

LITERATURE REVIEW  
ON  
INTEGRATED BED AND PATIENT MANAGEMENT

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## SUMMARY: FINDINGS OF THIS REVIEW

### **Increasing demand for acute inpatient hospital admissions is universal**

Increasing demand for acute inpatient hospital admissions has been demonstrated in the United Kingdom, the United States, Canada, Australia, New Zealand and other countries. While there are many causes for this increased demand, few are within the control of the health system.

### **Organisational strategies offer most to control increasing demand**

Within the health system, the interface between primary and secondary care is the most crucial area to control increasing demand for acute inpatient admissions. Organisational strategies that focus on care delivery systems rather than individual patient care have most to offer. Such strategies act at three levels, which overlap to some extent. Successful strategies to modify external demand include financial incentives designed to limit transfers from primary to secondary care; alternatives to inpatient admission; and reduction of 'inappropriate' admissions. Strategies to improve inpatient efficiency include process redesign and provision of senior and/or specialised staff in emergency departments; general observation units; pre-admission clinics and enhanced day surgery programs. Strategies to improve inpatient throughput focus on various forms of improved discharge planning.

Patient level strategies have less certain effects on demand for acute inpatient beds. Chronic disease management programs and home visits may reduce length of stay and readmissions but case management programs alone do not. While specialised treatment programs for particular diagnoses (e.g. chest pain observation units) may offer improved efficiencies for these patients their impact on overall acute inpatient demand is unclear.

The review did not identify any particular innovative or effective practices that were not already familiar in some form within the Victorian health system. However, to our knowledge, the strategies are not universally or consistently applied locally.

### **Commitment and planning are important**

Changing the patterns of health service delivery is difficult. Studies that achieved successful outcomes repeatedly mentioned the importance of the commitment of care delivery organisations and individual clinicians to achieve practice change. Careful planning and the use of formal quality improvement processes also appeared important. Similarly, the value of multidisciplinary involvement and coordination across care delivery sectors was evident. While this kind of review cannot quantify the influence of these factors they were mentioned sufficiently frequently to deserve comment.

### **The available evidence has limitations**

The studies identified for this review had several limitations. While the majority of the research identified was descriptive surprisingly few studies used formal qualitative research methods. Process outcome measures, such as inpatient occupancy rate, length of stay or readmission rate, were often not the primary outcomes of interest analysed by the researchers. Relatively few studies used comparison groups to control for potential biases or confounding factors. Unequivocal results from rigorous research were rare. The available economic analyses were small in number, limited in scope, rarely considered indirect costs, and were often of uncertain relevance to the health funding environment in Australia.

# CHAPTER ONE: MANAGING HOSPITAL ADMISSIONS

## Why is demand increasing?

Reports of "increased hospital admissions", and "winter peaks" have appeared in the press and medical literature over the past decade, adjacent to articles forecasting increased demand pressure as the size of the elderly population increases<sup>1-5</sup>. Throughout this period there has been a decline in bed numbers, and an acknowledged increase in efficiency of bed utilisation. There are many views on the causes of the increase in demand and hospital admissions, ranging from socio-demographic factors to technological advances, risk management and patient expectation and an increased ability to treat.

A recent paper<sup>6</sup> summarises 740 published articles on the rise in medical admissions. The authors conclude that the increase in admissions is due to three types of factors: patient mediated, gatekeeper related and health care organisation related. The main factors are an increasing number of elderly people, a reduction in socio-economic status for some groups, and changing patterns of societal care, notably a decreasing ability of families to provide residential care for elderly family members. These factors are largely outside the control of health services. Economic incentives for organisations to increase admissions and iatrogenic causes are also important factors in the increase. Changing incentives will change organisational behaviour. Factors within the control of health services include rate of re-admissions, elective waiting times, and changes in the number and behaviour of General Practitioners (GPs) and Emergency Department (ED) staff. Hobbs<sup>4</sup> states that the referring behaviour of GPs is not a factor in admissions, as it is ultimately the hospital doctors who make the decision to admit.

A recent review provides further light on the observed increase in admissions<sup>7</sup>. They are predominantly in the elderly age group, and primarily involve hospitalisation for respiratory and cardiac conditions. In the period 1989-1994 New Zealand had a 1.2% pa increase in admissions, and the United Kingdom, 2%pa. Scotland had an average annual increase of 4% pa during the period 1981-1994. During the same period there have been simultaneous decreases in bed stock and length of stay. The reviewers conclude that the increase is real rather than apparent, and that causes of the increase are multiple, complex and interrelated.

Hider et al<sup>6</sup> make the point that as emergency admissions are more expensive than elective admissions they make larger demands on hospital budgets, and reduce the ability of health services to meet non-urgent demand. While the growth in acute admissions is largely a medical rather than a surgical issue<sup>4</sup> the result is a reduced capacity of surgeons to work through elective waiting lists. The proliferation of day surgery may free up existing hospital surgical beds for medical admissions. Hobbs asks whether the observed increase in hospitalisation reflects health gain and improved access to care, or deteriorating health due to an over-reliance on secondary care and poorly performing primary and preventative care.

## Strategies to manage demand

With varying degrees of success, health care organisations have introduced a range of strategies to manage demand and admissions, and control costs. These include: forecasting peaks and troughs in demand, allocating capacity based upon the forecasted elective and emergency demand, reducing bed supply, increasing waiting lists, decreasing consumer expectation, reducing "inappropriate" admissions, and increasing use of non-acute inpatient alternatives. Currently there is concern about the appropriateness of acute hospital care for certain conditions, and increasing interest in providing care in settings that may better meet patient needs, and perhaps be cheaper<sup>6</sup>.

“Substitute care” is receiving increasing attention. Such substitutes include substitution for a hospital admission (eg. home care) and substitution for hospital stay (eg early discharge, including the use of intermediate care for patients in acute hospital beds who no longer require intensive care). The organisational purpose of such strategies must be clear. If the aim is to treat a constant level of demand at lower cost, then the introduction of “substitutes” must be accompanied by closure of acute capacity, otherwise there will be increased supply and increased costs. If alternatively, the aim is to treat increased demand, then “substitutes services” may do this more efficiently than opening more acute beds <sup>8</sup>.

The focus of demand management strategies is on the acute admission threshold. Edwards and Hensher <sup>8</sup> present a model (shown below) of the relationship between disease severity and management thresholds over time. Initially, a patient’s condition may be managed in the primary care sector, but with increasing care needs specialist ambulatory services are required. As the condition worsens hospital admission occurs, followed by return to the community and primary sectors, and more hospitalisations. The central part of their model is the level of secondary threshold and our ability to manage both sides of the boundary. The opportunities for reduced admissions and earlier discharges are discussed in this review.

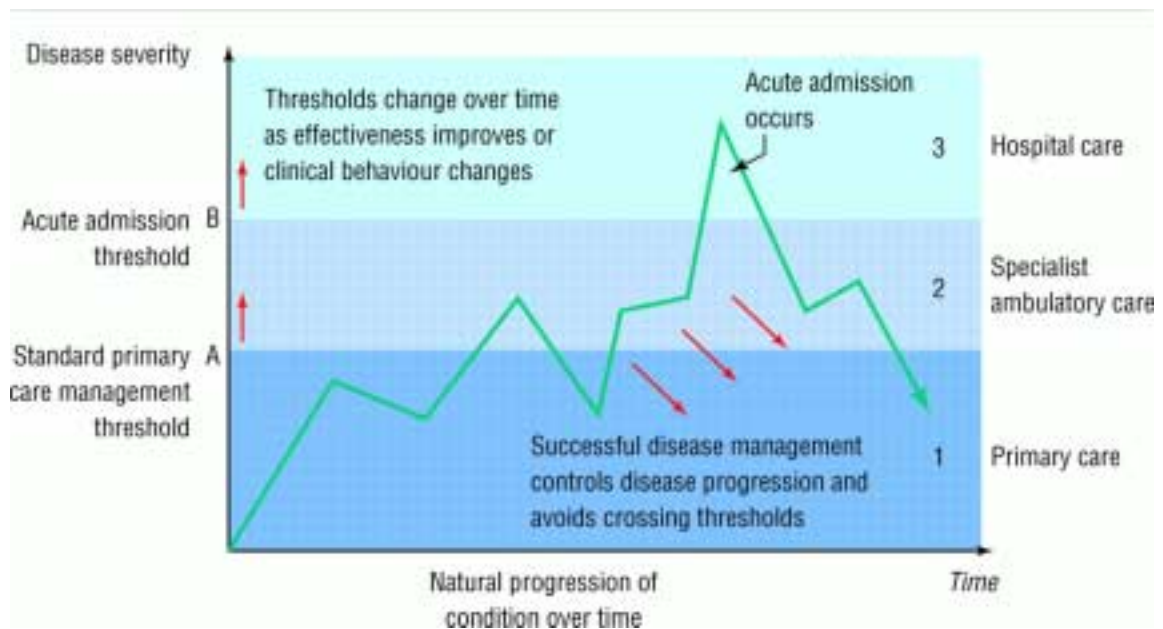


Fig 1. Relationship between disease severity and management thresholds over time <sup>8</sup>

### Organisational strategies

New Zealand Health Technology Assessment <sup>7</sup> published a comprehensive review in which they assessed the effectiveness of interventions to reduce acute medical admission rates. They concluded that the most effective interventions are at the macro-management or organisation level, targeting the interface between primary and secondary care. Such interventions include hospital closures, changing from hospital reimbursement on admission rates to prospective DRG payments, fundholding, public health interventions, the provision of hospital in the home (HITH) for acute episodes, to assist early discharge and for palliative care, high technology at home, community hospitals, GP beds, and patient hotels. These interventions have been used in the UK, USA and NZ. There is good evidence from randomised controlled trials that some of these

strategies (eg. HITH and comprehensive geriatric care) reduce acute admissions. The provision of prospective funding has also been proven to reduce admissions. There is some evidence that other strategies are probably effective in reducing admissions. Examples in this category include closure of hospitals, public health preventative interventions, community hospitals and GP beds, home alarms, and alternative and improved options for the long term care of the elderly.

In response to changing patient needs, hospitals in the UK are redesigning their bed and service provision to manage the emergency and elective demands (National Bed Inquiry)<sup>9</sup>. With limited research on forecasting demand for health services, changes in service delivery such as opening or closing acute beds and early discharge programs rarely produce long term benefits. Edwards and Hensher<sup>8</sup> stress the need for demand management strategies to focus on hospital care and substitutes for hospital. There is also a need to understand pathways to admission, and the relationship between the diversity of primary providers and continuity of care.

### **Patient level strategies**

Patient level or micro-management interventions have received some attention but few consistent results. They include primary care, hospital outpatient-based interventions, emergency department strategies such as observation units and chest pain evaluation units, maximising bed utilisation; programs to reduce admissions of the elderly, utilisation review to reduce “inappropriate” admissions, use of guidelines, interventions to reduce medication related admissions, changing the number or behaviour of GPs, and community based interventions<sup>7</sup>. There is good evidence from randomised controlled trials that placement of GPs in emergency departments reduces acute admissions. There is also evidence that more senior staff, and observation and chest pain evaluation units in emergency departments, probably reduce admissions. There is some evidence that drug education for patients and GPs and hospital outreach services reduce admissions<sup>7</sup>.

Some of the new technologies have been shown to be effective in reducing acute admissions<sup>6</sup>. These include use of low molecular weight heparin for anti coagulation therapy, Tc-m-HMPao for the diagnosis of appendicitis, troponin T levels as a rapid indicator for myocardial damage and plasma D-dimer for the diagnosis of thromboembolic disease.

Some patient level interventions have no demonstrable positive effect on admissions, although they may improve patient well being. These include out-patient based education, increased outpatient services, utilisation review and case management Hider et al<sup>6</sup>.

There is some interest in whether primary care can improve patient outcomes and reduce hospital admissions for people with chronic disease. This is the basis of the coordinated care trial program in Australia, which aims to improve health outcomes for people with chronic disease, within existing resources, through fund pooling and care coordination and the substitution of cheaper continuous community care for expensive episodic acute care (unpublished). A number of studies have found that the provision of home visits by health professionals is effective in reducing admissions<sup>10-12</sup>. The authors of a meta-analysis of the impact of home care on hospital days<sup>13</sup> concluded that home care reduces acute hospital days significantly in the period of time most proximal to active reception of care. Home care was defined as the delivery of either nursing, medical or support services in patients' homes. While the effect sizes reported are not overwhelmingly large, the consistent reduction in number of hospital days across studies suggests that home care had a significant impact on an important and costly outcome, and that home care for the terminally ill, in particular, has an unambiguous impact on this outcome.

## CHAPTER TWO: PRE-ADMISSION PROCESSES

### **Pre-admission clinics, admission on day of surgery and day surgery**

In the past decade, admission on day of surgery, day surgery centres and pre-admission programs have become routine at major hospitals throughout the USA, UK, Canada, New Zealand and Australia. Their purpose is to increase efficiency of resource utilisation, that is beds, operating theatres and staff time, and also to provide a better service to patients, through timely and appropriate admissions.

### **Pre-admission clinics**

#### **DEFINITION**

The use of pre-admission programs to assess patient readiness for surgery and identify higher risk elective patients was introduced in the early 1980s. Pre-admission assessment of patients one to two weeks before surgery is becoming standard practice in USA, Canada<sup>14</sup>, UK and Australia. There are a number of models of pre-admission, but the essence is an outpatient attendance one to four weeks prior to surgery. This generally includes some or all of the following: initial screening by a trained assessment nurse, anaesthetic assessment, completion of consent process, any required pre-operative assessment and diagnostic and screening tests. It may also include discharge planning, patient education and support. It is an established alternative to the traditional approach of admitting patients one or more days prior to surgery to ensure readiness for surgery.

Pre-admission requires some form of preliminary screening to identify those patients requiring additional tests or assessment prior to surgery. A number of techniques are used including personal interviews during a hospital or consultant visit, mailed questionnaires, telephone interviews and computer assisted questionnaires. Patel and Hanallah,<sup>15</sup> using a cohort design, collected pre-admission information via telephone for 5031 paediatric patients, and supplemented this with anaesthetic consultation as required. The group receiving this screening showed significantly lower rates of theatre cancellation than those not screened.

#### **BENEFITS**

Pre admission programs offer opportunities to reduce operating theatre delays and cancellations<sup>16</sup>, reduce hospital costs<sup>17</sup> and improve bed utilization, ward workload, diagnostic facilities management, patient satisfaction and quality of care. When Ottawa Civic Hospital introduced pre-admission and day of surgery admissions in 1993-4 and 1994-5, surgical volume remained constant, despite a reduction in bed numbers, operative hours increased each year, and there were no day of admission cancellations due to lack of beds or incomplete pre-operative preparation. In addition over 3000 bed days were saved in each year<sup>14</sup>. Pre-admission is currently used for most areas of surgery (ophthalmology, otolaryngology, neurosurgery, thoracic surgery, vascular surgery, dental procedures, general surgery, gynaecology, orthopedic surgery, urology, plastic, ENT and renal)<sup>14</sup>.

#### **PATIENTS**

Pre-admission clinics have increased importance for day of admission patients, as there is less time to deliver necessary information to the patient, ensure that consent procedures have been completed, and that test results are in order<sup>18</sup>. Studies of the timing of pre-operative patient education<sup>19</sup> found that there was no difference in pre-operative anxiety or knowledge between patients receiving the information up to a week before surgery or the day before surgery.

## RESOURCES

While cost effective in terms of maximizing theatre utilization, pre-admission is resource intensive, and sometimes inefficient, as not all patients require assessment. The use of pre-admission questionnaires leads to improved targeting of those who will benefit and improves resource utilization<sup>20</sup>. A randomised controlled trial (MacPherson in el Naggar et al<sup>21</sup> found that pre-admission reduced pre-operative hospitalisation from a mean of 2.9 to 1.6 days in the group attending a pre-admission clinic. While pre-admission is valuable in making efficient use of theatre lists, it requires significant nursing, clerical and medical staff time<sup>21</sup>. Epsom General Hospital uses nurses rather than junior doctors for pre-admission assessment. This has been possible with the development of a protocol for assessment. Obtaining consent and physical examination are still performed by medical staff. A retrospective audit over 4 separate months of 127 patients attending pre-admission found that nurses were as effective as medical staff in preventing cancellations<sup>22</sup>. Pre-admission results in changes in work flow for nursing, clerical and medical staff. While less preparation is required at ward level on day of surgery, pre-admission clinics require additional staff. There is also the risk of over-ordering or repeat ordering of diagnostic tests<sup>23</sup>.

There is some debate regarding appropriate staffing for pre-admission clinics, and the cost implications of this. A study by Starsnic et al<sup>24</sup> examined groups of surgery patients who had their pre-admission evaluation performed by surgeons or anaesthetists. They were compared for number of tests ordered and number of theatre cancellations. Anaesthetist assessment was found to be more cost effective in terms of cost of test performed.

## ADMISSION ON DAY OF SURGERY

Another approach to improving bed utilization is admission on day of surgery, either to the day surgery facility or surgical ward. Such admissions are increasing, although rates vary between hospitals for reasons including staff practices, procedure complexity and available facilities. Reported rates of admission on day of surgery were as high as 90% for a 295-bed hospital in New Hampshire<sup>25</sup>. The rate at Liverpool Hospital, Sydney, increased from 6% to 35% between July 1992 and December 1994<sup>26</sup>. Admission on day of surgery generally reduces overall length of stay by at least one day<sup>27</sup>. There is no evidence that admitting people on day of surgery delays discharge, or increases morbidity or mortality<sup>28</sup>.

For selected groups of patients, there is evidence that same day admission is safe, (as measured by level of pre-operative, intra-operative and post-operative complications) and cost effective. This is based on studies of patients admitted for coronary artery bypass grafting<sup>29</sup> aorto-iliac surgery<sup>28</sup> and thyroidectomy<sup>27</sup>. One expected benefit of admission on day of surgery is a lower rate of surgical site infection, because patients would have a lower likelihood of exposure to nosocomial pathogens. This has not been demonstrated. An American study<sup>30</sup> of 48,464 surgical procedures performed on consecutive patients from 1990-4, including 18,794 admissions on day of surgery, found no significant difference in surgical site infections between those admitted on day of surgery and those admitted one or more days prior to surgery. For neurological procedures, the rate of surgical site infection was higher in the group admitted on day of surgery.

## **SAME DAY SURGERY**

### **DAY SURGERY BENEFITS**

Use of day surgery has been facilitated by improvements in anaesthesia, and analgesia, surgical technology and earlier postoperative mobilization of patients. Day surgery facilities reduce costs, increase throughput for elective and non-elective surgery<sup>31</sup>, relieve pressure on hospital beds, reduce post operative infections<sup>32</sup> and are often more convenient and less traumatic for patients and their families.

### **DAY SURGERY PROCEDURES**

A number of papers have considered which procedures are suitable for day surgery. The type of surgery scheduled, rather than age or medical condition of the patient, determines whether day surgery is appropriate. Quite elderly patients with complex medical problems are undergoing day surgery. Reported re-admission rates vary from 0.1% to 9.5%.<sup>33</sup> The Royal College of Surgeons of England developed *Guidelines for Day Case Surgery* in 1992. They set the criteria for day surgery as those procedures for which unexpected admission following surgery was at most 2-3%.

Many surgical procedures can be performed safely as day cases. Such procedures include hysteroscopic endometrial surgery<sup>34</sup>, transurethral resection of the prostate<sup>35</sup>, head and neck surgery<sup>36</sup>, inguinal hernia repair and stripping varicose veins, and some major operations, such as cholecystectomy and thyroidectomy. Paediatric procedures such as tonsillectomy and adenotonsillectomy<sup>37</sup> and cleft lip repair<sup>38</sup> can also be performed safely as day cases. Patients require assessment for appropriateness for day surgery, and this can be performed at pre-admission clinics.

### **DAY SURGICAL CASE LOAD**

The percentage of total surgical caseload performed in day surgery facilities is increasing as hospitals become more confident that patient outcome is not compromised. Rate of total surgical caseload performed as day surgery has increased from around 50% in the early 1990s<sup>26 39</sup> to 60-70% in 1995<sup>33</sup>. At Liverpool Hospital, Sydney, 45% of the surgical caseload for the period July 1992-December 1994 was performed as day only cases<sup>26</sup>.

### **QUALITY OF CARE – POST-OPERATIVE READMISSION RATES**

With the substantial increase in day surgery from 1990 to 2000, attention shifted to the balance between access to surgery, efficiency and risk of complication. The latter is expressed as concerns regarding safety and quality of treatment. Many studies use rate of unplanned admissions to hospital following day surgery as a clinical indicator of surgical outcome, or patient management problems. A number of factors including complexity of procedure performed, and length of surgery influence the rate of unplanned admissions.

A study of post operative hospital admissions at Cambelltown Hospital NSW, in the period 1984-1990, revealed a rate of 1.2% hospital admissions following day surgery. Many of these were due to either multiple procedures or surgery that was more extensive than initially planned<sup>40</sup>. Johnson and Jarrett<sup>41</sup> report on a five year study involving 10,000 gynaecology, orthopaedics and general surgery patients treated in a day surgery unit. 0.7% required hospital admission following surgery. They concluded that day surgery was safe, but advised against its use for people needing extensive surgery, and those requiring a general anaesthetic for longer than 60 minutes. A retrospective case controlled chart review study of 8549 patients who underwent day

surgery in 1991 also found that surgery duration of longer than 60 minutes was the most important predictor of unplanned admission following day surgery<sup>33</sup>.

Margovsky<sup>42</sup> examined 920 outpatients who had day surgical procedures at Launceston General Hospital. 40% of elective surgery was performed as day procedures, with an unplanned admission rate of 4.7%. Sibbritt<sup>43</sup> examined NSW hospital admissions for 1988/89, and calculated re-admission rates. For those procedures considered potentially suitable for day surgery units, the re-admission rate was 4.4%, and 0.6% for unplanned re-admissions. Comparison with one private free standing day surgery unit found a rate of 0.24% unplanned re-admissions. This low rate was interpreted as indicating an appropriate use of day surgery. A retrospective study of 6000 day patients consecutively admitted to the Royal Adelaide Hospital Day Surgical Unit, found an unplanned re-admission rate of 1.34%<sup>44</sup>. The patients had been screened through a pre-admission process prior to surgery. 98.9 % were satisfied with the day surgery service. 4% of patients attended a medical practitioner following discharge and 3.1% attended emergency services, for mainly minor problems.

One study<sup>45</sup> found that afternoon surgery resulted in a higher rate of unplanned admissions than morning surgery due to the shorter period available for recovery. This is important in scheduling cases and arranging post recovery care.

#### **PATIENT SATISFACTION**

In terms of patient satisfaction with day surgery, a NSW survey of 150 patients attending 8 day surgery units (37.3 % response rate) indicated that patients find day surgery a satisfactory, convenient and safe alternative to inpatient care<sup>46</sup>. 78.4% of respondents would recommend day surgery to others and 94.2% would recommend the day surgery unit that they used. 2.7% required hospital re-admission in the seven day post-operative period. In a study of 142 patients undergoing day surgery septoplasty, the level of satisfaction was 83%<sup>45</sup>. The efficacy and level of satisfaction of day surgery is dependent on procedure and patient and carer preferences and expectations.

While day surgery has much to offer patients, application to children, especially when performed in adult units may not lead to best outcomes. While and Wilcox<sup>47</sup> describe a qualitative study of 20 children undergoing day surgery in a Health Authority after admission to either a paediatric ward or a day surgery facility. They concluded that care in the latter was deficient, largely because the unit was not prepared for the needs of children and their carers.

## SUMMARY

The early papers describe the introduction and establishment of pre-admission clinics for elective surgery patients, and demonstrate that pre-admission is appropriate for all areas of surgery. The percentage of elective patients attending pre-admission clinics varies depending on where the threshold for attendance is set. In two large Australian tertiary referral hospitals 22% and 33% of all elective cases attend preadmission. While attendance means that patients are better prepared, those attending such clinics are high risk patients, and experience higher levels of intra-operative events<sup>48</sup>. Studies report improvements in theatre cancellation rates with observed rates as low as 0.75%. While one aim of the clinics is cost savings, only one of the studies included financial analysis. This study found average savings of US\$20.89 per patient for a sample of 30,783 patients<sup>24</sup>.

Having established the clinics it quickly became apparent that while they reduced theatre cancellations, the clinics were quite resource intensive, in that patients needed assessment by an anaesthetist, and pre surgery diagnostic tests had to be completed. This required a shift of resources from one part of the process to another. This led to refinements in the operation of clinics through the development of screening tools to determine who needs to attend, and experiments with using nursing or other hospital staff, general practitioners or computer supported systems, to collect most of the information. Some groups tried to do most of the pre-admission process via paper or telephone, with attendance only for a minority. Surveys showed that patient satisfaction for those attending pre-admission clinics was high in all studies.

Another approach to improving bed utilisation is admission on day of surgery, either to the day surgery facility or surgical ward. Such admissions are increasing, although rates vary between hospitals for reasons including staff practices, procedure complexity and available facilities. For selected groups of patients, there is evidence that admission on the day of surgery is safe and cost effective.

Day surgery centres reduce pressure on hospital beds, and provide a more convenient surgery option for the patient. They can be either stand-alone facilities in the community or attached to hospitals. The percentage of surgery caseload performed in day centres has increased during the last decade to levels in excess of 70% at some hospitals, especially in the United States. One of the main issues identified in the literature is the safety of same day surgery. This is measured as the number of patients requiring inpatient admission following surgery. Day surgery is safe and less expensive than alternatives. For those who require major surgery or develop complications in the perioperative period hospital based centres provide better care than free standing units. The studies provide some benchmarks regarding admission rates following day surgery. While one large case control study reports a re-admission rate of 0.28%, values range from 0.11 to 4.7%, with some recommending 3% as a benchmark. The increase in complexity and number of day surgery cases demands a systematic way of selecting and preparing patients. All elective surgery can be considered for day case surgery, but must meet particular clinical criteria. Identified strategies to reduce unplanned admissions include improved patient selection and pre-operative assessment, patient waiting time and education, pre-operative anaesthesia, nursing care and post operative analgesia<sup>42</sup>. Prolonged surgery was a predictor of unplanned admission, and should be considered in patient selection. Patients reported high levels of satisfaction with day surgery.

# CHAPTER THREE - INITIATIVES IN EMERGENCY DEPARTMENTS

## Introduction — overcrowding, inappropriate admissions

Increasing numbers of patients are being admitted as emergencies internationally. In UK the rate of increase is estimated at around 2.0% annually<sup>49-52</sup>. Significant growth in emergency medical admissions is also reported in the US<sup>53 54</sup>, New Zealand<sup>6</sup> and New South Wales<sup>55</sup>. Between 1989-1994 the numbers of available acute beds decreased by about 28% in the UK and New Zealand and the average length of inpatient stay also decreased. The Medical Inpatient Study (DHS, December 2000 unpublished) surveyed large metropolitan teaching hospitals in Melbourne and found that 99% of medical patients were admitted through emergency departments.

Overcrowded hospitals are also an international phenomenon. Media and political concerns with this problem are prominent in the US<sup>54</sup> and the UK<sup>56</sup>. The reported impact of overcrowding sounds familiar to Australian readers. In the early 1990s a questionnaire survey of 239 US teaching hospitals undertaken by Andrulis et al<sup>54</sup> reported extended waits in emergency departments for admission beds, refusal of inter-hospital transfers, and prolonged diversion of incoming ambulances. Emergency department overcrowding, particularly bed-finding delay, contributes significantly to increased health care costs. Krochmal and Riley<sup>57</sup> demonstrated that patients who remained in emergency departments for more than 24 hours contributed an additional 8,455 extra bed-days at their 490-bed hospital over 3 years, at a cost of \$US6.8 million. In 1991 concern about the situation led the American College of Emergency Physicians (ACEP) to survey its members, hold a consensus conference, and develop a range of suggestions for management of overcrowding<sup>58</sup>. In the inpatient area these included evaluation of prolonged length of stay, enhanced discharge planning, the use of 'over-census beds', and aggressive disposition to appropriate levels of care. Within the emergency department their recommendations included establishment of observation wards, development of contingency plans for supplementary emergency department staffing, architectural redesign of facilities, and explicit allocation of clinical responsibility for emergency department boarders to senior clinical staff. Unfortunately ACEP did not report research findings that indicated the relative effectiveness of these strategies.

The causes of the increased demand for emergency medical beds are unclear. Two large, recent, systematic reviews published by the New Zealand Health Technology Assessment group concluded that they are complex, inter-related and mainly involve factors that are outside the control of traditional health services<sup>7 59</sup>. Such causes include an increasing number of older people, diverging socioeconomic conditions within population groups, and the decreased capacity of families to care for elderly relatives. Perverse incentives were also important, including economic incentives to increase admissions and iatrogenic factors related to increasing levels of therapeutic intervention. Factors related directly to the health system, such as increasing readmission rates, increased waiting times for surgery and changes in gate-keeping behaviour by primary care providers, had less significant impacts.

### INAPPROPRIATE ADMISIONS

Earlier research in the 1970s and 1980s suggested that some medical admissions were 'inappropriate', and studies focused on means to identify and divert such patients before they sought admission, or to expedite the discharge of 'long stay' patients. Numerous methodological problems affected this early research, particularly unsystematic measurement of

'inappropriateness' <sup>7</sup>. Recent research suggests a more complex picture, perhaps associated changing patterns of demand. Coast et al <sup>60</sup> screened a consecutive sample of 701 patients admitted to a UK hospital with a standardised review instrument and determined that 20% could potentially have been treated outside the hospital. A panel of GPs then reviewed the case notes of these patients to determine the most appropriate form of care. Even if the necessary facilities could have been provided, the GPs felt that only 10-15% of the patients were appropriate for them. The potential cost savings were small. These conclusions are supported by other studies that found even lower rates of 'inappropriate' admissions <sup>61-63</sup>. Closer to home an audit using standardised measures to assess a random sample of admissions in Wellington, New Zealand, found that only 8% could be regarded as 'inappropriate' <sup>64</sup>, although this figure was perhaps influenced by the non-availability of alternative forms of care. This area remains prone to inconsistent assumptions and methodological difficulties <sup>7 65</sup>.

### **COMPUTER MODELLING**

Several researchers have investigated the dynamics of hospital bed management through computer modelling. This approach has been demonstrated to be suitable for examining waiting times in emergency departments <sup>66</sup> and for planning the requirement for emergency beds <sup>67</sup>. The most extensive and relevant study by Bagust et al <sup>52</sup> used a stochastic simulation model to perform 11 different 'experiments' that examined the effects of varying common health system process measures (eg. rate of emergency admissions as a proportion of total beds, daily discharge rate, bed occupancy, degree of random variation in emergency admission rates) on the ability of a hospital system to accommodate new emergency admissions. The results were replicable and robust. They showed that the risk of a hospital having no bed available for an immediate medical admission was evident at bed occupancy levels of around 85% and that an acute hospital can expect regular bed shortages and periodic bed crises if average occupancy rises to 90% or more. The model also predicted that strategies used to address the problem have only short-term effects, briefly delaying the worst impacts but not addressing the growing mismatch between supply and demand.

### **RE-DESIGN OF EMERGENCY DEPARTMENTS**

In this context a degree of operational nihilism is understandable. Nevertheless the literature does contain examples of emergency department research that have suggested the effectiveness of different interventions, although the methodological rigour of these evaluations is sometimes poor. A group from the Sir Charles Gairdner Hospital in Western Australia has demonstrated comprehensively that it is possible to make clear and measurable differences to general hospital functioning by redesigning the emergency department <sup>68</sup>. Their approach combined motivational leadership by senior staff, upgrading the academic input to the service delivery systems, and concrete application of the principles of continuous quality improvement and evidence based practice.

The remainder of this section of the review focuses on the two most promising emergency department strategies relevant to influencing acute inpatient bed management — 'fast track' systems and observation wards.

## Fast Track

### DEFINITION

Meislin et al<sup>69</sup> introduced the term 'fast track' to describe their ten-week trial that diverted less acutely ill patients to a specialised treatment facility next to their standard emergency department. In their descriptive evaluation, the 'fast track' patients spent less time in the hospital and had fewer complaints about their care. Unfortunately, subsequent authors have used 'fast track' to refer to two quite different organisational processes, either rapid assessment and treatment units that focus primarily on the less acutely ill, or processes designed for specific treatments.

The bulk of 'fast track' research follows the original terminology, focusing on processes designed to increase emergency department throughput by creating facilities to treat less acutely ill patients. These studies consider outcome measures like clinical state and patient satisfaction, and process measures like throughput, the numbers of patients who leave without being seen, and economic factors. Unfortunately these studies have only an indirect relationship to overall inpatient bed management, and have not examined the impact of improved emergency department efficiency in these terms.

Since its original description<sup>69</sup>, the use of 'fast track' services to treat patients with minor complaints who present to emergency departments has grown rapidly in the United States. A selective survey conducted in 1993 of 49 US emergency departments in urban teaching hospitals showed that 58% had opened a 'fast track' treatment facility, while an additional 25% were considering doing so<sup>70</sup>. In 1994 a more rigorous and representative randomised survey of 250 hospitals across the US identified that only 22% of the total sample had 'fast track' facilities but that usage varied significantly according to hospital characteristics<sup>71</sup>. 'Fast track' (FT) facilities were most common in suburban (FT=47%) and teaching (FT=42%) hospitals with between 300-599 beds (FT=42%) that treated more than 60,000 emergency patients/year (FT=69%).

Others researchers use 'fast track' to describe processes designed to hasten specific treatments, or improve the efficiency of inpatient admission or discharge. These studies have more direct relevance to overall inpatient bed management but rarely quantify their findings in these terms.

### EVALUATION AND OUTCOMES OF RAPID ASSESSMENT AND TREATMENT UNITS

Despite the rapid growth of 'fast track' facilities in US Emergency Departments little rigorous research has evaluated their impact. Most reports use non-controlled, descriptive, methodologies that allow few conclusions about effectiveness to be drawn outside their immediate organisational environment. One author cites the Institute for Health Improvement's two *Collaboratives on Reducing Waits and Delays in the Emergency Department* (<<http://www.ihl.org/collaboratives/completed/bts-redwaits.asp>>) as evidence that 'fast track' facilities increase patient throughput, reduce waiting times and increase patient satisfaction with emergency department care. This review could not obtain reports from these initiatives within the required timeframe.

Although outside the nominal bounds of this review we include consideration of a 'fast track' facility for a general adult population from Ankara, Turkey,<sup>72</sup> because it is the only prospective, controlled, evaluation of this system we have identified. This emergency ward in a 1200-bed

hospital saw approximately 30,000 patients annually. On alternate days for a one-month period patients presenting with minor complaints indicating a selected group of diagnoses were assigned to either routine Emergency Department care or a 'fast track' facility. The 143 'fast track' patients had a median length of stay of 36 minutes compared to 63 minutes amongst the routine care patients. This difference was highly statistically significant overall (P=0.0001) but was not sustained in all diagnostic groups. The study found no differences in patient satisfaction or clinical outcomes at 5-day follow-up. The study suffers from poor description of the nature of the 'fast track' intervention, simplistic outcome measures and low subject numbers in some subgroup analyses. The authors report that neither patients nor clinicians were aware of the nature of the experimental intervention but do not discuss the ethical implications of this.

Fernandes and Christensen<sup>73</sup> performed a pre-post evaluation of the introduction of a 'fast track' system in Vancouver. They collected data for a 48-hour period before operation of the new facilities and for two 48-hour periods afterwards. They demonstrated only moderate, but statistically significant, reductions in emergency department length of stay in the 'fast track' group. Further continuous quality improvement initiatives at the hospital led to a further decrease in length of stay, measured over another 48-hour sample frame, from a mean of 163 minutes before 'fast track' operation to 114 minutes after<sup>74</sup>. Amongst patients not requiring investigations, mean length of stay reduced from 92 minutes before to 57 minutes after 'fast track'.

Wright et al<sup>75</sup> undertook an uncontrolled retrospective audit of a 'fast track' system in a US adult emergency department over a 12-month period. The 'fast track' facility saw 28% of the patients who presented to the emergency department. The patients were young (mean age 21.5 years) and had low rates of X-ray (21.5%) or laboratory (12.1%) investigations. Only 1% of the 'fast track' patients' received inpatient treatment. The mean length of stay of patients under the 'fast track' system was 94 minutes. The authors report that 'patients and medical staff were highly satisfied with the Fast Track system' but provide limited details of these findings.

Two research reports describe the implementation of 'fast track' systems in specialist paediatric emergency departments, performing prospective comparisons of 'fast track' patients against other emergency department patients for three months<sup>76</sup> and nine months {Simon et al 1996 ID: 720}. Their findings add little to those observed in general adult populations — moderate decreases in lengths of stay, decreased numbers of investigations, and no differences in measured levels of family satisfaction or clinical outcomes at follow-up.

The remaining reports identified by this review were either descriptive or anecdotal<sup>70 77-84</sup> and add little to the objective evaluation of 'fast track' facilities, although the commentaries in these and other reports contain common themes. First, they demonstrate the importance of clearly delineated triage criteria to determine the suitability of patients for the 'fast track' system. Several papers give detailed accounts of this process<sup>74 78 83 84</sup>. Second, the literature strongly emphasises the need to manage carefully the implementation of 'fast track' systems, preferably as part of an existing quality improvement program<sup>70 77 85</sup>, and to ensure staff support for the changes involved ; Nollman, 1994 #375; Docimo, 2000 #369]. Third, these reports illustrate the considerable impact of the logistics and location of ancillary investigation services (eg. laboratory and radiology) on provision of 'fast track' facilities<sup>74 77 82 85</sup>.

## **ECONOMIC FACTORS**

Some of the enthusiasm for 'fast track' systems in the United States arises from economic considerations. Although third-party payers increasingly restrict the reimbursement of patients attending emergency departments<sup>78 86</sup> these facilities still need to 'maintain non-acute market

share in light of competing care modalities' <sup>70</sup>. Some managed health care plans contractually oblige health care providers to offer 'fast track' services <sup>87</sup>.

Some descriptive reports suggest that 'fast track' systems confer an economic advantage through increased efficiency <sup>70</sup> or increased reimbursement by reducing 'walkouts' prompted by long waiting times <sup>78</sup>.

The limited amount of available quantitative research has questioned these findings. While 'fast track' facilities can halve the numbers of patients who leave the emergency department without being seen <sup>88</sup>, the overall economics of 'fast track' are complex. Simon et al <sup>89</sup> performed a regression analysis of the revenue and costs attracted by similar patients in their comparison of 'fast track' and other treatments in a paediatric emergency department <sup>90</sup>. When stratified by diagnosis and acuity, 'fast track' saved an average of \$US25/patient but the analysis only included consideration of direct treatment costs. Saywell et al <sup>86</sup> performed a more sophisticated break-even analysis of a 'fast track' system in a general adult emergency department over a 12-month period. These authors incorporated consideration of variable costs (clerical salaries, consumables), direct fixed costs (clinical staff salaries) and indirect fixed costs (overhead, infrastructure, and depreciation). They showed a relatively low average collection rate (62%) and high percentage of uninsured patients (31%) in their sample. The 'fast track' program revenues covered its direct costs but not its indirect costs, by a considerable margin.

#### **EVALUATION AND OUTCOMES OF PROCESSES DESIGNED PRIMARILY TO HASTEN SPECIFIC TREATMENTS, INPATIENT ADMISSION OR DISCHARGE**

This review identified two strands of research that described 'fast track' processes designed to hasten specific treatments, inpatient admission or discharge, namely those that study specific clinical diagnoses and those that take a more general, system-wide, approach. Each is discussed separately below. Given the range of terms and keywords used to describe these processes there is a possibility that in the time available our search may have missed some relevant material, although we would not expect this to affect the overall conclusions of this section of the review.

In theory processes that expedite specific treatments for acute medical emergencies should improve emergency department efficiency and directly affect overall inpatient bed management. Many researchers describe protocol-based systems that accelerate treatments for patients with particular diagnoses without necessarily referring to them as 'fast track' procedures. The extensive literature on improving 'door-to-needle' time for patients requiring thrombolysis after myocardial infarction provides an example. The following illustrates the need for coordination between clinical and organisational decision making to enable such services.

Multicentre randomised controlled trials have demonstrated conclusively that thrombolytic agents decrease overall 30-35 day mortality after myocardial infarction by 18-25%, with increasing benefit as the time from onset of pain to thrombolysis is reduced <sup>91-94</sup>. The challenge for clinicians is to introduce care delivery systems that decrease 'door to needle' times (the standard measure of speed to thrombolytic treatment).

A large body of research reports has documented these attempts. The best studies used prospective, controlled, observational designs that compared clinical outcomes for 'fast tracked' patients to those treated by other means. Some studies used historical controls. Unsurprisingly, we identified no randomised controlled trials of these 'fast track' systems. More surprisingly, few reports went beyond clinical outcomes or time-to-treatment to consider more wide-ranging process variables, for example, patient throughput, readmissions or overall bed management.

This review identified no studies that examined the economic implications of these 'fast track' procedures for inpatient services.

Providing a 'fast track' service that moves patients who meet particular clinical criteria directly from the emergency department to the coronary care unit for thrombolytic treatment reduces in-hospital treatment delay measured by 'door-to-needle' time<sup>95-97</sup> and correctly identified patients likely to benefit from this treatment<sup>95</sup>.

Later studies, performed when the benefits of thrombolytic treatment were more widely recognised, focused on improving 'door-to-needle times' within the emergency department itself. An authoritative prospective audit of 1755 patients treated with thrombolytic treatment was conducted as part of the US Time to Thrombolysis Substudy of the National Registry for Myocardial Infarction<sup>98</sup>. This study identified significant pre-hospital delays that contributed to delays in the initiation of effective treatment. It also clearly identified causes of in-hospital delays in treatment, in particular those due to hospital policies. Factors associated with decreased 'door-to-needle times' included initiation of treatment in the emergency department, preparation of the drug in the emergency department rather than the pharmacy, streamlined procedures for obtaining ECGs, and not contacting the patients' primary physician prior to initiating treatment. Both investigation and treatment delays were more common for women than men. A rigorous, prospective, controlled, observational study conducted in Perth, Western Australia, demonstrated that delivering post-myocardial infarction thrombolytic treatment according to agreed clinical guidelines in the emergency department rather than the coronary care unit reduced 'door-to-needle' times by over 50%<sup>99</sup>. Overall mortality was similar in both settings.

Attempts to reduce treatment delays further by tackling pre-hospital delay factors have had mixed results. Two British research groups have shown that providing direct access to coronary care units for general practitioners reduces 'door-to-needle' times<sup>100-101</sup>. Encouraging rural GPs to administer thrombolysis themselves in appropriate cases is safe, efficacious<sup>102</sup> and halves one-year mortality<sup>103</sup>, in a highly cost-effective manner<sup>104</sup>. Regrettably such services are under-used<sup>101</sup> or not sustained after the research program finishes<sup>105</sup>. On the other hand, programs that supplement existing clinical procedures by allowing ambulance staff to refer directly to coronary care units reduce thrombolysis treatment delays without increasing inappropriate referrals<sup>106-107</sup>.

Despite significant advances in reducing delays to receiving thrombolytic treatment over the last decade, a recent publication sounds a cautionary note<sup>†</sup>. Chang et al<sup>108</sup> compare the baseline characteristics, treatment and clinical outcomes for almost 15,000 myocardial infarction patients enrolled in two large multicentre trials of thrombolytic treatment in the US and Canada, GUSTO-I (1990-1993) and GUSTO-III (1995-1997). Between the different time periods of the two trials illness severity on admission increased, door-to-needle time decreased, and length of stay in both intensive care and hospital overall reduced. However, both 30-day and one-year mortality rates remained comparable across countries and time. This may illustrate the difficulties involved in the use of proxy outcome measures (eg. 'door-to-needle' times, length of stay) rather than 'hard' clinical outcomes (eg. mortality) when evaluating the effectiveness of 'fast track' procedures.

Other examples of 'fast track' procedures that bypass emergency departments for specific clinical circumstances exist, for example for adults with proximal femoral fracture<sup>109</sup> and children with sickle cell crises<sup>110</sup>. Both studies are predominantly descriptive and rely on retrospective controls. They illustrate markedly decreased times to definitive treatment in the experimental

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<sup>†</sup> Only the abstract of this paper was available within the timeline of this review.

groups, and greatly increased family satisfaction with 'fast track' treatment in the sickle cell study. The authors of each report emphasise the importance of a clear set of inclusion criteria to identify patients suitable for the 'fast track' process.

Whilst not specifically covered in this review some literature exists on processes to decrease length of stay in both intensive care and hospital overall for patients who have coronary artery bypass surgery. Mounsey et al<sup>111</sup> demonstrated that it is possible to identify patient factors that predict prolonged stays in intensive care and hospital after coronary artery surgery, but did not apply this to study alternative care delivery strategies. Two studies in the US have done so<sup>112, 113</sup>. Their 'fast track' procedures comprised standardised clinical protocols for post-operative management that decreased the incidence of complicating medical problems, decreased intensive care stay, and hastened discharge of coronary artery surgery patients without increasing mortality, morbidity or readmission.

While early discharge patients reported high levels of satisfaction with care their relatives did not<sup>113</sup>. Application of similar clinical algorithms for treatment of acute pyelonephritis<sup>114</sup> and severe trauma<sup>115</sup> produced similar results. Two small randomised controlled trials found that protocols designed to determine which chest pain patients required hospital admission reduced admissions and costs of care without negative clinical consequences<sup>116</sup>. This approach to 'fast track' raises the broader question of the effectiveness of clinical pathways and protocols in general, which is beyond the scope of this review but covered extensively elsewhere<sup>117</sup>.

#### **'FAST TRACK' DESIGNED TO ENHANCE SYSTEM-WIDE FUNCTIONING**

An intriguing area of research designed to improve the management of all emergency surgical admissions comes from the University Hospital of Wales in Cardiff. In 1995, Gaskell et al<sup>118</sup> reported a comparison of emergency surgical admissions between two surgical teams during 8 on-call weekdays for each team. In the study group patients were first seen by junior medical staff and then examined, without delay, by the senior registrar or consultant who specified the investigations required, whether admission was indicated and, if admitted, the appropriate management plan. In the control group patients were seen and admitted by junior medical staff in the usual way, with the involvement of senior staff at the junior staff's discretion. The study group admitted 72% of their referrals compared to 93% in the control group ( $P < 0.0005$ ). The operation rate per 100 referrals and the mortality rate within 3 months of referral were similar in both groups. The authors concluded, 'The findings of this pilot study suggest the possibility of important benefits to the health service and to individual patients were the decision to admit surgical emergencies to become the sole responsibility of consultants and senior registrars. Implementation of such a policy would involve considerable change in the professional lifestyle of those involved. The advantages, to doctors and patient alike, are likely to far outweigh the disadvantages.' Subsequently the same group performed a randomised controlled trial of the impact of senior radiologist input on the admission decisions made by senior surgical staff about patients presenting with intra-abdominal disturbances who did not require immediate surgery<sup>119</sup>. The senior surgeon and radiologist group admitted 20% fewer patients, without negative consequences, than the group of senior surgeons alone. A similar study examining the impact of using an experienced senior medical registrar to make decisions about medical admissions also showed a reduction in admissions, although the benefit wanes over time and is dependent on the individual registrar<sup>120</sup>.

## SUMMARY

Increasing numbers of patients are being admitted as emergencies internationally. This has occurred in the context of reductions in available acute beds and length of stay. Patients who remain in emergency departments for more than 24 hours contribute to additional bed-days and costs. The causes of the increased demand for emergency medical beds are unclear. Two large, recent, systematic reviews concluded that they are complex, inter-related and mainly involve factors that are outside the control of traditional health services.

One key to managing the increase in demand is to reduce inappropriate admissions, but there is little definitive work on how to do this safely. There are also ethical considerations. A number of studies describe the development and implementation of tools to assess the appropriateness of admissions. Most of these are post hoc and examine the need for admission and/or need for continued inpatient care. Few tools can predict who should be admitted. The largest NZ<sup>6</sup> and Australian<sup>121</sup> studies found only 5-7% of admissions to be inappropriate. It is important to distinguish between those who do not need any health care, and those who do not require health care in an acute facility. The greatest opportunities<sup>8</sup> are in specialty areas, particularly care of the elderly and orthopaedics. The decision to admit is a balance between uncertainty regarding severity and prognosis for the presenting problem, patient safety and available hospital resources. There have been very few trials of treatment in alternative settings, although the trials of chest pain evaluation units to determine whether an admission is required, are a step in the right direction<sup>122</sup>. Re-design of emergency departments improves hospital functioning<sup>68</sup>.

Several researchers have investigated the dynamics of hospital bed management through computer modeling<sup>52</sup>. The risk of a hospital having no bed available for an immediate medical admission was evident at bed occupancy levels of around 85%. An acute hospital can expect regular bed shortages and periodic bed crises if average occupancy rises to 90% or more. The model also predicted that strategies used to address the problem have only short term effects, briefly delaying the worst impacts but not addressing the growing mismatch between supply and demand.

Fast track aims to increase patient throughput, decrease waiting times and increase patient satisfaction by expediting a patient's transition through the emergency department. Fast track may operate in two ways, first by streaming patients with minor complaints into a rapid assessment and treatment unit and secondly by utilising specialised protocols and strategies to expedite a patient's admission with a defined condition. For both groups strict criteria need to be set for access to fast track programs. The management implications of fast track services and staff support for the changes involved, logistics and location of ancillary services such as laboratory and radiology need to be addressed. Fast track includes use of clinical pathways and the use of more senior staff in assessment and early treatment planning. Benefits include a decrease in "walkouts", decreased waiting times, decreased number of admissions and change in outcomes. Cost implications and increased staffing levels need to be considered. Randomised control trials have demonstrated the positive effect of early management by senior and specialised medical staff<sup>118-120</sup>. Fast track strategies often focus on specific interventions such as thrombolytic therapy for myocardial infarction. Whilst studies have concentrated on the time interval from arrival to initiation of treatment, there has been limited research into evaluation of these strategies in terms of clinical outcomes.

# CHAPTER FOUR – OBSERVATION WARDS

## INTRODUCTION

As the Emergency Department is the main route to an acute admission, there has been a significant amount of attention to interventions at this point. The interventions include process redesign (including structural design), guideline implementation and fast tracking, streaming into short stay observation units and use of new technologies. Many patients do not need to be admitted to an acute inpatient bed, and observation units can help in this decision process. They are an important innovation in emergency care, and are generally specially designed and staffed to enable appropriate testing and treatment and assessment of who should be admitted. Typically such units have a higher ratio of senior or specialist staff than Emergency Departments, and decisions regarding treatment for certain conditions are supported by protocols. There are general, condition specific (Chest Pain Evaluation Units) and age specific (paediatric) observation units, all of which are discussed in detail in this chapter.

## DEFINITION

This definition derives directly from the initial description of observation wards provided over 40 years ago <sup>123</sup> and subsequently elaborated in guideline documents produced by relevant professional medical organisations in the United States <sup>124</sup> and the UK [British Association for Accident and Emergency Medicine 1996]. The latter state that observation wards are ‘an essential part of every emergency department’ and suggest provision of 1 bed per 5000 new attendances. Much of the literature concerning observation wards was conducted before 1990 and is outside the scope of this review. All of the most rigorous evaluations occurred after this date. Williams et al <sup>125</sup> define five characteristics of observation wards in emergency departments. They are an integral part of and are staffed by the emergency department, they have policies for defining patients suitable and unsuitable for admission, the staff is mostly senior, the patients are reassessed frequently, and there is a time limit to admissions.

Surveys of the provision of observation wards indicate that 95 of the 270 major emergency departments in the UK had observation wards or short stay beds <sup>126</sup>. Their service provision was highly variable. The units had between 2 and 20 beds and admitted between 19,000 and 121,000 patients annually. The level of provision ranged from 1 bed per 2440 new attendances to 1 bed per 27,250 new attendances. Where data on admission rates were available (78%) the departments admitted between 0.1% and 13.3% of their new attendances. Diagnostic case mix was also highly variable. Beattie et al <sup>127</sup> showed that about 12% of emergency departments have observation wards that admit children. A 1988 survey by Jelinek <sup>128</sup> showed that 50% of major Australian hospitals had observation wards and a further 25% wanted one.

Three broad models of observation wards exist. General observation wards place no restrictions on the kind of patient they admit. Some observation wards specialise in patients from particular age groups, recognising their particular needs and their implications for service delivery. The third type of observation wards specialises specifically in the care of patients with particular clinical problems. Each of these types of observation ward is considered separately below.

The vast bulk of the research literature evaluating observation wards uses descriptive methodologies and reports favourable results that reflect the authors’ enthusiasm for this form of care. This review focuses attention on the relatively few reports that use any form of controlled comparison.

## General observation wards

A major and rigorous evaluation of the impact of an observation ward on general hospital process outcomes comes from the Sir Charles Gairdner Hospital group in West Australia<sup>129</sup>. This is the only report identified by this review that uses concurrent controls for comparison. The authors sought to evaluate the impact of opening an observation ward on hospital admission profiles over a 4-year period. At the time the comparison period began the authors' hospital was the only one in Perth that operated without an observation ward. After introducing this facility, the authors compared clinical and process outcomes for a cohort comprising all the patients in the 10 most common Diagnosis Related Groups (DRGs) who were admitted to their observation ward with all patients admitted to observation wards in other Perth hospitals over the same period. The opening of the ward coincided with a decrease in the numbers of patients admitted to other inpatient wards, an increase in the total number of patients in the 10 DRGs admitted to the hospital, and a significant reduction in total bed days and average length of stay. As there were no similar changes at the other Perth teaching hospitals, the observed changes were most likely due to the establishment of the observation ward. The observation ward improved the efficiency of managing certain patient groups. Toxicological emergencies and minor head injuries are suitable for observation ward admissions, and result in marked reductions in total bed days for these cases. The authors conclude that the establishment of properly structured and staffed emergency department observation wards increases the efficiency of a hospital as a whole, by decreasing hospital wide ALOS and total bed days.

## Observation wards specialising in patients from particular age groups

### CHILDREN

Some observation wards specialise in paediatric cases as these require specialist knowledge and expertise and account for a large component of presentations and admissions. In a comparative, quasi-experimental study of 4227 cases, Gouin et al<sup>130</sup> compared acute paediatric asthma admission rates before and after the establishment of a paediatric observation unit. Another quasi-experimental study of 1224 cases found that asthma admission for all ages were unchanged after the introduction of an observation unit<sup>(131)</sup>. A randomised controlled trial has found that relapse and re-admission rates for asthmatic patients were not different for observation unit and usual care groups<sup>132</sup>.

Beattie and Ferguson<sup>133</sup> used a postal questionnaire to determine the prevalence of short stay ward facilities for children in the United Kingdom. 50% of departments surveyed have a short-stay ward. Of these 25% admitted small numbers of children. These were mainly children who have sustained trauma-related problems. Observation units for children in Emergency Department settings can improve the quality of medical care provided; however, they must be properly organized with careful consideration for the needs of children<sup>134</sup>.

Short-stay observation units for children with asthma have the potential to reduce hospitalization rates for this common paediatric condition. One problem with the use of observation units is the determination of which patients are most likely to benefit from their use. Gouin<sup>135</sup> used a case controlled study to examine this issue. No clinical predictive factors determined at the time of arrival to the ED were identified for children with asthma who were successfully discharged from the observation unit except for a lesser need of oxygen supplementation. The patients observed in the unit had similar management in the initial 3 hours of arrival and similar length of stay in the observation unit, regardless of their disposition outcome. The authors concluded that maximal observation unit efficiency remains limited by the lack of clear predictive factors for successful discharge.

## THE ELDERLY

A number of studies report high usage of ED departments by the elderly, and predict increases in such use<sup>136 137</sup>. The current and predicted use of ED and hospitals by the elderly means that it is important to ensure the efficiency and effectiveness of EDs in assessing and treating this group. Because of the unique physiological, social and medical needs of the elderly, some have argued that they should receive attention in specialist units in ED, similar to those for paediatric presentations<sup>138</sup>.

Khan and Millington<sup>139</sup> reviewed the medical records of all patients over 65 years of age admitted to the short stay ward over a nine month period. Patients admitted to the short stay ward were those who appeared to need only a brief period of assessment or treatment. The short stay ward was used as a way of staging hospital care for the elderly. Admitting selected patients to the short stay ward allowed 71% to be discharged home, usually within 24 h, rather than being formally admitted to hospital. 13% of all the patients over 65 attending ED were admitted to the short stay ward. Of patients over 65 who were admitted to hospital, 20% were first admitted to the short stay ward. There were 502 admissions to the short stay ward of patients aged 65 years and above, who constituted 38% of the total admissions to that ward. The addition of a short stay ward reduced the demand for inpatient hospital beds, and improved the quality of care to elderly patients attending ED.

## Observation wards specialising in the care of patients with particular clinical problems

A number of observation units target specific clinical conditions such as chest pain, asthma, head injuries and self harm. The effectiveness of such wards can only be gauged by comparison with usual care. Chest Pain Evaluation Units (CPEU) were first introduced in the United States<sup>140</sup>, and have now been adopted to a limited extent in Australia. The units allow rigorous assessment of patients presenting with chest pain, and expedite their discharge if the assessment is negative. Goodacre<sup>141</sup> examined the evidence for effectiveness and economic efficiency of CPEU in the US using a search of the literature and critical appraisal of the validity of the data. Five studies comparing outcomes of CPEU care with usual care showed no significant difference in objective measures including mortality or missed pathology. Eleven studies described outcomes of a cohort of CPEU patients. Follow up was comprehensive and demonstrated no clinically significant evidence of missed pathology. Nine studies comparing CPEU costs with routine care demonstrated impressive cost savings that were more modest when randomised comparisons were made. Goodacre concluded that CPEU care is safe and costs are well defined. There is no strong evidence that a CPEU will improve outcomes if usual care is good. Cost savings have been shown when compared with usual care in the US.

A key component of observation units has been the use of protocols or guidelines to support clinical decision making. Two small unblinded randomised controlled trials found that the use of such protocols with patients presenting with chest pain significantly reduced the admission rate<sup>116 142</sup>.

Bazarian et al<sup>143</sup> used a pre- and post- design to examine the impact of an observation unit on the amount of time patients spent in ED. They examined four clinical conditions: chest pain, asthma, sickle cell crisis and seizure. They found a significant reduction in throughput time after the introduction of the observation unit, and a significant decrease in the number of patients waiting in ED for admission to an inpatient bed. The largest decrease was shown for chest pain and asthma patients. There was a small effect for sickle cell patients and no effect for seizure patients.

## Economic analysis – efficiency and cost effectiveness

Goodacre <sup>126</sup> presents an analysis of the cost effectiveness of short stay wards, based on four studies. He concludes that cost savings can be made, although producing a more cautious approach to direct discharge from Emergency Departments may reduce the effect.

Hadden et al <sup>144</sup> used a historical control study to assess the efficiency of a short stay observation ward attached to an ED at a main teaching hospital. They compared 107 patients admitted to the ED observation ward and 107 similar patients admitted to general wards after closure of the observation ward. Patients admitted to the ED observation ward were seen sooner by a senior doctor, had fewer investigations, and had a shorter stay in hospital than similar patients admitted to the general wards. The ED observation ward was more efficient than the general acute wards at dealing with short stay patients. A number of uncontrolled descriptive studies have reported similar findings.

Browne <sup>145</sup> in a descriptive retrospective uncontrolled study examined the effectiveness and efficiency of a short stay paediatric ward at a tertiary referral children's hospital and a paediatric unit in a general hospital (NSW). He found improved bed efficiency and reduced costs (savings of \$0.5m to \$2.3m over the two years), as well as greater parental satisfaction, and earlier return of the child to the family and community.

### SUMMARY

Observation wards are areas located in or adjacent to Emergency Departments. They provide short term care for patients that require observation but are not anticipated to require inpatient admission. They have policies for defining patients suitable and unsuitable for admission, patients are reassessed frequently and, there is a time limit to admissions <sup>129</sup>. Observation units are staffed by emergency personnel, or special teams of more experienced senior clinicians. Admission to such an area is generally for a defined period time, during which assessment and initiation of treatment occur. After this time a patient is discharged or transferred to a ward area. Three broad models of observation wards exist: General observation wards which place no restrictions on the kind of patient they admit; age specific observation wards; and observation wards specialising in the care of patients with particular clinical problems. For groups such as the elderly and children, their special physiological, social and medical needs must be considered <sup>138</sup>. Observation areas for particular clinical problems such as chest pain have shown that if usual care is good there is limited evidence of improved health outcome but cost savings can be achieved <sup>141</sup>.

While the use of observation units and decision support guidelines may relieve pressure on inpatient wards, and provide a centralised and efficient location for patient assessment, further evaluation is needed to determine their effectiveness in reducing admissions and re-admissions. There is some Australian evidence that patients in observation areas were seen by senior staff, had fewer investigations, decreased number of admissions and decreased total bed days for specific DRGs and had a shorter stay than other patients <sup>129</sup>. The use of observation units for particular conditions such as chest pain, asthma and COPD, and for particular patient groups such as the elderly or children may lead to increased efficiency and improved patient outcomes. Based on clinical evidence and cost effectiveness, the descriptive studies have not provided incontrovertible evidence of the value of short stay beds.

# CHAPTER FIVE - HOSPITAL IN THE HOME

## DEFINITION

Hospital in the Home (HITH) is defined as a service that provides active treatment by health care professionals, in the patient's home, for a limited period, of a condition that otherwise would require acute hospital in-patient care. HITH has become a common response to the increasing demand for acute hospital beds. Advances in medicine mean that HITH is a viable alternative for in-hospital treatment for chemotherapy, wound care, intravenous antibiotic and anticoagulant therapies, and genito-urinary tract and respiratory tract infections. Areas for expansion are being investigated.

## HITH COCHRANE REVIEW

The authors of the Cochrane systematic review {Shepperd and Illiffe 2000 ID: 10} assessed randomised control trials which compared HITH with acute hospital in-patient care. The participants were patients aged 18 years and over. The outcomes measured were mortality, clinical complications, re-admissions, cost (to the patient and family, to general practice, to the hospital and to the community), hospital days saved from the provision of HITH, discharge destination from hospital-at-home, general and disease specific health status, functional status, psychological well-being, patient satisfaction, carer satisfaction, carer burden, and staff views (including the satisfaction of doctors working in primary care. Five studies were included involving 866 patients. Because the studies were small and lacked power, the authors conclude that there is insufficient evidence to assess the effects of HITH on patient outcomes or the cost to the health service.

## PATIENT SATISFACTION

The Cochrane systematic review {Shepperd and Illiffe 2000 ID: 10} showed that patients discharged early from hospital to hospital-at-home following elective surgery expressed greater satisfaction with care than those who remained in hospital. This is supported by Shepperd et al <sup>146</sup>, Crotty et al <sup>147</sup> Board et al <sup>148</sup> and Caplan et al <sup>149</sup> who conducted randomised control studies and demonstrated higher patient satisfaction in patients managed at home.

With an increasingly aging population the study by Crotty et al <sup>147</sup> in South Australia, is of particular interest. In a sample of 188 patients with fractured hips, 36% met the criteria for home rehabilitation, but only 20% agreed to participate in the HITH program. The reasons for refusal include preference for inpatient rehabilitation, family reluctance and anxiety regarding ability to manage at home. The findings of this study suggest that home rehabilitation may be unacceptable to many elderly patients and their families.

## CARER SATISFACTION

The Cochrane systematic review {Shepperd and Illiffe 2000 ID: 10} showed that carers expressed less satisfaction with HITH compared with hospital care. This is further supported by Shepperd et al <sup>150</sup> who found that carers of patients recovering from hysterectomy preferred hospital care, while those of patients recovering from knee replacement preferred HITH.

However, Caplan et al {Caplan et al 1999 ID: 1236} found carer satisfaction was significantly higher in the group managed at home.

### **COST EFFECTIVENESS**

HITH schemes are an alternative to standard hospital care but there is uncertainty regarding cost effectiveness<sup>150</sup>. The Cochrane systematic review {Shepperd and Illiffe 2000 ID: 10} showed that in the one trial that compared overall health care costs of HITH versus inpatient care, no statistically significant differences were found.

The North Western Health and Health Service Evaluation Unit {Clinical Epidemiology and Health Service Evaluation Unit 1999 ID: 1234} conducted a case control costing study of HITH. Costing data was generated for 924 pairs of episodes (HITH and non-HITH). The authors found that HITH can be delivered within existing casemix funding. They defined HITH as “pure”, where there is total substitution of in home for hospital care and “mixed “ where there is partial substitution. They found HITH overall to be significantly cheaper than its matched in-hospital care, and average daily costs to be cheaper for HITH than in-hospital care. For pure HITH, HITH is cheaper than in-hospital care across all sites and conditions. After adjustment for confounders, it was 38% cheaper. Length of stay was shorter or the same for HITH cases when compared to in-hospital cases. For mixed HITH, results are less clear cut because of case selection issues. Total LOS for mixed HITH is greater than its matched in-hospital event. Episode cost for mixed HITH episodes is not significantly different to matched in-hospital episodes. Chemotherapy, cellulitis, respiratory conditions, venous thrombosis, kidney or urinary tract infections, and less complex post surgical conditions were cheaper in HITH than in-hospital. HITH for complex neonatal episodes, post-operative management of hepato-biliary surgery and gynaecological procedures was more expensive in HITH than in-hospital. The difference is attributed to a longer LOS in hospital prior to transfer to HITH.

Shepperd et al<sup>150</sup> compared the cost of HITH care with that of inpatient hospital care for patients recovering from hip replacement, knee replacement, and hysterectomy, elderly medical patients, and those with chronic obstructive airways disease. They found no major differences in health service costs between the two groups for patients recovering from hip or knee replacement and elderly medical patients, and that HITH care increased healthcare costs for patients recovering from hysterectomy and for those with chronic obstructive airways disease. For elderly medical patients and those with chronic obstructive airway disease HITH care resulted in some costs shifting to general practitioners.

Board et al<sup>148</sup> conducted a randomised controlled trial of the costs of hospital as compared with HITH for 100 acute medical patients in NSW. HITH was found to be statistically significantly cheaper than inpatient care (HITH cost per separation \$1,764 Hospital \$3,614) while producing no significant differences in clinical outcome.

### **PATIENT OUTCOMES**

In the Cochrane review {Shepperd 2000 ID: 10} no statistically significant differences were detected for patient health outcomes between HITH and in-patient groups. Sheppard et al<sup>150</sup> found no major difference in patients' reported health outcome between HITH and inpatient care, but because patients recovering from knee replacement commonly need hospitalisation, they were not regarded as suitable for HITH care. The North Western study {Clinical Epidemiology and Health Service Evaluation Unit 1999 ID: 1234} found no significant difference in mortality rates between HITH and matched in-hospital patients. Similarly, Board et al<sup>148</sup> found no significant difference in clinical outcome. Montalto 1998 in a descriptive study of safety of HITH

looked at the rate of negative and unexpected adverse events associated with HITH. He measured “return to hospital” and “adverse events” and concluded that HITH is very safe. Caplan et al {Caplan et al 1999 ID: 1236} used a randomised control trial of 100 older adult patients to compared complications in HITH and in-hospital patients`. They found a lower incidence of complications in the group managed at home and no significant difference in number of adverse events and deaths.

Montalto et al {Montalto et al 1999 ID: 1237} conducted a review of 9 HITH units in Victoria and looked at five clinical indicators: unexpected patient phone calls, unplanned staff call outs, unplanned return to hospital, medication administration errors and patient refusal to consent to HITH care. Of the 759 patients, 10% made unexpected phone calls; 2.4% required an unplanned staff call out; 7.3% required an unplanned admission to hospital; and, there was one medication error. The findings of this study suggest that only a minimal level of service provision is needed for HITH, particularly after hours support.

## **Alternatives to hospitalisation**

Coast et al <sup>65</sup> looked at acute admissions for 112 patients where panels of consultants and general practitioners assessed whether there may have been an alternative to inpatient care. Of cases reviewed, about 10% may have been suitable for alternative care. Main alternatives chosen were General Practitioner bed and urgent outpatient appointment.

Harvey et al <sup>151</sup> examined the feasibility of patient hotels for suitable patients who were entirely self caring, mobile and able to manage their own medication, eg patients receiving intermittent low-level therapy or investigations who could not travel to a hospital on a daily basis. These hotels would be ideally suited to patients who need to be resident for one night or who have recently required acute care and are awaiting planned discharge and are unable to go elsewhere in the meantime. This study found that there is scope for increasing day treatment and investigation, and for releasing beds by speeding discharge through the use of hotel like facilities. The concept of a patient hotel was acceptable to both patients and staff and could potentially be considered a means of increasing efficiency in patient care.

## **SUMMARY**

Hospital in the Home (HITH) has emerged as an alternative to inpatient hospitalisation for selected diagnoses. A Cochrane systematic review {Shepperd and Illiffe 2000 ID: 10} and a number of recent randomised controlled trials form the basis of this review. There is some evidence that HITH has achieved cost savings, but as few studies have examined cost effectiveness issues, no firm conclusion can be made from the literature examined. For lower complexity problems, where home care is substituted for the entire episode of in-hospital care, there is evidence of lower costs for HITH. A problem in evaluation is the heterogeneity of Hospital in the Home, which makes comparing like with like difficult. For carefully selected patient groups HITH results in good patient outcomes. Overall these programs are well accepted by patients with more mixed responses from carers. Patient acceptance of HITH is influenced by the problem being treated. For older patients HITH may be less readily accepted.

# CHAPTER SIX - DISCHARGE PLANNING

## INTRODUCTION

There is growing interest in strategies which reduce length of stay, once a patient has been admitted. One such strategy is "discharge planning". This involves the development of a personal discharge plan for patients. This process may commence at pre-admission or for emergency patients, while they are in the emergency department, or in the first days of their admission. The purpose is to assist patients in making a smooth, safe and timely transition from the hospital to home. Grimmer et al<sup>152</sup> observed that "effective" discharge planning is characterised by a reduction of acute hospital bed days and the discharge of a patient who can safely return to the community. A number of discharge outcome measures have been used throughout the literature, including rate of hospital readmission, length of stay, patient satisfaction and utilisation of community based health services.

## Discharge planning studies

The Cochrane Systematic Review of *Discharge Planning From Hospital To Home*<sup>153</sup> examined the impact of discharge planning on patient care, patient outcomes and costs of health care. The authors examined 8 randomised controlled trials. The Cochrane Review found some evidence that discharge planning reduced average length of hospital stay, but not for all hospitals. There was no clear result regarding the effect of discharge planning on re-admission rates. While three trials reported reduced re-admissions or days in hospital due to re-admission in the short term (one to four weeks), this difference disappeared at longer term follow up (6 weeks to 9 months). Although no differences were detected in health status, there is some evidence to suggest that patients receiving discharge planning experience increased levels of satisfaction with their care. The results may reflect some of the problems faced when evaluating interventions with multiple components, and the methodological quality of included trials. The timing of discharge also varied across trials. A further problem is the selection of outcome measures. An important element of discharge planning is the effectiveness of communication between hospital and community, yet this was not reported in any of the trials included in the review. The expectation is that discharge planning will ensure that patients are discharged from hospital at an appropriate time in their care, and with adequate notice to organise the provision of other services. A high level of communication between the discharge planners and the providers of services outside the hospital setting is clearly important.

The Cochrane Review indicates that discharge planning may lead to a reduction in hospital length of stay, and in some cases may reduce re-admission to hospital. Although the effectiveness of discharge planning is not clear, such a policy will be influenced by the context in which it is implemented, and the patient group targeted. The economic consequences of discharge planning are uncertain, it is not clear if costs are reduced or shifted from secondary to primary care as a result of discharge planning.

Ibrahim and Buick<sup>154</sup> in their report for DHS on Effective Discharge Strategy recommend that all patients have a discharge plan. The plan should consider information on the process of recovery, medication requirements, social, psychological and physical functioning and community support requirements. Not all patients will require the same discharge planning efforts. Collaboration is a common component of successful models and a number of the models

proposed in the literature look at having a particular person, usually a nurse, acting as a discharge co-coordinator. The majority of the published literature concentrates on multiday stay inpatients that are considered to have complex needs.

Clark et al <sup>155</sup> undertook an observational study to assess whether admission and discharge policies had been formulated and examined whether they took into account the specialised needs of the elderly. The study showed a lack of discharge policies for both the general population and the needs of the elderly. Furthermore a large number of hospitals did not employ discharge-planning nurses or routinely inform the patient's carer about discharge matters.

Johnson et al <sup>156</sup> undertook a 3 month prospective study to determine if there was a delay between a patient being considered medically fit for discharge by a general medical unit and the date of actual discharge. They found that a delay in discharge of one day in 31.1% of patients, with total number of days attributed to discharge delays representing 17% of all bed days. Major causes of delay were insufficient institutional care beds and failure to plan patient discharges. The authors advocated the use of interim care wards to provide flexibility in placing patients and to relieve some of the pressure on acute medical wards.

Effective discharge planning is an integral element of care co-ordination and is linked with pre-admission, case management and clinical pathways. A study undertaken by Johnson et al <sup>156</sup> in Brisbane also demonstrated that delays in discharge led to wasted bed days. The major causes are lack of nursing home beds and the failure to plan effectively for discharge. High re-admission rates, increased Emergency Department attendances, extended inpatient stays and higher hospital acquired infections are also symptoms of poor discharge planning.

Both Charlesworth and McKenzie <sup>157</sup> and Caplan et al <sup>149</sup> demonstrated improvements in clinical outcome and patient satisfaction when additional resources were devoted to discharge planning and support.

Strategies to improve discharge include early discharge planning, provision of interim care beds, and in the longer term provision of increased nursing home and hostel beds <sup>156</sup>.

## **RISK SCREENING**

The process of risk screening is essential to ensure that patients who are at greatest risk and highest need receive adequate discharge planning. Risk screening can commence as early as in the pre-admission clinics or in the consultant's rooms.

Evans and Hendricks <sup>158</sup> used a randomised controlled trial to investigate whether intervention with high-risk patients could reduce the need for hospital admission or skilled care. Of 13,255 patients screened, 835 were identified as high risk. Half the high-risk patients received discharge planning from day three of their hospital admission. The control group only received discharge planning if there was a written request from their physician. Patients who received discharge planning from day three of their admission onwards experienced an increased likelihood of return to home after hospitalisation and had a decreased chance of un-scheduled readmission within the 9-month study period. The length of the index hospital stay was not effected.

By identifying patients using an easily implemented questionnaire it is possible to identify those at high-risk and to subsequently target these patients for more intensive follow up in an attempt

to prevent further deterioration in their health. Caplan and Brown (1997) examined the effectiveness of a screening instrument developed for use in Emergency Departments to identify patients at risk of readmission. The study reviewed 468 consecutive consenting patients. Screening included demographic data, living arrangements, use of community services, physical and mental function, and mini mental status. Patients were followed up after 28 days to determine their health status. Those that were dependent in any one of a number activities of daily living had a significantly higher chance of being admitted to hospital in the follow up period.

Naylor and Brooten <sup>159</sup> considered patients with the following characteristics to be at risk: age > 80, inadequate support system, multiple active chronic health problems, history of depression, moderate to severe functional impairment, multiple hospitalisations during prior 6 months, hospitalised in the past 30 days, fair or poor self rating of health, history of non-adherence to therapeutic regime. More recent work undertaken by Narsavage and Naylor <sup>160</sup> examined patient factors associated with and predictive of the decision to refer for home follow-up, using a sample of older adults hospitalised with Chronic Obstructive Pulmonary Disease or Congestive Heart Failure. The study suggests that those who lived alone and require home health aids and have longer than an average length of hospital stay may need home care referrals.

### **THE DISCHARGE PLANNING PROCESS**

Anderson and Helms <sup>161</sup> state that the quality of the discharge planning process involves co-ordinating healthcare services required on discharge, communicating those needs effectively, and assigning responsibility to the team member who identifies a need. There must be information feedback between those who make referrals and those who receive them. It is therefore essential to include in any discharge planning process a clear delineation of roles, responsibilities and lines of communication.

Naylor et al <sup>159</sup> identify four phases in the discharge process, assessment, development, implementation and evaluation. The assessment phase consists of a specialist nurse visit within 48 hours of admission and contacting all caregivers. Using validated and reliable instruments the nurse completes a thorough assessment of the patient. At this stage a preliminary discharge plan is developed in collaboration with the patient, care giver, primary nurse, physician and other health care team members. This is documented in the patient history. The implementation phase includes hospital visits and discharge visit. The interim hospital visits, every 48 hours until discharge, continue to develop and implement the discharge plan through consultation with the patient care team. The discharge visit occurs within 24 hours prior to discharge. At this stage the nurse contacts the patient and all care givers to finalise the discharge preparations. Summaries are included in the patient history and are distributed to the patient, primary physician and other health care providers who will provide care at home. The evaluation phase consists of telephone availability and a telephone out reach program. The first call is within 48 hours of discharge and the second call is between 7-10 days post discharge. The nurse is available by telephone 8am to 10pm Monday to Friday and or reduced hours on the weekends.

### **DISCHARGE PLANNING STAFF**

Peters et al highlight the need for a designated discharge co-ordinator to ensure the quality of the discharge planning <sup>162</sup>. Kee and Borchers <sup>163</sup> recommend that clinical nurse specialists in the acute care setting assume more pivotal roles in discharge planning and care.

Haddock et al <sup>164</sup> in a cohort study found that a collaborative model utilising the expertise of both social workers and Clinical Nurse Specialists improved both patient and organisational outcomes

related to discharge. Analysis also showed that patients involved in collaborative planning were more satisfied, had a reduced length of stay, had fewer readmissions and received a higher rate of indicated post discharge services.

Lowenstein and Hoff <sup>165</sup> report that discharge planning by staff nurses who are orientated to the role and updated continually about the process can decrease LOS, increase patient and family education, facilitate continuity of care and promote professional advancement.

## **RANDOMISED CONTROLLED TRIALS**

Naylor et al <sup>166</sup> using a randomised controlled trial design targeted the discharge planning needs of 363 “at risk” elderly patients. Patients considered to be at risk had one or more of the following characteristics: age > 80, inadequate support system, multiple active chronic health problems, history of depression, moderate to severe functional impairment, multiple hospitalisations during prior 6 months, hospitalised in the past 30 days, fair or poor self rating of health, history of non-adherence to therapeutic regime.

The randomised control trial evaluated the impact of a gerontological Clinical Nurse Specialist (CNS) on various outcomes in medical and surgical wards. The CNS performed initial and subsequent assessment of each elderly patient, liaised with family and carers, co-ordinated community services and followed up each patient after discharge.

Patients were enrolled within 48 hours of admission and baseline data was collected and then the patients were allocated to intervention or control groups. Control patients received routine discharge planning and standard home care. The intervention extended from hospital to 4 weeks following discharge. Patients (and carers when possible) received standardised comprehensive discharge planning and home follow up. A protocol guided patient assessment and management and specified a minimum number of home visits.

Intervention participants received an initial visit within 48 hours of hospitalisation, subsequent visits every 48 hours, home visit within 48 hours of discharge and further visit 7-10 days post discharge. The number of visits were unlimited, 7 day a week phone availability and weekly telephone contact were offered. The home visits included physical and environmental assessments targeted at increasing patients’ and carers’ ability to manage unresolved health problems. Interventions focused on medications, symptom management, diet, activity, sleep, medical follow up and emotional status of patient and carers.

Through home visits and telephone follow up questions, any concerns from patients and carers or health care team members could be addressed. Patient’s progress was monitored and collaboration with physicians occurred to make adjustments in therapies and obtain referrals for services that were needed. Discharge summaries were distributed at the completion of the intervention. These were sent to patients, caregivers, physicians and other providers involved with the patient, the discharge summary included detailed plans, goal progression and ongoing concerns.

Baseline socio-demographic and health characteristics were the same for both groups. The study follow up did not differ significantly between control and intervention groups. Length of Stay (LOS) was not reduced, but there were significant reductions in re-admission rates and total cost for the intervention group. By week 24 after the index hospital discharge, control group patients were more likely than the intervention group patients to be readmitted at least once

(37.1% versus 20.3%;  $p < 0.001$ ). Fewer intervention group participants had multiple readmissions (6.2% versus 14.5%;  $p = 0.01$ ) and the intervention group had fewer hospital days per patient (1.53 versus 4.09 days;  $p < 0.001$ ). Time to first readmission was increased in the intervention group ( $p < 0.001$ ). At 24 weeks after discharge Medicare reimbursements for health services in the control group was double (\$1.6m versus 0.6m) for the intervention group ( $P < 0.001$ ). There were no significant differences in post discharge acute care visits, functional status, depression or patient satisfaction.

While the study by Naylor et al <sup>166</sup> was not disease specific a number of studies have demonstrated improvements in readmission rates for particular disease groups

Rich and Beckman report <sup>167</sup> randomised controlled trial which assessed the impact of a nurse directed multi-disciplinary intervention on 282 high risk patients of 70 years of age or older who were hospitalised with congestive heart failure. The intervention consisted of comprehensive education of patient and family, prescribed diet, social service consultation and planning for early discharge, review of medications and intensive follow up. The primary outcome measure was survival for 90 days without readmission, achieved by 91 out of 142 intervention participants and 75 out of 140 control ( $p = 0.09$ ) participants. The number of readmissions in the intervention group was reduced by 56.2% for heart failure and reduced by 28.5% for other presenting problems.

The primary outcome measure was survival for 90 days without readmission. This was achieved by 91 out of 142 intervention participants and 75 out of 140 control ( $p = 0.09$ ) participants. The number of readmissions for heart failure in the intervention group was reduced by 56.2 percent. The number of readmissions for other causes was reduced by 28.5 percent. In the control group 16.4% had more than one readmission as compared with 6.3% in the intervention group. In a subgroup quality of life analysis, scores at 90 days improved more from baseline for patients in the treatment group. Because of the reduction in hospital readmissions the overall cost of care was \$US460 less per patient in the intervention group.

Charlesworth and McKenzie <sup>157</sup> undertook a cohort study and identified a model that was successful in high needs paediatric cases. This group implemented discharge planning in a 77-bed acute paediatric hospital. The project was instigated after feedback from managed care providers that a need existed for a better discharge coordination process. Each patient had a discharge plan established on admission. Discharge process follows the nursing process of assessment, analysis, planning, implementing and evaluating patient needs. There was an emphasis on liaison with community agencies and providing staff development on discharge planning. The study demonstrated a decreased length of stay, improved staff development and better coordination of discharge resources. The program was well accepted by medical staff with 100% feeling that communication with discharge coordinators was effective and 50% feeling that the program was of benefit to patients and families.

The study was successful in showing that a unit based discharge program was successful in improving discharge coordination and providing a designated resource person for staff regarding discharge planning.

#### **STREAMLINING THE PROCESS OF CARE**

The opportunity to re-design the patient flow and build in quicker discharge is recognised by Caplan and Board <sup>149</sup> who used a sequentially controlled study of 224 elective abdominal surgical patients to assess total cost, time off work and patient satisfaction of a re-engineered surgical service. The re-engineered service included the use of preadmission clinics, education

of patients and carers, day of surgery admissions, post acute care at home after discharge. Patients reported shorter length of stay and significantly higher satisfaction with their treatment. Despite needing to provide additional services the cost saving to the hospital outweighed the cost of increased services provided in the community.

Winchester and Brown <sup>168</sup> in an observational study identify the use of a transit lounge as a potential strategy for expediting patient discharge and increasing the throughput in elective surgical beds. Any patient considered fit for discharge but unable to leave at that time was moved to a transit lounge area. As there were issues involving duty of care the lounge needed to be staffed by a registered nurse. Establishment of the lounge included publicising the unit and recruiting patients for the unit on a daily basis. Reluctance of patients to go to the transit lounge meant that patients encouraged family to collect them by designated time. Patients who used the lounge found it to be enjoyable. The authors state the need further data to evaluate whether a discharge lounge helped with hospital throughput transition from specialty wards to general areas.

## **SUMMARY**

The high cost of patient re-admissions, the need to optimise bed usage and resources, reported disparities between being medically fit for discharge and the date of actual discharge, the increasing number of patients with chronic disease, the aging of the population and the multidisciplinary care needs of these groups have stimulated interest in tweaking the discharge process. This has involved development and early implementation of patient discharge plans to assist patients in making a smooth, safe and timely transition from the hospital to home.

The Cochrane Systematic Review <sup>153</sup> found some evidence that discharge planning reduced average length of hospital stay, but not for all hospitals. There was no clear result regarding the effect of discharge planning on re-admission rates. While three trials reported reduced re-admissions or days in hospital due to re-admission in the short term (one to four weeks), this difference disappeared at longer term follow up (6 weeks to 9 months). Although no differences were detected in health status, there is some evidence to suggest that patients receiving discharge planning experience increased levels of satisfaction with their care.

Although the effectiveness of discharge planning is not clear, it will be influenced by the context in which it is implemented, and the patient group targeted. That is, some observed delays are due to insufficient institutional beds and the failure to effectively plan and implement discharges. The economic consequences of discharge planning are uncertain. There was no evidence that it led to reduced health service costs overall. That is, it is not clear if costs are reduced or shifted from secondary to primary care as a result of discharge planning. There are also some concerns regarding the capacity of "receiving" services to meet the additional demand.

# CHAPTER SEVEN - CARE COORDINATION

## DEFINITION

The Case Management Society of America defines case management as “A *collaboration process which assesses, plans, implements, coordinates, monitors and evaluates options and services to meet an individuals’ health needs through communication and available resources to promote quality cost effective outcomes*”. A working definition used by Yockey et al <sup>169</sup> is “a *mechanism that provides comprehensive management of complex patients through the entire episode of illness to transition back to pre hospital state*”. McPhee and Hoffenberg <sup>170</sup> described case management as “a *systematic process that parallels the nursing process with the case manager being the person accountable for this process of health care delivery*”. The process includes the identification of high risk and high cost patients, planning and implementing of care within an appropriate length of time and evaluating the outcomes.

The American Nurses Association described the goals for case management as “*provision of quality along a continuum, decreased fragmentation of care across many settings, enhancement of the quality of life and cost effectiveness*”. McPhee and Hoffman <sup>170</sup> define the goals of case management as reaching a specified clinical outcome, to provide continuity of care with collaborative practice and to use resources efficiently within a designated time frame. Yarmo and Scanlan <sup>171</sup> recommend that case management in Australia includes pre-admission assessment, discharge planning and outcomes management commencing as early as possible in the episode of care.

## Case Management

Effective bed management requires efficient co-ordination and management of the interventions by the members of the multi-disciplinary teams both within the acute setting and beyond. This section will examine the various strategies used to improve the management and co-ordination of care published since 1990. The emergent strategies integrate case management, care pathways, quality improvement and are supported by information systems. Case management originated in the social work disciplines in early 1980s. Published articles concentrated on mental health services. For the purpose of this review, case management in the psychiatric setting has been excluded.

In the late 1980s case management was extended to the outpatient care of the elderly. As acute care is the most expensive care sector it is imperative to coordinate in-patient and outpatient care to ensure the duration and frequency of admission is appropriate <sup>172</sup>. A review by Friedhoff <sup>173</sup> demonstrates that relatively few patients account for a high proportion of health care costs. Since the early 1990s case management has been implemented as a mechanism to improve the co-ordination of care.

A recent review <sup>174</sup> created a profile of resource usage patterns of acute services use by an elderly Medicare population. 4920 admissions or Emergency Department (ED) attendances were reviewed. They defined “high user” patients (n=75) as having six or more combined ED and inpatient attendances per year. These patients were referred from hospital in the home and had cardiac, diabetic, chronic respiratory conditions. To manage these “high users” they recommended case management and development of disease specific models of care including increased use of home care options for frequent admission and long stay patients and extending the ED role to becoming a link in providing a referral to home health and case management.

## **ROLE OF CASE MANAGEMENT**

Both Venner and Seelbinder<sup>172</sup> and Yockey and Bodier<sup>169</sup> are clear that the case manager's role needs to be separate from bedside nursing to ensure that direct patient care responsibilities do not detract from the case management focus. The case manager:

- plans and co-ordinates all the patient's care,
- is in contact with patients and care providers,
- is acknowledged as having the authority to make the arrangements required for the provision of care,
- is provided with care related information by hospital departments and agencies.

## **FAMILY MEMBERS AS CASE MANAGERS**

Seltzer and Litchfield<sup>175</sup> in a randomised controlled trial undertook a research program that examined the effect of training family members to act as case managers for their elderly relatives. Data was collected in an urbanised hospital setting for dementia and haemodialysis patients. Family members of both groups were randomly assigned to intervention or control groups. Intervention group received systematic training in performing case management activities and control group received only the services ordinarily provided by the hospital social work department. Experimental group family members performed significantly more case management tasks on behalf of their elderly relatives than did family members in the control group. Although the experimental group assumed more responsibility for case management there was no increase in the subjective or objective level of care giving burden.

## **TARGETING CASE MANAGEMENT**

To gain maximum cost benefit and patient care benefit, the literature indicates that case management needs to be targeted to those who will gain the most benefit. The only randomised controlled trial of 302 patients showed that discharge planning for community services and case management was effective in reducing length of stay for high-risk patients only {Hickey et al 2000 ID: 473}. A number of authors identified a high risk population that is likely to benefit from case management,<sup>169 170 173 176</sup>. Schifalacqua et al<sup>177</sup> in a cohort study classified the level of case management based on insurance level into high, medium and low risk. High-risk patients received individual case management, medium risk patients received telephone based case management and low risk patients received telephone contact with a geriatric outreach program.

Some higher need patients such as younger chronically ill patients with long-term care needs may need specifically targeted individualised case management strategies. Dring and Hiott<sup>178</sup> describe the establishment of subacute care unit within the medical centre developed by neurosurgery and gerontology case managers to provide care for patients who were awaiting long-term care. This area was suitable for patients who were medically ready to leave the acute facility but faced difficult placement issues and reduced acute care total costs per day from \$US 680.05 to transitional care \$US 267.18. Friedhoff<sup>173</sup> in a cohort study provided intensive case management to 19 high-risk patients over a 4-month period. The interventions provided were basic and included frequent telephone contact, arrangements for transportation, assistance with applications for social service funding and the provision of medications where necessary. The cohort studied had more frequent admissions but for a shorter period of time. This may have been as a result of recognising exacerbations in the disease earlier. Although the cost of case management accounted for 16% of the total charges for this group of patients it resulted in a 51% decrease in inpatient days and achieved an annual saving of \$US166, 083.

Yockey et al<sup>169</sup> in a cohort study targeted the case management efforts towards patients who had been in a critical care area. They considered it essential to screen patients to determine those who are most likely to benefit; potential triggers for needing case management are multiple risk factors, high cost episodes, significant variances from clinical pathways, high-risk

socioeconomic factors and chronic repeated admissions. Screening processes can be multifaceted and may include review of patient's current chart, data from the admission form, reviewing diagnostic results and patient interview. Dzyacky<sup>176</sup> in an uncontrolled observational study / review describes implementation of a model of case management. A large acute facility in US introduced a model of hospital case management using the expertise of nurses and social workers; a 6% reduction in length of stay post implementation is claimed. Haddock and Johnson<sup>164</sup> cohort study of case management for oncology patients demonstrated a decrease in length of stay and side effects of chemotherapy.

#### **BARRIERS TO EFFECTIVE CASE MANAGEMENT**

Hibberd<sup>179</sup> states that the factors for effective care management across the health service include:

1. *Organisational boundaries that support working across them.*

D'Addario and Curley<sup>180</sup> introduced case management on the acute medical surgical wards through redesigning the process of care for physical therapy and radiology. The major barriers to effective case management were related to discharging patients.

2. *Practitioners with clear roles, responsibilities and accountabilities and the use of multi-professional teams,*

The complex roles undertaken by different disciplines within the health care sector need to be overcome. Chimner and Easterling<sup>181</sup> identified role duplication between nursing case managers and social workers. They redesigned the patient care delivery system, implementing a collaborative patient centred delivery model aimed at achieving patient outcomes within resources and time frames in an inpatient rehabilitation ward. The implementation produced a number of benefits including improved interdisciplinary relationships and decreased LOS.

#### **INTEGRATING CASE MANAGEMENT AND CLINICAL PATHWAYS**

The UK National Pathways Association defines pathways as *"A tool that sets locally agreed clinical standards, based on the best available evidence, for managing specific groups of patients. The pathway forms part or all of the patient's record and allows the care given by members of the multi-disciplinary team, together with the progress and outcome to be documented."*

Pathways have been introduced widely since their introduction to health care in the mid 1980s as a strategy for managing defined clinical populations. For complex and high needs patients these pathways can be further supplemented by the support of a case manager. Clinical pathways are starting to extend beyond acute hospital care.

Clinical pathways support effective case management as shown by a 0% readmission rate over a period of two years when a cohort of congestive cardiac failure patients were managed via a combination of case manager and care pathway<sup>172</sup>. Winstead-Fry et al 1995<sup>182</sup> described a further example of the introduction of clinical pathways supported by case management for a cohort of Congestive Heart Failure patients. The model included the use of a standardised care pathway and the introduction of some outpatient and home based therapies. In the cohort studied there was a reduction in length of stay, reduction in the number of hospital admissions and improved patient functional status.

Marr and Reid<sup>183</sup> in an uncontrolled observational study described the introduction of case management and clinical pathways in a neuro-science clinical area. They reported a reduction in length of stay following the introduction of care pathways and case management. In a study by

DeWoody and Price<sup>184</sup> case management and clinical pathway use was initiated on admission for trauma patients. The average reduction in length of stay of 0.81 days was not statistically significant.

### **COLLABORATION WITH OTHER CARE PROVIDERS**

To be effective, care co-ordination must extend beyond the acute hospital boundaries<sup>185</sup>. This may include telephone follow up in the transition phase<sup>169</sup>. Schifalacqua and Hook<sup>177</sup> in a cohort study utilised a collaborative model of physician care panels and community case management. The success of this model was measured in terms of disease management, readmission rates, and hospitalised days and physician satisfaction with case management. Overall this study demonstrated a decrease in length of stay, decreased hospital days per thousand and a decrease in hospital readmission rates.

### **TOOLS TO ENABLE EFFECTIVE CARE COORDINATION**

As stated earlier, to gain maximum benefit case management needs to be targeted to high risk and high user patient groups. Clinical information systems or computerised databases that are accessible to multi-disciplinary teams can track patients across the continuum of care and identify high users of health services<sup>169 174</sup>. Both Abrahams and Macko<sup>186</sup> and Becker and Whitbeck<sup>187</sup> describe the need to span the continuum of care to effectively manage a group of patients for whom the risk is being carried. They concluded that in order to adequately serve a medically complex and functionally impaired elderly population it is essential to develop cooperative relationships and mechanisms for information exchange with providers at all levels of the systems, particularly reaching across the divide between acute and long term care.

### **PUBLISHED IMPROVEMENTS**

Predominantly the literature measures the success of case management programs in terms of length of stay and readmission rates. Publications demonstrated that case management leads to reduction in:

#### **1. Costs**<sup>173 178 186 188</sup>

Spooner and Yockey<sup>188</sup> in a cohort study established a model of case management for patients who had been admitted to a critical care area. This study demonstrated a decrease in the number of inpatient / outpatient admissions following the assigning of a case manager and a decrease in the average direct cost per encounter. Although the study is limited as it did not undertake a pre evaluation there was an indication that coordination of services improved, services were allocated more appropriately, there was more patient involvement in self care and the case manager provided valuable consultation after discharge.

#### **2. Readmissions**<sup>172 177 180 188</sup>

Gow and Berg<sup>189</sup> in a case controlled study of case management in a general medical ward setting looked at the effectiveness of case management. Initially 18 patients with complex medical problems, admitted to a medical ward under the care of a single multidisciplinary team had their care coordinated over that entire episode of illness. A control group of 59 similarly complex patients was used. The study did not demonstrate a difference in length of stay, however three patients in the control group may have had preventable readmissions if their care had been coordinated through their initial admission.

#### **3. Length of stay**<sup>164 170 176 177 180-185 190 191</sup>

McPhee and Hoffenberg<sup>170</sup> describe the successful implementation of a model of case management for infants with failure to thrive. The use of a clinical pathway led to the establishment of an outpatient service, which was used as an alternative to inpatient admission. This study demonstrated an average decrease in length of stay from 14 to 7 days.

#### 4. Increased patient satisfaction<sup>164 173 188 189</sup>

Spooner and Yockey<sup>188</sup> and Yockey and Bobier<sup>169</sup> in the pilot phase of their case management program for patients who had a high risk and high cost episode demonstrated a decrease in costs, increased productivity and improved patient satisfaction. Hospital readmissions and emergency room attendances decreased for patients who had a case manager. In a study by Friedhoff<sup>173</sup> patients were receptive to case management and felt well cared for, however as case management targets a high risk / high needs group there is a risk of increased dependency in these patients. Schurdell and Pendleton<sup>192</sup> reported that patients appreciated the concern of case managers. Haddock and Johnson<sup>164</sup> introduction of a case management model showed an increase in the effectiveness of patient teaching, patient appreciation and continuity of care for patients admitted for chemotherapy. Gow and Berg<sup>189</sup> carried out a case controlled study of case management in a general medical ward setting. Communication, coordination, discharge information, involvement in discharge planning and information on post discharge services were rated by study participants as being significantly higher and no dissatisfaction was reported.

Sherman and Johnson<sup>190</sup> in a case control study of oncology patients utilised Clinical nurse specialists as case managers who planned, coordinated and facilitated care on 36 bed unit. Patient satisfaction showed a statistically significant increase in the 6 months following the introduction of nursing case management, however there was little change in perceived quality of life. Barry and McQuade<sup>191</sup> describe a cohort study describes a case management model for sufferers of rheumatoid arthritis. The study demonstrates high levels of patient satisfaction and some reduction in LOS for inpatient episodes.

#### STAFF SATISFACTION

Spooner and Yockey<sup>188</sup> in a cohort study established a model of case management for patients who had been admitted to a critical care area. This model was an interdisciplinary collaboration and holistic approach to acute case management. One year following the introduction of the program staff identified continuity of care before discharge and continuation of care following discharge as benefits of case management. Considered especially important was following patients after discharge and having information available on admission. Physicians felt that the case manager had a good knowledge of the patients and that the availability of case management prevented readmission. There was a decrease in both physician and patient complaints. Staff felt there was an improvement in workflow, communication, and addressing patient needs in a timely manner.

Schurdell and Pendleton<sup>192</sup> reported that other staff appreciate the role of case managers and that this increased job satisfaction. Gow and Berg<sup>189</sup> reported that the 21 clinical staff involved in their study agreed that there was a significant improvement in care coordination with respect to efficiency, reduction of workload and better communication.

## **SUMMARY**

Case management is a mechanism that provides comprehensive management of complex patients through the entire episode of illness from community to hospital and back to community. The value of case management alone in reducing inpatient admissions is not clearly demonstrated Challis 1993, Fitzgerald et al 1994 although it may improve patient well being. The only randomised controlled study of case management showed that when combined with discharge planning, case management was effective in reducing length of stay for high-risk patients only {Hickey et al 2000 ID: 473}. The majority of the papers describe cohort studies. They provide some evidence of improvements in length of stay and patient and staff satisfaction. Of question is the rigour of these studies in terms of providing conclusive evidence that the improvements purely relate to case management and/or clinical pathways. Case management and clinical pathways have assisted in organising health services to get the most out of resources in order to treat the patient at the right time in the right setting by reducing fragmentation, reducing duplication and improving co-ordination across health care providers. Case management and clinical pathways need to be targeted to “high users” of the health services and “high risk” patients with complex health and social needs. Clinical information systems are needed to identify these groups, support case management activities, allow the sharing of information (with patient consent) and facilitate the extension of case management activities outside of the acute setting.

# CHAPTER EIGHT - CHRONIC FRAIL AGED PATIENTS

## Models of care for older patients in hospital

### TRANSITIONAL CARE

The problem of delayed discharges for short-term acute hospital patients has received some attention in Australia, UK, and Scandinavia. While the term “*bed blocker*” is sometimes used for this group of patients some authors have questioned the appropriateness of this term for this predominantly older group of patients<sup>193-195</sup>. The authors of a retrospective study of 428 people with delayed discharge in Uppsala, Sweden<sup>194</sup> concluded that this group represents generally frail, dependent persons who need help from others for their daily living activities. They raised questions regarding the capacity of other sections of the care system to meet the needs of these people on discharge. Such service provision requires funding, which with current State / Commonwealth arrangements may be difficult to achieve. Brymer and Kohm<sup>196</sup> using a retrospective review of social work records for 1985-92, found that the introduction of coordinated geriatric and discharge planning significantly decreased the percentage of beds occupied by patients waiting for transfer to long term care.

A study<sup>195</sup> of Australian inpatient morbidity data for 1988-9 and 1989-90 found that 7% of Occupied Bed Days (OBDs) were used by elderly people who were discharged home after stays of 35 days and probably many of these could have been discharged to the community had appropriate support services been available. Older patients who probably should have been receiving care in nursing homes used another 6-9% of OBDs. It would be valuable to have more recent data on this situation.

With increasing concern about pressure on inpatient beds, attention has shifted to *transitional, intermediate* or *near acute care* services for people who no longer need acute care, but are not ready to return home. Such services facilitate the transition from hospital to home, and from dependence to greater functional independence. Such care is generally time limited, 14 to 21 days, and is not convalescent (need time not therapy) or long term care (no goal of functional improvement). These patients may be recovering from a minor stroke or need intensive therapy. These services require little medical input, and can be staffed by nurses and therapists. In a brief article by Vaughan and Hanford<sup>197</sup> some initiatives in this area in the United Kingdom are described. Cited examples include “nurses spot purchasing tailored home-care packages from social services; fund holding GPs working with practice and district nurses to develop enhanced community nursing and therapies services; local councils working jointly with health services to renovate housing stock for nurse led intermediate care; community hospitals being revitalised to provide specialist-led intermediate care services; joint acute trust and community trust outreach services developing tailor made discharge packages of care for people who present to ED but do not require admission; and multi-professional rapid response services to work in people’s own homes”. These have not been evaluated but represent innovative attempts to address a problem.

### ACUTE CARE FOR THE ELDERLY

Fretwell and Raymond<sup>198</sup> performed a randomised controlled trial to evaluate the effectiveness of multidisciplinary assessment and care planning in a special unit for the elderly (over 75 years), versus usual care. They found no significant differences between the groups for length of stay, hospital cost, mortality, or physical/ mental function. One problem in this study was the disconnect between acute and community services, which meant that while the acute team could develop a care plan, they had no control over its implementation in the community sector. In a second randomised controlled trial<sup>199</sup> patients identified as having at least one risk factor

received a comprehensive inpatient geriatric assessment with limited follow-up. The control group received usual care. The intervention did not improve functional status or survival of the group, leading the authors to conclude that frail elderly do not benefit from a single inpatient geriatric assessment, and may in fact need comprehensive assessment with continuous management of their care. The problem of older persons who are hospitalised for acute illness and lose their independence after which they are discharged to long term care was investigated in another randomised controlled trial<sup>200</sup>. Patients either received usual care or were cared for in a special unit designed to help older persons maintain or achieve independence in self-care activities. Fewer patients in the intervention group were discharged to long term care institutions, demonstrating the benefits of special units for older persons with acute illness.

Covinski et al (1998) and Covinski et al (1997) used a randomised controlled design to compare the costs of caring for 650 medical patients on a special unit, the Acute Care of the Elderly unit (ACE), with costs of usual care. This unit was designed to help older people maintain or achieve independence in self-care activities. While the intervention increased costs, the group had shorter length of stay, and overall costs to the hospital for the ACE unit were less than costs of usual care. Ninety day nursing home use was also lower in the intervention group (ACE) than in the usual care group. Ninety day re-admission rate and care giver strain scores were similar for the two groups. Patients receiving ACE had improved functional outcomes on discharge.

#### **INPATIENT GERIATRIC ASSESSMENT UNITS**

Two studies describe the introduction of specific inpatient geriatric assessment units. One cohort study {Fillit 1994 ID: 193} spanned six years and found improvements in quality of care, significant reductions in length of stay, and significant cost savings for a group of patients presenting with complex and difficult problems, following the introduction of a Geriatric Evaluation and Treatment Unit. A case control study<sup>201</sup> also found benefits of establishing a hospital based geriatric assessment ward, including increased throughput, more active investigations and treatment, and a tendency towards shorter length of stay.

Trella<sup>202</sup> describes a cohort study in which multidisciplinary case management was used in a geriatric acute medical unit to provide “quality care in a cost effective manner”. The author concluded that care was better coordinated, and that therapy and discharge planning were implemented sooner in the special unit than in the control unit. There was also a decreased length of stay, improved financial costs and increased physician compliance in the special unit.

Older persons with acute illnesses have a significantly greater risk of adverse events than young people. Such events can prolong length of stay, and are traumatic for the patient. Five different approaches used in the US to improve hospital outcomes for older persons are described in the article “Nurses Improving Care to the Hospitalised Elderly” {**Anonymous 1994 ID: 342**}. The models are:

1. Use of a clinical nurse specialist to define and implement strategies for a specific geriatric problem such as delirium. This Geriatric Nursing Specialist (GNS) model is relatively inexpensive, and effective, but as the advice comes from an expert outside the unit, it may take longer to influence and change nurse practice. The model was developed at the University of Chicago hospitals.
2. Creation of a specialty unit to provide care to acutely ill older patients using a collaborative team approach. This Acute Care of the Elderly (ACE) model is expensive, but associated with quick implementation of innovative care. It was developed at the University Hospitals of Cleveland, USA

3. The Geriatric Resource Nurse (GRN) model has its origins in several hospitals in the New England area, and has now been implemented more widely across the United States. The model incorporates the expertise from various resources in a unit based, nurse centred geriatric care program.
4. The Comprehensive Discharge Planning model (CDP), used at University of Pennsylvania Hospital, targets older patients at high risk of poor outcomes after discharge. This model has succeeded in lengthening the time between discharge and re-admission, compared to the hospital's regular units.
5. The Case Management model (CM) was developed at the Beth Israel Medical Centre in New York City. This is a multi-disciplinary model in which selected staff nurses are designated as either circulating case managers or unit based patient care managers.

### **GERIATRIC ASSESSMENT**

Another randomised controlled trial investigated the impact of annual comprehensive geriatric assessments and follow up for people living in the community, who were 75 years of age or older<sup>203</sup>. They found positive benefits of such assessments in that those receiving them showed a delay in the development of disability and a lower rate of permanent nursing home stays. Acute admission and short term nursing home admission did not differ between the groups. This is particularly relevant to the Australian context given the recent introduction of a Medical Benefit Schedule item for health assessments for people over 75 years old.

### **ACUTE/LONG TERM CARE INTERFACE**

One author<sup>204</sup> presented the view that care for the elderly is fragmented, and that the present model of medical care is still very acute and episodic, with little attention given to management of chronic illness. Acute and long term care are seen as discrete health delivery systems by health providers; whereas to the individual, an inpatient admission is just one of many care elements in their health care continuum. Older people with acute/ chronic needs are at high risk of multiple hospital admissions. Management strategies such as case management and care coordination facilitate communication between formal caregivers and improve continuity of care. Providers of mental health services have recognized this need, and have quite good mechanisms for sharing assessment data, collaborating on treatment plans, quickly accessing pertinent information as individuals move across acute and chronic care models<sup>205</sup>.

Rather than “cure”, the goal for this group is enhancing function and decreasing disability progression. Care planning for this group is typically limited to “discharge planning”; the purpose of which is to move the patient to the next level of care. The structure of health funding which treats acute and long term care as separate from funding and programmatic perspectives mitigates against integrated care. Such integration requires condition specific care coordination across time and place of service. It also requires integration of information systems to create a record that contains clinical information and functional diagnoses, and is shared across all levels of care provider. The integration must include finance to address the multiple payers at multiple levels of care<sup>204</sup>. To optimally utilise beds, and to provide the best quality, efficient care that the frail elderly rightly deserve the authors recognize the need to develop good relationships between acute hospitals and nursing homes.

The Australian Coordinated Care Trials (1997-9) (unpublished) attempted to address the problem of providing and financing continuity of care across acute and community settings for older people with chronic illness. There were nine trials across all states of Australia, involving 16,500 people. The primary objective of the trials was to use fund pooling and care coordination to provide better care for people with chronic and complex health care needs within existing resources. The final evaluation document has not been published, but will no doubt provide valuable information on providing care for this group.

Edelstein and Lang <sup>206</sup> describe an uncontrolled observational study of 265 older persons receiving short term case management and support services for up to 6 weeks post discharge from an acute hospital. While client satisfaction was high, they were not able to demonstrate substitution of low cost for high cost services, and program funding was discontinued. This highlights the necessity for such programs to benefit funders and recipients. Some health providers have tried to overcome funding issues by capitalising on existing linkages between services to provide continuity of care for older persons. The importance of providing comprehensive case managed rehabilitation in the post-acute continuum is emphasised in a number of papers <sup>207</sup>.

### **RISK FACTORS**

Older people comprise a significant proportion of Emergency Department presentations. Factors responsible for this include higher rates of illness and poorer health status. A Canadian uncontrolled observational study <sup>208</sup> reported that older ED users, in comparison with younger adults, are more likely to present with life threatening or urgent medical conditions; have presenting complaints related to falls, self care or social issues; have cardio-respiratory complaints; require a number of tests; have longer ED stays; use ambulance transportation; and be admitted. Follow up studies for elderly patients after release from ED indicate considerable loss of independence, substantial rates of hospital admission or death, and higher rate of return to the ED than for younger patients. The authors recommend the development of a risk screening instrument to identify those elders likely to make repeated ED presentations, in order to reduce hospital utilisation and cost and improve quality of life for the group.

A cohort study of over 15,406 people in West Central Scotland examined hospital utilisation in the group over a 23-year period to determine the influence of risk factors on subsequent hospital admissions. Members of the group were aged 45-64 in the early to mid 1970s. Those at higher risk of admission were the older members of the cohort, especially men, those with low FEV1, smokers, those who were under-weight or obese, those with abnormal levels of blood sugar, those with high blood pressure, and those who lived in the most deprived areas. They concluded that programs, which affect these determinants of ill health may be useful in reducing age specific admission rates.

As well as risk of admission, there is a risk of delay in discharge. Such delays affect patient quality of care, decrease bed availability and increase resource utilisation.

### **APPROPRIATE ADMISSIONS OF ELDERLY PEOPLE**

Australia's ageing population and changing patterns of healthcare delivery are combining to increase the number of older people using acute hospital services. A number of papers examine the issue of resource utilisation by older people, and whether admissions of older people are appropriate or avoidable. The studies were either case control, cohort or uncontrolled observational.

Only one study compared resource use between younger and older patients. This uncontrolled observational study <sup>209</sup> found that when cared for by the same physicians, the elderly are more likely to be admitted to the hospital rather than be successfully cared for in a short stay unit, to stay in hospital longer and to have a greater number of consultants than younger patients. This perhaps is not surprising given the increased likelihood of co-morbidities in the elderly.

Using an uncontrolled observational design, a Canadian study <sup>210</sup> used the Boston Appropriateness Evaluation Protocol to assess 260 admissions (all ages). Results of the study suggested that 21.5% were inappropriate admissions, had inappropriate days of care or both. A

cohort study <sup>211</sup>, based on admission of people over 65 years of age, at a Dublin teaching hospital, using the same protocol, considered 29.1% of days of care to be inappropriate. Physician and hospital factors accounted for almost one half of the “inappropriate” days, rehabilitation services accounted for one quarter, and lack of availability of alternative care facilities accounted for 39.5% of inappropriate bed days.

An increasing number of people living in care are reported to be presenting to Emergency Departments. There is also a concern that they are often inappropriately admitted to acute hospital beds. An Australian prospective study of 184 consecutive admissions to hospital following Emergency Department attendance, for people over 65 years of age examined these questions. The authors concluded that the vast majority of admissions from residential facilities are both appropriate and unavoidable. Only 2 admissions (~1%) were judged “avoidable” and 19 (10%) could have been prevented through the provision of specialised care within the residential setting.

In another Australian study, 530 consecutive presentations to the Emergency Department, of people aged over 70 years, were assessed in terms of admission/discharge outcome. 386 were admitted. Medical need was found to be the predominant factor in making a decision to admit, although Activities of Daily Living function was a factor in outcome. The authors concluded that elderly patients who present to the ED do so because they predominantly have an acute illness. This cohort is heterogeneous and their needs require individual assessment.

In a Canadian study <sup>212</sup> all transfers of residents from a nursing home to hospital during a three year period were analysed for appropriateness, using retrospective review of their records. 26% of residents were transferred each year, with a total of 102 transfers overall. On the basis of the outcome measure, 7% of all transfers could have been diagnosed and treated in the nursing home and were considered inappropriate.

A survey <sup>213</sup> of acute medical beds in Northern Ireland was carried out on two separate days in June 1996 and January 1997. There were 1300 beds in the survey with 209 occupied by nursing home residents over the 2 days. The assessing doctor judged that 9.6% of admissions in June 1997 could have had investigations and or treatment instituted in the nursing home. The proportion of acute beds occupied by nursing home residents was 7% in June 1996 and 10% in January 1997. The authors concluded that there was a low proportion of nursing home residents in whom admission was unnecessary.

The authors of a survey of 689 consecutive admissions to an Inner London Trust during a one week period <sup>61</sup> concluded that inappropriate admissions were comparatively rare. 207 of the admissions were of people over 65 years of age and only two of these admissions were considered inappropriate (<1%).

Admission to an acute medical bed is not always the best way to look after elderly people. The environmental change associated with moving from home to hospital is often detrimental to their health, with problems such as confusion, falls, loss of function and other adverse events. Other options include special units for the older people with acute illness (as discussed above), augmented home, hostel or nursing home care, and general practitioner beds in hospitals <sup>214</sup>.

#### **ETHICAL ISSUES IN HEALTH CARE FOR THE ELDERLY**

See <sup>202 215</sup>

## SUMMARY

As the aged population continues to grow one of the major challenges facing the acute health system is how to provide appropriate quality care for older patients admitted to hospital. They present a risk in terms of adverse events, deterioration in independence, and prolonged stays in acute beds. The problem of long-term care patients in acute beds is exacerbated where there is a serious shortage of nursing home beds or a serious shortage of hospital beds.

From the mid 1980s hospitals tried a number of models to improve the quality of care for the frail elderly population admitted with acute medical illnesses. Nine papers on models of care were examined in this review. Five described randomised controlled trials, one described a cohort study, one a case control study and two reviews. They were all published between 1990 and 1998. The main points to emerge are that care planning is not effective if it is just limited to the inpatient setting; comprehensive discharge planning is effective, and is most effective if targeted to "high risk" patients. Special units for frail aged medically ill patients were effective in helping people to develop or maintain functional independence and reduced the likelihood of admission to a long term care institution following discharge. The costs in such units were not higher than usual care.

There are many different models for the provision of care for the frail elderly, and most are successful in improving both the quality of care and costs. Appropriate management of admissions and discharges is essential, as is coordinating care that requires transfer of information from one provider setting to another. Hybridisation of provider environments is suggested as a strategy to enhance collaborative work between providers on behalf of patients. It is essential to place patients in the most appropriate care environments. Discharge planning, which is very relevant for this group, is discussed in more detail in Chapter 7. Demonstration projects are useful for assessing the options.

While there is a low percentage of inappropriate or avoidable admissions to acute hospital beds, the provision of special assistance to residential care facilities may allow some people to be assessed and treated in situ. For some people this may be more appropriate than a hospital admission. Data provided in the literature indicates that 7-10% of residential care admissions/presentations to Emergency Departments could be treated in this way.

# CONCLUSIONS

## Implications for Victorian health services

Based on our review of the literature on bed and patient management strategies (post 1990), we have made a number of observations and drawn out some implications for the Victorian health system.

The literature review focused mainly on developments in Australia, Canada, New Zealand, the United Kingdom and the United States. We have tried in our reflections on the literature, to compare practice in Victoria with that in countries with comparable health systems. Our first observation is that, based on published material, there is very little that is particularly innovative or new in terms of bed and patient management strategies. Most strategies have been in place for the last two decades, and have been subject to incremental development, refinement and implementation. It is our impression that most of the strategies are in use in Victoria, although not uniformly. Their adoption has been dependent on interested and energetic clinicians and organisations. There is no consistent approach across or within health services, and we are uncertain of the role of the publication and dissemination best practice models. Most of the existing practice involves adapting and adopting rather than inventing. External incentive systems have been influential in the adoption of best practice in some cases, for example "Hospital in the Home". In other areas, such as emergency departments, the available incentives (Hospital Access Program) have not resulted in consistent and uniform uptake of best practice across the state. The examples in the literature indicate that clinical leaders have a significant role to play here, in understanding health priorities, assessing options and leading in bringing about change. This of course requires organisational and government support and encouragement for the adoption of best practice, and development and trialing of innovative solutions.

There is evidence that a number of strategies do lead to improved bed and patient management, and these should be generally adopted. They include discharge planning, pre-admission clinics, day of surgery admission, day surgery for certain procedures, and possibly Hospital in the Home, fast track, observation wards, and targeting high risk patients for special programs of care. Most of the strategies do require additional resources or diversion of resources. For example early discharge requires additional community support services, fast track and observation wards require structural and process re-design and practice change. In addition there are indirect costs such as provision of information sharing systems that cross the acute, community and primary boundaries, and more intangible requirements such as organisational and clinical commitment to create the environment and culture to support such changes.

The newer strategies include use of alternative accommodation for people who would previously have occupied an acute inpatient bed. Some of these strategies involve alternatives to admission such as treatment in the patient's residence. Others involve transfer to alternative accommodation for people in acute inpatient beds who are not ready to return home, but no longer require acute treatment. Various names have been used for such accommodation including "near acute" and "intermediate care". The main theme in such strategies is appropriate care in the appropriate setting. Such strategies have resource implications for health services, Local, State and Commonwealth Health Governments. The addition of near acute beds will increase bed supply and costs unless acute beds are closed. If the intention is additional beds, then the cost of such beds may be lower than acute beds. In addition there are workforce issues associated with staffing such beds. Such interventions lead to consideration of supply, demand and capacity issues, which must be addressed.

## **The way forward**

1. Identify successful models of practice change/ best practice within Victoria and attempt to replicate them across individual health services
2. Identify a list of best practice that should be provided at each health service. Develop priorities, and create incentives for implementation
3. Address the issue of public expectation of health care delivery. This is a broader issue than DHS can deal with alone, and maybe a broader issue than just health.
4. There is a range of identified strategies to keep people in primary care and they require additional resources

## **Models of Good Practice**

In the opinion of the review team there are a number of key studies, which demonstrate successful implementation of strategies to improve bed and patient management. For each of the interventions we have provided details of one of these studies. In some cases it is an example of best practice: in others it is a paper of particular value in understanding the topic. In some areas, such as case management, there a number of papers, none of which stood out. There were difficulties in interpreting the evidence for some topics. The literature in HITH illustrates this problem. While the most systematic review concludes that HITH is unproven, their criteria were very rigorous. In contrast others are very positive about the outcomes from HITH. The differences are sometimes due to the different viewpoints of academics and clinicians, and their requirements for evidence. While this does not diminish the value of reviews such as ours, it highlights the difficulties faced by health services managers and clinicians in implementing best practice. We have provided cross references to the relevant discussion in the text for the key studies identified by the review team in each particular area. One of the best reviews is the NZHTA Systematic Review, which although lengthy and slightly out of date is comprehensive. Key strategies from the literature are summarised below together with information on target group, benefits, risk and benchmarks.

## SUMMARY - MODELS OF GOOD PRACTICE

Intervention	Key Studies	Target group	Benefit	Risk	Benchmark	Issues
PRE-ADMISSION PROCESSES						
Pre-admission clinics	Graham et al 1996 (page 7)	Appropriate for all areas of surgery	Cost savings Reduced theatre cancellations	Must be targeted or costs increase Costs shift	22-33 % of all elective surgery patients	May require additional staff Role of surgeons and anesthetists
Admission on day of surgery	Kerridge et al 1995 (page 8)	All, except some elderly patients	Reduced LOS Patient outcome same	Requires practice and organisation changes	50%++ of all elective surgery patients	
Day Surgery	Royal Australian College of Surgeons Day Surgery Guidelines 1997 (page 9) Boothe and Finegan 1995 (page 9)	Based on clinical criteria	Safe Reduces costs High patient satisfaction	Preferably co-located within general hospital Generally not appropriate for procedures requiring >60mins anesthesia.	Outcomes: <3% require unplanned re-admission post surgery Inputs: Range of 45-70% of elective surgery is performed as day cases	Which procedures? What percentage of elective surgery? What level of re-admission is acceptable (2-3%?) Need special facilities for paediatric day surgery Location - stand alone or co-located

Intervention	Key Studies	Target group	Benefit	Risk	Benchmark	Issues
EMERGENCY DEPARTMENT						
Re-design	Jelinek et al 1999 (page 13)	All presentations	Improved hospital functioning			Cost of re-design
Use of new technologies:	See Hider et al 2000 (page 6)	Certain clinical groups	Reduced admissions		No	Cost of technologies
Use of senior staff in ED	Gaskill et al 1995 (page 6)	All presentations	Reduced admissions Reduced diagnostic tests	Reduces training opportunities		Changed practices Cost
Fast track	<a href="http://www.ih.org/collaborative/completed/bts-redwaits.asp">http://www.ih.org/collaborative/completed/bts-redwaits.asp</a> (page 14)	Myocardial infarction	Decrease in 30-35 day mortality for 18-25% of patients	30 day and 1 year mortality no different	yes	Long term mortality unchanged
Observation ward	Williams, et al 2000 Goodacre 2000 (page 20)	Chest pain, asthma, paediatric and elderly patients	Reduced waiting time in ED for admission to beds Increased efficiency Decreased average LOS Decreased diagnostic tests Decreased total bed days Increased quality of care for elderly Cost savings (chest pain units)		No benchmark In UK, 0.1-13.3% of ED presentations admitted to observation unit	Determining who will benefit from use Development and implementation of guidelines Additional beds or as substitute for inpatient beds?

Intervention	Key Studies	Target group	Benefit	Risk	Benchmark	Issues
INPATIENT INTERVENTIONS						
Hospital in the Home	Cochrane Systematic Review Shepperd & Illiffe 2000 (page 24 ) Clinical Epidem. & Health Service Evaluation Unit 1999 (page 25)	Selected diagnoses, lower complexity, Intravenous anti-biotic therapy, anti-coagulant therapy	Reduced costs Good patient acceptance Patient outcome not different from in-patient setting	May not suit older patients	Intravenous anti-biotic therapy, anti-coagulant therapy	Provision of after hours support Extend to hostels and nursing homes, and extend list of procedures
Discharge Planning	Cochrane Systematic Review (page 27) Naylor et al 1999 (page 30 )	All patients especially "high risk" - identified through risk screening tool	Reduced LOS Reduced re-admission rate Reduced costs	Cost shifting from acute to community and primary Moving costs within hospital process		Communication between hospital and community and primary Need interim care beds and other long term care options Model of discharge coordination (ward/ ED/other, and discipline) Capacity of receiving services to meet additional demand
Care Coordination /Case Management	Hickey et al 2000 (page 34 )	High users/ high risk patients	Reduced LOS Staff satisfaction			

Intervention	Key Studies	Target group	Benefit	Risk	Benchmark	Issues
Frail Elderly Special units for acute medically ill Discharge planning Transitional/ intermediate or near acute care	Anonymous 1994 (page 40 )	Long stay/ high needs patients	Increased continuity of care Decreased acute bed utilisation Increased independence on discharge Increased quality of care Decreased LOS Decreased or same cost			Connection between acute, community, primary and private sectors

# APPENDIX ONE - METHODOLOGY

## DEFINITION

The Commonwealth Department of Health and Aged Care states that, 'integrated bed and patient management is the management of all admissions, stays, transfers and discharges by a hospital within a framework that integrates and coordinates processes related to these activities. To do this the hospital must balance the access demands of the emergency department and elective surgical and medical patients to available beds' <sup>216</sup>.

This definition was used to define the scope of the literature review.

## Objectives

The literature review aimed to:

- Search extensively the health, medical and nursing literature to identify studies relevant to integrated bed and patient management
- Summarise the relevant literature, including assessment of the methodology and contribution to knowledge in the topic area
- Identify issues of relevance to the Victorian health system, including models of good practice and potential policy approaches

## Identification, selection, classification and retrieval strategy

### IDENTIFICATION OF MATERIAL

To identify articles on integrated bed management we addressed a number of specific questions (see below). We relied largely on published material identified through available electronic databases. Although we also incorporated some relevant "grey literature" material, our primary reliance on electronic sources may have limited the exposure this material received in our search strategy.

We used an initial scoping search to identify the breadth of the field. Two reviewers independently assessed each identified abstract or citation to select material appropriate for the review, using pre-determined inclusion and exclusion criteria (see below). Any disagreement was settled by discussion. Based on the issues identified in the articles retrieved, further specific questions were investigated.

### INCLUSION CRITERIA

- English language articles, or articles with English abstracts, originating in the USA, Canada, United Kingdom, Holland, Scandinavia, and New Zealand
- Articles published from 1990 onwards
- Articles of relevance to the acute care setting

### EXCLUSION CRITERIA

- Articles in a foreign language without English abstracts
- Articles published before 1990.
- Articles addressing mental health issues

- ❑ Articles addressing paediatric intensive care
- ❑ Articles specifically of clinical interest, addressing treatment options, methods etc
- ❑ Articles addressing models of nursing care, as we understand the Nursing Workforce Unit has covered this area
- ❑ Articles addressing call centres and telephone triage services, as we understand that DHS has already researched this area

#### **CLASSIFICATION OF METHODOLOGY**

Articles were classified on the basis of potential for bias in their study design, following the hierarchy of evidence outlined in *A Guide to the Development, Implementation and Evaluation of Clinical Practice Guidelines* (National Health and Medical Research Council, Canberra, 2000):

#### **RETRIEVAL STRATEGY**

For each developed question we performed pre-determined search strategies (see below) within the following electronic databases:

- ❑ Cochrane Library CD-ROM, Issue 4 2000
- ❑ Ovid Medline 1966 – December Week 4 2000
- ❑ Ovid PreMedline December 8 2000
- ❑ Ovid CINAHL 1982 – November 2000
- ❑ Ovid SocioFile 1974 – December 2000
- ❑ Informit Australasian Medical Index December 2000
- ❑ Informit APAIShealth – Health October 2000
- ❑ Informit Health and Society October 2000

### **Questions investigated for this report**

#### **PRIMARY QUESTION**

- ❑ “Does integrated bed management lead to improved health care services?”

#### **SECONDARY QUESTIONS**

- ❑ Is case management within the acute sector an effective method of reducing length of stay, and improving patient satisfaction and outcomes?
- ❑ Are pre-admission services effective in maximising theatre utilisation, reducing length of stay, and improving patient satisfaction when compared to standard procedures? (Pre-admission services were defined as pre-admission clinics, day surgery and day of surgery presentations)
- ❑ Is same day surgery as effective as multi-day surgery?
- ❑ Do short stay areas in emergency departments improve bed and patient management? (Inclusion criteria included articles addressing 24 hour access to diagnostic services, access to senior medical staff, and fast track services in ED, and short stay and observation wards in ED, and medical admission units.)
- ❑ Does fast tracking through emergency departments in acute facilities reduce length of stay and improve patient outcomes when compared to standard hospital admission?

An additional question on theatre scheduling was not pursued due to time constraints.

While undertaking the literature review large volumes of literature regarding critical care, high dependency and specialty areas were retrieved. This literature pertains to the appropriate use of beds, strategies for transition to ward areas, post specialty area management, factors influencing utilisation, step down areas, management of longer-term ICU patients and supply of beds. Due to time limitations we have not reviewed this topic, although there may be value in undertaking a further review of this area in relation to integrated bed management.

### Nature of reports identified

In all 1290 articles were identified and most were found to have some relevance. The review is based on analysis of 1107 articles and reports. There were few systematic reviews, although we found a number of randomised controlled studies, and many cohort and case control studies. The randomised controlled studies were often limited by small sample sizes, and we have generally indicated this. For some areas, the only information available is "expert opinion" and descriptive studies, which may be prone to bias.

### Search strategies and results for primary and secondary questions

#### Question 1: “Does integrated bed management lead to improved health care services?”

##### SEARCH TERMS:

The following terms were used to search electronic databases:

Field of focus	Search term
Bed management	Bed occupancy, bed
Hospital	Hospitalization (includes length of stay, patient admission, patient discharge, patient readmission, patient transfer); discharge planning; early patient discharge; transfer, discharge; readmission;
Specific area of interest	Trends; methods; utilization; organization and administration

### RESULTS

The search retrieved a total of 994 individual records. A first scan to identify records of possible relevance reduced the number to 332. The high proportion of initial irrelevance is explained by the use of broad search strategies in the databases, which do not all offer subject-heading indexing. Two reviewers then independently evaluated the remaining records.

The main themes from this material are summarised in Table 1. Secondary questions were formulated on the basis of this first cut.

*Table 1 Summary of key themes identified from initial scoping search*

PRE-ADMISSION PROCESSES	POST ADMISSION PROCESSES	DISCHARGE PROCESSES	AGED CARE
Streaming Emergency department Triage Transition	Models of nursing care Care coordination Case management Medical practitioner skill level GP beds	Discharge Coordination Planning Last day of stay Community care	Specialised geriatric care units Nursing home/ acute interface Nonagenarians

from/through Treatment delays Observation areas Short stay facilities	Seniority of staffing Physician skill level Timing (day of week/public holidays) Critical care Impact of long stay patients Practice guidelines High dependency interim care beds Admission criteria Decision support systems Predictors of resource need Predictors of LOS Computer simulations	options Patient hotels Diversionary strategies Hospice care Augmented home care Telehealth Respite	Trauma in the aged Bed blocking
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**Question 2 “Is case management within the acute sector an effective method of reducing length of stay, improving patient satisfaction and patient outcomes?”**

**SEARCH TERMS**

The following terms were used to search electronic databases:

Field of focus	Search term
Case management	Case management; patient care planning;
Acute care setting	Acute care; tertiary care; inpatient; acute disease; hospitals;
Outcomes	Length of stay; patient satisfaction; outcome assessment
Exclusion terms	Mental health; psych/otic/iatric; homeless

**RESULTS**

The search retrieved a total of 254 individual records.

**Question 3 “Are pre-admission services effective in maximising theatre utilisation, reducing patient length of stay and increasing patient satisfaction when compared to standard admission procedures?”**

**SEARCH TERMS**

The following terms were used to search electronic databases:

Field of focus	Details
Patients	Surgical procedures, elective; surgery, elective; elective surgery; day surgery; ambulatory surgery; ambulatory surgical procedures
Intervention	Patient admission; pre-admission; preadmission

**RESULTS**

The search retrieved a total of 222 individual records.

**Question 4 “Is same day surgery as effective as multi-day surgery?”**

**SEARCH TERMS**

The following terms were used to search electronic databases:

Field of focus	Search term
Day services	Ambulatory surgical procedures; ambulatory surgery; day surgery; day case
Hospital	Hospitalization (includes length of stay, patient admission, patient discharge, patient readmission, patient transfer); length of stay; patient admission; patient discharge; discharge planning; early patient discharge; transfer, discharge; readmission
Specific area of interest	Trends; methods; utilization; organization and administration; standards; administration

**RESULTS**

The search retrieved a total of 380 individual records. Due to the nature of the question many records of clinical relevance were retrieved. These were generally not considered for appraisal.

**Question 5 “Do short stay areas in emergency departments improve bed and patient management?”**

**SEARCH TERMS:**

The following terms were used to search electronic databases:

Field of focus	Search term
Acute facilities	Emergency services, hospital; emergency service; emergency
Short stay units	Short stay; observation units

**RESULTS**

The search retrieved a total of 137 individual records.

*Question 6 “Does fast tracking through emergency departments in acute facilities reduce length of stay and improve patient outcomes when compared to standard hospital admission?”*

**SEARCH TERMS**

The following terms were used to search electronic databases:

Field of focus	Search term
Acute facilities	Emergency services, hospital; emergency service; emergency
Fast tracking	Fast track/ing; fasttrack/ing

**RESULTS**

The search retrieved a total of 77 individual records.

## **Structure of the review**

After identifying relevant research reports we structured the literature review under the following subject headings:

- ❑ Demand for acute inpatient admissions and strategies to address them
- ❑ Pre-admission processes including day surgery, pre-admission clinics and admission on day of surgery
- ❑ Emergency Department processes (1) fast track
- ❑ Emergency Department processes (2) observation units
- ❑ Discharge planning
- ❑ Care coordination
- ❑ Hospital in the Home
- ❑ Care of the elderly

## **Constraints**

The scope of the literature review and the time available to complete it placed constraints on the finished product. This is not a systematic review but a broad overview of some topics relevant to management of inpatient demand, selected after discussion with the Patient Management Task Force. We identified studies using pre-defined search strategies, assessed their methodology and contribution to the selected topic areas. In some instances we were unable to obtain full text versions of research reports in the time available. We have cautiously incorporated material derived from the abstracts of journal articles if appropriate.

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