What is evidence of the effectiveness and safety of emergency department short stay units?

Evidence Summary No. 11

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What is the evidence of the effectiveness and safety of emergency department short stay units?

This report summarizes evidence of the effectiveness and safety of short stay units (SSU) in the emergency department (ED). Its intention is to support knowledge needs of stakeholders considering the implementation of SSUs in The Ottawa Hospital.

Key Messages

- Evidence from a moderately robust systematic review indicates SSUs may lead to improved clinical outcomes and efficiency in healthcare delivery. Yet, this systematic review is nearly a decade old. A rigorous and updated systematic review on this issue is strongly recommended.

- Most comparative evaluations of SSUs to date have involved before-and-after designs; consequently caution must be used in interpreting positive findings which may have also resulted from non-SSU improvement over time (e.g. changes in practice behaviors, increased hospital beds).

- There is a dearth of quality RCTs in both the literature assessing SSUs specifically, and ED overcrowding more globally. Evidence from the few RCTs reviewed are limited in generalizability due to the disease specific focus of the observation units evaluated (e.g. cardiac, asthma).

- There is limited evidence from one systematic review indicating that SSUs may lead to improved patient satisfaction in specific clinical contexts

Who is this summary for?

This summary was undertaken for The Ottawa Hospital and is intended for use by local health systems stakeholders, policy-makers and decision-makers within The Ottawa Hospital.

Information about this evidence summary

This report covers a broad collection of literature and evidence sources **with a search emphasis on systematic reviews.**

As such, evidence summarized from systematic reviews is highlighted in blue boxes, like this one. Systematic reviews are generally favoured over other study designs, because they incorporate evidence from multiple primary studies, instead of reporting evidence from just one study.

☑ This summary includes:

- **Key findings** from a broad collection of recent literature and evidence sources.

☒ This summary does not include:

- **Recommendations**;
- **Additional information** not presented in the literature;
- **Detailed descriptions of the interventions** presented in the studies.

Many sections conclude with a **"Bottom line"** subsection that provides a statement summarizing the studies or aims to provide some context. These statements are not meant to address all of the evidence in existence on the subject, rather, only that which is featured in this document.

All papers summarized in this document are available by request to kkonnyu@ohri.ca.

I. Background

Emergency department (ED) overcrowding has been defined as "a situation where the demand for emergency services exceeds the ability to provide care in a reasonable amount of time" (Bond et al., 2006). ED overcrowding is a serious and ongoing issue across Canada; according to a 2006 survey of Canadian ED directors, 62% of respondents reported overcrowding to be a major or severe problem in 2004 and 2005 (Bond et al. 2006).

Contents

Short stay units (SSUs) have emerged as a potentially useful strategy for managing overcrowding in emergency departments. The theoretical benefit of SSUs is to 'offload' stable patients from the acute ED and to reduce the amount of unnecessary hospital admissions. Typically, the focus of these units are on 1) expected short treatments such as blood transfusions, 2) further diagnostic investigations to finalize a medical diagnosis, and 3) safe discharge into the community such as social work involvement. To prevent such units from being a 'dumping grounds', most SSUs have strict inclusion/admission criteria. Part of the difficulty is evaluating the value of SSUs is terminology – many other terms have been used to describe such units (e.g. Observation Units, Assessment Units, Clinical Decision Units). Typically though, SSUs are some type of extension of the ED with an overarching objective for improving "the quality of medical care through extended observation and treatment, while reducing inappropriate admissions and healthcare costs" (Daly et al. 2003).

The objective for this review was to conduct a rapid summary of the evidence related to the effectiveness and safety of ED SSUs. Its aim is to inform initiatives within The Ottawa Hospital and greater Champlain LHIN region attempting to address ED overcrowding. To frame the literature, we used the definition of SSUs as operationalized by our Ottawa Hospital stakeholder; specifically seeking and summarizing evidence that related to "an area of the hospital reserved for patients admitted directly from the ED who require a period of observation to resolve diagnostic uncertainty before being sent home or who are expected to recover within 48 hours or who require complex outpatient support arranged".

II. Evidence

a. Evidence on SSUs specifically

6/11 A 2003 systematic review by Daly and colleagues in Australia assessed the evidence of short stay observation units with respect to efficiency of healthcare delivery and quality of services provided (Daly et al. 2003). Specifically, data from included studies was extracted according to the following domains: clinical outcomes, length of stay, re-presentation rates, ED efficiency and costs of care. Notwithstanding the fact that the reviews' search date is now over 10 years old, this is the best available synthesis of SSUs included in this evidence summary. Twelve studies (1 Canadian) comparing observation units with routine care were included; between-study heterogeneity prevented quantitative meta-analyses and findings could only be presented narratively. Table 1 from this report, summarizing the study characteristics and main conclusions is included below. Based on the evidence, the authors concluded that "[SSUs] have the potential to increase patient satisfaction, reduce length of stay, improve the efficiency of EDs and improve cost effectiveness. However, [SSUs] have commonly been implemented alongside new clinical protocols, and it is not possible to distinguish the relative benefits of each. As demand increases, providing effective and cost-efficient care will become increasingly important. [SSUs] may help organizations that are attempting to streamline patient care while maintaining their quality of service delivery"

Bottom line:
Evidence from one systematic review assessing evidence up to 2000 and including 1 Canadian study suggested SSUs may offer an effective and safe ED patient management option. Specifically, findings from the 12 studies reviewed suggested that SSUs may potentially lead to potential improvements in patient satisfaction, length of stay, ED efficiency, and cost effectiveness. Caution should be used in interpreting these findings however due to the methodological limitations of the included studies and the need for an updated search of the systematic review.

Table 1. Comparative studies of SSUs

Study	Location	No. of patients and design	Evidence level	Authors' conclusions
Farkouh et al, 1998[4]	Minnesota, US	424	I	An emergency department chest pain OU can be a safe, effective, and cost-saving alternative for patients at intermediate risk of cardiovascular events.
Rydman et al, 1998[5]	Illinois, US	113	I	The emergency department OU was a lower cost and equally effective treatment alternative for refractory asthma.
Gouin et al, 1997[6]	Canada	4227; before v after opening OU	II-1	An emergency department OU was associated with a significant reduction in admission of children with asthma; however, there was also a significant increase in the number of patients returning to the emergency department within 72 hours.
McDermott et al, 1997[7]	US	222	I	Treatment of selected patients with asthma in an emergency diagnosis and treatment unit results in the safe discharge of most such patients. Improved quality and cost-effectiveness can be achieved by the use of such units.
Gomez et al, 1996[8]	Utah, US	100	I	The protocol ruled out myocardial infarction and unstable angina more quickly and cost-effectively than routine hospital care.
Bazarian et al, 1996[9]	New York, US	1424; before v after opening OU	II-1	Reducing the number of admitted patients waiting in the emergency department for inpatient beds, in this case by establishing a short-stay unit, is associated with a decrease in the time that patients who are treated and released spend in the emergency department.
Hadden et al, 1996[10]	Belfast, UK	214; before v after OU closure	II-1	The accident and emergency observation ward was more efficient than the general acute wards at dealing with short-stay patients.
Gaspoz et al, 1994[11]	Massachusetts, US	Treatment, 529; control, 924	II-1	The coronary OU may be a safe and cost-saving alternative to current management for low-risk patients who require investigation to exclude acute myocardial infarction admitted from the emergency department. Replication in other hospitals is required.
Brillman and Tandberg 1994[12]	New Mexico, US	1224; before v after opening OU	II-1	Use of OU for patients with asthma reduces initial discharge rate without appreciably reducing eventual hospital admissions.
MacLaren et al, 1993[13]	London, UK	405; OU open v OU closed	II-1	Fewer patients with head injuries were discharged from the accident and emergency department when the short-stay ward was available.
Saunders and Gentile 1988[14]	Denver, US	54; OU v matched controls	II-2	Length of stay did not differ between patients with alcoholic pancreatitis in the OU and those admitted directly to hospital
Willert et al, 1985[15]	Chicago, US	103	I	Children with asthma treated in the OU had lower costs, shorter length of stay and no increase in morbidity or returns to the hospital.

(from Daly et al. 2003; highlighting added; references listed in 'References of interest')

b. Evidence on solutions for overcrowding (SSUs one of multiple solutions)

9/11 A 2006 systematic review by the Canadian Agency for Drugs and Technologies in Health (CADTH) assessed the evidence on interventions to reduce overcrowding in the ED (Bond et al. 2006). SSUs were captured in two before-and-after studies and were associated with positive outcomes; one study reported a decrease in ED length of stay for treat-and-release patients, while the other reported a decrease of patients who left before being seen and the number of ED diversions (listed in 'References of interest). Based on this evidence, the review authors categorize SSUs as one of the several interventions for which "limited evidence suggests that these efforts to address overcrowding at an institutional level should be encouraged and monitored; they have a high chance of success" (see Table 2 for overview of interventions assessed). Of note, although the review attempted to assess the relative effectiveness of interventions aimed at improving ED overcrowding, the lack of direct comparisons, and the general trend for positive outcomes restricted this aim. Consequently the reviewers could only conclude that "many interventions of varying complexity, intensity, and duration have been applied in an attempt to alleviate or control ED overcrowding. While most seemed to reduce overcrowding, it is difficult to determine the relative value of these interventions, and the lack of comparison studies makes it impossible to say which ones work best". As helpful direction for moving this evidence forward, they provide valuable recommendations for future studies including the need for comparable and representative comparison groups, blinded or unbiased outcome assessments, concurrent controls, comprehensive outcome assessment, and prospective design.

Table 2. Evidence-based interventions for ED overcrowding and clinical practice

Intervention	Systematic Review	ED Survey	Evidence
Fast track	✓	✓	++
Triage	✓	✓	inconclusive
Diversion strategies	✓	✓	+
Short stay units	✓	✓	+
Staffing changes	✓	✓	+
Physician order entry	✓	×	inconclusive
Specific processes: electronic tracking board, re-engineering of ED radiology services, admission system based on telephone consultation between ED physicians and in-house hospital staff, point-of-care testing, dedicated stat laboratory, implementing a satellite laboratory and research nurse in the ED for point-of-care testing, alternative care destination program, bedside registration	✓	×	+
Multi-faceted interventions: increased emergency physician coverage; designation of physician coordinators; new hospital policies regarding laboratory, consultation, and admission procedures	✓	✓	+
Interventions used by ED directors for which there is no evidence: float nurse pool, senior ED MD flow shift, home care and community care workers assigned on site to ED, over-census on wards ("hallway" patients), establishment of orphan clinics, "coloured" codes to decongest ED, emergency in-patient (EIP) units	×	✓	N/A

✓=reported in scientific literature; ×=not reported in scientific literature; ++=scientific evidence from RCTs supporting intervention; +=scientific evidence from non-randomized studies supporting intervention; N/A=not available.

(from Bond et al. 2006)

2/11 A 2008 systematic review by Hoot and Aronsky in the United States assessed the evidence pertaining to the causes, effects, and solutions of ED overcrowding (Hoot and Arongsky 2008); 4 studies assessing observation units (grouped under 'solutions') were included'. Study findings were summarized narratively and were generally positive with respect to process outcomes (e.g., decreased length of stay, rate of ambulance diversion, and number of patients leaving without being seen). Of note, while systematic methods were employed, the literature search was not comprehensive (i.e., only searched a single database, excluded non-English titles and grey literature) and extracted quality assessments were not used to frame study results. Based on the complexity of the included studies, the reviewers "refrain from making strong conclusions…based primary on judgment rather than numeric inference" and consider the review to be of value more as a "structured overview of the relevant literature" to "guide interested readers to the original articles". References of included observation unit studies are listed in "References of interest".

Bottom line:
Evidence from two systematic reviews published in 2006 and 2008, respectively, assessed interventions aimed at reducing ED overcrowding. Several studies assessing SSUs were included and resulted in generally positive process outcomes. While the 2008 review by Hoot and Aronsky abstained from making conclusions based on the complexity of included studies, Bond and colleagues of the 2006 CADTH report conclude that there is sufficient (albeit limited) evidence to warrant implementation and further investigation of SSUs across intuitions in Canada.

c. Other evidence

5/11 A 2006 systematic review by Boudreaux et al. in the United States assessed the evidence on performance improvement methods for increasing ED patient satisfaction. Observation units were captured as one of several interventions with "one supportive study (and no negative studies) demonstrating improvement in at least one indicator of satisfaction". Of note, only observation units for specific conditions (e.g. asthma and chest pain) were captured in this review. References of included observation unit studies are listed in "References of interest".

Bottom line:
There is limited evidence from one systematic review indicating that SSUs may lead to improved patient satisfaction in specific clinical contexts.

III. Upcoming event

Readers of this reported may be interested in attending the upcoming Western Emergency Department Overcrowding Conference to be held at the Sutton Place Hotel, in Edmonton, Alberta May 6 and 7th, 2011. On day 2 of this conference, there will be a presentation specific to 'output solutions' in which

'medical admission units' is the first topic scheduled to be discussed (May 6th; 15:00-16:30). Registration information can be found at: http://uofa-hospital.gobigevent.com

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Methods

Detailed search strategies were developed by an experienced Information Specialist (specific search terms available upon request). Searching was limited to the following databases:

- Biomed Central;
- Cochrane Database of Systematic Reviews (CDSR);
- Database of Abstracts of Reviews of Effects (DARE)
- National Health Service Economic Evaluation Databases (NHS EED)

Search concepts included Medical Subject Headings (MeSH) and non-thesaurus terms (i.e. text words). A 'grey literature' search was also conducted for potentially relevant studies by reviewing the web sites of relevant organizations and professional bodies (available upon request). Screening was conducted by two reviewers; quality assessment and extraction was done by one reviewer.

Based on the complexity, heterogeneity, and magnitude of the records, we chose to only include synthesized studies published during or after 2000. In addition, included citations had to have been published in English and be available in full text electronically. Of note, relevant primary studies however were screened and categorized, and are available upon request.

Risk of Bias Assessment of Systematic Reviews

AMSTAR is an 11-item measurement tool created to assess the methodological quality of systematic reviews. Each question is scored according to 1 of 4 options (yes, no, cannot answer, not applicable) and the number of 'yes' answers tallied. A higher score indicates increased methodological quality (Shea et al. 2007)

The 11 assessment criteria are as follows:

1. Was an "a priori" design provided?
2. Was there duplicate study selection and data extraction?
3. Was a comprehensive literature search performed?
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?
5. Was a list of studies (included and excluded) provided?
6. Were the characteristics of the included studies provided?
7. Was the scientific quality of the included studies assessed and documented?
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?
9. Were the methods used to combine the findings of studies appropriate?
10. Was the likelihood of publication bias assessed?
11. Was the conflict of interest stated?

The AMSTAR score (from 0 to 11) for each systematic review in this evidence summary is reported in the box that appears at the beginning of each finding.

Additional Information

This summary was produced by:

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Conflict of Interest

None declared

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