial effects was done by trained nurses and in the one study that showed no difference was done by receptionists. A scoping review included in a report by the Primary Care Foundation[13] also explored the interface between primary and emergency care. This review similarly found that GPs working in emergency departments made fewer referrals and undertook fewer tests. The review also found that redirecting patients away from the emergency department by referring to primary care services had variable results in terms of future attendances and safety.

Workforce issues

The CSU has expressed an interest in evidence related to workforce delivery to support 7-day working. For that reason we have summarised in this section systematic reviews on emergency care practitioners and on the role of nurse practitioners in treating minor injuries in the emergency department.

Emergency care practitioners

Emergency care practitioners (ECPs) were introduced in the NHS in 2003. Most come from nursing or paramedical backgrounds and they are widely employed in emergency departments and other urgent care settings. A recent systematic review assessed the activity and impact of ECPs in the NHS. This was a broad review and included empirical evaluation studies of any design (quantitative or qualitative).[14] The authors' main conclusion was that ECP services have been implemented successfully in a variety of UK settings. There was support from staff and patients for ECP services. A number of studies of high methodological quality found care processes provided by ECPs to be equivalent to or better than those provided by practitioners with traditional roles. However, the authors noted that the evidence was insufficient to conclude that commissioning an ECP service is likely to be more productive than alternatives such as GP visits or paramedic treatment.

In particular, improvements following introduction of an ECP service could be the result of new investment rather than the ECP role per se. Differences in study populations and research methods made it difficult to draw conclusions about the cost-effectiveness of ECP services.

Nurse practitioners in emergency departments

A 2009 systematic review examined the effectiveness of nurse practitioners compared with junior doctors in treating patients with minor injuries in emergency department settings.[15] Based on limited evidence, the review found no significant differences in rates of follow-up or significant errors. There was evidence that nurse practitioners reduced patient waiting time for assessment and treatment and overall length of stay in the emergency department, although this was derived from lower quality studies. Patient surveys indicated high levels of acceptance of treatment by a nurse practitioner and satisfaction with the treatment received.[15]

Unified triage systems

We define unified triage systems to mean systems that ensure patients presenting to the urgent care system, whether by telephone or in person, are directed to the appropriate service for their needs. Telephone triage has already been discussed. For patients attending in person, unified triage could involve having different types of service located in one place with a single point of access to all of them.

Pre-hospital triage

A 2013 systematic review looked at the evidence for triage systems specifically in the context of pre-hospital emergency services, including telephone triage (this would normally be 999 rather than 111).[16] Despite a thorough search, no studies met the review inclusion criteria. The main reasons for this were lack of a control group or that the study did not use a validated triage system. Thus, there is currently a lack of reliable evidence regarding triage of acutely ill patients outside the hospital setting.

Triage and emergency department "throughput"

A recent systematic review of 33 studies evaluated various interventions to improve patient flow through the emergency department.[17] The authors found that "fast-tracking" patients, a separate process for handling patients with less serious symptoms, reduced waiting times and emergency department length of stay. In the majority of the studies a triage nurse usually decided which patients to fast-track. A second systematic review (25 studies) published around the same time also evaluated triage systems in general but had somewhat different inclusion criteria; for example, fast tracking was specifically excluded.[18] The authors concluded that triage systems can improve patient flow in diverse healthcare settings. While this conclusion is too general to be helpful, the authors did emphasise the importance of collecting sufficiently detailed information on patient needs to enable decisions on prioritising care.

These reviews have some methodological limitations but overall they provide reasonable summaries of a substantial body of evidence. It should be noted that most included studies were observational and so potentially at relatively high risk of bias.

Another recent review [4 studies] evaluated the effectiveness of rapid assessment zones or pods to decrease overcrowding in emergency departments.[19] Rapid assessment zones are emergency department spaces adapted for treating patients with more complex acute ambulatory emergency patients than the typical fast-track patient, where assessment and

procedures can be performed in a chair or stretcher. Limited evidence suggested that rapid assessment zones reduce waiting times and length of stay. This conclusion appears reliable.

Who should triage?

A systematic review specifically looked at triage liaison physicians in emergency departments, either working as part of a triage team or on their own.[20] The review found reductions in waiting times and length of stay when compared to usual nurse-led triage despite variation in the experience and responsibilities of the triage physicians across the included studies.[20] Limited evidence from two other reviews suggested that team triage reduced waiting times and emergency department length of stay[17], and that triage nurse ordering of tests and interventions appeared to reduce length of stay especially for patients suspected of having a fracture.[21]

Another possible model of service delivery involves GPs being located at the front of the emergency department to screen out patients not requiring emergency treatment. In this model, patients not requiring treatment from the emergency department could be treated by the GPs/primary care staff or referred to other primary care services. We have not found any systematic reviews covering this topic (in Rowe et al.'s review of triage liaison physicians, triage was performed by emergency physicians).[20] The rapid scoping review included in the Primary Care Foundation report provides a limited overview of the evidence around management of primary care patients within the emergency department and interventions to redirect such patients.[13] The authors noted that UK studies of GPs working in emergency departments involved triage by other staff. No studies were found where the GP selected appropriate cases, although the authors stated that 'such systems are known to exist'.

Evidence about the safety of these interventions in terms of mortality and adverse events is particularly lacking. It should be noted that none of the reviews were specifically about out-of-hours provision although some of the patients included in some of the studies included in the reviews were treated out-of-hours.

Cost-effectiveness

Initial searches suggest that the evidence on cost-effectiveness of different models of urgent care provision is surprisingly limited. This may be because most of the research that has been done uses less robust methods and does not meet NHS EED's criteria for economic evaluation.

The systematic review of emergency care practitioners in the NHS included four studies comparing the costs of ECPs with those of other providers such as the ambulance service or emergency department. Three of these found cost savings associated with use of ECPs but the estimated cost savings varied widely between settings. The review authors appropriately concluded that there was insufficient evidence to draw firm conclusions about cost-effectiveness.[14]

A 2003 economic evaluation compared a nurse practitioner-led minor injuries unit with an emergency department for treatment of minor injuries.[22] This UK study found that costs were numerically higher and waiting times significantly shorter for patients treated by the nurse-led minor injuries unit. Given the age of the study, the findings may not reflect current practice.

The only other relevant economic evaluation identified to date evaluated the addition of a

GP to the emergency department.[23] Patients who referred themselves to the emergency department and were not in need of immediate treatment were seen by a GP. Costs and outcomes were compared with an earlier period when all patients were seen by emergency department staff (usual care).

Presence of a GP in the emergency department was associated with significantly lower process time, higher patient satisfaction and no difference in the number of correct diagnoses. Total costs (2007 prices) were significantly lower compared with usual emergency department care (mean difference €71, 95% confidence interval €23 to €121). It should be noted that the study only considered the cost of GP staffing between 10am and 5pm and so the reported cost savings may not be applicable to a UK out of hours service.

Implications

- This briefing represents a broad overview of the available evidence. We anticipate examining some of this evidence in more detail once the topics of most interest to local decision-makers are defined.
- Most of the evidence on telephone consultation/triage relates to services delivered by nurses or doctors. Although we have summarised it here, it may not be generalisable to the service delivered locally.
- In the emergency department setting, primary care professionals may be employed to treat patients presenting with less urgent problems. There is limited evidence to suggest that GPs order fewer tests, admit fewer patients and make fewer referrals than emergency care professionals.
- Other workforce models that have been implemented successfully include emergency care practitioners and emergency department nurse practitioners.
- Numerous interventions exist to promote effective triage and management of patients presenting for urgent care. Interventions with some evidence of effectiveness (usually in terms of outcomes like waiting times and length of stay) include ‘fast-tracking’, rapid assessment zones, triage liaison doctors and allowing triage nurses to order tests. However, the evidence is often limited and evidence on safety is particularly lacking.
- We found no systematic reviews on the role of GPs at the front of emergency departments to identify (and sometimes treat) patients not requiring emergency treatment. UK studies of GPs working in emergency departments have involved triage and selection of patients by other staff. Models in which GPs are more closely integrated with the emergency department are known to exist but formal published evaluations are lacking.
- Several of the systematic reviews included in this briefing provide some cost information but overall reliable evidence on cost effectiveness is lacking
- The limited evidence base for many interventions reinforces the need for careful evaluation of any new or modified services.
- Issues around implementation of change and impact on health inequalities have not been addressed in this overview but will be addressed once the topics of most interest to local decision-makers are defined.

References

1. Bunn F, Byrne G, Kendall S. Telephone consultation and triage: effects on health care use and patient satisfaction. *The Cochrane Database of Systematic Reviews*. 2004 (4):CD004180. PubMed PMID: 15495083.
2. Flores-Mateo G, Violan-Fors C, Carrillo-Santisteve P, Peiro S, Argimon JM. Effectiveness of organizational interventions to reduce emergency department utilization: a systematic review. *PloS One*. 2012;7(5):e35903. PubMed PMID: 22567118. Pubmed Central PMCID: 3342316.
3. Purc-Stephenson RJ, Thrasher C. Patient compliance with telephone triage recommendations: a meta-analytic review. *Patient Educ Couns*. 2012 May;87(2):135-42. PubMed PMID: 22001679.
4. Purc-Stephenson RJ, Thrasher C. Nurses' experiences with telephone triage and advice: a meta-ethnography. *Journal of Advanced Nursing*. 2010 Mar;66(3):482-94. PubMed PMID: 20423383.
5. Roberts E, Mays N. *Accident and emergency care at the primary-secondary interface: a systematic review of the evidence on substitution*. London: London Health Care System, King's Fund London Commission, 1997.
6. Chapman JL, Zechel A, Carter YH, Abbott S. Systematic review of recent innovations in service provision to improve access to primary care. *Br J Gen Pract*. 2004 May;54(502):374-81. PubMed PMID: 15113523.
7. Salisbury C, Munro J. Walk-in centres in primary care: a review of the international literature. *Br J Gen Pract*. 2003 Jan;53(486):53-9. PubMed PMID: 12564280.
8. Leibowitz R, Day S, Dunt D. A systematic review of the effect of different models of after-hours primary medical care services on clinical outcome, medical workload, and patient and GP satisfaction. *Fam Pract*. 2003 Jun;20(3):311-7. PubMed PMID: 12738701.
9. Unanue J, Perez I, Alcorta I, Gurruchaga M, Lasa M, Arrese-Igor A, et al. *Estudio de las prestaciones sanitarias urgentes y emergentes en la Comunidad Autonoma Vasca: analisis y propuestas de mejora.* [Study of urgent and emergency health services in the basque autonomous community: analysis and proposals for improvement] : 2009. Vitoria-Gasteiz: Basque Office for Health Technology Assessment (OSTEBA). D-09-05., 2009.
10. Huibers L, Giesen P, Wensing M, Grol R. Out-of-hours care in western countries: assessment of different organizational models. *BMC Health Services Research*. 2009;9:105. PubMed PMID: 19549325. Pubmed Central PMCID: 2717955.
11. Giesen P, Smits M, Huibers L, Grol R, Wensing M. Quality of after-hours primary care in the Netherlands: a narrative review. *Annals of Internal Medicine*. 2011 Jul 19;155(2):108-13. PubMed PMID: 21768584.
12. Khangura JK, Flodgren G, Perera R, Rowe BH, Shepperd S. Primary care professionals providing non-urgent care in hospital emergency departments. *The Cochrane Database of Systematic Reviews*. 2012;11:CD002097. PubMed PMID: 23152213.
13. Carson D, Clay H, Stern R. *Primary care and emergency departments*. London: Primary Care Foundation, 2010.
14. Hill H, McMeekin P, Price C. A systematic review of the activity and impact of emergency care practioners in the NHS. *Emergency Medicine Journal* : EMJ. 2013 Jul 13. PubMed PMID: 23851036.
15. Wilson A, Zwart E, Everett I, Kernick J. The clinical effectiveness of nurse practitioners' management of minor injuries in an adult emergency department: a systematic review. *International Journal of Evidence-based Healthcare*. 2009 Mar;7(1):3-14. PubMed PMID: 21631842.
16. Lidal IB, Holte HH, Vist GE. Triage systems for pre-hospital emergency medical services - a systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2013;21:28. PubMed PMID: 23587133. Pubmed Central PMCID: 3641954.
17. Oredsson S, Jonsson H, Rognes J, Lind L, Goransson KE, Ehrenberg A, et al. A systematic review of triage-related interventions to improve patient flow in emergency departments. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2011;19:43. PubMed PMID: 21771339. Pubmed Central PMCID: 3152510.
18. Harding KE, Taylor NF, Leggat SG. Do triage systems in healthcare improve patient flow? A systematic review of the literature. *Australian Health Review : a publication of the Australian Hospital Associatio*n. 2011 Aug;35(3):371-83. PubMed PMID: 21871201.
19. Bullard MJ, Villa-Roel C, Guo X, Holroyd BR, Innes G, Schull MJ, et al. The role of a rapid assessment zone/pod on reducing overcrowding in emergency departments: a systematic review. *Emergency Medicine Journal* : EMJ. 2012 May;29(5):372-8. PubMed PMID: 21515880.
20. Rowe BH, Guo X, Villa-Roel C, Schull M, Holroyd B, Bullard M, et al. The role of triage liaison physicians on mitigating overcrowding in emergency departments: a systematic review. *Academic Emergency Medicine : official journal of the Society for Academic Emergency Medicine*. 2011 Feb;18(2):111-20. PubMed PMID: 21314769.
21. Rowe BH, Villa-Roel C, Guo X, Bullard MJ, Ospina M, Vandermeer B, et al. The role of triage nurse ordering on mitigating overcrowding in emergency departments: a systematic review. *Academic Emergency Medicine : official journal of the Society for Academic Emergency Medicine*. 2011 Dec;18(12):1349-57. PubMed PMID: 21692901.
22. Sakr M, Kendall R, Angus J, Sanders A, Nicholl J, Wardrope J. Emergency nurse practitioners: a three part study in clinical and cost effectiveness. *Emergency Medicine Journal* : EMJ. 2003 Mar;20(2):158-63. PubMed PMID: 12642530. Pubmed Central PMCID: 1726060.
23. Bosmans JE, Boeke AJ, van Randwijck-Jacobze ME, Grol SM, Kramer MH, van der Horst HE, et al. Addition of a general practitioner to the accident and emergency department: a cost-effective innovation in emergency care. *Emergency Medicine Journal* : EMJ. 2012 Mar;29(3):192-6. PubMed PMID: 21441265.