Short-stay units and observation medicine: a systematic review

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ABSTRACT

Objectives: To conduct a systematic review of how short-stay observation units (SOUs) affect the efficiency of healthcare delivery and the quality of services provided.

Data sources: MEDLINE, CINAHL, Best Evidence and The Cochrane Library were searched for the period 1 January 1960 to 31 July 2000.

Study selection: Studies were eligible if published in English and rated at National Health and Medical Research Council evidence levels I, II-1, II-2, or II-3; 12 comparative studies published between 1985 and 1998 met these criteria.

Data extraction: Data pertaining to clinical outcomes, length of stay, re-presentation rates, emergency department efficiency and costs of care were extracted and evaluated independently.

Data synthesis: As there was considerable heterogeneity in the patient populations and outcomes, results were summarised rather than subjected to meta-analysis.

Conclusion: SOUs have the potential to increase patient satisfaction, reduce length of stay, improve the efficiency of emergency departments and improve cost effectiveness. However, SOUs 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. SOUs may help organisations that are attempting to streamline patient care while maintaining their quality of service delivery.

MJA 2003; 178: 559–563

WESTERN HEALTHCARE SYSTEMS are under increasing pressure to accommodate the growing demand for healthcare resulting from population growth, ageing, new technology and heightened expectations from a better-informed community. Chronic conditions are also affecting demand for healthcare, as they are the major cause of illness, disability and death in the United States today.[1]

In response to these trends, strategies that aim to cope with demand for hospital care have been implemented. In recent years, observation medicine has generated renewed interest because of its potential to help streamline appropriate health service delivery.

Short-stay observation units (SOUs) are designated areas, commonly located adjacent to emergency departments, that accommodate patients who require a brief period of observation or therapy. They have been developed as an extension of emergency services, providing continued patient management to better define diagnoses, and to reduce costs and inappropriate admissions and discharges. The ultimate goal is to improve the quality of medical care through extended observation and treatment, while reducing inappropriate admissions and healthcare costs.[2]

The aim of our review was to analyse the extent to which SOUs improve the efficiency of patient care delivery and their effect on the quality of services provided.

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METHODS

Data sources

We undertook this systematic review of SOUs between July and September 2000. The literature search involved a number of small, topic-based searches under the MeSH heading "observation unit" and then using different text words or phrases (eg, "short-stay ward", "emergency department", utilisation). Observation medicine has generally incorporated use of the term "short-stay ward", arising from literature published in the United Kingdom, while the same concept is described using the term "observation unit" in the United States.

We used the following electronic healthcare databases for our searches: MEDLINE, CINAHL, Best Evidence, and The Cochrane Library. Searches were limited to material published in the English language between 1 January 1960 and 31 July 2000.

Study selection

Studies we reviewed were included based on levels of evidence as rated by the US Preventive Services Task Force protocol (1989) as follows:[3]

I Evidence obtained from at least one randomised controlled trial;
II-1 Evidence obtained from controlled trials without randomisation;
II-2 Evidence from cohort or case–control analytic studies;
II-3 Evidence obtained from time series studies;

1: Comparative studies of observation units (OUs)

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.

III Evidence obtained from descriptive studies; and

IV Opinions of respected authorities based on consensus or clinical experience.

Evidence levels were applied to all the literature items based on the study design of each article. Comparative studies at evidence levels I, II-1, II-2 or II–3 were included; descriptive or opinion-based articles at evidence levels III or IV were excluded.

RESULTS

A summary of studies that have compared observation unit management with routine care is provided in Box 1.

Most of these comparative studies had a before-and-after design, which predisposes them to the influence of time-related changes such as altered practice behaviours, changes in casemix and increased hospital bed numbers. Five of the studies were randomised controlled trials, but the impact of the observation unit in these trials was generally confounded by the concurrent implementation of a protocol for patient care that was not used for the control group. Thus, it is not clear what proportion of the benefits observed can be attributed to the observation unit.

Box 2 summarises the evidence to support key outcomes pertaining to quality of care, length of stay and inpatient admissions.

Clinical outcomes

Two randomised clinical trials showed equivalent outcomes for patients in observation units and those receiving routine care for chest pain[4] and asthma,[5] respectively.

Farkouh et al compared 6-month outcomes (including non-fatal myocardial infarction, acute congestive heart failure, stroke, out-of-hospital cardiac arrest and death) in 424 patients with intermediate-risk unstable angina randomly allocated to chest pain unit management or hospital admission.[4] There were 18 events in the hospital admission group and 14 in the chest pain unit group. The difference between the groups was not statistically significant. Further, analysis of second-

2: Impact of observation units

Potential benefit	Level of evidence
Clinical outcome	
Improved	—
No change	I[4,5]
Worsened	—
Length of stay	
Increased	—
No change	II-2[14]
Decreased	I[8]
Efficiency of emergency department	
Improved	II-1[9]
No change	—
Decreased	—
Re-presentations to emergency department	
Increased re-presentations	II-1[6]
No change in re-presentations	I[15]
Decreased re-presentations	—
Medical admissions	
Increased	—
No change	I,[4] II-1[12]
Reduced	I,[7] II-1[6]
Cost effectiveness	
More costly than routine care	—
Cost neutral	—
Less costly than routine care	I[5]
Patient quality of life	
Improved	I[5]
No change	—
Decreased	—
Patient satisfaction	
Higher satisfaction	I[5,16]
Equivalent satisfaction	—
Lower satisfaction	—

ary outcomes, including additional visits to the emergency department for chest pain, cardiac revascularisation, cardiac diagnostic tests, and any hospitalisation for cardiac care, showed no significant difference in outcomes between the groups.

Rydman and colleagues examined the progress of 113 patients whose acute asthma exacerbation had not resolved after 3 hours of emergency department therapy, who were randomly allocated to receive treatment in an observation unit or inpatient care.[5] This study found no difference in clinical outcomes as measured by peak flow rates or post-intervention relapse-free survival at 8 weeks.

No level I or II studies have shown either superior or inferior clinical outcomes for patients managed through observation units.

Length of stay

In a randomised controlled trial involving 100 chest pain patients, Gomez et al evaluated the efficacy of their "rapid" protocol, which included a period of observation in a chest pain unit to exclude the diagnosis of myocardial ischaemia.[8] The average length of stay for "rapid" protocol patients was 15.4 ± 12.2 hours, which compared favourably with 54.6 ± 12.6 hours for patients receiving routine care. As the authors attributed these findings to their protocol, it is not clear what role the observation unit played.

Saunders and Gentile examined patients with mild exacerbations of recurrent pancreatitis and compared 27 consecutive patients managed through the observation ward with 27 randomly selected patients admitted directly to hospital.[14] The condition of 14 of the observation ward patients improved sufficiently for discharge within 24 hours, with a mean stay of 14.4 hours. The remaining 13 observation ward patients required continuing hospitalisation, with an average length of stay of 7.5 days, which exceeded the average length of stay for patients admitted directly to hospital (5.8 days). Observation ward patients had significantly lower serum amylase levels than patients admitted to hospital.

No studies have shown that observation units increase patient length of stay.

Efficiency of the emergency department

Bazarian et al examined the impact of using an SOU (to reduce the number of admitted patients held in the emergency department) on the amount of time that patients who are treated and released spend in the emergency department.[9] The mean ($\pm$ SD) number of admitted patients per day waiting in the emergency department for more than 8 hours for an inpatient bed dropped from 9.6 ± 4.2, before instituting the SOU, to 2.3 ± 2.6. The authors reported that, after implementation of the SOU, there was a significant reduction in the average time spent in the emergency department for "treat and release" patients with chest pain (from 7.3 ± 6.0 to 5.5 ± 4.8 hours per patient; $P < 0.001$) and asthma (from 5.0 ± 3.6 to 4.2 ± 2.9 hours per patient; $P < 0.05$), but not for those with sickle cell crisis or seizure. However, these findings were confounded by an increase in the average number of certified beds during the study period from 722 to 736.

There is no level I or II evidence to indicate that observation facilities impede the efficiency of emergency departments.

Re-presentations to the emergency department

There were two papers that examined the impact of SOUs on re-presentations of patients with asthma to emergency. Gouin et al noted an increased rate of repeat visits to the emergency department within 72 hours (from 3% up to 5%) after the introduction of an observation unit for asthma patients.[6] However, Willert and colleagues, in a randomised clinical trial of 103 children with asthma, showed no difference between groups in the rate of re-presentation to emergency.[15]

Medical admissions

In evaluating the impact of an SOU on the volume of patients admitted with chest pain, Farkouh et al based their findings on the assumption that all patients with intermediate-risk chest pain would have been admitted.[4] In their study, 97 (46%) of the 212 patients who presented to the emergency department avoided being admitted through assessment in the chest pain unit.

McDermott et al used a prospective randomised controlled trial in patients with acute asthma who did not meet discharge criteria within 3 hours of presentation to the emergency department.[7] Patients were randomly allocated to receive ongoing care in either the emergency diagnostic and treatment unit or in a hospital ward. Of the 110 patients managed through the emergency diagnostic and treatment unit, 59% were discharged home and 41%

were transferred on to a ward. In this study, 45 patients avoided an inpatient admission.

Brillman and Tandberg undertook a retrospective comparative cohort analysis of patients with asthma — 834 before the observation ward was opened and 390 after it was opened.[12] They found that use of an observation unit for patients with asthma reduced initial discharge rates from the emergency department and did not appreciably reduce eventual hospitalisation.

Cost effectiveness

Rydman et al compared direct costs of observation unit management with routine care for asthma patients over 7 days.[5] The total cost per patient was derived by summing the costs of all services for each patient. The authors concluded that observation unit patients had significantly lower costs (mean, \$1203 ± \$1344) than those admitted to inpatient care (mean, \$2247 ± \$1110). Mean costs for observation unit patients who failed to meet discharge criteria and were therefore hospitalised were \$2770 ± \$967.

Patient quality of life

Rydman and colleagues also examined patient quality of life.[5] Their randomised controlled trial of patients with asthma showed a pattern of improved quality of life associated with the observation unit. Patients who entered observation units had improved quality of life, compared with hospital inpatients, on five scales of the Short-Form Health Questionnaire (SF-36), and reported improvements in all four of the domains comprising the SF-12 mental health summary measure, compared with no statistically significant improvements in these domains among inpatients. Further, observation unit treatment resulted in significantly higher physical functioning.

Patient satisfaction

Patient satisfaction has been evaluated by randomised controlled trials in patients with chest pain and asthma. Rydman et al evaluated comparative levels of patient satisfaction in patients with chest pain presenting to the emergency department.[16] A total of 104 patients were randomly allocated to treatment according to the diagnostic protocol of a chest pain observation unit or to hospital inpatient management. Patient satisfaction was assessed by an interview before hospital discharge. The authors concluded that patients were more satisfied with rapid diagnosis in the chest pain observation unit than with inpatient stays. This study incorporated the use of a diagnostic protocol in conjunction with observation in a chest pain unit, and it is therefore not clear to what extent the observation unit enhances patient satisfaction.

Subsequently, Rydman and colleagues reported on patient satisfaction in 163 patients with asthma who met criteria for hospital admission after 3 hours of standard asthma therapy in the emergency department.[17] Eighty-one patients were randomly allocated to the asthma observation unit located in the emergency department, and 82 to routine hospital care. Patients in the observation unit scored higher on all seven care satisfaction measures, and their satisfaction was significantly greater for four measures (received service wanted, would recommend the service to others, were satisfied with the service, and were satisfied with their overall care). Patients in the observation unit also reported fewer problems with overall care and fewer problems with communication, emotional support, physical comfort, and special needs than patients receiving routine hospital care.

DISCUSSION

Key findings

These comparative studies show that SOUs have the potential to benefit patients, reduce length of stay, improve the efficiency of emergency departments and improve cost effectiveness. However, the benefits reported in studies of short-stay units show variation.

Comparison with other reviews

Krome published a review of SOU publications spanning 15 years and identified the following consistencies in what had been written about SOUs:[18]

- they have been shown to be a safe place to initiate treatment until a final decision can be made about admission;
- they must be under the administrative and medical control of the emergency department;
- they must have a time limit for patient observation that is strictly enforced;
- repeated observations of the patient must be made and documented;
- there must be a clear objective for each patient admitted to the unit; and
- the unit cannot function in lieu of inpatient beds.

Krome concluded that there was little left to be learned about their use.

Some 9 years later, Goodacre examined the use of short-stay units in the United Kingdom and undertook a review of the literature.[19] He found that use of these facilities is highly variable. While there were many reports of well run short-stay units, consistent evidence of clinical value and cost effectiveness compared with other methods of care were lacking. He concluded that further comparative studies were required to define the role of the short-stay ward.

Methodological limitations

Our review was restricted to analysis of English language studies that were available within Australia. However, the proportion of articles that could not be located in Australia was small, and we had access to over 90% of articles identified. The studies included in this review were conducted outside Australia, so the findings may not be generalisable to the Australian context.

Some of the studies cited are not recent, and the impact of observation units may have changed over time.

The very small amount of material at evidence levels I and II limits the generalisability of key findings. Further, most of the studies were confounded by the use of protocols, an overall increase in hospital bed numbers, or both, thus clouding interpretation of study findings.

Future research

The randomised clinical trials we reviewed were all disease-specific, examining either chest pain or asthma.

Future research should expand to the many other candidate conditions for management in SOUs.

In the comparative studies we reviewed, management through observation units was driven by clinical protocols, and it is not known what proportion of the observed benefits could be attributable to the clinical protocol alone. Studies of clinical protocols compared with routine care have shown similar benefits with respect to length of stay, costs and patient outcomes.[20-23] Further study is required to establish whether SOUs and clinical protocols have a synergistic effect that outweighs the benefits of clinical protocols alone.

Evidence of cost effectiveness, and qualitative factors, including patient and staff satisfaction, is lacking in Australian healthcare literature. Further research is required to establish key performance measures and benchmarks around SOU use and clinical effectiveness. In addition, further work is required to describe the impact of SOUs on emergency departments and hospitals with respect to enhanced capacity.

Conclusion

As demand pressures on healthcare systems grow, the imperative to provide timely, effective and cost-efficient care will become increasingly important. Adoption of new approaches that have the potential to streamline patient flow while maintaining the quality of service delivery and increasing patient satisfaction warrant considered attention.

COMPETING INTERESTS

The Department of Human Services (Victoria) provided project funding for us to undertake a review of the literature with respect to short-stay units as part of a project that examined the use of this model in Australia. This article reports on work undertaken as part of a larger project, the final report of which is now published.[24] Appropriate authorisations were obtained to allow the data to be used in the preparation of this article. The first author is an employee of the Department of Human Services, but identifies no conflict of interest in the design of the review or the decision to submit the article for publication.

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(Received 20 Sep 2003, accepted 14 Apr 2003) ❑