

# Evidence to inform urgent and emergency care systems

- Urgent and emergency care is a major focus for CCGs. This briefing presents an overview of the evidence for a range of interventions that seek to improve the delivery of urgent and emergency care.
- Telephone consultations by nurses or doctors appear to be as safe and effective as systems involving more face-to-face contact but effects on service use are mixed.
- A primary care front end to the emergency department involving GPs could be used to assess and treat patients presenting with less urgent problems.
- Other workforce models with promise include emergency care practitioners (ECPs) and nurse practitioners. ECPs can reduce patient transport to emergency departments, though this appears dependent on the setting.
- Interventions with limited evidence of benefit (in terms of reduced waiting times and or length of stay) include 'fast-tracking', rapid assessment zones, triage liaison doctors and allowing triage nurses to order tests.
- The evidence for many interventions is limited and a lack of cost-effectiveness data reinforces the need for rigorous evaluation of service change.

This evidence briefing has been produced by the Centre for Reviews and Dissemination. Full details of methods are available on request ([paul.wilson@york.ac.uk](mailto:paul.wilson@york.ac.uk) or [duncan.chambers@york.ac.uk](mailto:duncan.chambers@york.ac.uk)). The content of this briefing was judged to be up to date as of March 2014.

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## Background

Since 2009, CRD has been offering a knowledge translation service to support evidence-informed decision making in the NHS<sup>1</sup>. Over the last year, we have asked by a number of CCGs to review evidence on a number of topics relating to urgent and emergency care services<sup>2,3</sup>. Improving the way urgent and emergency care is delivered is a major focus for all CCGs<sup>4</sup>. This briefing combines the main messages from these discrete requests into a digestible format for CCGs generally.

As ever, our focus is on appraising and summarising the better quality evidence available, using an established framework<sup>5</sup>. For this briefing, systematic reviews and economic evaluations were identified by searching:

- DARE (quality-assessed systematic reviews of interventions)
- Cochrane Database of Systematic Reviews
- NHS EED
- CRD HTA database
- Health Systems Evidence

The scope of the above search was relatively broad and included any synthesised evidence that addresses models of urgent and emergency care service provision that could be relevant to the NHS. Full details of methods are available on request.

## Telephone consultation

Telephone consultation is likely to be the route by which most patients' first access urgent or emergency care. A Cochrane review found that telephone consultation was as safe and effective as systems involving more face-to-face contact<sup>6</sup>. However, effects on service use were mixed and the authors recommended further rigorous evaluations. The evidence also relates mainly to services delivered by doctors or nurses rather than by less qualified staff. A more recent review has found similar results (no difference between groups) for the effects of telephone consultation on emergency department visits<sup>7</sup>.

Telephone consultation will only be effective if patients both receive appropriate advice and follow that advice. A systematic review has looked at the extent to which patients followed advice from nurse-led telephone consultation<sup>8</sup>. The authors found that telephone services were successful in diverting patients with less severe symptoms from using emergency services or visiting a GP. However, most included studies lacked a comparison group and that combined with an absence of cost-effectiveness data limits the usefulness of the review.

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. A specific issue raised by the authors was the potential value of communication skills training for people providing telephone advice. A systematic review of qualitative studies by the same authors identified nurses' perceived need for clinical and communication skills training particularly in relation to handling calls from non-native English speakers<sup>9</sup>.

## Out-of-hours systems

Only one systematic review specifically evaluated effects of different models of out-of-hours primary care<sup>10</sup>. The review was poorly conducted even by 2003 standards and the included evidence is now out-of-date.

Researchers in the Netherlands have provided an overview of models of out-of-hours care used in different western developed countries<sup>11</sup>. They have also conducted a non-systematic but reliable review of research evaluating the integrated out-of-hours system used in the Netherlands<sup>12</sup>. This evidence is included here because the Dutch healthcare system, although insurance-based, in many ways resembles the NHS. The overview cites research using quality indicators that suggests patients generally received treatment in accordance with relevant guidelines. 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. Future developments in the Netherlands are likely to include greater integration and collaboration with hospital emergency departments, in which GPs would take care of self-referring patients<sup>12</sup>.

## Pre-hospital emergency care

### *Pre-hospital triage*

A recent systematic review found a lack of reliable evidence for triage systems specifically in the context of pre-hospital emergency services, including telephone triage (999 rather than 111)<sup>13</sup>. Despite having a broad scope, no rigorously designed studies met the review inclusion criteria.

### *Emergency care practitioners*

Emergency care practitioners (ECPs) 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<sup>14</sup>. 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.

Another recent systematic review examined the effect of pre hospital practitioners (including paramedic practitioners and extended care paramedics as well as ECPs) on ambulance transportation to the emergency department<sup>15</sup>. The review included 13 studies with over 163,000 participants, of which nine were studies of ECPs in UK settings.

All the included studies found that ECPs were less likely than conventional ambulance crews to take patients to the emergency department. However, the size of the effect varied widely between studies. ECPs were 1.6 to 26 times more likely to discharge patients at the scene than conventional ambulance crews. The evidence had important limitations: all the included studies were observational and most did not allow for potential confounding

factors such as differences in age or severity between patients seen by ECPs and conventional ambulance crews. Furthermore the studies provided limited evidence about the appropriateness of care provided by ECPs and other similar practitioners or whether emergency department attendances were merely postponed, rather than avoided, by ECP intervention.

Overall, this review suggests that deployment of ECPs is likely to reduce patient transport to the emergency department and increase likelihood of patients being discharged at the scene, but the magnitude of these effects is highly uncertain.

Although the focus of this briefing is on evidence from systematic reviews, one individual study included in both reviews provides additional evidence on the impact of ECPs in different NHS settings<sup>16</sup>. The NEECaP trial was a quasi-experimental trial that compared services including ECPs with usual care provider services in five different settings (ambulance, care home, minor injury unit, urgent care centre and GP-led OOH service). Importantly, this study found marked differences between settings in the likelihood of patients being discharged rather than referred. In ambulance and care home settings, patients were significantly more likely to be discharged by the ECP service than the usual care provider. By contrast, in more static services such as the OOH service and urgent care centre, patients were significantly less likely to be discharged by ECPs. A cost-effectiveness analysis included in the full report of the study<sup>17</sup> found that only ECP services with a mobile element (e.g. ambulance or mobile care home services) reduced costs compared with usual care providers.

This was a carefully designed and conducted study. The main limitation was that details of service delivery were specific to the included sites and the findings may not be applicable to similar services in other settings. However, the authors stated that the comparisons in the study were not atypical of how different services had developed nationally.

## Emergency department “throughput”

A recent systematic review of 33 studies evaluated various interventions to improve patient flow through the emergency department<sup>18</sup>. 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) also evaluated triage systems in general but had somewhat different inclusion criteria; for example, fast tracking was specifically excluded<sup>19</sup>. 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.

Both 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<sup>20</sup>. 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?*

Triage liaison physicians in emergency departments, either working as part of a triage team or on their own, were found to reduce 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<sup>21</sup>. Limited evidence from two other reviews suggested that team triage reduced waiting times and emergency department length of stay<sup>18</sup>, and that triage nurse ordering of tests and interventions appeared to reduce length of stay especially for patients suspected of having a fracture<sup>22</sup>.

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.

A rapid scoping review included in a report by 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<sup>23</sup>. The authors noted that UK studies of GPs working in emergency departments involved triage by other staff. No studies were found where the GPs selected appropriate cases, although the authors stated that 'such systems are known to exist'.

### *Primary care 'front end'*

Patients requiring urgent but non-emergency treatment may be advised to attend an urgent care centre or minor injuries unit. Many patients attending emergency departments may also have conditions that could be treated by the primary care professionals who typically staff urgent care centres. This has led to interest in increasing integration between urgent care centres and emergency departments.

While co-location of the urgent care centre and emergency department represents a degree of integration, a higher degree of integration could be achieved by having a single point of assessment (triage) with patients treated by primary care or emergency department staff as appropriate. This would potentially have the benefit of reducing the need for handover of patients between urgent care and emergency department staff further down the pathway. Two main variants of this type of service have been implemented in the NHS: GPs or other primary care staff at the front of the service to screen and treat patients requiring non-emergency care; and primary care staff working within the emergency department itself<sup>23</sup>. The second type of service, in particular, would require staff to provide a wider range of interventions than would be usual in general practice.

A 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 limited evidence that GPs ordered fewer tests and X-rays, admitted fewer patients and made fewer referrals than emergency professionals<sup>24</sup>.

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 it was done by receptionists. A scoping review included in a report by the Primary Care Foundation<sup>23</sup> 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.

### *Nurse practitioners in emergency departments*

The effectiveness of nurse practitioners has been compared with junior doctors in treating patients with minor injuries in emergency department settings<sup>25</sup>. Based on limited evidence, the review found no significant differences in rates of follow-up or significant errors. There was also limited evidence that nurse practitioners reduced patient waiting time for assessment and treatment and overall length of stay in the emergency department. Patient surveys indicated high levels of acceptance of treatment by a nurse practitioner and satisfaction with the treatment received<sup>25</sup>.

## **Cost-effectiveness**

Initial searches suggest that the evidence on cost-effectiveness of different models of urgent care provision is surprisingly limited.

A 2003 economic evaluation compared a nurse practitioner-led minor injuries unit with an emergency department for treatment of minor injuries<sup>26</sup>. 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<sup>27</sup>. 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.

## **Implementation**

A key source of evidence in this area is the 2010 report from the Primary Care Foundation, which included a web-based survey of acute hospital trusts, providers of primary care in emergency departments and commissioners (Primary Care Trusts), as well as a systematic scoping review<sup>23</sup>. We are not aware of a more up-to-date report on this topic and it is likely that many of the issues identified will remain valid despite recent changes to the NHS.

The following is a brief summary of the key lessons identified by the report authors:

- Early clinician engagement is important to devise workable approaches, check that there are sufficient cases to justify involvement of primary care clinicians and build sufficient flexibility to deal with changing workloads.
- Absence of dialogue between commissioners and clinicians (primary care and emergency department staff) has sometimes been a barrier to improving patient care.

- Joint working between primary care and emergency care clinicians requires clarity over the strengths of each group, how they are best deployed and what each group is expected to do.
- Integrated primary and emergency care systems take time to become fully established and the report authors recommend that commissioners should proceed with a degree of caution.
- Linking of IT systems will be needed to support these developments.
- Establishing agreed systems of funding that encourage clinicians and managers to work together and avoid perverse financial incentives will be critical to success.
- Finally, the authors recommend that integration of primary care within emergency departments should be considered within the broader context of the whole urgent and emergency care pathway.

This is a very ‘high-level’ list but issues of this kind have often provided barriers to integration of NHS services (and integration of health and social care) in the past. It will be important to consider where problems might arise and take early action to minimise risks.

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