Interventions to reduce acute paediatric hospital admissions: a systematic review

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CRD summary
The authors concluded that there was little published evidence on the most appropriate method for reducing acute paediatric hospital admissions, and this evidence was of low quality and open to substantial bias. This was a well-conducted systematic review and the authors' cautious conclusions are likely to be reliable.

Authors' objectives
To evaluate the effectiveness of interventions that aim to reduce acute admissions to hospital for children.

Searching
MEDLINE, EMBASE, PsycINFO, The Cochrane Library, Science Citation Index Expanded and DARE were searched, for studies in any language, from inception to September 2010; search terms were reported. Reference lists of articles were handsearched, and experts in paediatric hospital admissions were consulted, to identify further relevant literature. The search was updated in August 2011.

Study selection
Controlled trials of initiatives designed to reduce acute admissions of paediatric patients (aged zero to 19 years) were eligible for inclusion. The initiatives of interest were paediatric consultant compared with junior doctor decisions on admission; telephone triage by paediatric consultant; a short stay in hospital, after the four-hour wait, in short-stay units, observation units, ambulatory care units or assessment units; algorithm-based management of the admission decision or clinical guideline driven care at admission; and next day emergency paediatric clinics, fast-track clinics or rapid-access clinics. The outcomes of interest were admission and readmission rates, patient or carer experience, and the costs of the initiatives. Conference proceedings were included if there was sufficient data to assess the risk of bias.

The included studies evaluated the introduction of a short-stay facility on admission rates, or guideline-based admission policies for various conditions (diarrhoea, seizures, gastroenteritis, and asthma). Three studies were conducted in the UK and one was conducted in each of the USA, Spain, France, and Canada. Data were collected between 1991 and 2005. Comparator groups received the normal practice before the guideline implementation, or accident and emergency, paediatric emergency unit, or hospital care, without a short stay unit.

Two reviewers independently selected studies for inclusion, and any discrepancies were resolved through discussion with a third reviewer.

Assessment of study quality
Quality was assessed using criteria derived from two published checklists. Overall, 29 criteria were assessed and reported for each study. One reviewer assessed quality and a second reviewer checked the assessment, with consensus achieved through discussion.

Data extraction
The data on the number of attendances, overnight stays, and re-attendances within 72 hours, and the mean length of stay in days, were extracted. Authors were contacted for any missing data.

One reviewer extracted these data, and a second reviewer checked them.

Methods of synthesis
The study results were presented in a narrative synthesis and in tables. The authors stated that due to heterogeneity in the study designs, quality, populations and outcome measures, no statistical synthesis was performed.

Results of the review
Seven studies were included in the review, with 24,633 attendances, children, staff or visits in total. Sample sizes ranged from 60 to 8,287. Four studies were historically controlled; one was an interrupted time series; one was a survey; and
one was a prospective cohort study. All the included studies were open to significant bias.

Four studies evaluated the introduction of a short-stay facility. One reported a statistically significant lower admission rate in a hospital with a short-stay unit (42%) than in general hospitals (77%; RR 0.55, 95% CI 0.49 to 0.62). Two studies reported the admission rates before versus after the introduction of a short-stay unit; one reported a statistically significant reduction in admission rates in children with asthma (31% before to 24% after; RR 0.91, 95% CI 0.88 to 0.94). The other study reported a fall in rates, but did not present statistical analyses. The fourth study assessed the impact of new paediatric ambulatory care unit in the UK on parental and staff perceptions, and reported that it was preferred to traditional accident and emergency services.

Three studies evaluated algorithms and guidelines to manage the admission decisions, comparing before versus after their implementation. No statistically significant differences in admission rates between the periods were found in any of these studies.

**Authors’ conclusions**
There was little published evidence on the most appropriate method for reducing paediatric admissions, and this evidence was of low quality and open to substantial bias.

**CRD commentary**
The review question and inclusion criteria were clear. The authors searched a number of databases for studies in any language, and appear to have sought unpublished studies by contacting experts, reducing the potential for language and publication bias. Steps were taken to minimise reviewer error and bias. A comprehensive evaluation of study quality was made and the results were presented in tables and in the discussion; the study designs were limited and open to bias. The results were appropriately summarised in a narrative synthesis and the authors appropriately acknowledged the limitations of the studies, including a lack of criteria to define admission and discharge.

This was a well-conducted systematic review and the authors’ cautious conclusions are likely to be reliable.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that there was a need for institutions with new short-stay units to publish clear data on their effects on costs and benefits. They also stated that there was a need for high-quality, well-conducted research, with more appropriate outcome measures, to enable decisions on service change.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.