

Final protocol

PROJECT TITLE:

The effectiveness of interventions to reduce acute paediatric hospital admissions

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1.1 Decision Problem

Approximately 35% of all admissions in the NHS in the UK are emergency admissions costing approximately £11 billion pounds. Acute hospital admissions for all age groups have been rising steadily since the early 1990's. The HES dataset estimates that in the five-year period from 2004/5 to 2008/9 there was an 11.8% rise in emergency admissions in England equivalent to an additional 1.3 million admissions. Children and young adults below the age of 19 years contributed to approximately 25% of this increase with the biggest changes (within this age group) seen in those below the age of four.^{ref} Several hypotheses have been presented to account for the rise in emergency admissions including the aging population in England, increased public expectation, more treatable illness, more conservative decision making as a result of an increasingly litigious climate, central targets and payments by results, changes in other linked services e.g. GP out of hours services and an over-reliance by the public on Accident and Emergency as a way of seeking urgent care. A report published in July 2010 by the Nuffield Trust analysed and explored the trends and patterns in admission data over the past five years and were unable to find one overwhelming reason for the increase in emergency admissions. However, the report highlights an associated rise in short stay admissions (zero bed days) and a reduction in the number of admissions leading to the death of a patient. Together this data may suggest that less severe cases are being admitted to hospital and the authors suggest that the clinical threshold for acute admissions may have been lowered. Acute admissions are undesirable, distressing and expensive and many hospitals are seeking mechanisms whereby acute admissions can be reduced whilst avoiding significant increases in mortality and morbidity.

Hospital is not an ideal setting for any child, for many reasons, including disruption to family life, absence from school and home activities, reduced play and developmental opportunities, increased emotional distress and exposure to infections. Therefore it is imperative that any child is only admitted to hospital if it is essential for medical or surgical care.

There are also significant cost implications for hospital admission and the Government has several initiatives to reduce hospital admissions for financial reasons. It is important that healthcare professionals are advocates for their patients and work to balance these different motivations. Thus we should seek to reduce paediatric hospital admission without compromising safe medical practice for all patients.

1.1.1 Purpose

The purpose of this systematic review is to help to clarify the effectiveness of interventions used to reduce acute paediatric hospital admissions.

1.1.2 The interventions

- a) Paediatric consultant decision on admission
- b) Telephone triage by paediatric consultant
- c) Short stay in hospital beyond the four-hour wait in e.g. short-stay units, observation units, ambulatory units, assessment units. These units are not necessarily led by senior clinicians
- d) Algorithm based management or clinical guideline driven care
- e) Next day emergency paediatric clinics which may also be known as fast track clinics or rapid access clinics. These are consultant-led clinics designed to cater for patients with an acute medical need that does not require immediate hospital admission but that cannot wait for a routine clinic appointment in e.g. four to six weeks' time

1.1.3 Population

Children (0-19 years) referred by either a general practitioner or the Accident and Emergency Department for an urgent specialist paediatric opinion.

1.1.4 Comparators

Usual care.

1.1.5 Outcomes to be examined

If possible outcome measures will include:

- Number of children admitted to hospital for an inpatient (overnight) stay
- Number of children discharged from hospital without an inpatient (overnight) stay
- Number of children discharged from hospital without an inpatient (overnight) stay with no increase in morbidity, mortality or adverse events
- Number of children who having been discharged, returned to the hospital for an unscheduled visit or were readmitted with the same problem.
- Cost
- Patient/carer experience
- Experience of the staff involved in implementing the intervention/comparator

1.2 Methods of synthesis of evidence of clinical effectiveness

We will conduct a systematic review of the evidence for the effectiveness of interventions to reduce unnecessary paediatric admissions. The review will be undertaken following the general principles published by the NHS Centre for Reviews and Dissemination.

1.2.1 Search strategy

Refer to Appendix 1 for the draft search strategy for MEDLINE.

The search strategy will comprise the following main elements:

- Searching of electronic databases, including MEDLINE, Pre-Medline, and EMBASE
- Scrutiny of bibliographies of included studies
- Contact with experts in the field
- Current research will be identified through searching the Current Controlled Trials Register and the MRC Clinical Trials Register
- Hand searching of highly relevant journals

1.2.2 Study selection criteria and procedures

1.2.2.1 Types of study to be included

Randomised clinical trials and other controlled trial data will be included. These study design criteria may be relaxed to include other comparative study designs depending on the availability of more methodologically robust evidence.

Studies will only be included if they describe the effects of interventions to reduce unnecessary paediatric hospital admissions and report data on one or more of the required outcome measures.

Criteria	Specification	Notes
Population	All children aged between 0 and 19 years referred by either a general practitioner or via the Accident and Emergency Department for an urgent paediatric opinion	
Interventions	<ol style="list-style-type: none"> 1. Paediatric consultant decision on admission 2. Telephone triage by paediatric consultant 3. Short stay in hospital beyond the four hour wait 4. Algorithm based management 5. Next day emergency paediatric clinics 	<p>Studies that describe an intervention of nurse or GP led triage will be excluded but short-stay units led by non-senior staff will be considered.</p> <p>Studies in which the description of the intervention is not sufficiently detailed to enable replication will be excluded.</p>
Outcomes	<ol style="list-style-type: none"> 1. No. of children admitted to hospital for an inpatient stay 2. No. of children discharged from hospital without an inpatient stay 3. No. of children discharged from hospital without an inpatient stay without an increase in mortality, morbidity or adverse events 4. No. of children who having been discharged returned to the hospital for an unscheduled visit or readmission 5. Cost 6. Patient / carer experience 	<p>An inpatient stay is defined as being 'overnight'</p> <p>Should we include a time within which readmission may occur to be of interest – 48 hours / 72 hours / do we mind?</p> <p>Are we happy to include papers that only report outcomes 6 and/or 7 or are we only interested in these if they come with outcomes 1-4 (or 5).</p>

	7. Experience of the staff involved in implementing the intervention/comparator	
Setting	All hospitals with acute medical facilities	The setting will not be limited to countries in which the health care setting is similar to the UK since all/most Western nations have a 'free' acute medicine service for children
Study design	Any comparative study design	
Date	No date restrictions	

1.2.2.2 Types of study to be excluded

- Animal models
- Pre-clinical and biological studies
- Narrative reviews, editorials, opinions, letters
- Reports published as meeting abstracts only, where insufficient methodological details are reported to allow critical appraisal of study quality
- Studies which describe interventions utilising nurse or general practitioner led triage
- Studies in which the description of the intervention is not considered sufficiently detailed to enable replication

1.2.2.3 Study selection

The abstracts and titles of references retrieved by the electronic searches will be screened for relevance by one reviewer and independently checked by a second using the pre-specified inclusion/exclusion criteria. Full paper copies of potentially relevant studies will be obtained. Using the same methods, the retrieved articles will be assessed for inclusion. Discrepancies will be resolved by discussion, with involvement of a third reviewer, where necessary. All duplicate papers will be double checked and excluded.

1.3 Quality assessment strategy

The quality of individual studies will be assessed by one reviewer, and checked by a second. Any disagreement will be resolved by consensus and if necessary a third reviewer will arbitrate.

Appropriate quality assessment criteria will be used depending on the design of the included studies using the general principles published by the NHS Centre for Reviews and Dissemination and the Cochrane Collaboration.

1.4 Data extraction strategy

Data will be extracted from included studies by one reviewer into a piloted, standardised data extraction forms and checked by another reviewer. Discrepancies will be resolved by discussion, with the involvement of a third reviewer if necessary.

1.5 Data synthesis

Data will be tabulated and discussed in a narrative review. Where appropriate, meta-analysis will be employed to estimate summary measures of effect on relevant outcomes, based on intention to treat analyses.

If meta-analysis is conducted it will be carried out using fixed and random effects models, using bespoke software and STATA. Heterogeneity will be explored through consideration of the study populations, methods and interventions, by visualisation of results and, in statistical terms, by the χ^2 test for homogeneity and I^2 statistic and, where appropriate, using meta-regression. Small-study effects (including publication bias) will be visually assessed using funnel plots and quantified using Egger's statistic.

Appendix 1 : Database: Ovid MEDLINE(R) <1950 to August Week 2 2010>

- 1 (Consultant* adj10 emergency).ti,ab. (201)
- 2 Emergency Service, Hospital/ma [Manpower] (1225)
- 3 Emergency Service, Hospital/og [Organization & Administration] (5283)
- 4 Medical Staff, Hospital/ec, sd [Economics, Supply & Distribution] (1411)
- 5 Triage/mt [Methods] (1257)
- 6 (Consultant* and telephone referral*).ti,ab. (1)
- 7 assessment unit*.ti,ab. (325)
- 8 (ambulatory adj2 (unit* or assessment)).ti,ab. (484)
- 9 (short-stay adj2 (ward* or observation or unit*)).ti,ab. (224)
- 10 (rapid access adj2 (clinic* or unit*)).ti,ab. (55)
- 11 day unit*.ti,ab. (164)
- 12 (fast track adj2 (ward* or observation or unit* or clinic*)).ti,ab. (34)
- 13 (acute adj2 (observation or unit* or clinic)).ti,ab. (1617)
- 14 (emergency adj1 (ward* or observation or unit* or clinic*)).ti,ab. (2378)
- 15 (guideline* adj (implement* or develop* or approach or assess*)).ti,ab. (2002)
- 16 Emergency Medicine/st [Standards] (1007)
- 17 (triage adj (scale* or tool* or system*)).ti,ab. (550)
- 18 (Checklist adj2 (implement* or develop* or approach or assess*)).ti,ab. (551)
- 19 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 (17769)
- 20 child/ (1181671)
- 21 infant/ (556389)
- 22 adolescence/ (1366950)
- 23 exp infant, newborn/ (440039)
- 24 exp child, preschool/ (653999)
- 25 20 or 21 or 22 or 23 or 24 (2467521)
- 26 (child* or paediat* or pediat* or adolesc*).ti,ab. (920299)
- 27 25 or 26 (2613336)
- 28 19 and 27 (3392)
- 29 (accident adj emergency).ti,ab. (196)
- 30 "A&E".ti,ab. (8436)
- 31 emergency room.ti,ab. (8441)
- 32 emergency department.ti,ab. (26798)
- 33 exp Emergency Service, Hospital/ (36832)
- 34 exp Hospitals/ (171621)
- 35 hospital.ti,ab. (478106)
- 36 (doctor adj5 referr*).ti,ab. (357)
- 37 (emergency adj2 admission*).ti,ab. (1862)
- 38 emergency care.ti,ab. (3808)
- 39 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 (621561)
- 40 28 and 39 (2108)