Rapid Review of Hospital Element of Unscheduled Care Services in North Wales: Literature Review on Best Practice in Unscheduled Care Services

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Purpose and Summary of Document:
This report forms part of a series of documents comprising elements of a rapid review of the hospital element of unscheduled care services performed by the National Public Health Service for Wales on behalf of the Unscheduled Care Services Project Team

Publication/Distribution:
- Clinical Strategy Website
1.0 Literature search

A systematic literature search was carried out by the Library & Knowledge Management Service Team (LKMS) of the NPHS, to identify evidence of best practice in the delivery of unscheduled care. Full lists of search terms, strategy and search results are available from LKMS.\(^1\) Search strategies are available in Appendix A.

1.1 Search methodology

The methods used follow a rapid review methodology prepared by the Health Evidence Bulletins Wales team at SURE Unit, Cardiff University. This provides a framework for carrying out a rapid literature review within a restricted time frame. The search protocol was developed by the LKMS team of searchers and agreed by the project team. Restricting the review parameters (e.g. reducing the number of sources searched, supplementary searches, the number of limits applied and the precision of the search strategy) helped to focus the review. It aimed to capture the relevant literature while ensuring that an unmanageable number of papers were not identified. Supplementary high level searches using previously validated methods were performed by the reviewer.\(^34\)

Electronic databases: British Nursing Index, CINAHL, Cochrane Library, Embase, Health Technology Assessment Database, HMIC, Medline,

Meta search engines: SUMsearch, TRIP

Websites searched include:

Biomed Central, National Library for Health Emergency Care specialist library, Map of Medicine. NICE.

Research departments – Health Services Management Centre, King’s Fund, Institute for Health Care Improvement, Sheffield Research – Emergency care, TRUST – Thematic Research Network for Emergency and Unscheduled Treatment, Warwick Medical School

Professional bodies and associations – Ambulance Service Association, British Association of Emergency Medicine, British Paramedic Association, College of Emergency Medicine, Royal College of Nursing- Emergency Care Association

Government departments and NHS organisations - Department of Health, NHS modernisation Agency, NHS Institute for Innovation and Improvement, NLIAH, Scottish Health – including Unscheduled care collaborative, Welsh Assembly Government

\(^{1}\) LKMS email : Dinah.roberts@nphs.wales.nhs.uk
A full list of websites is included in the literature review form Appendix A.

The electronic table of contents of key journals, such as Emergency Medicine Journal, International Journal of Emergency Medicine were scanned [September 2008 - March 2009 issues] to identify reviews, which have not yet been indexed in the major electronic databases. A separate search was run on selected databases to identify research papers by well known experts in unscheduled and emergency care.

Some checking of reference lists of key review articles was also undertaken. A few additional papers were identified as potentially relevant by the project team and these were included in the search results.

Search results were imported into Reference Manager databases. Duplicates were removed by searchers. References included abstracts and links to full text where available.

1.2 Search strategy

A series of topic based searches were undertaken focussing in on models of delivery, needs assessment, staffing, quality and outcomes to identify evidence for the review, specifically the sections relating to:

- Best practice guidance in unscheduled care
- Effectiveness and costs of A&E
- Models of care

The search terms used in all searches were a combination of subject headings [MESH, HMIC] and free text, aiming for a balance between sensitivity and specificity [See Appendix A]. Terms used in recent literature reviews on unscheduled care, urgent care were considered in scoping relevant terminology for these searches. ² The term “unscheduled care” is not widely used. Search limits were set to retrieve papers published between January 1996 and March 2009. No date limits were set for the high level searching.

The searches were undertaken in a stepped approach. Search filters were used to limit results to high level evidence such as meta–analyses, randomised controlled trials (RCTs) reviews and systematic reviews. Other grades of evidence were included and reviewed, where Level 1 was not identified, provided they included a methodology.

The search strategies for the separate searches have been saved to allow updating and refinement. These were run across the databases rather than developing different search strategies for individual databases.

² References 14 and 15.
Searching websites and grey literature requires a very different and time consuming approach. The searchers used website “site search engines” with natural language free text and scanned publication and research sections for relevant information.

The search team also collated references to national policies and strategies.

Following critical appraisal of the articles by the reviewer, the quality of the evidence was graded using the National Institute for Health and Clinical Evidence (NICE) hierarchy of evidence and the quality checklists. Evidence was rejected if graded as poor quality, apart from where it was of Level 1 type (see Appendix B for explanation of evidence grading system) and was highly relevant to the topic.

1.3 Inclusion and exclusion criteria

Papers were included if they were written in English (and French, German Spanish for the high level searches). Letters, editorials were excluded.

Articles and reports were not included if their primary focus was unscheduled care for specific age groups or conditions. References dealing primarily with specific treatments, diagnostics or technologies were excluded.

Although the search covered international literature, papers dealing with emergency care and unscheduled care in the developing world were omitted.

Evidence was excluded by searcher if not relevant in terms of being generalisable to the UK and North Wales setting, for example: - US reviews, where problems / issues addressed are within a different healthcare system. This exclusion criterion was not used for all the topic searches. For example: - access and rurality issues and outcomes may be comparable.

1.4 Search results

The searchers examined titles and abstracts and screened the results using agreed quality and relevance criteria. Duplicate records within the separate Reference Manager databases were removed.

A total of 498 references were identified in this series of searches and assessed for relevance by a single reviewer.

1.5 Limitations of the Literature Search/ Review

Limitations included the following:

• Reviewer bias – but every effort was made to avoid this by including a balanced selection of relevant references
• Language restriction – papers were only considered if in English, French, German and Spanish
• Time constraints – the searches were comprehensive for a rapid review, but there was not enough time to select all relevant references.
• In order to describe the full range of urgent care services the searches had to be extended to cover primary and community interventions and this resulted in a huge amount of literature.
• Economic evidence was lacking or possibly very difficult to find.

2.0 Best Practice Guidance in Unscheduled Care Services

A considerable amount of healthcare in the United Kingdom (UK) is provided at less than 24 hours notice and there are a number of health services that people can access for unscheduled care (USC), such as general practice, the ambulance service and accident and emergency (A & E) departments. Over the past few years the drive for improvement has resulted in a proliferation of new services and points of access, with a net result of increasing the complexity. There is consensus between the Department of Health (DH), the Welsh Assembly Government (WAG), the Royal Colleges and the College of Emergency Medicine (CEM) about the need for service reorganisation to simplify and improve the efficiency and effectiveness of USC.

Compared with other health service areas, it appeared from a search of the literature that national standards, best practice examples and guidelines for USC are scarce. A review by the National Public Health Service (NPHS) in 2005 did not find any explicit standards for effective emergency services, but found that the literature clearly described consistent themes with varying levels of evidence to guide future design of emergency services. A report from the DH outlined some of the major improvements that have taken place in emergency care and some key service principles for best practice, such as simple access, no unnecessary delays and integrated whole system care that should inform future development of emergency services. Guidance from the Royal College of Physicians recommended that in large acute hospitals that receive critically ill patients, the ‘front door’ should comprise an ‘emergency floor’ with co-location of the emergency department (ED), the acute medical unit (AMU), critical care, and other acute and urgent care facilities and key support services, including the ambulance service. The report also provided detailed recommendations about the remit, configuration and operational policies for the AMU.

The geography of Wales causes significant difficulties in delivering healthcare and the fact that the areas of social deprivation and the disease spectrum differ from the average in England means that the solution to service delivery will vary from England. The publication in 2008 by WAG of a strategy for delivering emergency care services provided guidance on the future delivery
of emergency care and indicated what key elements an effective strategy should include:

- Pioneering new urgent care centres (UCCs) to provide care for patients who currently access EDs with non-life threatening conditions.
- Using new technology to link rural and remote MIUs with major EDs.
- More care and support provided close to people’s homes, where appropriate.
- Staff working differently to ensure that patients are seen by the most appropriate available health professional at the right time.
- Better sharing of information to allow more seamless transition of care – sharing data electronically across USC providers.
- Services will have to work with a clearly defined clinical model, operating on a seven day per week basis.
- The reduction of unnecessary admissions by accelerating the process of diagnosis and supporting people with problems more effectively in the community.

The National Leadership and Innovation Agency for Healthcare (NLIAH) produced a Good Practice Guidance (GPG) that recommended that a USC model should be based upon current best practice that ensures joint working with neighbouring hospitals, local health boards (LHBs), specialist care networks and local authorities. Consideration should be given to the best available model and adapting it to the provision of care for each care community. The schematic diagram below identifies the key elements required to commission a model for delivery of care to critically Ill and Injured patients, USC and a service for elective and scheduled care.

(Copyright permission obtained from NLIAH)
In Scotland the 3 year National Collaborative USC programme was launched in 2005. *Delivering for Health*\(^6\) sets out the Scottish Executive’s commitments to redesign the model of USC throughout Scotland, the purpose being to develop a stratified USC system which will improve integration, quality and productivity by:-

- maintaining care at local level for the majority of unscheduled cases through multi-disciplinary teams working in Community Casualty Units
- allowing a greater separation of planned and emergency care wherever possible to protect capacity in both
- reducing the number of appointment cancellations for patients, and reduce waiting times
- achieve a more efficient use of limited facilities and specialist staff across the country

Part of this will mean a much greater emphasis in Scotland on providing the majority of USC at local and community levels in a planned and co-ordinated way, thereby preventing inappropriate access to services such as A & E and additional travel to and unnecessary stays in the hospital setting. It will require GPs, community pharmacists, the Scottish Ambulance Service, district and community nurses and NHS 24 to work together to act as the first point of contact for USC, especially for minor illness in the community. This, in turn, will result in people being assessed and either treated in a setting local to them or directed to a most appropriate part of the service.

In Ireland there is a drive to improve USC and the working group have produced standards for MIUs and other USC components.\(^7\)

Children represent a large proportion of attendances at EDs and the following points represent best practice guidance for the emergency care of children from a summary of key evidence in a document from North Wales.\(^8\)

- Urgent planned care including general acute paediatrics, urgent and emergency care, neonatal care, Acute specialist services including paediatric intensive care and child protection/forensic services should be available 24 hours per day\(^9\)
- Urgent care must be provided 24 hours a day with no distinction in quality or access between working hours and OOH. It is essential that all frontline staff delivering urgent care for children are competent for safe practice in which ever setting they work. If these staff are not available it is proposed that only a proportion of UCCs are designated for the care of children.\(^9\)
- Wherever possible UCCs treating children should be co-located or integrated with EDs with shared facilities for triage, observation, investigation and second opinions. The role of the GP who works across traditional primary and secondary care boundaries should be revisited. All urgent care venues should have systems to allow easy
access to second opinions whether in person, by phone or via telemedicine.  

- EDs seeing more than 16,000 children per annum should employ a consultant with sub-specialty training in paediatric EM.
- Paediatric care should be delivered as part of a managed clinical network including primary care, paediatric assessment units, EDs, inpatient paediatric units and specialist units. All clinicians assessing children should have training in the skills needed for the safe care of children.
- The majority of children have minor injuries or illness and can safely be treated close to home. If no appropriate local facilities are available, large numbers of families will be faced with long journeys.
- The Scottish Executive has described a tiered model of emergency care for children and young people (see Section 4). The DH proposes that very sick or seriously injured patients are taken directly to larger centres. Commissioners and providers must work together to provide safe urgent care for children in a geographical network, taking local needs into account.
- Regional networks must be in place to develop protocols to stabilise and transfer children to a paediatric intensive care unit. Regional networks must be in place to provide early advice and transfer for trauma.
- All children attending EDs must be visually assessed within minutes of arrival, to identify an unresponsive or critically ill child.
- All hospitals receiving acutely ill or injured children must have the facilities and staff required to establish high dependency care, and intensive level care for airway and respiratory support.
- If EDs in the UK lose on-site, 24-hour paediatric services, commissioners may plan to divert paediatric attendances to other centres.
- However, EDs will continue to receive very sick children even in centres where “bypass” arrangements have been made with the ambulance service, because parents with very sick children (particularly babies and infants) will attend the nearest facility.
- If paediatric on-site support is lost, the paediatric skills of ED staff must be enhanced, or additional paediatrically trained staff employed.
- Urgent help must be available for advanced airway management.
- Paediatric anaesthesia should only be carried out by competent staff.
- Ambulance services may need to provide for an increased number of journeys due to inter-hospital transfers.
- Five generic skills may be expected of all personnel involved with the care of critically ill or injured children in the DGH:-
  - to recognise the critically ill child
  - to initiate appropriate immediate treatment.
  - to act within a team
  - to maintain and enhance skills
  - to be aware of issues of safeguarding children
• Hospitals providing emergency children’s surgery need to have suitably trained anaesthetists, paediatricians, paediatric nurses and paediatric High Dependency care. They should be part of a clinical network providing access to tertiary services and paediatric intensive care. 

Conclusions/key points

There was lack of literature on best practice and guidelines for USC.

There are programmes within the UK designed to improve USC that are working on the development and implementation of new models for USC, but as yet have not produced a definitive proposal on best practice.

The elements that comprise an USC service have been described, particularly for the emergency care of children.

3.0 Effectiveness and costs of A&E departments

Considerable effort has been put into the assessment of the evidence of the clinical effectiveness of USC schemes. The principles of an effective emergency service have been set out in several key documents.

The literature search revealed that there were some good quality systematic reviews that comprehensively reviewed the effectiveness evidence for the various interventions for providing emergency care. The results of these reviews indicated that most of the published evidence focuses on the magnitude and causes of delays in EDs, but that there is little information on service developments and little research has been undertaken in the areas of bed management, innovations to reduce delayed discharges, working practices and workforce numbers. The authors also highlighted the absence of consistent outcome measures and definitions which make it difficult to combine study results and assess their generalisability. With the time constraints for the production of the present literature review, these systematic reviews have been used extensively to inform the present review, supplemented with additional evidence, where available.

3.1 Effectiveness

3.1.1 Out of hospital care

There was a considerable amount of literature demonstrating that 30% to 52% of ambulance calls do not require an emergency ambulance response. This has led to the suggestion that the response from the ambulance service should be modified in order to increase the appropriateness of care. The following changes have been suggested to reduce attendances at EDs:-

• diversion of non serious 999 calls to nurse advice.
• on scene treatment and discharge by ambulance crews
• use of alternative destinations to ED.

3.1.1a Diversion of non serious 999 calls to nurse advice

A randomised controlled trial (RCT) in the UK investigated the impact of telephone assessment and triage for callers who present with category C calls. During intervention sessions, nurses or paramedics within the control room used a computerised decision-support system (CDSS) to provide telephone assessment and triage. It was found that nurses were more likely than paramedics to assess calls as requiring an alternative response to emergency ambulance dispatch. Further RCT evidence demonstrated that the transfer of non-urgent callers/patients to a NHS Direct nurse advisor for further advice and triage was an acceptable and cost-effective approach to managing the increasing demand on emergency 999 ambulance services and treatment at A&E departments. The number of times that an ambulance was called to attend to patients who had contact with a nurse advisor was higher than anticipated and can partly be explained by caller/patient choice, but also to some extent by the cautious approach adopted by the nurse advisors during the trial. A systematic review of electronic clinical decision support tools (CDSS) found that of 17 studies (12 RCTs) 13 found positive or variable outcomes related to CDSS intervention with 4 studies showing no significant effect. The authors concluded that more work is required to determine effective implementation strategies across multiple settings.

3.1.1b On scene treatment and discharge by ambulance crews

A postal questionnaire study showed that 10/36 of the UK ambulance services that replied had investigated non-conveyance of some groups of 999 callers and 13 reported looking at other models of care for category C patients. Only three services had evaluated such work. The development of ‘treat and refer’ protocols for ambulance crews attending patients with non serious conditions has been reported. The results indicated that the protocols were used by the crews and were acceptable to the patients, but the anticipated operational benefits were not demonstrated and safety concerns were identified.

Emergency care practitioners (ECPs), a generic practitioner who combines extended nursing and paramedic skills are increasing in number in the UK. One of the roles of such individuals is the treatment and discharge of patients from the scene. Published quantitative and qualitative data indicated that the care provided by ECPs reduces the need for referral to other emergency and USC services.

A cluster RCT study of community paramedics for older people with minor injuries involving 56 clusters was performed in Sheffield and the results showed that patients in the intervention group were less likely to attend an ED
or require hospital admission within 28 days and were more satisfied with their healthcare episode. They found no evidence that care provided by an ECP was less appropriate than care from usual providers.  

Some literature has been published that suggests that there are safety concerns with the ECP role in treating and discharging patients and e.g. potentially significant conditions are not being recognised by ECPs. Recent studies confirm that there is a need for further development and improvements to the ECP role.

3.1.1c Use of alternative destinations to emergency departments.

A cluster RCT in London involved 409 cases and 425 controls from the London Ambulance Service. The study group was attended to by ambulance crews who had had training and extra protocols to enable transport to a minor injuries unit (MIU) rather than the main ED. The study group had no increase in the use of the MIU and made no more discharges from the scene.

The effects of telephone consultation and triage by different professionals in a range of settings on safety, service use, and patient satisfaction were assessed in a recent systematic review. Drawing on evidence from a sub set of five RCTs, the authors concluded that out-of-hours care telephone consultation did not reduce attendance at EDs and questions remain about its, safety, costs and patient satisfaction. A similar finding was reported in a study comparing ED attenders who had contacted the Health Direct service in Australia with those who had not, a pilot study of the New Zealand ‘Healthline’ and two recent analyses of the impact of NHS Direct on immediate care services.

O’Cathain et al asked 4 NHS Direct nurses using different decision support systems in their practice to tell an interviewer how they would respond to a set of low urgency case vignettes. They had the opportunity to ask questions about each scenario. The level of agreement between nurses was ‘fair’ but 21% to 31% of these low urgency calls would have been triaged to the 999 ambulance service.

More recently service developments in community pharmacy have led to pharmacies becoming an important access route for people requiring USC, particularly over weekends and public holidays. Examples of the tools available to some pharmacists in England include:

- the National Patient Group Direction for the Urgent Supply of Repeat Medicines and Appliances.
- community pharmacy Direct Referral to local out of hours (OOH) services
- the NHS Minor Ailment Service element of the new community pharmacy contract which has established community pharmacy as the first port of call for the treatment of minor or routine ailments
Evidence from other UK schemes shows that it is clearly more cost effective to deliver minor ailment services through community pharmacies than through GP practices. This is already proving effective in the small number of pilots in Wales and throughout Scotland, where minor ailments are now part of the new community pharmacy contract. A review by the NPHS on minor ailment schemes in community pharmacists discussed research that showed that community pharmacy could manage an estimated 8% of adult attendances to inner city A & E departments.  

Conclusions/key points

There was good quality evidence to indicate that diversion of 999 calls to an advice line may reduce the number of ambulance responses. The use of clinical decision support tools was also supported by good systematic review evidence.

The evidence, which was not of good quality, suggests that there are safety concerns over ambulance crews discharging patients at the scene.

The use of ECPs to treat and discharge patients from the scene is increasing both in the UK and internationally.

There was a limited amount of good quality evidence to indicate that ECP intervention reduced the need for referral to other USC destinations and the evidence was inconsistent with regard to the safety of such practice.

Some quantitative and qualitative studies supported the role of ECPs in reducing the need for referral to the ED.

The use of NHS Direct or telephone consultation services with other professionals on reducing attendances at the ED remains questionable and there was a lack of evidence on patient satisfaction and safety.

The use of community pharmacies as an alternative destination for patients with minor injuries is being investigated, but high level effectiveness evidence was lacking.

3.1.2 Primary care

People who attend EDs with problems that could be resolved in primary care are often cited as causing long waiting times, poor care and preventable costs; this issue is not confined to the UK (see e.g. 36).

Many reasons are given for people attending EDs with a primary care problem. Poor access to GP services has been suggested as an important cause of people attending the ED, although in the UK and internationally, this was not always supported by the published evidence.  A comprehensive
study has been performed in Wales on understanding why the public uses USC services and what services are used. 1576 people responded to a postal survey (41.7% response rate) and 40 of these took part in a follow up telephone interview to discuss their recent use of USC services. Four focus groups were held with a variety of subjects. The main results are given below:—

- Awareness of NHS Direct, GP out of hours and A&E is generally high, but knowledge of how to actually make contact with services tended to be lower, particularly for NHS Direct and Pharmacy OOH services.
- A quarter of contacts was made OOH, between 6.30 pm and 8am, at the weekend or on a bank holiday.
- Half of respondents first contacted their GP during open access, emergency surgery or OOH; followed closely by NHS Direct and A&E.
- Patients may seek USC for reassurance or to endorse their own judgement. However, if they are hoping for an intervention, they may be unhappy with being advised to self-care.
- Availability of ‘same day’ consultations varies greatly between practices, and some patients may feel excluded by appointment arrangements. In turn, this may have an impact on demand for other unscheduled health care services.

3.1.2a Interventions to reduce primary care attendances at emergency department

Various methods have been published including:

- GPs working in the ED
- primary care interventions

3.2.1b GPs working in the emergency department

There was some research that showed that GPs working in EDs investigate less and prescribe less, but other researchers have shown they prescribed more and did not change attending behaviour of patients. Since the development and evaluation of the introduction of general practice primary care services within inner city EDs in the early 1990’s, there has been little further high quality research in this area. In a Canadian study, Campbell et al examined the factors associated with re-utilisation of health services in relation to where the patient sought help. Based on data from 600 patients with pre-specified minor illness, visits to the ED were more strongly associated with re-use of services than visits in primary care and the costs of treatment in the ED were substantially higher.

The CEM and British Association of Emergency Medicine (BAEM) recommended that the patient’s own primary care team are best placed to deal with their primary care needs, but acknowledge that because of problems
in access many people attend the ED, especially out of normal working hours and it is therefore logical to have OOH primary care located close to the ED, so that these patients can be triaged to the primary care facility. It is also suggested that a common triage/ reception area, staffed by experienced ED nurses should direct this initial flow of patients. 43

3.2.1c Primary care interventions

New primary care services for OOH GP care have been introduced, both in the UK and internationally, but very little research has been published on the effects of these changes.

3.2.1d Out of Hours

From the mid 1980s the establishment of general practice co-operatives was one of the key changes in the organisation of OOH general practice care in the UK and internationally. The impact of primary care co-operatives on EDs has been assessed as part of a health technology assessment, 44 which found that high quality evidence was lacking. It would appear that the majority of new OOH services have been introduced without a strong evidence base and without rigorous evaluation. 45 Van Uden et al 46 evaluated a service transition from 24 small practices to three co-operatives in the Netherlands and in one approach to integrating emergency and out-of-hours care reported the impact of locating a GP co-operative within an ED so that all self-referring patients were assessed by the co-operative first. This new model was associated with a 53% reduction in the proportion of patients using the ED and a 34% reduction in emergency admissions to hospital.

The use of a co-located OOH centre and ED is theoretically an opportunity to remove the responsibility of choice from the patient to the health care providers. One study of a co-located, but independent service showed persistent inappropriate attendance attributable to lack of knowledge (80%) of the new system and incorrect perceptions of relative waiting times. Of the 48 patients attending the GP co-operatives OOH centre, based in the same building as the ED, 35 (72.9%) had found out about the GP emergency service on the day of the attendance and 81.3% were first time attenders. 35 One other study supported the lack of knowledge of primary care centres for excess attendance in EDs. 47

3.2.1e Walk-in centres, minor injuries units and urgent care centres

Successive health policy initiatives in the UK, designed to improve patient access to urgent care have increased the range of centre-based services available to the public. Out-of-hours primary care centres or their equivalent are available in most parts of the UK, but there are fewer MIUs and walk in centres (WICs).
**Walk in centres**

Walk in centres are nurse led drop in services that are usually open from 07.00h to 22.00h, seven days a week, diagnosing and treating minor illnesses. Some WICs established in a second phase of development are co-located with EDs, in contrast to the ‘high street’ model of the first centres. In a systematic review of WIC initiatives, Salisbury and Munro 48 observed that a number of countries have long term experience of WICs, but evidence of their effectiveness and impact has been limited and comparisons between centres in the UK and those in Canada and the US are difficult because they are staffed principally by doctors rather than nurses and also charge for their services. As in the UK, North American WICs offer care to people without a prior appointment and the convenient access they offer is well regarded by patients. In Ontario a programme of research into the development of WICs described health professional concerns about the place of the centres in the care system. 49

Two recently published papers report on the evaluation of second phase NHS WICs established alongside EDs. Salisbury 48 examined the impact of the centres on attendance rates, visit duration, process, costs and outcome of care in hospitals with co-located EDs and WICs compared with eight matched EDs without WICs. Unlike the first wave centres, those established alongside EDs did not have a distinct identity. No differences were observed in re-consultation rates, the costs of care or self-reported patient outcomes at sites with or without WICs.15 In an accompanying paper reporting patient experience of the new centres, Chalder et al 50 reported that just over half of the patients taking part in a survey having attended the centre were unaware that they had in fact attended a WIC. There was no difference in satisfaction with care between patients attending a centre and those attending an ED, but patients attending an ED were more likely to report dissatisfaction than patients attending the co-located WIC in relation to visit duration, cleanliness of the facility, time given to discuss healthcare problems, involvement in decision-making, discussion of fears and anxieties, and privacy during the consultation. There was no evidence that WICs reduce attendances to EDs 14 or waiting times for access to primary care. Although there had been a demonstrable increase in the number of practices achieving the target waiting time of less than 48 hours to see a GP, there was no evidence that WICs had contributed to this improvement. 51

**Minor Injury Units**

Minor injuries units are often established as part of a service reconfiguration, but these have not been extensively studied and there was very little published evidence on the assessment of their impact. They have been shown to be acceptable to patients 52 and often can provide effective evidence-based care for a local population, but the services provided and standards are highly variable. 53
A review of options for treating patients with minor injuries concluded that for MIUs to be successful they should have a close relationship with the nearest major A & E department. The lack of good quality studies on the effectiveness or cost-effectiveness of MIUs made conclusions about their contribution to improving health, as opposed to managing patient demand unclear. The safety of minor injuries management using telemedicine was tested by Benger et al by assessing patients attending a peripheral hospital using three methods: telemedicine by an emergency medicine specialist; an on-site emergency medicine specialist and an on-site GP (current practice). The study showed minor injuries telemedicine to be safe and effective in this setting.

**Urgent Care Centres**

Urgent care centres (UCCs) provide episodic USC to patients with acute illnesses and minor injuries, which are not anticipated to be life threatening in nature. The CEM has discussed the role of UCCs and concluded that they are convenient for patients, but are not a substitute for conventional emergency care, a solution to ED overcrowding, nor are they a substitute for having a GP or an appropriate primary care infrastructure.

International evidence confirmed that these units will not impact on ED overcrowding, unless they are co-located with an ED, where patients are triaged from the ambulatory care side of the ED to the UCC. The CEM further states that UCCs should ideally be co-located with EDs, or if free standing should have clear links with established EDs to facilitate urgent patient transfer, if required. All units must have adequate facilities for resuscitation, with appropriately trained staff, for the initial resuscitation and stabilisation of any critically ill patient who may inadvertently arrive at the facility or clinically deteriorate while there. The facility needs on-site access to plain x-ray and point of care blood tests. Critical to the success of an UCC is the ease with which patients can access the radiology and laboratory services. Complex diagnostic facilities such as CT scanning and MRI should be easily available. The service should be delivered by appropriately trained doctors and nurses under the clinical supervision of a consultant in EM.

There have been doubts expressed about the effectiveness of UCCs, particularly from GP leaders who have attacked the plans as lacking an evidence base and repeating the errors made with WICs. The CEM has also expressed major reservations about UCCs, imposed for financial reasons, especially if these are used to limit the choice of patients to present directly to the ED. The College is clear that the ED already fulfils many of the functions of an UCC and therefore there is no clinical reason for locating such facilities in front of an ED and furthermore there is no evidence of the clinical or financial benefits of this model.

The CEM together with the BAEM and Emergency Nursing Association has issued a position statement on UCCs and views such proposals as clinically unproven and against the principle of patient choice of access to proper...
emergency care. A toolkit to assess the governance and business plans for such centres has been developed.  

There have also been reports about one of the first to open UCCs in Hemel Hempstead, which saw 6,309 patients in its first three months of opening. Discharge figures show that 38% of patients were told to contact their own GP; with just 27% discharged. A further 16% of patients were referred to hospital, with 7% referred to A&E.  

Conclusions/key points

There was considerable evidence demonstrating that significant numbers of patients attend EDs with non-urgent or primary care problems.

The introduction of GPs into EDs has not led to evidence on the reduction of attendances to the ED or on waiting times.

The evidence was inconsistent on whether poor access to primary care is a reason for high attendance rates at the ED. Some studies have shown that those who have good access to primary care still attend the ED.

Walk-in centres operate in the UK, but there was lack of evidence on their reduction in ED attendance rates or waiting times for primary care.

There was very little evidence on the assessment of the impact of MIUs. One review concluded that for MIUs to be successful there must be close cooperation with the nearest major A & E department. There was some evidence that the use of telemedicine in a MIU was safe and effective.

The development of UCCs is a government initiative, both in England and Wales. The recommendations are for them to be co-located with the ED. Concerns on their effectiveness and safety have been expressed by some specialist bodies. There was a lack of literature on their effectiveness.

With the new innovations in of out-of-hours primary care, it is important that they are fully evaluated.

3.1.3 Emergency department

3.1.3a Observation Units/Wards

Observation wards and units allow patients to be observed on a short-term basis and facilitate patient monitoring and/or treatment for an initial 24–48 hour period. They are sometimes used as an alternative to immediately admitting people to hospital. Reviews and trials suggested that observation wards can reduce unnecessary hospital admissions, decrease the length of stay in hospital, provide a safety net function against inappropriate discharge and reduce costs.
3.1.3b Clinical decision units

In some hospitals in the United States, observation or clinical decision units (CDUs) are an integral component of ED care. There was some evidence that they may be beneficial for the care of patients with certain conditions such as chest pain.\textsuperscript{60} The CEM\textsuperscript{69} considered that the CDU/observation unit is an integral part of the ED and that there is scope to increase the numbers of patients who require a period of specific investigation and active clinical management to allow early safe discharge. Average lengths of stay would be 2-12 hours. This requires very active involvement of senior staff to ensure speedy patient flows. It also needs ready access to diagnostic services. There was a lack of evidence on effectiveness.

3.1.3c Acute medical units

Acute medical admission units (AMUs) have been introduced into the UK during the past few years and are considered to have a positive effect on the provision of acute medical services. These units are led by consultant physicians who are specialised in acute care. In 2004 the Royal College of Physicians recommended that all trusts admitting acutely ill medical patients should have a dedicated area (to be called an AMU) where they can be managed.\textsuperscript{61} A retrospective analysis of 3163 medical patients admitted before and after a ward was reconfigured to function as acute medical was reported by St Noble et al in 2008.\textsuperscript{62} The change in AMU process resulted in improved direct discharge rates and patient length of stay, with no adverse effects on readmission rates.

3.1.3d Triage

There have been many studies on the effectiveness of different triage methods.\textsuperscript{15}

\textit{Triage and initial assessment}

In the 1980s systems for triage were introduced into UK EDs as a risk management tool to prevent patients with critical illness having to wait for care. A variety of three or five level triage systems are used and the five level systems have demonstrated a high degree of accuracy and inter-rater reliability.\textsuperscript{63} Triage if used solely to prioritise patients may delay care, but it does usually provide a clinical safety net at busy periods.\textsuperscript{14}

The Heath Commission survey reported that see and treat models have not replaced triage in EDs, but are used more widely in MIUs and WICs, where patient case mix will differ with larger numbers of non-urgent presentations and lower overall attendance figures than EDs. There was evidence that many of these services operate both see and treat, and triage depending on patient volume.\textsuperscript{64}
**Triage out**

Triage out is the system whereby after people arrive at the ED they are redirected to an alternative source of care, usually from triage. In an RCT, Washington et al. studied 156 patients who were referred to a next day primary care clinic according to criteria (all were abdominal, respiratory or musculoskeletal conditions). The self-reported health status of those deferred to clinic was no different from those seen immediately, although the power of the study could not detect a one day additional period of infirmity at home. No prospective studies in the UK of such systems were found and if the principle of ‘triage out’ is to be adopted then its acceptability to patients, its safety and its efficacy should be studied.

### 3.1.3e Fast track systems

Many studies, some of which were RCTs, supporting the fast tracking of minor illnesses and injuries have significant weaknesses, but all demonstrate improvements in waiting times. None of these studies showed any adverse effects from introducing fast track systems. It appeared from the literature that some departments implemented fast track systems with no extra resources, but the generalisability is questionable. The evidence suggested that fast track systems reduce waiting times of non-urgent patients and are safe and satisfactory to them. There is a need to assess the various fast track models that would be optimal for the UK. Two observational studies from Australia demonstrated that streaming fast track patients in the ED can reduce waiting times and length of stay for discharged patients, without increasing waiting times for admitted patients.

### 3.1.3f Use of care pathways in the emergency department.

There was a considerable amount of literature on the use of clinical pathways for patients requiring emergency care, some of which are condition specific and others for paediatric or adult patients. Most areas surveyed by the Healthcare Commission in 2007 had developed pathways, along with the policies and protocols that support them, for common conditions and situations, such as chest pain. Pathways were less well developed for some other conditions such as chronic obstructive pulmonary disease and for mental health disorders.

### 3.1.3g Social care in the emergency department

One review identified few papers concerning social care interventions that met the inclusion criteria, yet multidisciplinary models of intervention that include social care, especially social work appear to show promise in the care of older people including risk identification and admission prevention; in the care of people with mental health problems and in engaging frequent service users with health and social care services. Urgent care service providers need to work together to ensure that patients for whom continuity of care is especially
important have the quality of their care maintained OOH, especially patients receiving palliative care and patients with mental health problems.  

3.1.3h Diagnostics

There was abundant evidence that there is a need for early access to diagnostic services.  

24 hour radiographic services

There is debate about the necessity for 24 hour radiology. The incidence of major trauma does not follow exactly the same pattern by time of day as other trauma. One study, for example, showed that 72% of all major trauma occurred outside normal working hours (weekdays from 0900–1700). Evidence about the reduced value of 24-hour radiographic services may therefore not apply to 24-hour radiographic services for major trauma. However, the authors of the NCEPOD report on emergency admissions stated that as with CT provision 24 hour radiology must be provided for emergency patients and this is reaffirmed by CEM.  

Computerised tomography

Amongst patients with major trauma, the most common anatomical site of fatal injuries is the head and it is widely recognized that CT scanning and possibly on-site neurosurgery are effective in improving the management and outcome of patients with severe head injuries. The CEM recommended that the CT scanner should be available within or immediately adjacent to the ED and should be available 24 hours a day. The NCEPOD report in 2007 on emergency admissions also stipulated that hospitals admitting emergencies must have 24 hour provision of CT scanning with immediate reporting.  

Ultrasound

Ultrasound is now established as a fundamental component of the assessment of the ill and injured patient in the ED.  

Magnetic resonance imaging

Access must be available for urgent MRI 24 hours a day for those conditions where immediate surgical intervention may be necessary (for example, spinal cord compression). This facility may be in another unit, but systems should be in place for timely referral and transfer.  

3.1.3i Size and Location of Departments

**Size**

There is increasing imperative to reduce the number of hospitals providing the broad range of acute services and to centralise many specialised services in larger hospitals, with services being withdrawn from smaller units. This desire to rationalise services extends to limiting the number of hospitals providing the full range of emergency medicine services. In 1979 Luft and his colleagues focused attention on the possibility of a connection between an increased volume of clinical work and improved outcome. There is, however, continued debate about the ideal size for A & E departments and the evidence is inconsistent. A Health Care Needs Assessment (HCNA) reviewed the evidence and concluded that the evidence did not definitively indicate that large high volume departments are preferable to smaller units. In 1997, the NHS Centre for Reviews and Dissemination at the University of York published a systematic review of the evidence available on the volume/outcome relationship in health care, based upon data available up to 1996. Although the authors identified many studies that showed a volume outcome association, they concluded that the research evidence was flawed. A subsequent review was undertaken in Scotland, the results of which indicated that there is a shortage of evidence supporting the hypothesis that the volume/outcome association is a causal association, whereby manipulating volume will have a beneficial impact on outcome. The authors emphasised that it should be noted that the problem is a lack of evidence, rather than clear evidence of a lack of a causal effect.

A recent paper from the Institute for Public Policy Research (IPPR) indicated that acute emergency services need to be concentrated in order for hospitals to see enough patients to achieve safe volumes and to maintain staffing levels. The Royal College of Surgeons recommend that the preferred catchment area population for an acute hospital, or alternatively a network of hospitals, with emergency services concentrated on one site would ideally be 450,000–500,000 people. However, since that scale of reconfiguration would be politically and financially unlikely and undesirable from other perspectives including access, the College recommends a minimum catchment population of 300,000; in rural areas some hospitals will have to serve smaller populations. The IPPR discussed the effect on hospital reconfiguration that the RCS recommendation would have on hospital reconfiguration and calculated that 57 A & E hospitals in England would need to be merged to reach a level of one A & E hospital per 300,000 population.

There are real challenges in sustaining an emergency service in small hospitals (<40,000 attendances per year) and where EDs are less than 10 km apart, consolidation of small hospitals is likely to help sustain a comprehensive service.

The IPPR document has been criticised for selective bias in that some relevant systematic reviews were omitted, the inclusion of which would
illustrate that evidence for a volume outcome relationship is inconsistent and of fairly poor methodological quality. The critique states that the vast majority of coronary care in the UK is given on a non-emergency basis and there is no evidence that outcomes are better for non-emergency intervention care for coronary heart patients.\(^{76}\)

The World Health Organisation stated that although it is tempting to think that larger hospitals are more cost effective than smaller ones because of economies of scale and that patient outcomes are improved, the available evidence does not back this up.\(^{78}\)

**Location**

The concept of the ‘golden hour’, the first sixty minutes after an injury or onset of illness, is still an intensely debated issue and opponents of hospital reconfiguration argue that patients’ lives will be put at risk if they have to travel longer distances to reach hospital. Nicholl and colleagues\(^{79}\) who studied 10,315 patients transported to hospital with life threatening problems, reported a 1% increase in mortality for each additional 10km the patient had to travel to get to hospital. It should be emphasised that the patients who suffered an increase in mortality were those with respiratory disease. Whilst these figures appear concerning, the authors acknowledge that their study had a number of limitations, including the fact their results are based on data from 1997 to 2001 and therefore do not take into account the improvements in pre-hospital and hospital based care that had taken place in the intervening six years. Expert opinion however suggests that there have not been significant changes in out-of-hospital support to the patient in respiratory failure (Williams E., personal communication). Crucially they only studied the group most at risk of dying and the results were not applicable to the much larger group of less sick patients who make up the majority of those transported to hospital. The article also states that whilst some groups of patients (trauma, acute myocardial infarction) can have improved survival by bypassing a unit unable to provide the expert care needed, it is not acceptable to close local emergency departments in order to ‘trade off’ one group’s improved survival against a poorer outcome for the respiratory group of patients.

For acute myocardial infarction (AMI) national guidance recommends that thrombolysis should be given in hospital within 60 minutes. These time limits are important because thrombolysis will greatly limit cardio-necrosis and for every hour thrombolysis is delayed, mortality is increased by 20%.\(^{80}\)\(^{81}\) Thrombolysis if received within 15-30 minutes of symptom onset can in some cases prevent any permanent damage.\(^{82}\) The authors of one review consider that in rural areas where an AMI patient needs to travel to hospital, travel times are crucial. One study, for example, found a strong correlation between distance travelled and survival to admission, with the distance of 12 miles being the cut off point for survival.\(^{83}\) Pre-hospital administration of thrombolysis relies on accurate diagnosis of AMI.\(^{82}\) In one study GPs who independently gave thrombolysis misdiagnosed at a rate of 22%.\(^{84}\) In order to obtain more accurate diagnoses paramedics have used electro-
cardiograms and linked with cardiologists at the main hospital. This has involved the use of rigorous protocols, checklists and telemedicine and although this may create a delay in treatment, accuracy of diagnosis has improved. 85 It has been suggested that an ideal scenario is a dual GP and paramedic response.

There is good evidence that the treatment of choice for AMI is primary angioplasty. This is a particularly important issue for remote and rural residents as patients must be in a hospital that provides the service. 82 A Scottish study reported that delays in reperfusion therapy for acute myocardial infarction (AMI) were associated with higher 6-month mortality. 86 The authors of the report on the PRAGUE-2 trial concluded however, that long distance transport from a community hospital to a tertiary percutaneous coronary angioplasty (PCI) centre in patients with AMI was safe. 87 This conclusion has been questioned because of methodological problems with the study. 88 Another study using data from the Global Registry of Acute Coronary Events indicated that treatment delays in reperfusion were associated with increased 6 month mortality and this relationship may be even more critical in patients receiving fibrinolytic therapy. For patients who received fibrinolytic therapy, 6 month mortality increased by 0.3% per 10 minute delay in door to needle time between 30 and 60 minutes compared with 0.18% per 10 minute delay in door to balloon time between 90 and 150 minute for patients having primary PCI. 89

In remote rural areas, care for critically ill patients is problematical. A Danish study on the effect on mortality of closure of a rural hospital with acute care function showed that there were no statistically significant changes in mortality over a 6 year period after closure. The authors suggest that increased ambulance services may have contributed to the lack of effect on mortality. 90 For severe head injuries the recommendation is that following trauma, treatment (including an MRI scan, followed by decompressive surgery) should be performed within four hours. 91 Paramedics can be trained to give advanced airway management and critical care intervention, however since such specialist skills are rarely used problems may occur. In areas of Scotland attempts are made to bring the specialists to the patient. This service helps to bring integrated care to remote areas. 92 When road travel times are in excess of one hour then air transport is used. 93 Evaluation was very limited, but all patients undergoing such care were stabilised and a high proportion survived.

The evidence from one observational study demonstrated distance rurality effects on telephone contact to OOH services and showed that patients may delay seeking access to healthcare if travel distances are extended. 94 A search for evidence for the ‘golden hour’ effect for the main conditions that patients attend an ED in North Wales found only those shown in Table 1.
Table 1

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>RECOMMENDED JOURNEY TIME TO A &amp; E DEPARTMENT/TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute myocardial infarction</td>
<td>Maximum of 60 minutes of the patient arriving at the hospital where the PCI will be performed. The Call to Needle Time should be 60 minutes (NSF and Welsh Cardiac Network)</td>
</tr>
<tr>
<td>Stroke</td>
<td>10 minutes to emergency medicine physician evaluation, neurologist assessment within 10 minutes, and 25 minutes to CT scan, allowing tPA administration within an hour (NICE CG 68)</td>
</tr>
<tr>
<td>Head injury</td>
<td>A journey time to the neurosciences unit of &lt; 20 minutes direct transport might improve outcomes but beyond this time, direct transport might worsen outcomes (NICE CG56)</td>
</tr>
<tr>
<td>Violence</td>
<td>A doctor should be available within 30 minutes of rapid tranquillisation, physical interventions and/or seclusion of a violent patient (NICE CG25)</td>
</tr>
</tbody>
</table>

3.1.3j Hours-of-Opening

An important choice for A & E facilities is the hours of opening. Major A & E departments with consultant cover are usually open for 24 hours, but MIUs are usually only open between eight to 16 hours per day. Night-time opening is expensive because it involves employing extra staff at enhanced rates of pay, when the number of attendances is low. In one study it was predicted that opening between 8.00 am and midnight for seven days a week would result in an average cost per attendance of 20% less than a 24-hour service with little impact on the travel time of the 4% of cases attending A & E during these hours. Although this option retains the access advantages for the vast majority of patients of having an extra A & E department or MIU, part-time opening may mean that patients are uncertain whether or not the department is open and this has been reported to be unsatisfactory. No published literature was found to determine optimum opening times, but Irish standards for MIUs indicated that they should be open for 12 hours, seven days a week.

3.1.3k Dedicated operating theatre services

There was good quality evidence demonstrating that e.g. in trauma patients that delays to surgery are associated with poor outcomes and dedicated operating theatres are therefore considered to be clinically effective.

The Association of Anaesthetists of Great Britain and Ireland discuss the problems with ‘OOH’ surgery and delays to surgery and state that:

- The benefits of organising emergency work during the day and evening include a reduced requirement to provide resident theatre staffing after
the late shift and a reduction in sleep disturbance for on-call anaesthetists and surgeons.

- Emergency lists should be organised and staffed by senior anaesthetists and surgeons working to a fixed sessional pattern with no other commitment to routine work or outpatient clinics; this is pivotal to the success and efficient running of such lists. These lists should not normally be used for non-emergency surgery.
- Consultant anaesthetists, surgeons and hospital managers should together plan the administration and management of emergency admissions and procedures. In order to avoid queuing for theatre space it may be necessary to nominate an arbitrator in theatres who would decide the relative priority of theatre cases.
- Many patients requiring immediate emergency admission can be scheduled for surgery early on the next day. Less urgent cases can be discharged home with written instructions to return suitably fasted the next morning, possibly to a day unit, for scheduled surgery.

### 3.1.3i Services for Children

Attendances at paediatric EDs varies by area, demography, primary and community care service provision, social factors and available resources. These local factors will affect the planning of provision for emergency attendances and will influence the model required to meet local demand. A HCNA reported that there was no conclusive evidence to support the requirement for separate facilities for children, but the outcomes for some paediatric conditions are improved in dedicated paediatric units. The RCPCH states that it would be naïve to propose a single solution that would be fit for purpose and achievable throughout the UK. The College therefore recommends that commissioners consider the best interests of children in the populations they serve, in consultation with local primary care trusts, ambulance trusts, acute trusts, Patient Advice and Liaison Services (PALS), the public (including parents and carers) and neighbouring acute trusts, taking into account the geography, transport, demography and workforce characteristics of their local areas. Special arrangements must be made for departments in geographically isolated areas.

See Sections 2 and 4 for further information on best practice and models for paediatric care.

### 3.1.3m Specialities on Site

Access to appropriate on-site specialties such as anaesthetics, general surgery, A & E medicine, neurosurgery and orthopaedic surgery 24 hours per day in major A & E departments is presumed to be effective in improving outcomes. A HCNA reported that there was some evidence that secondary transfer of patients, particularly those with head injuries should be avoided and that delays in specialist treatment lead to poor outcomes and there was further evidence to support this.
The CEM \textsuperscript{57} has summarised the challenges for EM in a local hospital (i.e. a hospital without some inpatient specialties) and the recommendations are copied below:-

\textbf{Critical Care}

In order to provide a safe service an ED requires ICU facilities with 24-hour support by doctors skilled in critical care. Only 1-2\% of people attending the ED will have a problem requiring immediate critical care intervention. In a department serving a population of 250,000, this means that 3000-6000 patients per year have a possibly immediately life-threatening problem and 600-1,200 will need immediate critical care. In a population of this size, and even in smaller populations that are geographically isolated, on site critical care will be essential. At present, in most hospitals, critical care services are provided by anaesthetists. If all surgery were to be removed from such a hospital, it could be very difficult to sustain a safe 24/7 rota to provide critical care. If daytime surgery remained, the anaesthetic/ critical care service would be much more viable.

\textbf{Acute Medicine}

Acute medicine is an essential component of acute hospital care as the largest numbers of admissions to hospital from the ED are to acute medicine.

\textbf{Orthopaedics}

When there is no on site emergency orthopaedic service, ideally the ED should not receive trauma ambulance cases and there should be protocols for the ambulance service that they should not take trauma cases to such a department. Where geography or existing arrangements necessitate the reception of patients with serious bony injuries in departments without on-site orthopaedic support, then protocols must be established for their care, in consultation with the regional orthopaedic unit and the EDs involved. There must be proper transfer protocols. Many patients with more minor orthopaedic injuries are treated in EDs. If the orthopaedic service provided local fracture clinics and day case surgery this would sustain links to the ED.

Serious musculoskeletal injuries, such as spinal injury, complex lower limb injury and major pelvic injury should be treated in specialised centres preferably following appropriate pre-hospital triage.

\textbf{General Surgery}

There is an increasing trend to centralise general surgical services. This will pose two problems. Firstly, there are significant numbers of patients admitted with acute abdominal pain. The majority of these only require a period of observation. A proper Clinical Decision Unit led by EM could assess many of these patients; a significant minority will however need surgery. A senior
doctor presence in the ED 24/7 is needed to ensure safe practice in the care of this type of patient. There should be clear processes for the management of these cases, preferably with review at least once a day by a general surgeon. Telemedicine could assist in such a process. The second problem is severe uncontrollable bleeding. All the evidence suggests that control of bleeding as quickly as possible improves outcomes. Giving fluids and delaying surgery results in poorer outcomes. This is a low frequency but high risk occurrence.

**Paediatrics**

25% of patients attending a general ED are children, with peaks in the evening and weekends. The majority of these children will have minor illness or injury not requiring a specialist inpatient service, but all children need to be treated by doctors and staff with specific training and experience. A significant number of children benefit from a period of observation of less than 12 hours, to differentiate minor illness from that requiring a specialist consultation. There should be cooperative working between paediatricians and ED consultants to decide how children can be managed safely in the local hospital. It is vital that Level 3 critical care is available.

**3.1.3n Trauma Teams**

Early management of patients with trauma by a relatively junior doctor and late involvement of specialists can lead to inadequate resuscitation, missed diagnosis of injuries and delays in definitive treatment, all factors which have been judged to contribute to avoidable death in the trauma patient.\(^98\) One response to this problem has been to develop the concept of the trauma team.\(^99\) It is argued by some that the best way of managing major trauma is in trauma centres, but until the issue of in which circumstances they are advantageous is resolved, the use of trauma teams provides a more efficient and organized approach to the care of the seriously injured in district general hospitals.\(^100\)

The 2007 report from NCEPOD on trauma care provides standards of care and the recommendations include the use of advance warning systems by the ambulance service, the establishment of trauma teams, the involvement of a senior anaesthetist from the outset and criteria for the activation of the trauma team.\(^101\)

**3.1.3o Advanced Trauma Life Support training**

Advanced trauma life support is a highly structured protocol for the initial assessment, management and resuscitation of seriously injured patients, developed in the United States during the 1980s for medical staff, but now extending to other staff in the A & E department.\(^102\)
Although there is considerable dispute about the effectiveness of the practice of advanced life support in the field, in hospital the value of a casualty team trained in ATLS is accepted widely.  

3.1.3p  Regional trauma systems

A pivotal before and after study on regionalisation of trauma services was published in 1997 from North Stafford, the negative results of which caused significant controversy amongst orthopaedic surgeons in the UK.  

Subsequent evidence for trauma care however, supported regionalisation. A study compared mortality from trauma in patients treated in trauma centres with those treated in non trauma centres. Death rates were 25% less in those treated at a trauma centre. This was a study from the US and may however not be generalisable to the UK. Whilst it seems self-evident that regional trauma centres, with 24-hour trauma teams led by senior, experienced medical staff and with all major specialties on site and with a high volume of major trauma activity, could be effective in improving the outcomes for multiply injured trauma patients admitted to the centres, the effectiveness of regional trauma systems is not clear cut. The Royal College of Surgeons (RCS) published a policy in 2007 recommending that trauma services should be organised on a network basis with a range of units designed to treat trauma of varying severity. The UK mortality for severely injured trauma patients is 40% higher than the US and the report noted that in England there is an average delay of 6 hours in transferring patients from a local hospital to a trauma centre and delays of 12 hours are not uncommon. The report also indicated that high volume trauma centres reduce death from major injury and concluded that the evidence underscores the core philosophy behind regionalisation, that of taking the patient to the closest facility most appropriate to the particular patient’s needs, rather than simply the closest facility.

Conclusions/key points

There was good evidence that observation wards/units decrease the length of stay and provide a safety net for inappropriate discharge.

For some conditions such as chest pain, there was evidence that clinical decision units provide effective care. Such units were recommended as part of ED service by the CEM.

Observational evidence provided support for the effectiveness of acute medical units in providing improved general medical care to patients.

Triage has been used in EDs for over 20 years and there was evidence that it is useful when the ED is busy, but that it may delay care.

There was no evidence to support the practice of triage out which redirects patients to alternative care sources.
There was some high level evidence to support the effectiveness of fast track systems in reducing waiting times in the ED.

Care pathway use for emergency patients is well established and there was evidence to support their use in some clinical conditions.

Despite the lack of evidence, the use of multidisciplinary teams containing a social care element is thought to improve care.

There was clear evidence for the necessity of good access to diagnostic services. 24 hour access to radiology, CT and MRI was recommended. Every resuscitation room should have an ultrasound machine.

The ideal size on an ED serving a particular size of population was not clearly defined. Guidance from the Royal College of Surgeons recommended a minimum catchment area population of 450,000 to 500,000 for an acute hospital or network of hospitals. It has been calculated that 57 hospitals in England will have to close to meet this target. The College acknowledges that this figure may be unrealistic and suggests a catchment population of 300,000; the College acknowledges that in geographically isolated areas hospitals will have to serve smaller populations.

The evidence on the important question about optimum size of EDs and outcomes was inconsistent.

The CEM recommends that EDs in small hospitals with < 40,000 attendances per year, if less than 10km apart, should be merged. With distances of 10-20km then emergency services should be sustained.

With regard to location, the overall evidence on outcomes was inconsistent. For life threatening conditions such as stroke, head injury, respiratory failure and acute coronary syndromes the bulk of the evidence indicated that delays in treatment lead to adverse outcomes.

Hours of opening are defined by national guidance and there was a lack of studies exploring this issue.

Delays to surgery for certain patients are known to influence outcomes. There was national guidance and recommendations for dedicated operating theatre services.

Children constitute a large proportion of attendances at EDs. There was a lack of evidence to support the need for separate facilities for children and it was recommended that commissioners develop a solution that fits the needs of the local population, paying particular attention to rural areas.

There were clear recommendations for on site specialities required for EDs and the CEM has detailed the problems for a local hospital without some inpatient specialities. One particular issue is the provision of ICU facilities.
and it has been calculated that in an ED serving a population of 250,000, 3,000-6,000 patients per year have a potentially life threatening condition and 600-1,2000 will require immediate critical care. In this size population and smaller ones, if geographically isolated then on site critical care is essential.

The 2007 NCEPOD report recommended the establishment of trauma teams and there was some supporting evidence. Regionalisation of trauma services was proposed over a decade ago and there was some good quality evidence from the US to support this idea. There were recommendations from the RCS that trauma services should be networked, particularly in the light of the raised UK mortality for severely injured trauma patients compared with the US.

3.1.4 Patient education

Education of patients as to what types of condition are appropriate for the ED is widely advocated and government campaigns are run regularly. In one study where 7000 households were sent a booklet informing them about common non-urgent conditions and encouraging the use of alternatives to emergency care, attendances at EDs were not significantly reduced. 106

Patients with asthma are frequent attenders at EDs and one systematic review found that educational interventions applied in the ED reduced subsequent asthma admissions to hospital. The interventions did not, however, significantly reduce ED re-attendances. Self care is being encouraged for patients with chronic diseases and reviews of the literature have reported some successful interventions. 107 One study found that some patients resent advice on self care for their conditions because they expect to receive treatment. 39

Conclusions/key points

There was a lack of consistent evidence on the effectiveness of patient education on appropriate conditions for ED attendance and studies of information leaflets did not show a positive effect.

There was evidence for the effectiveness of education of patients with chronic diseases to recognise when emergency care was required.

3.1.5 Staffing

Most EDs have fixed staffing levels. No high quality studies were found to help predict optimum staffing. Many of the studies previously mentioned have suggested that increased involvement of senior staff would improve the emergency care system, but have not supported this with evidence. The debate about 24 hour senior cover in the ED was summarised by Cooke et al. 108 A British study undertook an RCT reviewing patients who had been referred to the surgical team for intra-abdominal abnormalities which did not require emergency surgery. In the intervention group patients were seen by a senior surgeon (consultant or senior registrar) and then had abdominal
ultrasound and/or plain x-rays, which were evaluated by a radiologist. The two groups had no significant difference in mean waiting time in ED, length of admission, surgical intervention, re-admission rate, and mortality. There was however, a significant difference in the number of patients admitted. 

Medical staff

The CEM has provided detailed examples of consultant and other medical staff and emergency nurse practitioners for EDs. Table 2 shows a summary:-

Table 2 Summary of example staffing with departments with average case mix

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>Consultants</th>
<th>Middle grade</th>
<th>FY2</th>
<th>ENP</th>
</tr>
</thead>
<tbody>
<tr>
<td>40,000</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>70,000</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>100,000</td>
<td>16</td>
<td>12</td>
<td>20</td>
<td>14</td>
</tr>
</tbody>
</table>

As a minimum for an ED the CEM states that there should be adequate consultant staff to provide and supervise all the activities required (including teaching, management and research). Such consultant-led departments should have as a minimum, an EM consultant available for advice and support 24 hours a day. It is not currently possible to have a consultant-based service (consultant present in the department 24 hours a day) although the College believes an extended presence for 18 hours should be the goal.

Nurse practitioners and specialist nurses

The primary function of a nurse practitioner in the A & E department is the care of patients with minor trauma, although they also manage patients with other minor conditions. Nurse practitioners are used widely throughout the UK and schemes are increasing rapidly. They have been shown to be as safe as junior doctors and patients are satisfied with the care they administer. A systematic review of the literature indicated that nurse practitioners can reduce waiting times in the ED setting, produce high levels of patient satisfaction and equal the level of care given by middle grade doctors. A retrospective case note audit from Australia confirmed the patient satisfaction and reduction in waiting times with nurse practitioner care in the ED.

Increasing numbers of nurses are also acquiring specialist skills in diagnosis in defined areas of emergency practice. Emergency nurses are now present in a number of settings in addition to the ED, such as WICs, MIUs and UCCs. These developments in service provision have required an expansion of roles and responsibilities with nurses in key decision making roles. New and
innovative roles, such as advanced practitioners allow the management of increasingly complex patient presentations.

**Allied health professionals**

The use of occupational therapists in EDs has been judged by doctors to prevent 21% of admissions referred to them. The data quality and description did not allow full interpretation of this small study. 116

In a Cochrane review of pharmacist interventions, one study demonstrated a decrease in admissions 117 and there is further interest in developing the role of community pharmacies in the treatment of minor ailments. 34

**Conclusions/key points**

There was guidance from the CEM on staffing for EDs with an average case mix. The College believes that at a minimum there should be an extended presence of an EM consultant for 18 hours per day. The table gives recommended staffing levels for units with an average case mix.

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>Consultants</th>
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<th>FY2</th>
<th>ENP</th>
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<tr>
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<td>8</td>
<td>5</td>
</tr>
<tr>
<td>70,000</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>100,000</td>
<td>16</td>
<td>12</td>
<td>20</td>
<td>14</td>
</tr>
</tbody>
</table>

There were very few studies looking at the impact of differing staffing levels or skill mix.

There was evidence that increased use of senior medical staff reduced admissions and decreased delay. Nurse practitioners have also been shown in a systematic review to reduce waiting times, produce patient satisfaction and a level of care equal to middle grade doctors.

New roles in emergency care for allied health professionals need further research but there was increasing evidence for a role for community pharmacies in seeing patients with minor injuries.
3.2 Costs

The present rapid review confirmed the findings of Cooke et al on the lack of literature reporting a full economic evaluation (for example, a cost-effectiveness analysis). The optimum configuration of USC services is a prime concern for NHS purchasers and the costs of the components of an A & E service must also include the costs from the use of investigations, hospital admission, subsequent outpatient care and the use of general practice, social services and ambulance services. The CEM is of the opinion that “the fixed costs of an emergency service capable of treating all types of seriously ill patients will escalate exponentially if high volume work is removed from the hospital. Co-location of a full range of urgent and emergency services is the only way of minimising fixed costs”.

3.2.1 Out of hospital care

A systematic review of economic literature concluded that there was a paucity of out-of-hospital care literature that addresses cost and economic value. The available literature was limited in scope, poor in quality, and evaluates small subsets of out of hospital emergency care costs. Favourable cost-effectiveness has not been firmly established for most aspects of out-of-hospital care. Only 14 papers with full economic evaluations were identified by the authors and these were limited to cardiac arrest and trauma patient emergency care.

3.2.1a Diversion of 999 calls to nurse advice

The current developments in the ambulance service provide opportunities for it to work with other healthcare providers to optimise the response to emergency calls about patients with non-serious conditions, but research about the cost effectiveness was lacking.

One review found that diverting non-urgent 999 calls to nurse advisors reduced the mean costs of emergency care compared with the standard approach. The overall impact of the service was a reduced cost of emergency care that ranged from £8 to £102 per patient, with the variation depending primarily on the cost of an emergency ambulance attendance. The cost impact on subsequent services was however less certain, but it appeared that further savings are possible.

Following a report from the Health Commission a review of NHS Direct has been started, after it was reported that in some areas it was sending up to 60% of patients to other NHS services and therefore the service is not cost effective.
3.2.1b On scene treatment and discharge by ambulance crews.

ECPs were found to have an impact on patient care with an average 25% reduction in conveyance rate to hospital and high patient satisfaction. Limited economic data indicated savings of between £31 and £37 per case when ECPs replace standard ambulance responders.

3.2.1c Use of alternative destinations to emergency departments

There was lack of evidence found on the cost effectiveness of the use of destinations other than the ED. Bojke et al provided an economic analysis of an intervention in a Liverpool general practice which allowed patients contacting the practice with minor ailments to choose to see a pharmacist at a local community pharmacy instead. Choice of pharmacy alternative was principally determined by the type of minor ailment and patients with upper respiratory tract infections were less likely to elect to see a pharmacist than patients with other minor ailments. The evidence indicated that pharmacists can provide cheaper advice than GPs for minor ailments but point out that there are hidden costs.

3.2.2 Primary care

Primary care attenders in EDs have been cited by many as a source of problems for EDs. They are seen as causes of prolonged waiting times, inefficient care, staff stress and preventable costs. Scott et al reported annual costs incurred by general practice OOH providers per 1,000 population in a detailed study of eight sites with different service models including a deputising service, a practice rota and different types of co-operatives. They reported a four-fold variation in annual costs and suggested that the variation was likely to have been influenced by local contexts and geography, as well as by differences in the level of general practitioner cover provided in different services.

3.2.2a Interventions to reduce primary care attendances at emergency departments

3.2.2b GPs working in the emergency department

In the study at King's College Hospital in London, the cost-effectiveness of introducing GPs into an A & E department was evaluated. For the NHS, a GP’s time is more expensive than a senior house officer (SHO) due to higher remuneration and GPs spent more time with each patient. However GPs were found consistently to use fewer investigations, particularly X-rays and refer fewer patients for specialist care. The cost per case of patients seen by a GP, including the use of investigations, was 61% of the cost of patients seen by an SHO. This cost difference might be partly offset by the cost of a higher number of onward referrals to general practice by the GPs in the A & E department.
3.2.2c Primary care interventions

3.2.2d Out of Hours

A report from the National Audit Office confirmed the lack of cost effectiveness data of OOH services. The actual costs of providing OOH care were considerably more than Department of Health allocations. The total cost for the first full financial year of arrangements was £392 million, 22% more than the £322 million allocated by the Department. 125

3.2.2e Walk-in centres, minor injuries units and urgent care centres

Walk in centres

Salisbury et al 126 examined the impact of the centres on attendance rates, visit duration, process, costs and outcome of care in hospitals with co-located EDs and walk-in centres compared with eight matched EDs without walk-in centres. No differences were observed in the costs of care at sites with or without walk-in centres. 15

Minor Injury Units

It is feasible that because many of the facilities of an A & E department are regarded as inappropriate for minor trauma, it is more cost-effective to manage them in a MIU. MIUs can vary from being in a hospital with an associate specialist and full X-ray facilities, to a small MIU, run by nurses with very limited access to X-ray. 72 This variability makes evaluation of comparative costs very difficult. The average cost per attendance in a MIU is usually lower than in a full A & E department, but this is largely because of a higher proportion of low-cost re-attenders. The appropriate question is whether the costs of the joint production of treating major trauma and minor trauma together is more than treating them in separate facilities and there appeared to be no available evidence to answer this.

There was uncertainty about the cost effectiveness of MIUs that are located close to A&E departments and whether they can be cost effective if they attract additional users who would otherwise be managed at home. A paper by Sakr et al 127 described nurse practitioner care of patients with minor injuries in the same unit. In a well-designed before and after cohort study, nurse-led MIU care was compared with doctor-led ED care. Nursing care was clinically safe and as good as that provided by senior house officers in the ED. Costs (calculated using case adjusted workloads) were almost equal. Slightly higher revenue costs for MIU care were attributed to an increased rate of follow up, but this was judged to be largely appropriate. 15

The safety of minor injuries management using telemedicine was tested by Benger et al 55 and a subsequent cost consequences analysis showed
telemmedicine to be a more expensive option for providing minor-injuries telemedicine. 128

**Urgent care centres**

Urgent care centres are one of the most contentious parts of the NHS reforms. Both the CEM and the King’s Fund have consistently questioned the evidence base and the clinical and cost effectiveness for this major policy change. 69 129 There was a lack of literature on cost effectiveness of such centres.

### 3.2.3 Emergency department

There was little evidence found of relevance to the UK on the costs and cost effectiveness of EDs. Evidence from the Sheffield experiment that presented three year data after the centralisation of adult A & E services from two sites to one indicated that the costs had increased by 5.4%. Part of this increase was due to the requirement to improve staffing levels.130 Schemes in the US to divert patients away from the ED have not been shown to significantly reduce costs. 131

#### 3.2.3a Observation Units/Wards

Extra costs from providing these services could arise from the duplication of services and an increase in unused capacity. The overall cost consequence is not clear and there was a lack of cost effectiveness data. A study in an emergency care tertiary centre with 46,000 annual visits examined the cost reduction in providing observation beds. It was found that only 32% of the admissions could have been treated in an observation ward and the potential savings from inpatient bed closures would only have amounted to 1.68 full-time equivalents because they would have been evenly spread across the hospital and this would not be enough to staff a four-bed observation unit, which would require at least five full-time equivalents. 132

Goodacre examined the use of short-stay observation units in the UK and reviewed the literature and found that evidence for cost effectiveness compared with other methods of care were lacking. 133 Cooke also concluded that vigorous financial studies have yet to be performed in the UK. 14

#### 3.2.3b Clinical decision units

In the review by Hassan it was concluded that the cost effectiveness of CDUs is yet to be determined. 60

#### 3.2.3c Acute medical units

A retrospective analysis of hospital data to determine the impact of an AMU on ED waiting times for a hospital bed, consultant practice and length of stay (LOS) and costs was published from Ireland. The median LOS shortened
significantly and the number of patients waiting in the ED for a hospital bed was reduced by 30%. Extrapolated cost savings for the hospital were estimated to be approximately 4039 bed days and 1,714,152 Euros.\textsuperscript{134}

3.2.3d Triage

Richards et al\textsuperscript{135} conducted a cluster RCT trial comparing triage of same day appointments by practice nurses with initial triage by NHS Direct. The model was feasible but cost difference per call triaged was +£2.88 per call for NHS Direct, taking into account that calls to NHS Direct were longer and more likely to refer callers to a GP appointment.\textsuperscript{15}

**Telephone triage and consultation**

A review of the literature found that economic data on telephone consultation and triage was lacking.\textsuperscript{136}

**Triage and initial assessment**

There was an absence of up to date evidence revealed by the searches. A UK study published in 1996 reported that for triage and initial assessment, excluding costs of admissions, the average costs per case were £19.30, £17.97, and £11.70 for senior house officers, registrars, and general practitioners respectively. With the cost of admissions included these costs were £58.25, £44.68, and £32.30 respectively.\textsuperscript{40}

3.2.3e Fast track systems

Fast track systems were concluded to be cost effective in a Canadian Health Technology.\textsuperscript{137}

3.2.3f Use of care pathways in the emergency department.

Despite the recommendations for the development and implementation of care pathways for emergency care no cost effectiveness literature was found.

3.2.3g Social care in the emergency department

In a study of an ED in the US, Gordon et al\textsuperscript{138} demonstrated that social workers covering the department 24 hours a day can be economically beneficial. There were greater advantages in larger departments, when looking at decrease in return visits, prevention of admissions only for social reasons and saving in other staff time. The applicability of this study to the UK is limited by the variation in costing health care.
3.3.2g Diagnostics

There was a lack of high level evidence found for the cost and cost effectiveness of the diagnostic services recommended by the professional bodies.

24 hour radiographic services

There was poor quality evidence on cost effectiveness.\(^7\)

Computerised tomography

There was fair evidence on cost effectiveness, particularly in patients with head injury.\(^7\)\(^9\)

Ultrasound

No evidence was found.

Magnetic resonance imaging

There was evidence indicating that the use of MRI in the ED was cost effective for some musculoskeletal disorders\(^1\)\(^0\)\(^1\)\(^1\) and for the detection of ischaemic stroke.\(^1\)\(^2\)

3.2.3i Size and Location of Departments

In the NHS there have been moves to increase the size of A & E departments to improve the quality of care and to reduce costs. In the analysis of the costs of 250 providers there was no evidence to support the existence of cost economies, either for total or new attendances. The combination of two medium sized A & E departments was predicted to produce savings of around 15%, although this saving was substantially reduced by the additional costs for the ambulance service from the consequent increase in the number of patients transported between the two hospitals.\(^1\)\(^3\) Centralising A & E services increases the average travel time for patients and the private cost to patients of the time and inconvenience caused by the extra journey should be considered against any cost economies for the hospital. Reduced access may also deter some patients who, as a consequence, may decide to visit their GP or other locally-organized emergency treatment service.

3.2.3j Hours of opening

An important choice for the cost of A & E facilities is the hours of opening. There was poor quality evidence of the cost effectiveness of extended opening hours.\(^7\)

3.2.3k Dedicated operating theatre services

There was fair evidence to support a dedicated emergency theatre. 72

3.2.3l Services for children

A survey into whether the recommendations for emergency care for children by the RCPCH had been implemented found that paediatric emergency services were under resourced. 144 No cost effectiveness data were found for the different models of paediatric emergency care.

3.2.3m Specialities on site

No evidence was found for the cost effectiveness of the individual on site specialties.

3.2.3n Trauma teams

Trauma teams have a cost in terms of a reduction in staff availability elsewhere, whilst they are active in A & E departments. Advanced trauma life support training has a cost in terms of staff hours. 72

The evaluation of the first UK trauma system based around a pilot trauma centre in Stoke included a detailed costing of the centre itself as well as a follow-up for six months of the use of hospital and other services. There was a large investment in staff, and a dedicated theatre which accounted for around an extra £1 million per year on the costs of running the A & E department. Substantial variations in these costs are expected if trauma systems are established at other locations. The additional service requirements had only small additional consequences for costs elsewhere. It was estimated that the regional trauma system cost an additional £0.52 million per annum and because there was little evidence of any health benefits it was concluded that the system was not a cost-effective service for major trauma. 145

3.2.4 Patient education

Evidence was not found on the cost effectiveness of providing education for patients on conditions requiring attendance at an ED.

3.2.5 Staffing

Nurses are being used both to triage cases and as alternatives to junior doctors in the provision of services. The cost of having a triage nurse is the need to divert a trained nurse from other activities and this will depend on the grade of the nurse. The cost comparison between trained nurses and junior doctors is more complex since the cost of their time will depend not only on the grade of nurse and the scale points of the nurse and doctor, but whether they are working overtime. Furthermore the evidence from comparing GPs
and senior house officers in the King’s College Hospital Study suggested that it is also important to examine the consequences for the use of investigations, drugs and referrals to specialists. \(^{124}\)

**Medical staff**

**Nurse practitioners**

A literature appraisal concluded that depending on the protocols and patients’ age restrictions, ENPs could independently treat between 24% and 30% of patients attending ED, but the cost per case may be higher. \(^{146}\)

**Allied health professionals**

There was a lack of evidence found for the cost effectiveness of physiotherapists and occupational therapists. One review of community pharmacy minor ailment schemes found that the evidence was inconclusive with regard to cost effectiveness, but it did suggest that there are cost savings with pharmacy interventions compared with GP consultations for minor ailments. \(^{34}\)

**Conclusions/key points**

The current review confirmed previous studies on the paucity of literature on cost effectiveness of the various components required for USC. There was some cost effectiveness evidence of variable quality for the following:-

- Diverting 999 calls to nurse advisors
- On scene treatment and discharge of patients by ECPs
- GPs working in A & E departments
- MIUs
- Community pharmacy minor ailment schemes.
- Hours of opening
- Dedicated operating theatre services

The available evidence indicated that merging EDs did not produce the expected cost savings. In one study following merger of 2 departments, costs rose by 5.4% and another reported that predicted 15% savings were substantially reduced.

Further work is required to obtain information on the costs and cost effectiveness of the various elements required to deliver an USC service that is of relevance to the North Wales situation.
4 Models of Care

Emergency and USC services are undergoing reorganisation and new models of care have been implemented through the ambulance service (e.g. paramedic practitioners with extended skills training), NHS Direct, a 24 hour nurse-led telephone based healthcare advice and information line (e.g. handling non-serious 999 calls), MIUs, WICs and UCCs. New primary care contracts in general practice and community pharmacy also provide the opportunity to change the pattern of care delivered. These new models of care have yet to be fully evaluated to understand the impact on patient care and the NHS through, for example, changes in demand for other services.

The CEM in collaboration with the Healthcare Commission have developed standards and audit tools for common conditions that can be used to assess the quality of clinical practice in an ED.

A review of primary care OOH services identified six main models, practice-based services, deputising services, EDs, co-operatives, primary care centres, and telephone triage and advice services. There was a lack of evidence on the effect of different service models on subsequent medical workload, apart from the finding that GPs working in EDs may reduce the subsequent medical workload; clinical outcome data was also absent. Studies consistently showed patient dissatisfaction with telephone consultations.

By 2005 a number of centrally driven initiatives had been established and Figure 2 shows the model for emergency care in 2005 suggested by the CEM.

Figure 2 (Copyright permission obtained from CEM)
The period saw the growth of WICs and NHS Direct. However, these initiatives did not reduce demand for either primary care, the use of 999, the ED or the acute admission service and possibly created new demand or caused duplication. There was some evidence that WICs and MIUs have stemmed the growth in minor illness and injury patients attending the ED, but the numbers of patients needing admission continued to rise.

The proposition for the integration of primary and secondary care services is currently receiving considerable attention. A review of the UK and international literature indicated that integrated care can be an effective way of delivering healthcare. The evidence suggested that approaches that focus on integration around the patient pathway are more likely to be successful than those which involve wholesale transfer of functions from other organisations. The results of studies from the integration of hospital emergency care are accruing. In Cambridge the MAU was relocated into the existing ED and came under the 4 hour target. Medical, surgical and paediatric short stay wards were opened next to the ED and a CDU replaced the more traditional observation unit. Following these changes there was a 16.3% decrease in emergency medical admissions and a 3.9% decrease in surgical admissions. However, performance against the 4 hour target declined and the number of bed days increased slightly. The authors discuss the limitations of their model and emphasise that their hospital is large with a full range of necessary services and that the system requires further testing.

Good evidence from the literature was lacking with regard to assessing future demand for USC. WAG considers that the demand for unscheduled care is relatively predictable and that it is possible to plan for future provision and a picture of current demand is required that should include data from all current service providers with both numerical and case mix derived data. An overview of the epidemiology of conditions requiring A & E management indicated that the key conditions determining future demand for emergency services in North Wales include injuries, poisonings, violence, wrist trauma, fractured neck of femur, deliberate self harm, acute myocardial infarction, stroke, asthma, mental health problems and substance misuse.

The CEM’s assessment is that the major gaps in the current provision of emergency care are the management of acute exacerbations of chronic illness and the care of the elderly patient. These gaps cannot be effectively managed efficiently unless there is close cooperation between community and hospital services. Even in areas with maximum cooperation all the evidence suggests that even with effective community services, the reduction in admissions is in the region of 5-15%. The College has outlined services that could meet the demands of emergency health care over the next decade. The main innovation is the linking of primary care, existing community services, the ED and the acute hospital into a much stronger emergency care network. This network would have to share staff, clinical governance procedures such as policies and guidelines, staff education and individual patient care plans. Figure 3 outlines services that could potentially meet the demands of health care over the next decade. The CEM strongly
recommends that any new systems of delivering emergency and urgent care are subjected to robust independently assessed pilots.

**Figure 3** The joined up emergency and urgent care system.\(^{57}\) (Copyright permission obtained from CEM)

4i Examples of existing models for USC

England

In Sheffield, work has been progressed on implementation of the network model for USC, as recommended by the CEM.\(^{37}\) Results from the findings of the first stage of work on Emergency and Urgent Care Networks (EUCNs) have been reported. Preliminary case studies with 6 networks including interviews and assessment of network documents were presented that identified a number of common issues:-

- Achievement of policy initiatives around emergency and urgent care requires a system approach. One way of delivering a system is by using networks to organise, co-ordinate and manage the necessary processes.
- Size of network is important. Consideration of regional system requirements has to be balanced with the need to deliver services that are relevant and appropriate to local health economies. No single network model can achieve this.
- The best option appears to be a two tiered model with a regional network board to manage strategic direction, planning and system wide services and issues supported by local PCT based EUCNs serving populations of around half a million people which can implement and deliver agreed network plans and objectives.
• Membership of local network Boards will reflect the strategic aims and objectives of the network but should at least include PCTs, Acute Trusts, Ambulance Trusts, NHS Direct, Mental Health Trusts, Patient Groups and Social Care. Regional boards may include more diverse members and representatives of the local networks to facilitate the co-ordination role.

• Networks have the potential to reduce inefficiencies, deliver innovative services, improve quality of care and give value for money. There is some evidence of success in these active networks in delivering this potential already, and some examples of potential cost savings in systems managed by networks, but it is not clear cut.

• There are conflicting views about the future role of networks in the commissioning of emergency and urgent care and whether or not they should provide a service that supports commissioning by service development and information sharing or one which is directly involved in commissioning services at a network level.

In London under the Healthcare for London USC programme, the model for USC takes a tiered approach which encompasses three broad responses to patients’ USC needs – rapid/moderate; urgent; emergency. The new delivery model envisages the same range of urgent care services being delivered in hospitals and in polyclinic centres. In this model the A & E department would become more akin to the US model of an emergency room or ED. When patients arrive by ambulance the initial streaming decision would be made by the ambulance crew as to whether the patient should be brought directly to the ED or taken to the UCC. EM consultants would have a key role in supporting UCCs. The polyclinics would have a major role in enhancing urgent care in the community. The UCCs should be integrated with the ED and staffed by multidisciplinary teams (MDTs) including GPs, nurses, ECPs as well as staff skilled in dealing with maternity, substance misuse and mental health problems. There are further recommendations:-

• MIUs and WICs should be reviewed and possible developed into UCCs
• Pharmacies need to be firmly integrated into USC schemes
• There should be a single telephone access point
• Triage should occur at every access point

Paediatric unscheduled care

The Royal College of Paediatrics and Child Health (RCPCH) have proposed a model for paediatric USC. There is currently a focus on delivering urgent care using different providers, going beyond the traditional primary/secondary care model. The College advocates the development of a short stay paediatric assessment unit (SSPAU) which is a facility within which children with acute illnesses, injuries or other urgent referrals (from GPs, Community Nursing teams, WICs, NHS Direct and EDs) can be assessed, investigated, observed and treated without recourse to inpatient areas. Currently, children requiring a further period of assessment are often admitted to wards. This results in a
longer period of stay due to traditional ward processes. The solution could be short stay facilities for children that mirror CDUs developed in the adult emergency setting. Patients can stay in such units for up to 24 hours and then be admitted if necessary. The development of SSPAU is likely to benefit patients and increase efficiency. Conditions particularly suitable for management in an SSPAU include breathing difficulties, fever, diarrhoea and vomiting, abdominal pain, seizures and rash, as well as head injury and non-intentional poisonings; these are some of the most common reasons for attendance in the ED. The RCPCH has made suggestions for developing such units but states that the exact model of care will depend on local circumstances and services already present in the locality. The following suggestions for models are given:-

**Type A – co-location with paediatric ward, this type of unit is widespread in the UK.** These units are usually adjacent to the inpatient ward and take referrals from a variety of sources, including GPs and EDs. Published studies have demonstrated that these units are popular with patients, reduce admissions and decrease LOS.  

**Type B – co-location with ED, run by the paediatric department and ED.** An alternative model of care is for the units to be jointly run by the paediatric department and paediatric emergency medicine specialists and to be situated adjacent to the ED. There is encouragement from the Academy of Medical Royal Colleges and the CEM to consider the development of such facilities, as on-site inpatient paediatric services become less prevalent. There was less published evidence from these units, but what has been published is encouraging. This model is present in the Hope Hospital, Salford Royal Foundation Trust.

**Type C – co-location with ED, run by ED in a specialist paediatric hospital.** This type of unit is also likely to be staffed by dedicated paediatric ED staff, including consultants. There may be variable levels of liaison with the paediatric department. These assessment units will be adjacent to large paediatric EDs with a critical mass of numbers and staffing. Increasing evidence shows this type of observation unit to be efficient and safe for children. 24/7 provision can be more easily delivered since the ED is open 24/7. This model is present in the Birmingham Children’s Hospital.

**Wales**

New ways of working and models of care provision will be explored through the DECS Framework. The Framework suggests that for example, where UCCs are co-located with A&E Departments a 14.6% reduction in the numbers of patients with primary care needs attending A & E has been reported. The proposal for the establishment of UCC, whether co-located with an A&E department or stand alone and based for example, in community hospitals, are designed to provide an appropriate service for those people who currently access A&E (level 3) with nonemergency conditions. The exact
configuration of skills offered will build upon the resources available locally and may include:

- Nurses - with skills in general practice, community care and USC
- Doctors - with skills in General Practice and USC
- Allied health professionals such as physiotherapists and occupational therapists
- Pharmacists
- Social care professionals
- Paramedics working in the community
- Voluntary Sector partners.

Staff working in rural or isolated situations such as some MIUs will be supported to deliver safe services, as locally as possible. The feasibility of developing a national network linking these units to Major A & E departments in order to provide remote clinical decision support via video-conferencing technology will be explored.

In the Good Practice Guidance from NLIAH there are 2 options for models for USC (see diagrams below). The UCC would be replicated in the 24hours and day UCCs, the main difference being with the 24/7 UCC, is the colocation with the ED. Integration with community services is not proposed.

(Copyright permission obtained from NLIAH)
The review of USC in the North West Wales Health Community gives a proposal for future delivery of USC. Attendances to the ED at Ysbyty Gwynedd have been steadily increasing. At present patients have open access to the ED and the proposed model will ensure that the USC services provide a triage service at every physical point of access for emergency and urgent care. Patients would not have direct access to the acute ED but will be triaged to the appropriate services to meet their needs and the model is based on the front door to health services described in the NLIAH Good Practice Guidance. The authors of the review considered that the key benefits of the 'front door' system would be:

- Early triage would mean that patients are signposted to the most appropriate service quickly.
- Single triage: one universally agreed triage process, allowing patient to be treated or referred to the appropriate service.
- Implementation of the principles of an Emergency Care Centre will simplify access to the user by ensuring they enter via a single entry point and are then appropriately directed.
- The Emergency Care Centre will control and manage access to more acute services and utilise other services appropriately.

Within North East Wales a multi-agency USC group has been established that will set the strategic direction for USC and oversee the implementation of the North East Wales Emergency Response Area (NEW ERA). The NEW ERA will facilitate the integration of primary care OOH with the emergency services.
services, complete redesign of the existing ED, establishment of a CDU, establishment of a joint medical and surgical assessment unit, redevelopment of community services and integration of OOH social services and appropriate community services.

**Scotland**

Patients can become an emergency inpatient admission along a variety of pathways – only some of which involve a GP. The four most common pathways are: patient attends A&E; patient calls an ambulance; patient is referred for emergency care by a GP 'in-hours'; patient is referred by an out-of-hours service. Only the latter two are likely to involve a GP. Scotland has added a fifth flow to the four high volume patient flows that reflect the length and complexity of the patient journey. This 5th flow will support the development of further alternatives to hospital attendance and admission and will be key to making the programme relevant to rural and remote areas. The model for USC for Scotland will then be described and implemented using this tiered structure. (Figure 4)

**Group 1 – Minor Injury and Illness**, including care provided in A&E Departments, in Minor Injury Units and through schemes such as Paramedic See and Treat.

**Group 2 – Acute Assessment**, this includes the ‘majors patients’ in A&E and patients referred to Acute Assessment and Receiving Units. The key to understanding the definition of this flow is the patients’ predominant need for ongoing assessment to determine the next step in their care pathways. This flow should be limited to a maximum of 48–72 hours in Assessment Units reflecting patient needs. However, the 4-hour waiting time target applies to trolleyed areas in these units, to ensure that patients are treated equitably irrespective of the point of access and in the most appropriate clinical environment.

**Group 3 – Medical Admissions**, patients who require a period of acute hospital care under the management of a Medical or Elderly Care team. Work in this flow will be linked to the chronic disease management agenda.

**Group 4 – Surgical Admissions**, patients who require a period of acute hospital care, under the management of a Surgical Team. Work in this flow will be linked to redesign of the elective surgical flow and links to theatres’ redesign.

**Group 5 – Out-of-Hospital Care**, this flow will support the development of alternatives to hospital attendance and admission, reducing waits and delays for patients who need urgent hospital assessment and treatment, and facilitating timely discharge for those who are ready for discharge from hospital. Involvement of partners in community care will be essential to delivery of significant change.
A tiered model (Figure 5) for paediatric USC has been developed in Scotland and this paediatric model has been recommended for use in England. 6

Figure 5  Tiered Framework for Emergency Care for Children and Young People (Copyright permission applied for)
Ireland

In Ireland, emergency medical care has traditionally been provided by doctors and nurses in public EDs and by GPs. In 2007, UCCs had only been developed by the private sector in Ireland. Early Irish UCC models have been staffed by doctors of varying experience with little supervision from specialists. This is a return to the old “casualty” model that has been universally discredited and these units must be reorganised and led and supervised by fully trained specialists in order to offer a safe and effective service. Consultants in emergency medicine are the most appropriate specialists to undertake this role in Ireland. UCCs should ideally be co-located with EDs, or if free standing should have clear links with established EDs to facilitate urgent patient transfer if required. Critical to the success of an UCC is the ease with which patients can access the radiology and laboratory services and CT scanning and MRI should be easily available. Full integration with primary care is pivotal as is the development of standards for children attending UCCs.

Australia

There are several different organisational models of emergency care being tried in Australia and considerable literature about their local effectiveness and perceived benefits. These models include:-

- Co-locating a short stay observation ward with an ED
- Fast tracking’ the assessment and treatment of patients with specific conditions
- Transit lounges for patients awaiting transfer
- Primary care units for patients requiring GP type services.

There was however, a lack of comparative assessments to evaluate which projects offer the greatest overall benefits in managing patient flows and under what conditions. New models of care are being implemented in Australian EDs, but there was no clear evidence that any particular model is superior to another.

Conclusions/key points

High level evidence was lacking on predicting future demand for USC. There was however expert opinion on how to assess the potential demands using local numerical and case mix data. The College of Emergency Medicine suggests that the major gaps in provision that will require to be addressed in the future are acute exacerbations of chronic illness. They also state that the evidence indicates that even with effective community services, the reduction in admissions is only in the region of 5 -15%. In North Wales the key conditions requiring A & E attendance include injuries, poisonings, deliberate self harm, violence, fractured femur, AMI, stroke, asthma, mental health problems and substance misuse.
The College of Emergency Medicine recommends an USC model that integrates and links existing community services, primary care, the ED and acute hospital in an emergency care network. A pilot study is taking place in Sheffield.

In London the new USC model envisages the same range of USC services delivered in hospitals and polyclinics. The ambulance crew would decide whether ambulance patients should be taken to the ED or the UCC. The UCC will be integrated with the ED. The polyclinics would be important in urgent care in the community.

For children the RCPCH recommends the development of a short stay paediatric assessment unit, but the exact model of care will depend on local circumstances. The adoption of the paediatric model of care developed in Scotland has been recommended by the NHS Modernisation Agency.

The Welsh Assembly Government and the National Leadership and Innovation Agency for Healthcare have proposed models for USC for development in Wales. Patients will not have direct access to the ED and there will be a UCC that will be co-located with the ED when the department is open 24/7. North East Wales has set up a group to develop these propositions for USC.

Scotland is working towards developing a model for adult USC and has already developed a paediatric model. Ireland is developing UCCs and co-locating them with EDs.
# Appendix A

## Unscheduled care: Literature review

### Search methodology

<table>
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<tr>
<th>TEAM UNDERTAKING REVIEW:</th>
<th>Health and Social Care Quality team for N Wales Planning Forum</th>
</tr>
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<tr>
<td>CONTACT PERSON:</td>
<td>Rob Atenstaedt, Conwy and Denbighshire Local Public Health Director</td>
</tr>
<tr>
<td>TOPIC:</td>
<td>Unscheduled care services.</td>
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<td>PRINCIPAL RESEARCH QUESTION/OBJECTIVE:</td>
<td>To review the evidence in relation to best practice models for unscheduled care</td>
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<td>DATE:</td>
<td>February/March 2009</td>
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### 1. METHODOLOGY

#### i) Search strategy for identification of studies

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<th>Period of publication</th>
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<td>CINAHL</td>
<td>Emergencies Emergency medical services Emergency patients Emergency service Emergency service-hospital Trauma centers</td>
</tr>
<tr>
<td>BNI</td>
<td>Accident and emergency services Ambulance services</td>
</tr>
<tr>
<td>Embase</td>
<td>See MESH</td>
</tr>
<tr>
<td>HMIC</td>
<td>Accident and emergency departments Emergency health services Pre hospital care</td>
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<tr>
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<tr>
<td>Emergency care</td>
<td>Patient education, patient education as a topic, education, educational interventions, [consumer] health information, health knowledge/attitudes; self care, self management, disease management, patient compliance; patient readmission, unplanned readmissions, hospitalisation, inappropriate admission, health services misuse.</td>
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<td>Emergency department</td>
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<tr>
<td>Emergency health care</td>
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<td>urgent care</td>
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</table>

1. Patient education- self management/ NHS Direct
Admission avoidance/ inappropriate admissions
Risk - general not focus on specific conditions - asthma, injuries

2. Staffing requirements

| Accident and emergency nurses, Ambulance personnel, Emergency care practitioners, ECP[s], emergency medical technicians, general practice Manpower, medical specialists, medical workforce, [advanced] nurse practitioners patient emergency management, pharmacist [technicians] paramedics, skills mix, training and |
3. Models and service delivery

- Access to health services, Clinical decision units, Clinical support systems, Delivery of health care, Delivery of health care.
- Emergency Medical Services/og, mt, td, ec [Organization & Administration, Methods, Trends, Economics].
- Emergency Medicine/td, og, mt, ec [Trends, Organization & Administration, Methods, Economics].
- Emergency practices, Emergency treatment example$, health services accessibility managed care programs/ , medical assessment unit$. mp.
- Minor injury services, model$. mp.
- Observation units, out of hours health services, patient emergency management quality of patient care, rapid access.mp.
- Reconfiguration, Re-design, see and treat.
- Substitution, telemedicine, Walk in centres.

4. Access – rurality issues, transfer of patients, travel distances

- Access to (health) services, Health services accessibility, Health care access, Ambulatory Care Sensitive Conditions, Catchment area-health.
- Rural areas, Rural communities, Rural health services, Rural hospitals, Rural life.
- Rural population, Rural transport, Ambulance service, Ambulances.
- Patient transport, Patients transportation.
- Transportation of patients, Transportation Forecasting, Health needs assessment.
- Health services needs and demands.
- Needs assessment, Trends, Service demand.
- Service delivery, Health service utilisation Utili$ation, Trends, Admission.
- Mental health, Mental disorders.

5. Cost effectiveness

- Cost benefit analysis, Cost effectiveness, Effectiveness, Best value, Value for Money, cost assessment, cost utility analysis, economic analysis.

6. Quality/standards

- Quality of patient care, quality of health care, quality of care, quality assurance of health services, quality of nursing care, quality standards, quality assurance, standards, Standards of care, health service evaluation.

**Electronic databases**

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### Hand searching journals

#### Last 6mths Electronic ToC

<p>| Journal                                                        | Status |
|                                                               |        |
| Academic Emergency Medicine                                   | ✓      |
| Accident and Emergency Medicine                               | ✓      |
| Annals of Emergency Medicine                                  | ✓      |
| Annals of Royal College of Surgeons                           | ✓      |
| Emergency Medicine Australasia                                | ✓      |
| Emergency Medicine Journal                                    | ✓      |
| Emergency Nurse                                               | ✓      |
| International Journal of Emergency Medicine                   | ✓      |
| Journal of Accident and Emergency                             | ✓      |</p>
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### ii) Selection criteria for inclusion of studies

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Appendix B

Evidence levels and quality grading *(modified from NICE Guideline Methodology Manual)*

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<tr>
<th>Level of Evidence</th>
<th>Type of evidence</th>
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<td>1**</td>
<td>High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
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<tr>
<td>1+</td>
<td>Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1-</td>
<td>Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>2**</td>
<td>High-quality systematic reviews of case–control or cohort studies. High-quality case–control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal</td>
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<tr>
<td>2+</td>
<td>Well-conducted case–control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>2-</td>
<td>Case–control or cohort studies with a high risk of confounding bias, or chance and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>3</td>
<td>Non-analytic studies (for example, case reports, case series)</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion, formal consensus</td>
</tr>
</tbody>
</table>

**Quality grading**

++ = good quality  
+  = fair  
+- = fair to poor  
-  = poor
5. References


4 Welsh Assembly Government. *The delivering emergency care services (DECS) strategy*. Cardiff: WAG; 2008 (Level 4 evidence)


21 Turner VF et al. Telephone triage in Western Australia. Med J Aust 2002; 176:100-3. (Level 1 evidence)

23 Snooks H et al. New models of care for 999 callers with conditions that are neither life threatening nor serious: results of a national survey. *Pre Hospital Immediate Care* 2000; 4:180-2. (Level 3 evidence)


30 Graber DJ et al. A telephone advice line does not decrease the number of presentations to Christchurch Emergency Department, but does decrease the number of phone callers seeking advice. *N Z Med J* 2003;116:496. (Level 2 evidence)


36 Blanco A, Pileggi C, Angelillo IF. Non urgent visits to a hospital emergency department in Italy. *Public Health* 2003; 117: 250-5. (Level 3 evidence)


41 Murphy AW et al. A comparison of general practitioner and usual medical care in an urban accident and emergency department in terms of process, health status and comparative costs. *BMJ* 1996; 312:1135-42. [cited in reference 72]

42 Campbell MK et al. Re-utilization outcomes and costs of minor acute illness treated at family physician offices, walk-in clinics, and emergency departments. *Can Fam Physician* 2005; 51:82-3. (Level 3 evidence)


54 Read S. Patients with minor injuries: a literature review of options for their treatment outside major accident and emergency departments or occupational health settings. Discussion Paper No. 1. Sheffield: University of Sheffield; 1994. [cited in reference 72]


60 Hassan TB. Clinical decision units in the emergency department: old concepts, new paradigms, and refined gate keeping. Emerg Med J 2003; 20: 123-5. (Level 4 evidence)


87 Widimsky P et al. Long distance transport for primary angioplasty vs immediate thrombolysis in acute myocardial infarction. Final results of the randomized national multicentre trial--PRAGUE-2. Eur Heart J 2003; 24: 94-104. (Level 1 evidence)


91 Sergides I et al. Is the recommended target of 4 hours from head injury to emergency craniotomy achievable? Br J Neurosurg 2006; 20: 301-5 (Level 4 evidence)


93 Myocardial Infarction National Audit Project (MINAP). [cited in reference 82]


96 Hendry SJ, Beattie TF, Heaney D. Minor illness and injury: factors influencing attendance at a paediatric accident and emergency department. *Arch Dis Child* 2005; 90;629-33. (Level 3 evidence)

97 Royal College of Paediatrics and Child Health. *Short stay paediatric assessment units. Advice for commissioners and providers.* London: RCPCH; 2009. (Level 4 evidence)


100 Spencer JD, Golpali B. Audit of six months’ activity of a trauma team. *Injury* 1990; 21 68–70. (Level 3 evidence)


103 Oakley PA et al. Effectiveness of regional trauma systems *BMJ* 1998; 316: 1383 (Level 2 evidence)


Available at: [http://new.wales.gov.uk/docrepos/40382/dhss/reportswelsh/english/chronic_disease_1.pdf](http://new.wales.gov.uk/docrepos/40382/dhss/reportswelsh/english/chronic_disease_1.pdf) [sessionid=FsZCJFFGkWb1Jf1nf0cyDR2wyQNGx1RX3pzK1Kh49rSmW11yqs1614610361?lang=en] [Accessed 20th Mar 2009]


109 Cochrane RA, Edwards AT, Crosby DL et al. Senior surgeons and radiologists should assess emergency patients on presentation: a prospective randomized controlled trial”, *J R Coll Surgeons of Edinb* 1998; 43:324-7. (Level 1 evidence)

110 Neades BL. Expanding the role of the nurse in the accident and emergency department. *Postgrad Med J* 1997; 73:17-22. (Level 4 evidence)

111 Sakr M et al. Care of minor injuries by emergency nurse practitioners or junior doctors: A randomised controlled trial. *Lancet* 1999; 354:1321-1326 (Level 1 evidence)
Sakr M. Randomised controlled study comparing the care and clinical outcome of patients with minor injuries treated by nurse practitioners versus senior house officers. 2000. [cited in reference 14]


Wilson A, Shifaza F. An evaluation of the effectiveness and acceptability of nurse practitioners in an adult emergency department. *International Journal Nursing Practice* 2008; 149-156. (Level 3 evidence)

Hann C. Use of occupational therapists in A&E. *Emerg Nurse* 1997; 5: 26-30. (Level 3 evidence)


Turner J et al. *The costs and benefits of managing some low priority 999 ambulance calls by NHS Direct nurse advisors*. Report for the NIHR Service Delivery and Organisation R&D Programme. Sheffield: University of Sheffield; 2006. (Level 2 evidence) Available at: [http://www.shef.ac.uk/content/1/c6/02/41/14/The%20costs%20and%20effectiveness%20of%20managing%20low%20priority%20999%20ambulance%20calls%20by%20NHS%20Direct%20nurse%20advisors.pdf](http://www.shef.ac.uk/content/1/c6/02/41/14/The%20costs%20and%20effectiveness%20of%20managing%20low%20priority%20999%20ambulance%20calls%20by%20NHS%20Direct%20nurse%20advisors.pdf) [Accessed 9th Apr 2009]


135 Richards DA et al. NHS Direct versus general practice based triage for same day appointments in primary care: cluster randomised controlled trial. *BMJ* 2004; 329: 774. (Level 1 evidence)


143 Normand C, Hunter I. *Sheffield health authority review of accident and emergency services*. London: London School of Hygiene and Tropical Medicine; 1991. [cited in reference 72]


146 Sakr, M. Emergency nurse practitioners. [cited in references 14, 15]


149 Fulop N. Integrated care: what can the evidence tell us?. Presentation. NHS Confederation Integrated care organisations: evidence and experience seminar. 11th Nov 2008. (Level 4 evidence)


154 NHS Modernisation Agency. *Improvements in emergency care: case studies*. (Level 3 evidence)
