NHS

Evidence Adoption Centre

East of England

Models of Care Managing Emergency Department Attendances

A rapid review of the research literature

<February 2011>

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1. Request

The Evidence Adoption Centre received a request from NHS Cambridgeshire PCT (Primary Care Trust) for a rapid literature review on the effectiveness of A&E Triage services. The practical question is: "How effective and cost effective is the practise of shifting minor and standard cases from Emergency Departments (ED) to lower cost settings? Describe different models of care for emergency treatments which reduce emergency department attendances (such as A&E front door schemes & triage services)".

2. Research Questions

What is the effectiveness and cost effectiveness of shifting minor and standard cases (primary care type illnesses and diseases) from Emergency Departments (ED) to lower cost settings?

Which models of care can be effective and cost effective in reducing Emergency Department (ED) attendances and treating patients with primary care type illnesses and diseases?

Problem: Increased Emergency Department (ED) attendances in the UK, Patients with primary care type illnesses in EDs.
Intervention: Emergency Department pathways (PCT based pathways in EDs, intermediate primary care pathways, other pathways)
Comparison: N/A
Outcome: Reducing ED attendances, shifting care from secondary to primary care (treating patients with primary care type illnesses)

3. Introduction

More than 15 million patients attend Emergency Departments (EDs) in England and Wales every year.[1] The conditions that place the greatest burden on the NHS are those related to heart diseases and respiratory illness.[2] The average population age will increase in the first half of this century. This proportional increase in the older population will result in a corresponding proportional increase in the number of long term conditions such as heart disease, chronic lung disease and diabetes etc and an increase in emergency hospital admissions.[2]

ED attendances in the UK have increased, as has demand for the service of general practitioners (GPs). It has been estimated that more than half of out of hours calls could be handled by telephone advice alone.[3] In the UK, there was no significant decrease in the use of EDs and ambulance services after the introduction of NHS Direct.[3] The various known factors that influence a patient's choice of where to obtain healthcare include process factors, such as the organisation of primary care and secondary care and psychological factors.[4]

The proportion of patients attending EDs with primary care conditions is estimated to range from 10- 30%.[5] Primary care disease can be defined as "a type that would frequently present to a General Practice so that all general practitioners would feel confident in treating such cases".[5] Patients with primary care type conditions can cause overcrowding in EDs, increased waiting times, inefficient care and staff stress etc.[4] Integrated care pathways should be developed to reduce the burden on EDs. The interventions that may reduce the burden on EDs are: PCT based pathways in EDs, Intermediate Primary Care pathways and others. These interventions can identify patients with primary care type conditions in EDs and reduce the over crowding and financial burden on secondary care. The Department of Health (DoH) has commissioned the Primary Care Foundation (PCF) to provide a viable estimate of the number of patients that could be dealt with elsewhere in primary care. The PCF will produce a commissioning guide to assist PCTs and acute trusts in setting up new services and to ensure that new and existing schemes are efficient.[4] The commissioning guidelines will be posted on their website.

This rapid literature review will explore the available evidence regarding interventions that can reduce ED attendances and deal with patients presenting with primary care type illnesses in EDs. There were no good quality economic modelling studies available in the public domain which analysed the financial impact of different models that can be commissioned safely for treating patients with primary care type illnesses. This rapid literature review will describe the different models of care that could be effective in transferring the load from secondary care to primary care.

4. Methodology

This is a rapid literature review which was based on the secondary findings of other published papers. The literature searches were performed by the East of England Public Health Librarian's Network following standard EAC processes. 49 studies were identified in the literature searches discussing different models of care for patients with primary care illnesses. This review is not intended to be a systematic literature review and therefore the search strategy lacks sensitivity in some areas. It may be that some significant publications were not identified in the literature search. The details of key words used for the literature search by the librarians can be accessed in appendix 1. This review is mainly based on the findings of the other systematic reviews and scoping literature reviews relevant to the given topic. Additional primary studies were included adding to the findings of included literature reviews. The included studies in this rapid literature review were full text. The detailed methodology of the included studies can be found in the appendices.

a. Data sources

Data sources included were AMED, BNI, EMBASE, HMIC, MEDLINE, PsycINFO, CINAHL, HEALTH BUSINESS ELITE and Cochrane databases were used for this review.

b. Search Strategy

The combination of key words used to conduct the literature search were - urgent care centre, front door, accident and emergency, emergency department, ED*, emergency medical services, telephone, triage, emergency service, hotlines, after-hours care, out of hours care*, triage nurse, nurse triage, GP triage, overcrowding, urgent acre centre*, out of hour* and helpline*. Studies published in languages other than English were excluded from the literature search.

c. Study selection

Due to the time limit, this review summarised the findings of the most recently published literature reviews relevant to the given topic.

d. Data Extraction

The data was extracted in four tables. In table one the following details from the included studies were extracted: study no., title, first author, publication year, geographical setting, study design, problem, intervention, outcome and limitations.

In table two, table three and table four, the brief qualitative summary of outcomes from the included reviews were extracted. The tables can be accessed in the appendices.

e. Data Quality Assessment

This review is essentially based on the findings of other scoping literature reviews and systematic reviews. Critical commentary on the included studies can be found in the availability of information section (5a).

5. Literature Review

a. Availability of information

A large quantity of literature describes the causes of increased attendances and delays in EDs, however, it does not focus on the innovations which help reduce the burden on EDs. The most common approach adopted is locating GPs alongside EDs. It is relatively easy for PCTs to set up and commission these services. This review summarised the findings of the Warwick report 2010[4], the SDO review (National Co-ordinating Centre for NHS Service Delivery, Organisation Research and Development), 2004[1], the Cochrane review 2004[3], and the SDO review, 2006[6]. Additional studies[7, 8] relevant to the rapid literature review were included. A critical commentary on the included studies is given below in figure 1.

Figure 1: Critical commentary on the included studies

Study	Title of the study	Critical commentary
Warwick report, 2010[4]	A rapid review exploring the interface between primary care and emergency care in England.	This was a scoping literature review. The study reported a comprehensive search strategy and the study selection criteria were addressed appropriately. The quality assessment of the included studies was not described comprehensively in the review. The reviewers did not do meta-analysis due to the heterogeneity among the included studies. The findings of the review are applicable to the UK settings, however, given the quality of included studies, should be treated with caution.
SDO review, 2006[6]	The costs and benefits of managing some low priority 999 ambulance calls by NHS Direct nurse adviser.	This study was based on a RCT and an observational study. The RCT compared outcomes of transferred 999 calls for nurse advice with calls receiving the standard ambulance response. The observational study discussed the practical and operational issues that affect service development and implementation. The study was performed in the UK. The study was based on a small number of participants. The studies findings were dependant on follow-up questionnaires to provide details on health service use and health events. The findings look appropriate given the level of evidence, however, further scoping of this intervention would be required before implementation.
Cochrane review, 2004[3]	Telephone consultation and triage: effects on health care use and patient satisfaction.	This was a Cochrane systematic review. A comprehensive search strategy was reported in the review. The review reported detailed quality assessment for the included studies. The conclusions made in the review are in line with the level of evidence reported.
SDO review, 2004[1]	Reducing attendances and waits in emergency departments: a systematic review of present innovations.	This was a scoping literature review. The study adequately addressed the search strategy for included primary care studies and systematic reviews. Meta-analysis was not possible due to the heterogeneity in the included studies. Comprehensive data quality assessment of the included studies was not provided. The findings of this review are applicable to the UK.

Salisbury et al, 2007[7]	The impact of co-located NHS walk-in centres on emergency departments	A controlled before and after study. The study addressed a structured question and the objectives were clearly stated. The authors clearly stated the limitations of the study which could have influenced the results. The numbers of walk-in centres included in the review were few and therefore, it is difficult to detect significant differences. The study was performed in the UK and findings are applicable to the UK.
Tsai et al, 2005 [8]	A meta-analysis of interventions to improve care for chronic illnesses.	This review answered a clear question that was described in terms of the intervention, population and study design. The study selection and data extraction were done by one reviewer which could have resulted in bias. The authors concluded that clinical outcomes, processes of care, and to a lesser extent quality of life, were improved in patients receiving at least one element of CCM. However, these findings may not be reliable given the limitations of the review methods.

b. Findings

The known interventions that have been commissioned to screen ED patients and reduce ED visits can be divided into the following three groups.

- PCT based pathways in EDs.
- Intermediate primary care pathways
- Other pathways

c. PCT based pathways in ED

The pathways used by PCTs in EDs are: managing patients in ED (a GP or nurse working in EDs) and redirecting patients from EDs (primary care gate keeping).

i. Managing patients in ED

The majority of the studies analysed in the Warwick review, 2010[4] stated that nurses or doctors are predominantly used by PCTs for triage of patients into urgent and non urgent cases. Primary care GPs can be used to deal with the non urgent cases in EDs. A GP working in EDs can reduce the number of referrals for admissions and order less investigations. It can be cost effective but the level of evidence is weak.[4] There were 10 studies (4 from the UK) exploring the management of patients with primary care type illnesses in EDs. A majority of the studies reported in the review used triage systems using a nurse or a GP.

The majority of included studies reported using GPs/Physicians as an intervention. The benefits reported in the included studies were reduction in ED attendances, fewer prescriptions issued, fewer investigations requested and fewer hospital admissions etc. GPs in EDs for primary care conditions can be more effective as compared to trainee doctors.[5] The methodological quality of the included studies varies considerably.

Dale et al, 1996 found that ED doctors were significantly more likely to order radiographs, prescriptions and make more referrals as compared to GPs ($p<0.05$). The study also found that patients that had been seen by a GP in EDs made more visits to their own GP, underwent more investigations and were referred more. Another study done by Ward et al, 1996 also found that ED doctors significantly took more investigations ($p<0.001$) and were more likely to refer to the on-call teams (10.6% v 4.5%; $p<.05$). The study found GPs more likely to advise follow-up with community GPs (70.9% v 55.3% - $p< 0.05$). Clancy et al, 2009 found 90% of patients being managed at 'see and treat' in their study.

Four included studies in the Warwick report, 2010 indicated some potential cost benefits. The quasi-randomised trial published by Dale et al, 1996 estimated the cost per patient excluding admission was £19.30 for a house officer, £17.97 for a registrar and £11.70 for a GP. Including admission costs this was £32.30, £58.25 and £44.68 respectively. The costs were based on staff time, diagnostic tests, treatments and referrals.

Dale et al., 1996 accepted that referrals to GPs and other primary care services in the community were not included in the analysis. They also found that at 30 day follow-up, 12% of patients managed by a GP re-visited the ED with the same complaint as compared to 9% of patients managed by the ED doctors. The study found more patients managed by GPs visiting their own GP (12%) for the same complaint as compared to patients managed by an ED doctor (9%). Dale et al., 1996 reported a 40% cost saving between an SHO managed patient and a GP managed patient. However, these reported costs benefits should be treated with caution as not all the costs could be accounted for in their analysis.

Only one of the included studies presenting economic analysis was applicable to England, therefore, the Warwick report found it difficult to analyse the cost-effectiveness of such systems. There is little evidence in relation to the prescribing habits of professionals. The evidence suggests that GPs can prescribe more appropriately than junior emergency medical staff working in EDs.[9] The use of GPs in EDs has some short term benefits but it may increase ED attendances.[1] Further rigorous evaluation in the future will be essential to analyse the impact of this intervention on targeted outcomes.

ii. Redirecting the patients from ED

Primary care gate keeping can be defined as "a health care professional, usually a primary care physician or a physician extender, who is the patients first contact with the health care system and triages the patients further access to the system".[10] Primary care gate keeping or simply triaging the patients out of EDs can reduce the numbers but the safety of such a system is not known.[4] The Warwick report, 2010[4] included 20 studies investigating the redirection of patients with primary care type illnesses from EDs and discouraging subsequent utilisation. The majority of included studies reported triage systems where patients were screened and non-urgent cases referred to primary care. The effect of this intervention is variable.

Only one of the 20 included studies in the review was conducted in the UK, therefore, the findings might not be applicable to UK settings. There is varied evidence around the effectiveness of redirecting patients from EDs. Some studies found that ED

attendances could be reduced and primary care attendance could be increased, whilst other studies found no effects on subsequent ED utilisation or any increases in primary care attendances.

A number of studies included in the Warwick report, 2010 found misclassification in diverting patients. The study done by Gadomski et al, 1995 found that more children in the re-directed group were hospitalised after 6 months. This finding can also have an important implication for economic benefit. The study was done in the United States and it was a BAC (Before and After with Control) study. The study found that redirecting patients had no significant effect on their future health seeking behaviour as compared to the comparison group. Another study done by Shaw et al, 1990 investigating 588 indigenous children denied emergency department access, found that 45% of redirected children were lost to follow-up and 2 children were later admitted to hospital. Further research with rigorous methodological design and adequate follow-up is essential to analyse the full impact of this intervention on health care outcomes.

The redirection of patients is seen as risky, especially if serious cases such as meningitis could be missed. It can also be time consuming and not always in the patients best interest.[11] Primary care appointments made for redirected patients, might not be kept by those patients and that can put them at a risk and aggravate their problems. Diverting patients away form EDs can increase the journey time of patients and high risk patients can be missed. Patients attending EDs might be from different socio-demographic backgrounds and diverting these patients away from EDs might result in 'lost to follow-up'. This could increase health inequalities among the general population. Patients should be treated in the same NHS service that they have approached.

d: Intermediate care pathways

Intermediate care pathways can be divided into case management, primary care clinics for chronic diseases, NHS walk-in centres and out-of-hour services.

i. Case management

Case management can be defined as *"A collaborative process which assesses, plans, implements, co-ordinates, monitors and evaluates the options and services required to meet an individuals health, care, educational and employment needs, using communication and available resources to promote quality cost effective outcomes."*[12]

The main aim of targeted intervention (such as case management) is to develop useful ways of coordinating services in order to improve quality of life and reduce use of secondary care resources. The SDO review, 2004[1] found that specialist nurse care in heart failure, COPD (Chronic obstructive pulmonary disease) and DVT (Deep venous thrombosis), with home support to patients and social support schemes, can reduce ED attendances and hospital admissions. However, the evidence around case management provided to a local population reducing the burden on secondary care is uncertain.

There is some limited evidence that targeted interventions (such as case management and self-management) can improve the quality of care in a sub-group of patients (for

example, patients with long term conditions or elderly people)[8]. Though, there are still uncertainties in terms of targeted interventions reducing the use of secondary care resources.

Case management for patients with chronic diseases can improve their quality of life. The Department of health has recently published an evaluation report on Partnerships for Older People Projects (POPPs). The report suggested that targeting interventions to people with long term conditions can improve their quality of life and it can be cost effective.[13], though, the evidence around cost-effectiveness is not clear. Further scoping of this intervention will be required to analyse if case management can reduce emergency hospital admissions and be cost effective. Case management for patients with chronic diseases can be provided through primary care clinics, community matrons and virtual wards etc. Well structured primary care clinics for patients with long term conditions can reduce outpatient visits while improving patients access to care.[14] The cost of transferring care is largely unknown and further research will be essential for the scoping of this intervention.

ii. NHS walk-in centres and Out-of-hours services

Several studies have analysed that poor access to primary care services is a major factor in increasing patient's attendances to EDs. Although most of these studies were done in the USA and may therefore not be applicable to the NHS.[1] The evaluation of the first wave of Walk-in Centres suggested that, although they provided safer and better care, there was no evidence of a reduced demand on secondary care.[7] There is lack of evidence to suggest that Walk-in Centres and Out-of-Hour services could reduce attendances at EDs. Although they certainly provide other benefits to improve patient's quality of life.[1]

A study done by Salisbury et al published in 2006, analysed that there was no evidence of any effect of Walk-in Centres on attendance rates, service cost or the long term outcomes of care.[7] A controlled before and after study was conducted. All eight sites with a new walk-in centre established in 2004 and co-located with an ED were compared with matched EDs with no co-located walk-in centres facilities. Sites with and with-out walk in centres were individually matched. The study compared between those patients attending combined emergency/walk-in centres sites (Intervention group) versus those attending similar EDs without a co-located walk-in centre (Control group). The study found that year on year cost increased in the intervention group (22%) and control group (10%). The difference was mainly due to the increase in the clinical staff cost. The estimated total cost (£000) of intervention sites for a 3 month period was 16,893 and 20,615 during January–March 2004 and January–March 2005 respectively. The estimated total cost (£000) of control sites for a 3 month period was 16,389 and 18,009 during January–March 2004 and January–March 2005 respectively. Costs at intervention sites increased by £6.22 per patient and costs at control sites increased by £8.28 per patient. When admissions costs were included in a sensitivity analysis, there remained no evidence of difference in the change in cost per patient (-£ 20.97; 95% CI – 64.98 to 23.04 per patient).

The Walk-in Centres included in the study[7] were newly opened and would have required time to get established. Lack of evidence dose not however means that these interventions are not effective. They can be beneficial for improving quality of care for patients. Further rigorous evaluation will be requited to evaluate the long term

effectiveness and cost effectiveness of walk-in centres in reducing the burden on secondary care.

e. Other pathways

Other pathways to reduce ED attendances are telephone consultations, diverting some 999 calls to nurse advisors and patient education.

i. Telephone triage and consultation services

The Cochrane review, 2004[3] found that telephone consultations can reduce the number of GP surgery contacts and out-of-hours visits, however, there may be an increase in repeat visits. The majority of included studies in the Cochrane review (5 out of 9) were carried out in UK settings. Telephone consultations either by GPs or nurses were considered to be safe.[3] The review found that, in general, about 50% of the calls could be handled by telephone advice alone (ranging from 25.5% to 72.2%). All the studies interpreting nurse telephone consultations in this review used computer algorithms.[3] The majority of the included studies had variability in the interventions studied, lack of power and methodological limitations, therefore the results should be treated with caution.

The Cochrane review emphasised the following three interventions.

1. Telephone consultation versus normal care

The review included 6 studies in the analysis. Three of the included studies were RCTs and three were interrupted time series (ICTs). Four of these studies (Two RCTs and two ICTs) looked at the number of visits to emergency departments. The two RCTs analysing telephone consultation by a doctor found no significant difference between telephone consultation and face to face appointments. An ITS analysing telephone consultations by a doctor found a significant increase in contact rates with EDs but after performing a regression model, the increase was not found to be statistically significant.

Two ITSs reported data on costs. One study, which did a thorough economic evaluation found little difference in cost between the intervention and control groups (mean difference 1.48 (95% CI 0.19 to 3.15). The other ITS study only looked at the cost for telephone calls and they found telephone bills to be increased by 26%.

2. Telephone consultation by one health care professional group versus telephone consultation by another health care professional group or health care worker

Two RCTs compared nurse telephone consultations with normal telephone triage by a doctor in an out-of-hours deputising service, and one CCT compared telephone triage by a health assistant with telephone advice from a doctor or a nurse. The Cochrane review found that one of the included RCT was underpowered for the majority of the outcomes measured. All three included studies found a slight increase in the number of visits to A&E in the intervention group (range 0.3% to 2% increase), however, the results were not significant. In one RCT with an economic evaluation, the cost of providing nurse telephone consultation was £81,237 a year but there was a decrease in overall cost of £100,000.

3. Nurse telephone consultation with and without computer assisted algorithms

There were no studies identified with head to head comparisons of with and without algorithms in the Cochrane review, therefore the review was unable to asses their effect.

Another systematic review, 2003 evaluated that telephone triage and advice services could be effective in reducing the immediate medical workload and this has the potential to reduce costs.[9] Further rigours evaluation and economic modelling will be required to analyse the clinical outcomes, safety and cost effectiveness of telephone triage services.

ii. Diverting some 999 calls to nurse advisors

The study commissioned by the SDO, 2007[6] evaluated the costs and benefits of managing low priority 999 ambulance calls using NHS Direct nurse advisors. Generally emergency calls are classified into three categories: A (immediately life threatening), B (serious) and C (not life threatening or serious). The study explored whether diverting category C calls to nurse advisors was an acceptable, clinically safe and cost effective intervention. Three ambulance services covering geographically diverse locations in England and Wales took part in this study. The study reported that 52% of all calls (including those returned to the ambulance service) assessed by the nurses were not transported to hospital compared with 22% in the control group. The study found that the intervention of the nurse advisor had the potential to significantly reduce the total ambulance 'job cycle time' with a saving of around nine minutes on the complete cycle.

The economic evaluation in the SDO report found that the use of nurse advisors for certain low-priority calls, while generating additional nurse-advisor costs, reduced ambulance cycle times and the number of ED attendances. Together this reduced costs by £8 – 102 per patient in the study areas. The study failed to make comparisons between different groups of calls. The impact of these results on the wider NHS population is less clear. The scope of the study did not cover following all patients through the health care system, therefore, the study was dependent on the follow-up questionnaires to gather information on health service use and adverse events. The report was based on a low response rate for the patient questionnaire. There were other difficulties found in the interpretation of the questionnaire that restricted the power of analysis. The study found that the patients in the intervention group had more contacts with other immediate care services but fewer hospital admissions.

The four key factors identified for an effective transfer system were: good knowledge of local services and the development of local care referral pathways, appropriate training, strong leadership with staff fully engaged in new processes and good IT systems that facilitate good communication betweens services.[6] The proportion of callers who were eligible for transfer was low due to the studies' high exclusion criteria. The results should be treated with caution and further research will be required to scope this intervention.

iii. Patient education

The main factors that influence patient's choice are education, socio-demographic factors and knowledge about the availability of services.[4] Using interventions to

discourage patients from attending EDs can be harmful. The Warwick report, 2010 included 1 study, analysing the effect of changing patient's behaviour. The included study was conducted in the US and the findings might not be applicable in the UK settings. Their pattern of attendances was more likely to be influenced by their insurance premier.

Patient education includes sign posting, leaflets, awareness campaigns and so on, as to what nature of conditions is appropriate for EDs. The role of patient education in reducing the burden on EDs is not proved except in the area of long term conditions management.(1)

6. Limitations

This review did not describe how the keyword searches were filtered and refined to the final studies.

Due to the time limit, literature searches were not reported comprehensively and they might have lacked some sensitivity. There might be some publications that would not have been identified in the literature searches, however, given the level of evidence included in this rapid literature review, we expect the findings to be applicable to the UK settings.

Most of the published studies have analysed the cause of overcrowding in EDs. There were only a few studies evaluating innovations to reduce overcrowding in EDs. There were no good quality economic evaluations available in the public domain interpreting cost effectiveness of primary care services in EDs.

Other issues not fully discussed in this review were the behaviours of the professionals in EDs, difficulties in coordinating primary and secondary care clinicians, and the effectiveness of "see and treat" in EDs. A few innovations have been adopted in the UK without assessing their safety. For example, the role of paramedics in discharging patients from the scene or deciding on their destination is not clear and the safety of primary gate keeping in UK is not clear. Further assessment is vital before spreading these at PCT level.

Walk-in Centres and other primary care services have been implemented in the NHS. But due to varied functionality and lack of coordination, it is not possible to compare the services. There is no evidence to support that they have been effective in reducing the burden on secondary care. Benchmarking of these services will be required to compare these services in the future. Further rigorous economic evaluation will be required to analyse the cost effectiveness of these services.

This rapid literature review did not discuss the list of conditions/diseases that could be identified as primary care diseases.

This rapid literature review did not cover the efficacy of different case finding tools that might be beneficial for identifying patients at high risk of using secondary care resources (such as emergency hospital admissions) and those tools might be more useful in targeting interventions effectively.

7. Need for further research

Further rigorous evaluation will be required to evaluate the effectiveness and cost effectiveness of joint working between EDs and primary care.

Further research and audit will be required to scope the role of out of hours services, urgent care services, telephone triage services and ambulance triage services etc. Additional research is required to analyse the use, efficacy, safety and cost effectiveness of these interventions.

Further research is required to scope the effectiveness and cost effectiveness of diverting some 999 calls to nurse advisors.

Further research will be essential to analyse if case management techniques can be effective in reducing the financial burden on secondary care.

8. Conclusions and Recommendations

The following conclusions can be made from the literature reviewed. Commissioners in the East of England should consider commissioning interventions showing good effectiveness in reducing ED attendances and treat patients with primary care type diseases in EDs.

a. PCT based pathways in EDs

- GPs in Emergency Departments for primary care conditions can be more effective compared to trainee doctors.[5] GPs working in EDs reduce the number of referrals for admissions and order fewer investigations. It can be effective but the level of evidence is weak.[4]

- Primary care gate keeping can reduce the number of patients in EDs but the level of safety is unknown.[4] Further research will be essential for analysing this intervention.

b. Intermediate primary care pathways

- Case management for patients with long term conditions can improve the quality of care[8], however, there are uncertainties if case management to patients with long term conditions can reduce use of secondary care resources. Further research is essential to analyse the impact of case management on secondary care resources.

- NHS Walk-in Centres are not supported by good evidence for reducing attendances at EDs[7] but they might be beneficial in improving quality of care.

c. Other pathways

- Telephone consultation and triage services can be effective in reducing emergency hospital admissions but further evaluation will be required to scope this intervention.[3]

- Diverting some 999 calls to nurse advisors can be effective and cost effective.[6] The four key factors identified for an effective transfer system were: good knowledge of local services and the development of local care referral pathways, appropriate training, strong leadership with staff fully engaged in new processes and good IT systems that facilitate good communication betweens services.[6] Further scoping of this intervention will be essential before its implementation.

- On the basis of current evidence, patient education is only beneficial for long term conditions.[1]

9. Appendices

a. Appendix 1: Search History

Search History:
1. AMED, BNI, EMBASE, HMIC, MEDLINE, PsycINFO, CINAHL, HEALTH BUSINESS ELITE; "urgent care centre".ti,ab; 16 results.

Search History: BNI searched 16 March 2010
1. BNI; "urgent care centre".ti,ab; 1 results.
2. BNI; "front door".ti,ab; 2 results.
3. BNI; shifting.ti,ab; 121 results.
4. BNI; exp "ACCIDENT AND EMERGENCY SERVICES"/; 1256 results.
5. BNI; 3 AND 4; 0 results.
6. BNI; "emergency medical services".ti,ab; 12 results.
7. BNI; (telephone AND triage).ti,ab; 115 results.

Search History: Medline searched 01 March 2010
1. MEDLINE; exp EMERGENCY MEDICAL SERVICES/; 71712 results.
2. MEDLINE; exp TRIAGE/; 5840 results.
3. MEDLINE; exp TELEPHONE/; 9277 results.
4. MEDLINE; exp HOTLINES/; 1762 results.
5. MEDLINE; 2 AND 3; 238 results.
6. MEDLINE; 4 OR 5; 1986 results.
7. MEDLINE; exp PHYSICIANS, FAMILY/; 13232 results.
8. MEDLINE; diversion.ti,ab; 9905 results.
9. MEDLINE; exp EMERGENCY SERVICE, HOSPITAL/; 35123 results.
10. MEDLINE; exp "DELIVERY OF HEALTH CARE"/; 612838 results.
11. MEDLINE; exp AFTER-HOURS CARE/; 564 results.
12. MEDLINE; 9 AND 10; 7257 results.
13. MEDLINE; 6 OR 7 OR 8 OR 11; 25599 results.
14. MEDLINE; 1 OR 9 OR 11; 72085 results.
15. MEDLINE; 10 AND 14; 12952 results.
16. MEDLINE; 6 OR 7 OR 8; 25108 results.
17. MEDLINE; 15 AND 16; 491 results.

Search History: Embase searched 04 March 2010
1. AMED, BNI, EMBASE, HMIC, MEDLINE, PsycINFO, CINAHL, HEALTH BUSINESS ELITE; "urgent care centre".ti,ab; 16 results.
2. EMBASE; exp EMERGENCY HEALTH SERVICE/; 14783 results.
3. EMBASE; exp EMERGENCY CARE/; 7799 results.
4. EMBASE; 2 OR 3; 21691 results.
5. EMBASE; diversion.ti,ab; 7803 results.
6. EMBASE; "telephone triage".ti,ab; 128 results.
7. EMBASE; ("nurse triage" OR "triage nurse").ti,ab; 125 results.
8. EMBASE; "front door".ti,ab; 54 results.
9. EMBASE; exp GENERAL PRACTITIONER/; 32642 results.
10. EMBASE; "shifting care".ti,ab; 17 results.
11. EMBASE; 5 OR 6 OR 7 OR 8 OR 9 OR 10; 40718 results.

12. EMBASE; 4 AND 11; 711 results.
13. EMBASE; "introduction of integrated".ti,ab; 31 results.
14. EMBASE; EMERGENCY TREATMENT/; 8933 results.
15. EMBASE; 12 AND 14; 22 results.
16. EMBASE; HEALTH CARE ACCESS/; 23975 results.
17. EMBASE; 12 AND 16; 76 results.

Search History: AMED searched 16 March 2010
1. AMED; "urgent care centre*".ti,ab; 0 results.
2. AMED; "urgent care centre*".ti,ab; 0 results.
3. AMED; "telephone triage".ti,ab; 1 results.
4. AMED; (accident AND emergency).ti,ab; 51 results.
5. AMED; exp EMERGENCY MEDICAL SERVICES/; 124 results.
6. AMED; "front door".ti,ab; 3 results.

b. Appendix 2: Figure 1: Data extraction from the included studies

S. no	Title of the study	Validity of the study
1	Cooke et al, 2004.	**Study title:** Reducing attendances and waits in emergency departments: a systematic review of present innovations. **Type of Study:** Systematic review. **No. of included studies:** 109 studies were included. **Geographical settings:** **Problem:** Increased attendances at emergency departments and increasing waits in emergency departments. **Interventions:** Out of hospital care, Primary care, Emergency department, Patient education, Diagnostics, Admission avoidance, Bed management, Delayed discharge, Staffing **Outcomes:** Waits/delays in the emergency department, attendance/re-attendance at the emergency department, length of inpatient stay following emergency admission, emergency department admission avoidance, and transfer of care following emergency admission. **Limitations:** The large literature in the area of overcrowding of emergency departments and delays and waits in the emergency care system is mainly anecdotal and tends to focus on assessing the extent of the situation or giving 'expert' opinion on causes and possible solutions.
3	Bunn et al, 2004.	**Study title:** Telephone consultation and triage: effects on health care use and patient satisfaction **Type of Study:** Cochrane systematic review **Geographical settings:** The majority of studies in this review, five out of nine were set in the UK General Practice **Study designs:** Nine studies met our inclusion criteria, five RCTs, one CCT and three ITSs. **Problem:** Effects of telephone consultation on safety, service usage and patient satisfaction and to compare telephone consultation by different health care professionals **Interventions:** Telephone consultations

		Outcomes: Visits to A&E departments and GPs' surgeries, home visits by GPs/deputising services within normal hours, out-of-hours contacts, number of calls handled by telephone advice alone (e.g. no referral to other health care professional/face to face contact), unplanned hospital admissions, mortality rates, adverse events, patient and carer satisfaction, patient quality of life, health care professionals attitudes/satisfaction, cost to health care system and cost to patient **Limitations:** No studies met all the methodological criteria on the EPOC checklist which may adversely affect the validity of the results. There was limited data on a number of important outcomes.
4	Fisher et al, 2010 Warwick Report.	**Study title:** A rapid review exploring the interface between primary care and emergency care in England. **Type of study:** A rapid literature review **Study designs:** The studies included 3 RCTs, 15 before and after studies, 4 controlled before and after studies, 2 quasi-randomised studies and 1 audit. **Geographical settings:** 5 studies were conducted in the UK. **Problem:** Manage patients attending the emergency department with primary care-type illnesses and injuries. **Interventions:** Interventions for managing patients with primary care type conditions, however defined, either within or in close proximity to the emergency department **Outcomes:** Attendance at primary care, attendance and or re-attendance at emergency departments with primary care type conditions, adverse events, patient satisfaction, investigations requested, referrals requested and prescriptions issued.
5	Carson et al, 2010	**Study title:** Primary care and emergency departments, Primary Care Foundation. (This report was based on the findings of the fisher et al, 2010 review) **Critical Commentary:** There were only few cost analyses available to the group. Most of those analyses compared the full reference tariff cost with the marginal cost of the PCT running the primary care service. Therefore it was not possible to compare them.
6	Turner et al, 2006. SDO, 2007.	**Study title:** The costs and benefits of managing some low priority 999 ambulance calls by NHS Direct nurse advisers.

		Geographical settings: UK **Study designs:** 1 RCT and 1 observational study **Problem:** Rising demand on emergency services **Interventions:** Refer non-urgent 999 calls to nurse advisors. **Outcomes:** Clinical efficacy and cost-effectiveness.
7	Salisbury et al, 2007.	**Study title:** The impact of co-located walk-in centres on emergency departments. **Geographical settings:** UK **Study designs:** Controlled before and after study **Problem:** Increase burden on the secondary care. **Interventions:** NHS walk-in centres **Outcomes:** Attendance rates, visit duration, process, costs and outcome of care **Limitations:** This study was conducted after the centres had been open for only a few months, and the organisational model and patients' use of the new facilities may change once the facility is well established. Most of the data were collected from routine records, which may be of uncertain quality. The low survey response rate limits the generalisability of the findings on patients' experience reported here.[7]
8	Tsai et al, 2005	**Study title:** A meta-analysis of interventions to improve care for chronic illnesses. **Type of study:** Meta-analysis **Study designs:** Randomised controlled trials (RCTs) and non-randomised controlled trials were eligible for inclusion. **Problem:** Patients with long term conditions. (Asthma, Diabetes, Depression, Chronic Heart Failure)

		Interventions: Studies that assessed interventions comprising of at least one or more elements of CCM were eligible for inclusion **Outcomes:** Details of the outcomes of interest (clinical, quality of life and process of care) selected for each of the four chronic diseases were reported.
9	Leibowitza et al, 2003.	**Study title:** A systematic review of the effect of different models of after-hours primary medical care services on clinical outcome, medical workload, and patient and GP satisfaction. **Type of study:** Systematic review **Geographical settings:** Studies included in this review were from the UK, Australia, Denmark, Ireland, Canada and the USA **Problem:** Increasing demand on heath care, economic considerations and changes in doctors' attitudes. **Interventions:** Different models of after-hours primary medical care services. **Outcomes:** Clinical outcome, medical workload, and patient and GP satisfaction
11	Ministry of Health, New Zealand 2009.	**Study title:** Solutions to emergency department (ED) overcrowding: A literature review, 2009. **Geographical settings:** The review was written in New Zealand. The systematic review included in this review was conducted in the UK. **Study designs:** Literature review **Problem:** Emergency department crowding **Interventions:** Potential solutions. **Outcomes:** Improve quality and reduce overcrowding **Limitations:** The methodology reported in the review was not sufficient. The review analysed that many of the possible interventions have not been researched.

14	National Primary Care Research and Development Centre and Centre for Public Policy and Management of the University of Manchester, 2007	**Study title:** Outpatient Services and Primary Care: A scoping review of research into strategies for improving outpatient effectiveness and efficiency. **Study designs:** A scoping literature review **Problem:** Can primary care reform reduce demand on hospital outpatient departments? **Interventions:** Transfer of outpatient services to primary care Relocating specialists into community settings Liaison between primary care and specialists Professional behaviour change **Outcomes:** • Patient outcomes — Satisfaction, quality of life, acceptability, preferences — Health status • Service outcomes — Quality of care — Impact on hospitals: waiting time, outpatient attendance, acceptability to clinician — Impact on primary care: waiting time, workload, acceptability to clinician • Costs — NHS costs, patient costs, full economic costing. **Limitations:** The review was not intended to be a comprehensive systematic review, and is thus likely to have missed publications of relevance. Inclusion decisions, data extraction and data synthesis were conducted by only one reviewer for each model or sub-type of care. This was necessary to ensure completion of the review within the available time and resources but is likely to have produced some inconsistencies and inaccuracies.

c. Appendix 3: Figure 2: PCT based pathways in EDs

Intervention	Settings	No of evaluated studies	Effectiveness	Adoption	Costs	Reference
Managing patients in ED	4 out of 10 included studies were conducted in UK.	UK: 2 quasi-randomised trial + 2 observational studies. International studies: 1 RCT* + 5 BAS***	GP working in ED for primary care condition can be more effective than trainee doctors.	This model can be easily adopted.	Insufficient evidence	Warwick report, 2010[4]
Redirecting patients from ED.	1 out of 20 included studies were conducted in UK.	UK: 1 observational study. International studies: 2 RCTs* + 2 observational studies + 4 CBA** + 10 BAS*** + 1 audit.	Insufficient evidence (The results reported in the studies were variable). Safety is unknown.	Further research will be essential before the adoption of this model.	unknown	Warwick report, 2010[4]
Redirecting patients from ED.	-	-	Can reduce emergency department visits but its safety is unknown.	Further research will be essential before the adoption of this model.	unknown	SDO, 2004[1]

*RCT = Randomised controlled trial
** CBA = Controlled before-after study
*** BAS = Before-after study

d: Appendix 4: Figure 3: Intermediate primary care pathways

Intervention	Settings	No of studies evaluated	Effectiveness	Costs	Adoption	Reference
Case Management	-	-	Can be effective for long term conditions.	Unknown	The infrastructure will be required to target the patients with the long term conditions.	SDO, 2004[1]
NHS Walk-in Centres and Out of Hours Services.	3 out of 4 studies were conducted in UK	UK: 3 observational studies. International study: 1 time-trend study	They have not demonstrated to reduce attendances at EDs.	Unknown	They have the potential to divert patients form ED but this has not been demonstrated in the studies yet.	SDO, 2004[1]
NHS Walk-in Centres and Out of Hours Services.	UK	Controlled before and after study	There was no evidence of any effect on the attendance rates, process or outcome of care.	Unknown	It requires the major cultural shift in attitude on the part of service providers.	Salisbury et al, 2007 [7]

e: Appendix 5: Figure 4: Other pathways

Intervention	Settings	No of studies evaluated	Effectiveness	Adoption	Costs	Reference
Telephone Triage and advise services	9 studies (5 from UK)	5 RCTs + 3 interrupted time series + 1 controlled before/after study	Can reduce the number of surgery contacts and out of hour services.	There may be an increase in the repeat visits.	Insufficient evidence.	Cochrane review, 2004[3]
Diverting some 999 calls to advise lines.	UK	-	It is an acceptable approach to managing demand on the high cost services (999 ambulance services and treatment at EDs)	Further evaluation will be required before rolling out the intervention.	Can be cost effective.	SDO, 2007[6]
Patient education	1 International study	1 observational study	It has not shown to change the attendance patterns.	-	Insufficient evidence.	Warwick report, 2010[4]
Patient education	2 US studies and 1 Ireland study.	1 RCT* + 1 non-randomised study + 1 cohort study.	Patient education is unproven in most areas except chronic disease management.	-	Can be cost effective for patients with long term conditions, however the evidence is weak.	SDO, 2004[1]

*RCT = Randomised controlled trial

10. Additional Information

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This rapid literature review has been peer reviewed by the EAC Critical Appraisal Network, **with expert input from Dr. Raj Nagaraj on behalf of Hertfordshire Primary Care Trust.**

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