Alternatives to ward admission from the Emergency Department

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Type of paper: Review

Key words: Short Stay Unit; Observation Ward; Home Care Services, Hospital-Based, Hospital-in-the-Home

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as doi: [10.1111/jpc.13100](https://doi.org/10.1111/jpc.13100)

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Abstract

There is ever-increasing pressure on hospital resources in general, and emergency departments (ED) in particular. At the same time, there is increasing recognition that traditional inpatient ward-based care is not necessary for the majority of children presenting to the ED with acute illness, and that there are patient, family and hospital benefits to pursuing other options. Here we describe alternative pathways for children presenting to the ED, including short stay and observational medicine, hospital-in-the-home and non-admission enhanced care, in other words additional management practices or pathways for children who are discharged from the ED. We discuss the principles, models and practical considerations involved in each of these.

Key points

1. The majority of children admitted from the emergency department (ED) with acute illness do not need admission to a traditional hospital ward.
2. Short stay and ED observation units provide successful models for quick turnaround hospital care for children with well-circumscribed illnesses with clear management and discharge plans.

3. Hospital-in-the-home programs provide hospital interventions in the home, allowing a child to remain out of hospital safely, with demonstrated psychosocial and cost benefits.

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Introduction

Admission from the emergency department (ED) occurs when a patient requires treatment that cannot be provided at home, observation for deterioration or manifestation of a serious illness, access to other staff or inpatient services, complex coordination of care, or to provide respite and reassurance.

Admission to hospital disrupts normal family function, subjects patients and parents/carers to sleep deprivation and psychological distress, and exposes the patient to the risk of hospital-acquired infection, medical error and environmental harm¹. It is also costly, and as health care resources fail to keep pace with demand, EDs increasingly suffer from overcrowding. Therefore alternative pathways that avoid traditional ward admissions and shorten treatment times for those who need hospital care are more attractive than ever.

Medical conditions that are readily identifiable and/or have predictable rapid resolution are amenable to streamlined care. Most children and young people have no major co-morbidities, suffer from single system disease and improve quickly. A large proportion of their diseases and injuries have well-defined treatments and most patients respond predictably. For example, studies have found that the average length of stay for acute asthma is 39 hours² and 15% of hospital stays for children are less than 24 hours duration³. In addition, some traditional inpatient treatments can be given at home, especially in light of improvements in

communication technology and pharmacology. The majority of children want to be at home and have an available parent/carer.

Therefore paediatrics is particularly suited to short stay units, quick turnaround observation units, ED procedural care, hospital-in-the-home, and other non-admission enhanced care. This article will outline the principles, models and practical considerations pertaining to these alternatives to traditional ward admission from the ED.

Short stay and observation medicine

Definition

Whilst definitions overlap, in general terms, observation medicine describes hospital care episodes of 4-24 duration, and short stay describes 12-48 hours (occasionally up to 72 hours). The type of care may be investigation, treatment or monitoring of children with straightforward presentations that are amenable to pathways and guidelines^{4, 5}. Patients whose presentations or circumstances are complex are not appropriate for short stay care. The care plan should be standardised or at least well circumscribed, and the child should be able to be discharged as soon as the clinical condition improves. In this way, both the patient and hospital will maximally benefit from the model of streamlined care and low-intensity staffing. Administrative oversight, policy, procedures, governance and quality monitoring should at least equal those of an ED or inpatient unit.

Background

Approximately one third of paediatric admissions from the ED are suitable for an observation unit⁶ and another third to half for a short stay unit (SSU)⁷. These illnesses can encompass up to 80% of emergency admissions in a non-tertiary setting, but probably a smaller percentage in a tertiary setting due to the larger numbers of complex cases⁸. Eligibility and destination relate to the disease and skill mix in any particular unit. Different unit models exist, for example inpatient team-led or ED-led, weekdays or seven-day operation and based on inclusion criteria or exclusion criteria ie whether it is the default admission pathway. Beyond the principles outlined above, the particular staffing model, target patient group, location and business rules of such units develop uniquely within each institution in the context of demand, patient mix, staff skills and available space and financial resources. For instance, a large ED in a tertiary paediatric centre may aim to relocate patients who need 3-8 hours of care from ED trolleys, thereby freeing both ED cubicles and inpatient beds⁹, whereas a mixed community ED with no inpatient paediatric beds might reduce transfers to other centres and improving access to paediatric staff⁷. Demand for the use of SSUs may vary over time, either because of changing patient conditions (eg after introduction of vaccines¹⁰) or changing provision of other services (eg implementation of hospital-in-the-home programs - see below). Monitoring variations allows SSUs to respond to changes in demand.

Potential benefits of short stay care^{11, 12} include: reduced inpatient time^{13, 14}, improved patient and parent comfort and satisfaction^{7, 9, 15-18}, cost effectiveness^{9, 14, 18-20}, improved ED flow, improved patient access and reduction in inpatient hospital admissions^{9, 20-22}. A successful short stay admission constitutes disease improvement, discharge within the pre-defined timeframe, and no unplanned return with the same disease. However, short stay admissions do not automatically equate to improved hospital efficiency²³ and in one study there was a high rate of seeking medical advice after discharge¹⁵.

It is therefore important to ensure quality of short stay care is assessed. An unplanned representation or transfer-to-ward rate of up to 10% may be acceptable, although depending on the objective for the unit higher proportions may be tolerated²⁴. Audits help to identify patient factors (co-morbidities, need for specialist consultation) or systems factors (lack of weekend admissions, inaccessibility of diagnostic investigations) that predict stays beyond the guideline time for the unit^{25, 26}.

Practical considerations

Paediatric observation units and SSUs typically cater for patients with simple medical or surgical conditions that have a clear management pathway: asthma, croup, pneumonia, bronchiolitis, gastroenteritis, cellulitis, lymphadenitis, urinary

tract infection, febrile seizures, abdominal pain, head injury, overdoses or poisonings. Each unit may define targeted admission diagnoses according to its model of care (staff level and skill, rostering practices, length of stay criteria). Children whose presentations are poorly differentiated, who have complex co-morbidities or social needs, who require extensive investigations or who are at risk of deterioration or deviation from a predicted course of recovery should be unlikely to have short admissions and should be excluded. At admission, patients should have a clear diagnosis and treatment plan or, if the diagnosis is unclear, a short and circumscribed differential diagnosis with a clear set of desired endpoints. Admissions should be approved by sufficiently experienced staff. Discharge criteria should be pre-defined and standardised where possible so patients can leave as soon as criteria are met. The practice of nurse-initiated criteria-led discharge is suited to short stay care, for which unambiguous discharge criteria and instructions are important¹⁵.

Finally, there are some patients who traditionally would have been admitted to hospital, who, with the right ED resources and processes can be cared for entirely in ED. Patients with isolated limb injuries who need procedural sedation for suturing or fracture reduction are a prime example, as is incision and drainage of abscess. Appropriate medical interventions for this type of quick turnaround care include rapid nasogastric or oral rehydration, rapid bronchodilator therapy, or one dose of intravenous antibiotics in a well febrile child with a petechial rash pending

blood cultures. Children receiving this type of procedural care are particularly amenable to rapid review (see Non-admission enhanced care below). This differs from ED observation or short stay care in that it usually involves a single procedure rather than a management pathway, and any improvement is expected to occur rapidly without the need for extended monitoring, and certainly within the target time frames of the ED.

Hospital-in-the-home

Definition

Hospital-in-the-home (HITH) programs offer clinical interventions in the home, usually once or twice a day, that would otherwise require the child to be an inpatient. They act as a hospital bed replacement service, and patients are considered to be on a virtual ward. At their most fundamental, all HITH programs have nursing staff who attend the patient at home to deliver hospital interventions under medical governance. These may include intravenous antibiotics and chemotherapy, hydration/respiratory/cardiac assessments, education and management of diabetes, eczema and infantile spasms, and management of nasogastric tubes and central venous catheters. Some HITH programs have, in addition, dedicated senior and/or junior medical staff, physiotherapists and pharmacists.

Background

Although HITH-type services for children have been described since the 1970s, this has generally been for post admission, convalescent care (such as prolonged intravenous antibiotics for cystic fibrosis or bone and joint infection)²⁷. In contrast to adult HITH services, referrals directly from the ED for children is a novel concept.

There are benefits of a HITH admission versus an inpatient admission for both the patient and hospital. Patients have improved psychological outcomes on HITH compared to inpatient wards, and given the choice most children and parents prefer to be at home^{28, 29}. Patients also have reduction in the risks associated with hospital admission such as hospital-acquired infections, medical error and environmental injury. From a hospital perspective, it frees a bed for another emergency or elective patient, and it is more cost-effective with a HITH bed being about a quarter to a third of the cost of a hospital bed³⁰. From an ED patient flow perspective, not having to wait for an inpatient bed can reduce time in ED³¹.

Streamlined referral from ED requires clear guidelines, easy communication, minimal paperwork and coordination on behalf of the referring ED clinician, and an assurance that the appropriate care and monitoring will occur. For this, the HITH service needs robust resourcing, including 24 hour nursing support and medical cover extending into weekends. Additionally, for ongoing care, rapid access to hospital services (such as medical imaging), clear communication and

coordination with inpatient and emergency teams, and firm governance of patient care underpin the success of a HITH admission. Telemedicine can enhance HITH care and is feasible and acceptable to families.³² In a collaborative approach, the Royal Children's Hospital Melbourne implemented a direct from ED to HITH pathway and in its first year showed high clinician and patient/parent satisfaction, a median length of stay of 3 days and a low readmission rate of 3% (compared to 6% for all HITH patients).³³

Potential disadvantages include the risk of being 'out of sight, out of mind'. Medical staff may be concerned that deteriorations may go unnoticed³⁴. However, this is partly due to lack of understanding that HITH does not equate to discharge, with at least daily review of the child by a senior nurse and 24 hour-a-day telephone access to the HITH team for parents. These concerns are not upheld in the literature where studies have found no increase in adverse events or complications in HITH patients over inpatients³⁵. Even accepting that this may be due to the fact that patients are selected for HITH who are unlikely to develop complications, these are precisely the patients who therefore do not need to be in hospital.

Practical considerations

It is important that ED and HITH collaboratively determine a pathway for direct transfer to HITH. The patient and parent conditions for this include a clear diagnosis, treatment that can be given once (or perhaps twice) a day, and minimal

risk of time-critical severe complication (eg septic shock, hypoxia), a safe and supervised home environment with parents/carers accepting the care plan.

Acute clinical conditions in patients presenting to the ED suitable for care under HITH include cellulitis, urine infection/pyelonephritis, infected eczema, pneumonia and lymphadenitis³⁶. Given the requirement for once daily parenteral antibiotics, ceftriaxone and gentamicin are commonly used. This represents a departure from more frequent inpatient regimens, such as flucloxacillin and penicillin, and the risks of broad-spectrum antibiotics needs to be balanced against the risks of hospital admission. Certainly, ceftriaxone seems to be effective in skin/soft tissues infections and pneumonia, with low complication rates^{35, 37, 38}. HITH may also be used to support children with chronic or developmental conditions presenting to ED to avoid a hospital admission.

Non-admission enhanced care

Finally, there are a number of services which are considered outpatient or post-discharge care which can provide extra support to a patient once they have gone home as an alternative to admission. These include ambulatory services, home services and rapid review.

Some medical interventions that are only needed for a few days may be able to be administered on an outpatient basis with the patient re-attending the ED or an

ambulatory unit on a daily basis. The most common example of this is outpatient parenteral antibiotic therapy (OPAT), and for hospitals that do not have a paediatric HITH service, this is a way of providing intravenous antibiotics for stable patients (for example for cellulitis or UTI) without admitting them to hospital.

Home services can be delivered by Post Acute Care programs, which may be based in hospitals or the community and assist patients to recuperate at home after attendance at the ED or ward admission. These can involve nursing or personal care and aim to prevent re-attendance and readmission. Other community services may also enhance discharge such as community physiotherapy or visits by the Royal District Nursing Service.

Rapid review usually refers to a pre-booked early review appointment (often within a week) for a child whose disease trajectory is uncertain. This can act as a safety net and provide reassurance for ED clinicians and also parents when the diagnosis is not clear or when the condition may not improve as anticipated. Thereby a number of 'just in case' admissions may be avoided. This can be done in different ways, for example in a rapid review clinic with a paediatrician, in a clinic designated for this purpose in the ED, or with good communication, by the general practitioner.

Conclusion

Alternative care pathways have benefits for the child, the family, and the health care system. Many unexploited opportunities exist for patients presenting to ED to receive alternative care to ward admission. By understanding the benefits of each option, and its limitations, clinicians can make decisions for their patients that enable a rational use of limited resources while providing improved comfort and well-being for their patients.

Acknowledgments

During this work, P Bryant was in receipt of a grant from the Victorian Department of Health entitled 'Improving the pathway between the Emergency Department and Hospital-in-the-Home.'

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Title:

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Date:

2016-02-01

Citation:

Bryant, P. A. & Hopper, S. M. (2016). Alternatives to ward admission from the emergency department. JOURNAL OF PAEDIATRICS AND CHILD HEALTH, 52 (2), pp.237-240. <https://doi.org/10.1111/jpc.13100>.

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