

**From triage to treatment:
An exploration of patient flow systems in Emergency
Departments**

by

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Abstract

With overcrowding and increasing waiting times leading to angry and frustrated patients and clinical staff, Emergency Departments (EDs) need to ensure their patient flow processes – from triage to treatment – improve patient safety and satisfaction. Under conventional triage processes, all patients enter the ED through one portal, and treatment priorities are based on clinical assessments. This process disadvantages lower triage category patients, who have to endure unpredictable and often lengthy delays before receiving treatment. Extended waiting times can create an environment which leads to difficult behaviour and increased rates of patient initiated violence, as well as risk to patients who leave EDs without being medically assessed. There are also further risks posed by undifferentiated patients who may deteriorate while waiting for treatment.

To find an effective approach to managing or reducing waiting times for lower triage category patients processed through one particular metropolitan ED, an extensive search of the literature revealed several different patient flow processes, but not all suited local conditions. These approaches are discussed, in relation to suitability for the particular ED. The history of triage, including how and why it evolved, plus the realities of triage today are explored. Included are case examples of two patients on a journey through the department the way it is presently, and how it could be if particular approaches are introduced.

Extending nursing practice by introducing nurse-initiated x-rays at triage and the introduction of a separate stream for minor category patients in a dedicated ambulatory care area is one approach that could improve waiting times for these patients. There would be the added advantage of improving triage compliance figures for category three patients. The additional costs involved in such a process could be offset by improved efficiency in terms of waiting times, improved triage compliance figures, happier patients and clinical staff, and an emptier waiting room.

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Introduction

Triage is a process of prioritisation whereby a person is assessed (usually by a nurse in New Zealand, NZ), on arrival at an ED and a clinical decision is made on the timeframe for receiving medical care. This is to ensure the sickest people are seen first in an environment in which too many people are presenting for all to be seen immediately. Category one patients require immediate attention for life threatening conditions such as cardiac arrest or obstructed airway; category two patients need to be seen within ten minutes for conditions like cardiac chest pain or very severe pain; category three patients require care within 30 minutes for conditions like severe abdominal pain, asthma or a child with shortness of breath; category four patients require attention within 60 minutes for more minor conditions like ‘unwell but alert’ or recent injury; while category five patients with very minor or chronic problems should be seen within 120 minutes (see Table I). The Australasian College for Emergency Medicine (ACEM) ¹ has developed these categories and all EDs in Australasia follow them.

Table 1. – Triage urgency rating codes and indicator thresholds

Category	Urgency	Time frame to doctor	Performance indicator threshold
One	Immediate	Immediate	100%
Two	Imminent/time critical	10 minutes	80%
Three	Urgent	30 minutes	75%
Four	Semi-urgent	60 minutes	70%
Five	Non-urgent	120 minutes	70%

(Australasian College for Emergency Medicine, 2002).

The times outlined in Table 1 relate to the maximum time a patient should wait for medical assessment and treatment. The non-urgent category five 120-minute wait refers to the maximum time it is deemed ethical to make a patient wait for care, not to a clinical need for care. This highly complex decision-making by triage nurses (explored

¹ The college sets standards for the practice of emergency medicine in Australasia, including design of buildings, staff numbers and skill mix, as well as accreditation standards.

in the next section) involves speed and confidence, and ACEM states that triage nurses must have at least 12-18 months of emergency nursing experience before attempting the triage role (Australasian College for Emergency Medicine, 2002). They also state that triage decisions should be based on clinical urgency, not on fast-track systems, team responses (like trauma teams) and nurse-initiated interventions. Because nurses can start treatment, this does not stop the clock for time to assessment unless it is a documented protocol or clinical pathway approved by the director of Emergency Medicine (Australasian College for Emergency Medicine, 2002; Monash Institute of Health Services Research, 2000).

The performance indicator thresholds as outlined in Table 1 are percentages of patients in each category who must be seen within the time frame for that category. Prolonged waiting times for any category of patient is deemed as a failure of access and quality (Australasian College for Emergency Medicine, 2002). This data is benchmarked against all other EDs in the Australasian region.

After this initial triage assessment, which should take no longer than two to five minutes (Australasian College for Emergency Medicine, 2000), each department then institutes its own policies around patient flow (how and where the person goes), and whether any interventions take place at triage. What this system does is ensure category one and two people have treatment begun within the stated timeframes. However, because of the increasing problems of ED overcrowding, category three people, at risk of deterioration in health status, and category four and five people, often have increased waiting times.

With the rise in patient census², and the increase in access block³, conventional triage processes are not improving patient flow and waiting times for medical assessment in EDs all over the Western world are increasing (Ardagh & Richardson, 2004; Australasian College for Emergency Medicine, 2004; Eilers, 2004; Kennedy, Rhodes, Walls, & Asplin, 2004). This often results in prospective patients and nurses becoming stressed and frustrated, with increasing abuse and violence towards nurses, people who

² Patient census is the number of people treated each year

³ Access block refers to the inability of an ED to admit people to inpatient beds because these beds are full

leave without being seen and reduced quality of care being delivered. Category three patients are not getting timely care, which increases the risk of deterioration in health status, and category four and five patients are having extended waits each day. In a 1999 study at a large tertiary Australian hospital, it was found that the largest number of admissions and in-hospital deaths were patients recruited from triage category four (Dent, Rofe & Sansom, 1999). While the largest numbers of patients in any ED are triage category four, this study has implications when considering patient flow techniques such as referring triage category four and five people to other providers in an effort to reduce ED overcrowding.

Background to the study

As an emergency nurse of over 20 years standing, I have seen many changes in emergency care over this time. I have been directly involved in the instigation of changes in the workplace, and in the education of nurses from novice emergency nurses to advanced level. I have long been interested in the concept of triage, and providing triage education for nurses. I have developed and carried out triage audits (which assess the quality of triage decisions, not waiting times), which now occur annually. I am currently Clinical Nurse Educator in the Department of Emergency Medicine. My interest in this particular problem of waiting times and alternative patient flow systems was reignited when a patient left the waiting area to be assessed elsewhere, and later died. While it has been generally accepted that people have to wait when the department is busy, I felt there was more we could do to alleviate the problems of extended waiting times for lower triage category people, without compromising the care of sicker patients.

The department in question is a metropolitan ED. It is a new facility with 7.5 full time equivalent (FTE) consultants, 7.5 FTE registrars, 10.0 senior house officers and 4.0 house officers. There are 6.1 nurse co-ordinators, 2.2 FTE senior nurses and 36.4 FTE staff nurses, plus a service leader. The treatment area has a central core with private rooms arranged around it providing 22 treatment spaces. There are three large resuscitation rooms. The department currently sees more than 40,000 patients per year, both adults and children.

Aims and rationale of the study

This study explores patient flow processes from triage until medical assessment, and seeks a solution to extended waiting times related to increasing patient census and access block, for one particular ED. It does not seek to offer a solution for the latter problems although the reasons for the increase are explored briefly. It also does not presume that the solution offered would suit any other ED.

Search strategy

With this in mind, I commenced searching for and gathering relevant articles. I did this by using several **key words**: triage; history of triage; waiting times; access to emergency care; decision-making by nurses; emergency department overcrowding; access block; nurse practitioners; ‘see and treat’; GP clinics within emergency departments (EDs); minor injury clinics; nurse-led initiatives, streaming and primary care.

The databases I used were:

- CINAHL (Cumulative Index to Nursing and Allied Health Literature)

- Medline

- Nursing and Allied Health

- Cochrane

- Joanna Briggs Institute

- ProQuest

- Newspaper articles

- Departmental information

- Ministry of Health website

- District Health Board website

- Australasian College for Emergency Medicine website

Several authors appeared in the literature more than once. Issues around decision-making at triage featured Cioffi (1999), Considine, Ung & Thomas (2000, 2001) and Gerdtz & Bucknall (1999, 2000, 2001). Ardagh (2004), Ardagh & Richardson (2004), Richardson, S. (1999) and Cooke (2002) have written on the issues of overcrowding in

EDs, and the problems people have accessing health care. Dent et al (1999) and Dent, Phillips, Chenhall & McGregor (2003) have published on general practice patients in EDs while Fry (2001, 2002) has written on expanding nurses' roles in the ED. Many authors have explored alternative patient flow processes in the ED, nurse-initiated x-rays, and still others have focussed on the problems of the triage process itself.

Overview of the paper

Numerous articles were critiqued, which led to my restricting the study to the issues surrounding the processes immediately after triage itself, and only dealing briefly with the other overcrowding problems of access block and increasing patient census. I wanted to know if there were other systems that could be incorporated, that would streamline the process of getting lower triage category patients to the treatment area, and would suit the size and conditions encountered in the ED. Because of the medium size of the ED, I soon discovered that most of the alternatives offered in the literature would not suit as they were designed for larger departments. I had to ensure I kept this in mind, as the numbers of category four and five patients seen has the potential to have a large impact on the cost effectiveness of some solutions. This research paper is not a business case, but has the potential to form the basis for one. So, the questions to be answered were: are there any patient flow systems that could be incorporated after triage to streamline the flow of category four and five patients to the treatment area, and would these systems have an impact on the timely assessment of category three patients?

The first section of this research paper covers the nature and origins of triage, which looks at triage history and development; the aims of triage; decision-making by triage nurses; the realities of triage today; waiting times and access to emergency care. The second section is about patient flow systems and their applicability to the ED. The third section is a 'snapshot' of the department in which I work today. I have included case examples of the experiences of two patients as they move through the department. I decided this was the best method of identifying the inadequacies of the current system. The fourth section discusses the best options for the department, and again uses case

examples of the same two patients moving through the new system. The conclusions of the research are included in this section.

Section I Triage - nature and origins

Triage is used in most EDs in NZ hospitals, and is the principal method of sorting patients into priority levels so the sickest are seen first. Conventional triage is a nurse-led process (although based on medical protocols), requiring advanced emergency nursing knowledge and skills to ensure patient, organisational and nurse safety. This section explores triage as a whole, from its development during the Napoleonic, Crimean and American Civil wars of the 19th century, through refinement in the hospitals of the United States of America (USA) in the 1960s, to triage in New Zealand today.

The History of Triage

Triage is derived from the French word ‘trier’, meaning ‘to sort’ or ‘pick out’, ‘classify’ or ‘choose’ (Monash Institute of Health Services Research, 2000; Wuerz, Fernandes & Alarcon, 1998). The term was originally used in medicine to describe the sorting of injured soldiers in the Napoleonic wars into two groups; those who would or would not be able to get back onto the battlefield. Baron Dominique-Jean Larrey (1766-1842), who was a surgeon in Napoleon’s army, is considered the father of triage. He developed a system whereby wounded soldiers, no matter their rank, were treated on the battlefield and then moved to military hospitals at the rear. The revolutionary aspect of this system was that it was based entirely on severity of injury, rather than the rank of the soldier (Kennedy, K., Aghababian, Gans & Lewis, 1996; Laniox, Wiener & Zayas, 2002; Ramler & Mohammed, 1995).

In 1846, an American by the name of John Wilson started to classify war injuries into ‘slight, serious or fatal’. This was to ensure the soldiers most in need received care, while those with injuries likely to be fatal were left untreated (the early concept of ‘the greatest good for the greatest number’ in disaster medicine). These measures were refined in subsequent wars, most soldiers in the Vietnam War receiving definitive care within two hours of injury, as compared to 12-18 hours in the Second World War (Kennedy, K. et al., 1996; Laniox et al., 2002).

During the American Civil War, the Director General of Hospitals for the American Revolutionary Army, John Morgan, sorted those with minor injuries and illnesses from the truly wounded. This process did not sit well with regimental surgeons who needed large numbers of casualties to secure more supplies (Kennedy, K. et al., 1996), perhaps a harbinger of funding issues of the future.

During the 1950s and 1960s in the USA, EDs started to emerge at the front door of the hospital, as opposed to the basement or a consulting room somewhere within. At this time, primary health care services declined in availability as doctors took up specialisation, there was a sharp rise in the number of people presenting to EDs and most of this rise consisted of patients with minor problems (Ramler & Mohammed, 1995). Some of the reasons for the increase are purported to be: people seeking a second opinion; the presumed accessibility of a doctor; the need for xrays; and the person's perception of the urgency of their problem (Roberts, 1998). The concept of triaging patients based on urgency of presentation was born in an effort to control the flow of patients through EDs and manage risk.

In England meanwhile, formal triage was introduced in the mid-1980s. Nurses were now providing care in the front line, assessing people as they arrived at the front door of the hospital (the ED). They were able to develop their assessment and management skills, paving the way for the later development of nurse-led initiatives and the nurse practitioner role (Edwards, 1999). In 1994, the Manchester Triage Group⁴ set about developing standards and devised the Manchester Triage System, a 5-tier system with algorithms to assist nurses in making triage decisions (Manchester Triage Group, 1997). This system was very like the National Triage Scale (described next), with five categories to which to assign patients. Algorithms were developed for most conditions or groups of conditions, for nurses to refer to when allocating the triage code.

⁴ Manchester Triage Group – a group of emergency clinicians in Manchester, England, who sought to standardise the allocation of triage categories.

Early triage in Australia (in the 1970s), consisted of a tiered system where ambulance cases were generally given priority while others were seen in order of arrival (Ramler & Mohammed, 1995). In 1993, ACEM adopted a 5-tier triage system called the National Triage Scale, which in 2000 became the Australasian Triage Scale (ATS), (see Table 1). Today, nurse triage is standard practice in Australasia, and has become a sub-specialty of emergency nursing in many areas (Australasian College for Emergency Medicine, 2002).

Triage evolved over time from the early wars of the Crimea until the modern development we see today. It evolved as a matter of necessity in an effort to ensure the most severely injured were seen first (or left to die if it was judged care would be fruitless or time and resource consuming, in the context of large numbers of casualties with limited resources). In contemporary EDs, the aim is to see the sickest first but in a disaster situation, the aim is to do the greatest good for the greatest number. The aims and triage processes will now be looked at in more detail.

The Aims of Conventional Triage

In Australasia, triage is primarily a nursing role. The main aim is to prioritise patients as they arrive. The nurse assesses and makes a clinical decision of severity or potential severity, and decides on the urgency rating (Ritchie, Crafter & Little, 2002). It must be remembered that urgency is not the same as severity. For example there are time-critical conditions such as ‘time to electrocardiograph (ECG)’ for patients with chest pain who may not be in immediate danger, but if infarcting heart muscle, require urgent intervention to prevent or minimise heart muscle damage. Triage also allows for the allocation of the patient to the most appropriate area of the department (patient flow).

Decision-Making by Triage Nurses

Triage decisions are made in response to the patient’s presenting signs and symptoms and on the basis of necessity for time-critical interventions. No attempt is made to form a medical diagnosis (Monash Institute of Health Services Research, 2000). There are two types of decisions made by triage nurses: the primary decision being to determine

patient acuity through initial assessment and instituting first aid; the secondary decision being the initiation of nursing interventions such as nurse-initiated x-rays, intravenous line placement and blood taking for laboratory tests (Gerdtz & Bucknall, 2000). Each department has its own policies regarding secondary decisions, as the only requirements of ACEM are that secondary triage should not take place at the expense of primary triage (Monash Institute of Health Services Research, 2001).

Increasingly, triage nurses are making other decisions, which could be labelled the third type of decision-making. These decisions relate to the ongoing care of patients who are trapped at triage because of an overloaded department. This is where the system fails category three patients who languish in corridors waiting for suitable placement, and also lower category patients who wait in waiting rooms.

As the triage area is often physically isolated from the rest of the ED, the triage nurse is an independent practitioner, who very often must act alone on decisions made, while being responsible for the waiting room, and, in some EDs, sending non-urgent patients to more appropriate health care providers (Gerdtz & Bucknall, 1999). Triage is stressful and usually busy, requiring the nurses to justify and be accountable for their decisions.

Decisions made by triage nurses are fundamental to the health outcomes of patients and are vital to the initiation of emergency care. Hence, education and experience of the nurse plays a crucial part in this complex process (Considine, Ung & Thomas, 2001; Monash Institute of Health Services Research, 2001). Not only must the nurse take into consideration the clinical needs of the patient, but also the social context of the presentation, often under pressure, while trying to undertake several tasks at once. A small Australian correlational design study by Considine et al., (2001), using a survey method, suggests that the chronological experience of nurses has no impact on the accuracy of decisions made by triage nurses, and that perhaps the quality of the experience should be examined. As this study was very small, further research is needed to determine its accuracy.

Cioffi (1999) and Wilkinson (1999) advocate that experienced emergency nurses need extra education in decision-making skills, clinical scenarios and reflection to become effective triage nurses. Whatever the education provided, it is evident it must be of good quality, relevant and realistic to the demands of the particular environment in which triage is practised.

The Realities of Triage Today

There are many issues that impact on the provision of triage in modern western hospitals. Several relevant to this study such as funding, decision making, time to medical care and decreasing the number of presentations, are discussed here.

Funding

While triage was developed to increase patient safety by improving patient flow through the department, it is used in some places by health funders to determine ED funding. This clearly contravenes the ATS user manual, which regards triage as a clinical decision, based only on the patient's individual need (Considine et al., 2001). ACEM expresses concern at the practice of systematic over triage or under triage of patients in response to funding models or incentive programs, believing this model to be unethical (Monash Institute of Health Services Research, 2000). If patients are over triaged (are allocated a higher than expected triage category), their waiting time is shorter than expected, which may be detrimental to other sicker patients. The reverse is also true, but for the under triaged patient. ACEM does however advise the use of performance indicator thresholds as a performance indicator for benchmarking purposes, and for resource allocation.

Emergency departments themselves use the figures of non-compliance to lobby for more staff or resources, but on the whole it seems the responsibility of each ED to fix the problems of overcrowding and access block. I would argue the latter issues should have an organisational strategy, requiring commitment from management to change attitudes and culture as the problems extend far past the ED.

The ED where I work does not get funded on triage codes per se. The service receives approximately \$190 per patient visit (as at August 2005). This model of funding comes with its own problems, as patient acuity is ignored. The cost of providing emergency care to a category one patient would far exceed this amount, as evidenced by the pricing structure to NZ non-residents⁵ (see Table 2). This is also important when considering the option of turning away some category four and five patients in order to reduce numbers. With the current funding model, these patients are our ‘bread and butter’, in effect paying for the care given to higher category patients. The perceived need to attract people to the ED to secure sufficient funding is contradicted by the need to restrict numbers in some way to reduce overcrowding.

Table 2 – Non-resident charges as at August 2005

Category	Price
Triage 1	\$787.68 medical, \$954.96 surgical
Triage 2	\$627.43
Triage 3	\$546.88
Triage 4	\$331.67
Triage 5	\$221.00

These costs are purely for consultation and do not include diagnostic tests like xrays, blood tests, ECG. It can be seen that \$190 does not cover any of the categories. The figures were obtained from Capital and Coast District health Board.

Decision making and processes

The primary triage process itself is based on validated evidence that ensures the sickest people are seen first and that all others are in a queue based on prioritization and time of presentation (Australasian College for Emergency Medicine, 2002; Manchester Triage Group, 1997). Strict adherence to this queue is not mandatory and indeed it is imperative that people are reassessed to indicate the need for re-triaging. This is where the assessment and decision-making skills of the nurse come to the fore. It is relatively easy to follow policies and guidelines to assign a triage category but it can take experience

⁵ A NZ non-resident is a person who does not have NZ residency or citizenship.

and intuition plus excellent knowledge of physiology to decide if someone is deteriorating.

One author, however, is very critical of triaging in the UK. Edwards (1999) says triage is colonised with medical concepts, which separates the person from the problem, and categories are centred on medical notions of urgency. He says the patient's issues are not accounted for or documented. While agreeing with his comments on medical language, it has to be kept in mind that when dealing with large volumes of people, it is imperative that those in the most danger of dying or deterioration must be seen first. I would also argue that the Manchester Triage guidelines do take into account pain and distress. If these issues are not being documented in the UK, then that is a failing of individual systems and hospitals. In NZ, the ATS very clearly does take into account a person's pain and/or mental distress, and the reasons for a triage category allocation are required to be documented (Australasian College for Emergency Medicine, 2002). Triage nurses often take into account a person's circumstances, for example if a mother presents with an unwell child, with several other children in tow, every effort will be made to accommodate the needs of all concerned, ensuring the child gets seen as quickly as possible even if it has been allocated a category four. The real problems seem to lie not with the primary triage process itself but with the processes after this.

The most obvious is that while seriously ill or injured patients have decreased waiting times, those with less serious complaints have increased waiting times. There is an argument that the triage process will impact favourably on waiting times and patient flow, but while ensuring the waiting room has 'known quantities', the triage nurse can have no impact on issues such as access block. It can be argued the triage nurse simply re-distributes the workload (Monash Institute of Health Services Research, 2000). I take this to mean that the nurse, by assigning a triage category, designates the area of the department the patient will be treated in, which impacts on patient flow, but that this process does not necessarily impact favourably on waiting times, as all patients are still entering the treatment area through one portal.

Time to 'medical care' or 'emergency care'

While the time to medical care is deemed to be time from triage to assessment and treatment by a doctor, (it is this time that is benchmarked), the care and management of patients delivered by nurses at triage and in the treatment area, is ignored completely by ACEM guidelines. One Australian author, Considine, is particularly critical of this and is pushing to have ACEM consider the concept of 'time to emergency care', rather than 'time to medical care' (Considine, Ung & Thomas, 2000). While this would not impact on the actual time the patient waits for medical assessment, the often crucial care given by nurses at this time, such as burn care or eye irrigation, would be acknowledged as part of the patient's treatment, and as having an impact on the patient's outcome.

Some hospitals now stop the clock if the patient fits a protocol for nurse-initiated care commenced either by the triage or primary nurse for the benefit of the patient, but also to manage triage times, as per ACEM recommendations. One example of this is a Category two patient with chest pain requiring an electrocardiogram within ten minutes. As soon as a doctor sights the ECG, the clock stops, even if that doctor does not see the patient within ten minutes. It was the nurse however, who commenced diagnostic tests. Even the Ministry of Health acknowledge this in their latest quarterly report and note that in the majority of time, nurses are monitoring patients while they are waiting for the doctor (Ministry of Health, 2005).

The effectiveness of conventional triage processes relies heavily on the workload of the department. If there is enough space within the treatment area, patients do not get trapped in the triage corridor for extended periods. The concept of triage works well when patients arrive conveniently spaced, allowing time for the nurse to collect relevant information and make an informed decision on urgency and disposition within the department. In reality, the busier the department, the less effective primary triage processes become. Decision-making becomes rushed, continually interrupted, and very subjective, as there is less time to collect any physiological data (Gerdtz & Bucknall, 2001). If the department is full, a queue at triage is inevitable, with all the attendant risks. Not only does the nurse become responsible for the waiting room plus triaging

new patients, but very often for the sicker patients waiting for a space to become available. Reassessment of these patients at triage category expiry time can become sporadic, or at worst, impossible.

Decreasing the number of presentations

It could be argued that one method of decreasing the number of people with minor illnesses and injuries presenting for emergency care is to refer them back to a more appropriate primary health care provider. Anecdotal evidence suggests some EDs do this but the risks can be high. If a person is sent to another provider based on a triage decision, and that person's health status is compromised because of this, the nurse and the organization could be held responsible. According to Ardagh (2004) ACEM explicitly advises against this as the ATS was designed to determine urgency not appropriateness for referring away. Category four and five patients have relatively high rates of serious pathology that require hospital care. He also argues that the triage assessment, deliberately brief, may miss serious illness with seemingly minor signs and symptoms, so care is delayed if the person is referred away.

Cost is another issue. Primary health care in NZ is not free; and many people in lower socio-economic groups find it unaffordable. Often there is no primary health cover after 11pm, forcing more people to access the ED. It has been the policy of the ED not to triage people away from the department unless the condition is extremely minor. This sits with the ACEM policy that states that no one should be denied access to emergency care (Australasian College for Emergency Medicine, 2002). The following subsection explores the issues around waiting times and their effect on patients and staff, and also explores some of the barriers to accessing care.

Waiting times and access to care

When it comes to patient satisfaction in EDs, the single standout feature is waiting times (Holden & Smart, 1999; McKay, 1999; Nielsen, 2004). People like to know how long they will be waiting. A minor category patient may be getting to the top of the queue, but more serious patients keep arriving, meaning the queue ahead of them gets longer.

Giving a time to the patient increases frustration when that time frame is exceeded. Abuse and violence can result, and the rate of 'walk-outs' increases (people who leave before being medically assessed). The risks to the nurse, patient and organization increase, as do the patient dissatisfaction rates. ACEM considers prolonged waiting times for undifferentiated patients to be failure of both access and quality, no matter how minor the problem (Australasian College for Emergency Medicine, 2002).

While the rational basis for a triage system is obvious, that is, the sickest people will be seen first, it is also obvious that the people deemed able to wait do wait, what for many is an unpredictable and frustrating length of time. No wonder abuse and violence is increasing and people feel disadvantaged by the system. Many have minor injuries or illnesses that could be quickly treated.

Most studies on the efficacy of triage have focussed on accuracy and whether it reduces waiting times. Waiting times appear to be reduced only when nurses combine triage with advanced roles such as nurse-initiated x-rays and the institution of treatment protocols (Cheung, Heeney & Pound, 2002; Edwards, 1999). Edwards also suggests conventional triage forces patients through a single triage gate, which disadvantages those with minor illnesses and injuries, who are most amenable to treatment.

Access block

The reasons for rising patient census and acuity in the Western world's EDs have been studied extensively, but no one reason stands out (Ardagh & Richardson, 2004; Kennedy J. et al., 2004; Nielsen, 2004; Richardson, S. 1999; Richardson & Ardagh, 2004; Dunn, 2003). These issues are combined with fewer inpatient beds, and associated access block (Richardson, D. 2003). While access block appears to be the major cause of ED overcrowding, due to a complex set of issues including flawed processing systems and a lack of facilities for aged care and rehabilitation (Pickard, Bulbeck & Woolmore, 2004; Schafermeyer & Asplin, 2003), it will only be discussed briefly here as the main focus of this paper is identifying ED solutions.

Lack of inpatient beds has been presented as the primary cause of ED overcrowding by many authors in western countries (Ardagh & Richardson, 2004; Australasian College for Emergency Medicine, 2004; Dent et al., 1999; Dunn, 2003; Hughes, 2004; Kennedy, J. et al., 2004; Pickard et al., 2004; Schafermeyer & Asplin, 2003). ACEM goes so far as to cite an article by Cooke (2002) that hospital bed occupancy over 85% is a sign of failure to plan, and creates a lack of surge capacity (Australasian College for Emergency Medicine, 2004). In-patients board in the ED, occupying space in place of presenting patients, reducing the level and quality of care for all patients, and adding to the stresses placed on staff. It is acknowledged there is a worldwide shortage of clinical staff, particularly nurses, which impacts on the number of patients wards can admit and that nurses can care for in overcrowded EDs (Australasian College for Emergency Medicine, 2004). At present, there are few governmental or organisational strategies for solving these problems therefore individual EDs are usually left with the problem. So is there an opportunity to limit the number of people attending EDs? One group to consider are those who are deemed to be 'inappropriate' attenders.

'Inappropriate' attenders

Limiting the number of inappropriate attenders to the ED has been met with controversy and very limited success over the years. The definition of 'inappropriate' is controversial, as most studies use retrospective methodology (using data from past presentations), using final diagnosis to gauge the appropriateness of a presentation. How and why (the social context) a patient presents to the triage nurse is not taken into consideration, nor is the state of the patient on presentation (Edwards, 1999; Richardson, 2003). Ardagh (2004) writing about a particular NZ ED, estimates less than 10% may have been more appropriate to see a GP. He states that the international literature cannot agree on who is an inappropriate patient and that they could not be accurately identified at the brief triage assessment.

There have been efforts in NZ to stem the tide of people presenting to EDs with complaints easily treated in the primary health sector. Richardson, S. (1999) reported on a study by Havill, Van Alphen, Fairweather and Van der Pyl in 1996 at Waikato

Hospital ED, in which an exclusion policy introduced in 1989, forcing people with minor complaints to visit their GP or a private emergency clinic, proved unworkable and was revoked. From personal and anecdotal experience, a similar policy in ED around the same time (communicated through an advertising campaign), resulted in people who should have presented to ED (for example, people with chest pain) not doing so, while having no real impact on the numbers of people presenting with minor complaints.

Access to care

Edwards (1999) suggests that allocation of a low triage category may be used as a punishment for people with minor injuries or illness who could have attended their GP for treatment. It could be argued that instead of referring to these patients as inappropriate and trying to turn them away to other providers, emergency departments should instead provide this care, as this is what people appear to want, and find most convenient. Lowering barriers to appropriate care (cost, in NZ) instead of raising barriers to perceived inappropriate care could also benefit patients (Ardagh & Richardson, 2004). However, primary care is free in the UK and yet people still seem to prefer attending EDs. One analysis in the USA found that some ED users were more likely to be in poorer health because of disruptions to regular care, including dissatisfaction with the usual carer, and that providing a primary care provider was insufficient to reduce such use (Weber, Showstack, Hunt, Colby & Callaham, 2005). The reasons for this were unclear in the article, although in the USA, cost and insurance issues would probably play a part as the poorer you are, the less likely you are to have health insurance, and the more likely you are to have chronic health problems (Kennedy et al., 2004; Weber et al., 2005).

In the UK it has been argued that although the National Health Service has had many successes over the years, it has failed to keep pace with changes in society (Hughes, 2004). The same could be said for NZ's health service. Changing disease patterns, longer work hours, the influx of immigrants and refugees from third world countries, changing lifestyles and the aging population have all impacted on the provision of satisfactory health care. General practitioner numbers have dropped as the cost to

consumers has risen (Watt, 2005), and many no longer wish to provide after hours care. While it is considered beneficial to have continuity of care, particularly for those with chronic problems, people seem to prefer being able to drop into an urgent medical clinic or the local ED, particularly young adults (Hughes, 2004; Rajpar, Smith & Cooke, 2000).

Immigrants, particularly refugees from third world countries, are used to accessing health care by going straight to the hospital, but often present late, and are therefore sicker. Refugees typically come from countries with high rates of communicable diseases and where healthcare is disrupted or non-existent (Mortensen & Young, 2004). The same authors report there is evidence of increasing numbers of refugees presenting to EDs in NZ with minor problems because of the availability of interpreters, and as they are more likely to be unable to afford primary health care.

Anecdotally, any experienced emergency nurse will tell you that patient acuity seems to be rising. The reasons for this phenomenon also appear extensive. Changing disease patterns caused by socio-economic factors, lifestyle choices, such as fast foods, the increased availability of alcohol and lack of exercise, seem to have led to an increase in diabetes related illnesses, cardiac disease and trauma. Poverty is present in many parts of NZ, leading to diseases related to overcrowding (meningococcal and other infectious diseases such as tuberculosis) and poor nutrition (obesity) (Ministry of Health, 2001). Poverty also limits access to primary health providers, as in NZ people are charged for attending their GP. The aging population and advances in technology may mean people live longer and have more interventions than ever before. People present later and sicker, putting pressure on already overloaded EDs. This in turn, impacts further on the waiting times for patients with minor injuries and illnesses.

Effects of prolonged waiting times

Another issue to consider is why waiting times should be lowered at all for these patients with minor complaints. The prevailing attitude in most EDs used to be 'it is only minor, he will just have to wait'. These attitudes are in response to the anger and frustration

displayed by patients in the waiting room, as harried clinical staff try to deal with sicker patients with limited space and resources. From experience, when the department is overloaded and there are many minor category patients in the waiting room, the triage nurse is often begging for these patients to be slotted between sicker patients. It is very unpleasant to be in full view in the waiting room, trying to triage, and placate waiting people. The triage nurse needs to draw on all the skills acquired from experience and education to deal with angry, anxious people who are often in pain.

It is acknowledged that prolonged waiting causes anxiety for patients, with feelings of abandonment and powerlessness, all of which lead to anger, usually unleashed at the triage staff (Eilers, 2004; Fry, 2001, 2002; Tambimuttu, Hawley & Marshall, 2002). These same authors argue that providing pleasant waiting areas with up-to-date magazines, televisions, tables, natural light and grouped seating, while improving the perception of length of waiting time, in the end are just icing on the cake. Patient satisfaction is measured primarily by waiting times, and so we must endeavour to shorten them.

Another risk of prolonged waiting times is that of patients who leave without being seen (did not wait - DNW). There have been some studies regarding this group of people in an effort to identify their characteristics and their reasons for leaving (Fry, Thompson & Chan, 2003; Goodacre & Webster, 2005; Moshin, Bauman & Ieraci, 1998). It seems if you are young, male, have a lower triage category, and self-presented at times when waiting times are longest, you are more likely to leave without being treated (Goodacre & Webster, 2005). This information was gathered from the data of 5512 patients who had been triaged but not seen at a large UK hospital.

A phone questionnaire of patients who DNW over a three month period at New South Wales hospitals in 2003 (Fry et al., 2003), identified time delays in being seen as the main reason for leaving, but also the attitude of staff and feeling unsafe in the waiting room. It was found that nearly 70% of these patients sought medical attention within 24 hours of leaving the ED. While this is reassuring, most of these patients should never

have left in the first place and every effort should be made to prevent it, requiring commitment from the organization to help find solutions. These patient actions also produce feelings of helplessness and frustration, not to mention worry for the triage nurse, which adds to the stress of the job.

The ED in which I work has had one major incident concerning a patient who left to attend a GP, having waited over three hours to be seen. The patient subsequently died. While it was the patient's choice to leave and seek care elsewhere, the prolonged waiting time obviously influenced the decision to leave. Good practice would indicate attempts to follow up patients who do leave, but time and lack of staff have made this unrealistic at this stage.

The importance of communication with waiting patients comes across strongly in all the literature. A systematic review of the literature about patient satisfaction in emergency medicine, found three frequently identified service factors: perceived waiting times, provision of information or explanations and interpersonal skills and staff attitudes (Taylor & Bengner, 2004). The authors suggest future research should focus on the evaluation of interventions addressing these factors. In the ED, every effort is made during triage education to instil in the nurses an attitude of professionalism and empathy with patients, using scenarios to help them see the story from both sides and encourage them to develop strategies for dealing with stressed patients.

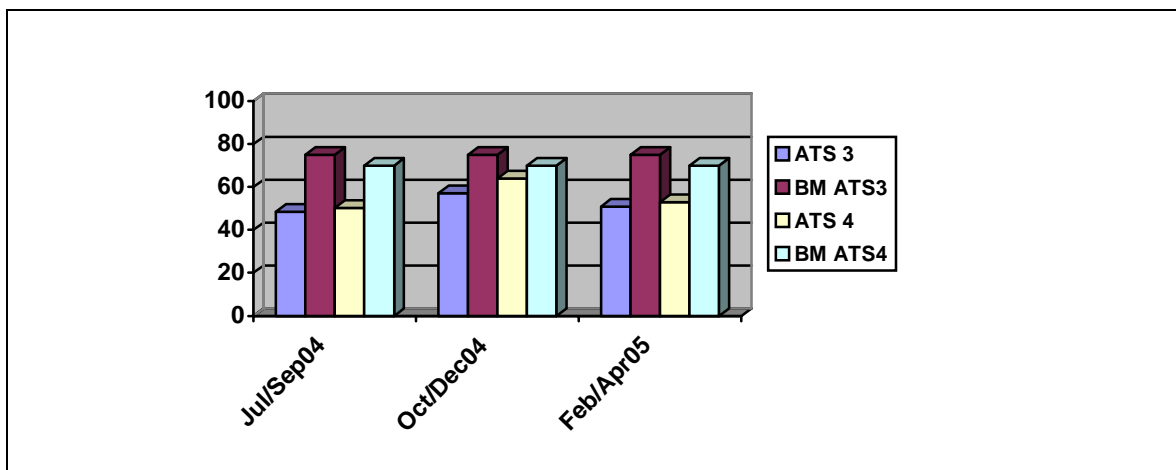


Figure I Triage compliance figures

Figure I indicates triage compliance figures from Capital and Coast District health Board for July/September 2004 to February/August 2005. ATS stands for Australasian Triage Scale and BM stands for benchmark. The benchmark figure is the percentage of patients within a particular triage category who should be seen within the required time period (for category three – 30 minutes, for category four – 60 minutes). This figure is set by ACEM. In the quarter October –December 2004, the department saw 57.20% of category three patients within the 30-minute time frame (75% should be seen). While this is an improvement on the previous quarter (48.57%), it is still way below the ideal (Ministry of Health, 2005). For the same period, 62% of category four patients were seen within the allowed 60 minutes (should be 70%). For April 2005, only 53% of category four patients and 51% of category three were seen, perhaps reflecting the rise in patient census over this time. These figures have been taken from the department data system and the Ministry of Health DHB Hospital Benchmark information.

These triage compliance figures indicate the increased strain the department has been under, particularly over the last year. It can be seen that while triage category four patients are waiting longer to be seen, it is the triage category three patients who are most at risk of deterioration in health status as their triage compliance figures are poor.

Summary

Conventional triage processes are used in many parts of the Western world, including Australasia. They are used to ensure that an experienced emergency nurse will assess patients rapidly on presentation to the ED, and allocate an urgency category. This ensures the sickest patients are seen first. While serving the needs of some of the ED population, it can be seen to disadvantage those with minor illnesses and injuries, as waiting times often become extended. Of equal concern is the fact that category three patients also have extended waits, which can directly impact on health outcomes. Triage is used to benchmark quality of care, while not taking into consideration the work of nurses at triage, and yet when nurses extend their role, waiting times are reduced. Triage is a demanding role, requiring experienced and educated emergency nurses.

Waiting times are of major concern and every effort should be made to reduce them. Extended waiting times cause frustration, anger and anxiety for the patient and the nurse. The number of patients who DNW increases as waiting times increase, leading to raised risk for the patient and the organization. There are many reasons for rising patient census and acuity in EDs, as has been discussed, but the fact remains that increased demand leads to extended waiting times and the negative consequences described above. The challenge is to manage the consequences of high demand through innovative strategies which move beyond triage. In the next section I discuss patient flow systems between triage and treatment, in an effort to identify a system or systems that may be suitable to institute in the department.

Section II Patient flow systems

There are several patient flow systems that can complement conventional triage. Each one will be discussed here; in particular their advantages and disadvantages in relation to their suitability for a metropolitan ED. They include 'see and treat', doctor at triage, nurse-led minors clinics, ambulatory care, nurse-led initiatives and GP clinics within the ED. It is essential that any strategy is effective in reducing waiting times for category three, four and five patients.

'See and treat'

One definition of the 'see and treat' system is: "seeing and treating patients with minor illnesses and injuries more quickly (sometimes almost immediately), with a dedicated patient stream and allocated staff" (Hughes, 2004, p.390). This system has been used extensively in UK EDs since 2002 and is actively promoted by their Department of Health in an effort to reduce waiting times for minor patients (Hughes, 2004; Parker, 2004). Another definition is that patients with minor complaints are assessed and treated as soon as they arrive at EDs, without being asked to wait (Parker, 2004). In the UK, senior consultants or nurse practitioners carry out the role alone or in a team. Not all minor patients are suitable, as many require further diagnostic tests like radiology, or more complex suturing (patients are 'allocated' a time of between six to fifteen minutes, depending on the hospital, to be assessed and treated).

The advantages of this system appear obvious: patient waiting times are reduced, complaints reduced, staff less frustrated, there is less abuse, and faster treatment of sicker patients, as other staff are freed up to care for them (Emergency Nurse, 2004; Liple, 2004; Parker, 2004). There seem to be three factors that contribute to a successful 'see and treat' system. The first involves clarity of purpose. The aim is to reduce waiting times for minor patients, thereby creating an emptier and happier waiting room. Staff must want to change their attitude and perception of these people from inappropriate to wanting to provide their health needs. The second factor involves having dedicated staff and workspace, and the third is matching the number of staff to

the number of patients, although no ratios are given in the article (Parker, 2004; Rogers, Ross & Spooner, 2004).

According to Hughes (2004) and Parker (2004), when 'see and treat' is in operation, triage of walk-in patients is unnecessary. In one hospital, the reception staff are trained to recognise those who would be suitable, and after registration these patients are asked to wait to be assessed (North, 2004). This immediately rings alarm bells for me, as the potential risks are enormous with untrained staff making these decisions. For example, could a receptionist recognize that a person with a sore arm may in fact be experiencing cardiac pain? It could also be argued this method belittles the skills and professional status of nurses by implying that an experienced nurse does not need to be at the front door and that a receptionist with no nursing training can make clinical judgements. Parish and Liplely (2002) contend that all patients should be triaged soon after arrival into minors (needing very few diagnostic tests, that is, minor injuries and illnesses) and majors so that no unassessed patients are in the waiting area. See and treat can be part of the minors stream.

The system appears to break down when staff are called away to other areas of the department, and if unsuitable patients are directed through the system (requiring longer than the allocated 6-15 minutes), or at times of peak demand (Parish & Liplely, 2002; Rogers et al., 2004; Windle, 2002). At times of peak demand, the ability to assess, treat and discharge within 30 minutes is reduced, forming a queue of unassessed patients. Other criticisms of the system drew attention to the fact that holistic care cannot be provided in six minutes and that instances of child abuse or domestic violence may be missed (Parish & Liplely, 2002).

All articles accessed espousing the benefits of 'see and treat' refer to departments with a census of over 50,000 new presentations a year (Dancocks & Shrimpling, 2003; North, 2004; Rogers et al., 2004). These are bigger departments than the local ED, which has a current census of approximately 43,000. Therefore, the population of minor patients presenting would presumably be greater, and allow for a system that could run at least 8-

12 hours a day. Unfortunately, these studies used percentages of patients, not numbers, so the numbers of patients they were seeing each day suitable for see and treat is not able to be calculated.

On April 23rd 2005, the local ED had a total of 64 category four patients and 13 category five patients (CCDHB daily triage compliance report). From experience, about 30% of these patients would be suitable for a 'see and treat' system, making about 25 in total. This fits with one retrospective English study that found 29.4% of patients could have been discharged from triage without any treatment or investigation, apart from advice for self-care (Cooke, Arora & Mason, 2002). Consider again that about half would have presented between the hours of midday to 8pm and the lack of cost effectiveness can be appreciated. Having a senior doctor and nurse dedicated solely to this process for at least eight hours a day is a very expensive option. Perhaps in the future, when there are emergency nurse practitioners in NZ EDs who can assess, treat and discharge without referral to medical staff, the underlying economics may change.

The other problem in relation to the local ED is the lack of a suitable space for this process. There is one triage assessment room near the ambulance triage area, which is usually occupied by a trolley-bound patient waiting for a treatment space in the main department. Providing at least two treatment spaces with storage areas and a hand basin would require considerable renovation, for a relatively small number of patients.

While 'see and treat' appears to be a solution for some larger EDs internationally, the cost-effectiveness for a smaller ED does not seem to make it viable at this stage. The risks involved in allowing un-triaged people to sit in a waiting room also seem too great to bear.

Doctor at triage

This system also involves a senior doctor and nurse at triage. There are two main reasons for this: the doctor can immediately assess and discharge patients who only require advice on self-care; and the doctor can immediately assess and order diagnostic

tests for sicker patients and even start treatment. The latter reason is the difference between 'see and treat' and this system. It is preferable from a risk management point of view that the doctor is a senior registrar or consultant, as experienced doctors work more efficiently and safely (Richardson, Braitberg & Yeoh, 2004).

The advantages of this system include: minor patients are seen and discharged quickly and sicker patients have their care initiated faster and it is streamlined. This would particularly be so in situations of ED overload when patients are backed up after triage, waiting for a treatment space.

The disadvantages are again related to cost: there would need to be two senior registrars or consultants on shift, so one can be in charge of the clinical area; and there would need to be sufficient private spaces at triage to assess patients fully. Without proper controls there is also the potential to slow the triage process for sicker patients. The triage nurse's responsibility is primarily assessment and allocation of the triage category, therefore an extra nurse would be required to carry out ordered treatments. Another risk is the potential for doubling up treatments or missing vital information from the initial treating doctor to the staff in the treatment area.

At this ED, there may be two consultants on during the 8am to 5pm shift, but only one at any other time (none after 10pm). There is only one registrar on at any one time, so to institute this system would require the employment of extra consultants and registrars. While this system may work for an ED with adequate private space at triage, for an ED with inadequate treatment spaces compared to patient census and a shortage of nursing staff to carry out the treatment orders, it would not be a suitable option.

General Practitioner within the ED

On first analysis, this concept appeals, as there are definitely some people each day who present with problems that could be easily treated by their family doctor. But what is this workload and does it contribute to ED overcrowding? It has been nearly impossible to ascertain definite local numbers because of data retrieval problems. Assuming that triage

category four and five patients are automatically suitable to see a GP is wrong; as many as 10% of category five patients are admitted to hospital (Australasian College for Emergency Medicine, 2002). Picking out diagnoses to analyse for GP suitability is also fraught with problems, as some of these patients may still need hospital admission. An overview could be obtained by analysing each presentation on several different days of the week. Another method is to multiply the total self-referred presentations by the difference between GP referred discharge rates and self-referred discharge rates from the ED. This figure, however, gives the low acuity presentations and does not necessarily indicate patients who could have been treated by their GP (Sprivulis, 2003).

In Sprivulis' (2003) retrospective analysis of a mixed (adult and paediatric), metropolitan teaching hospital ED in Western Australia, seeing 40,000 presentations a year, he found that low acuity presentations reached approximately 11% ($P < 0.001$), but that providing GP services from 9am to 11pm would only change the total presentations by 2-3% and lower costs by 2%. From these figures, it can be seen that providing GP services within the ED is unlikely to lower the workload enough to prevent overcrowding. This ED has roughly the same characteristics as the local ED.

To assume that heavy repeat users of an ED are GP type patients is also wrong. One study found that the heaviest repeat users of an inner city ED were not general practice patients and that 90 of these 500 heavy users died during the 64 months of the study (Dent, Phillips et al., 2003). The Australian study was in response to media and political perception that there is a large group of people with minor ailments who repeatedly use the ED as a source of free health care. Many EDs find that people with GP type problems do not cause overcrowding as they do not require trolleys, need only brief interventions and can wait in the waiting room (Dent, Phillips et al., 2003).

ACEM recently released a report on the relationship between ED overcrowding and the provision of after-hours GP services (Australasian College for Emergency Medicine, 2004). They state that very few category four and five patients are suitable for GP care and that the GP-type workload in ED settings is small. Admission rates to hospital for

ATS 4 patients was found to be 20-30% and 5-10% for ATS 5 patients, while the rate was only <1% for patients seen by GPs.

How would this system work? To have a separate room set aside near triage for a GP to work from sounds appealing. But would this be effective and cost efficient to maintain? Many people presenting with minor injuries need hospital type treatment such as plastering facilities for fractures, x-rays and suturing.

The other issue is one of ethics. Primary health care in NZ is not free. Providing a free GP clinic within an ED is potentially taking work from private GPs. Charging for this care introduces other problems. The triage nurse is then expected to refer people to this clinic, perhaps sensing that the patient cannot afford it. Does the nurse ask outright if the patient can afford it? Would people be too embarrassed to admit this? If the patient walks out, who becomes responsible for denying care? As has been discussed, the ACEM guideline is that no one should be denied emergency care. For the homeless and others on the poverty line, an ED is their only option for accessing any healthcare at all. Offering reduced charges also has the potential to take work from GPs.

A recent newspaper article in the Dominion Post, illustrates this problem (Macdonald, 2005). The report outlines the situation where a GP runs the ED after-hours at a small provincial town hospital. Any patient, who is deemed to have a problem that could be treated by primary care, is charged for the service. This reduces on-call time for many GPs and makes staffing the ED easier. However, there is the risk of the patient leaving if they have to pay and there is a very high bad debt rate (20%), not to mention the risks of GPs seeing and treating emergency patients. Emergency physicians require many years postgraduate training to provide safe and fast emergency care, unlike GPs who are generalists.

In the UK now there are many 'walk-in centres', where people can access primary care without appointments. Most are run by nurse practitioners. It has been found that many people prefer this option, particularly commuters, as it fits with their lifestyles (Hughes,

2004). However, in the UK, primary health care is free. While there are many ‘accident and urgent clinics’ in NZ, they charge fees for service, which after hours, are much more expensive than normal GP care. Hence, the options for disadvantaged people are fewer.

Minor injuries or ambulatory care areas

There are two ways of running this system. The first is a clinic with a doctor and nurse working as a team, with patients identified by the triage nurse as suitable. The second is clinics run solely by nurse practitioners. It is in effect a streaming mechanism, designed to treat these patients more quickly. Streaming off patients with minor problems has been shown to have a positive outcome for both minor and major patients (Cooke, Wilson & Pearson, 2002). This system is less restrictive than a ‘see and treat’ system as there would be more patients requiring a limited number of diagnostics, for example, x-raying of an injured ankle, or the prescription of antibiotics for a simple urinary tract infection. If it can be set up as a separate area, not using current treatment spaces, the concept is very appealing.

One study of 13,918 new patients presenting over ten weeks to a major UK ED, aimed to gauge whether waiting times were reduced when a minor injuries clinic was introduced for 14 hours a day (Cooke, Wilson et al, 2002). Data was collected for five weeks before the separate stream was introduced, and for five weeks after. It was found that there was a decrease of over 30% in the number of patients waiting over an hour to be seen and that category three patients also had reduced waiting times. As category three patients are most at risk of deterioration while waiting, this is a major advantage of the system.

As far back as 1996, over 50% of large Level One trauma centres in the USA had ‘fast track’ or separate minor emergency areas within their EDs (Buchanan & Powers, 1996). They report on one survey of 185 hospitals, where mean waiting time was 72 minutes in EDs with a ‘fast track’ system in place, as compared to 90 minutes in EDs without such a system.

Such clinics are in wide use in the UK and the USA, with most in the UK being run by nurse practitioners. An ED nurse practitioner (NP) in this context is a nurse who has had training in assessing and treating minor injuries and illnesses. Usually there are certain criteria for the types of patients they are allowed to see and some are allowed to prescribe. There is large variation throughout the UK and USA in the training of these nurses. In NZ there is a formalised system for registering nurses as NPs but as yet there are no ED NPs.

In NZ, the role of nurse practitioner was formalized in 2002. It came about after the Ministerial Taskforce on Nursing recommended the development of the role in response to the changing health needs of New Zealanders and to ensure nursing remained relevant and responsive (Nursing Council of New Zealand, 2001). There is a growing body of evidence internationally that nurse practitioners achieve improved outcomes for their populations (Nursing Council of New Zealand, 2001). These nurses are experts in their field with a specific scope of practice and the potential to prescribe medications without reference to medical protocols. They are independent practitioners but also work in collaboration with other health professionals. There is an opportunity now for the development of emergency nurse practitioners who could have a specific scope of minor injuries and illnesses. This could increase job satisfaction for expert emergency nurses as well as respond to the needs of EDs in NZ.

The development of collaborative, multidisciplinary teams, with the patient at the centre of all clinical activities, is essential in the development and modernisation of emergency services (Swann, Roberts, Whotton & Hewitt, 2003). At an ED in the UK, management has rejected all interdisciplinary boundary arguments between nurses and doctors in the minor care area, reducing duplication of assessment and increasing efficiency, while decreasing patient wait times. Most of these units have an inclusion and exclusion criteria list of patient problems that can be referred to the area (Beales, 1997; Buchanan & Powers, 1996; Byrne, Richardson, Brunson & Patel, 2000). Such is the success of the units in the UK that one survey of 269 patients suggested 98% of patients were happy with the care given by nurses (Mabrook & Dale, 1998), and that there had been

no complaints in the first year of operation. This is obviously a very small sample and further assessment is required. Patients in the UK are used to receiving total care from nurses and are probably more accepting of it. When Emergency Nurse Practitioners finally come on line in NZ, the public may take longer to accept this innovation.

Nurse led minor injury units (MIUs) also seem to be as safe and cost effective as ED units run by doctors. A three-part study conducted in Sheffield, England, attempted to discover whether nurses had the same error rate as doctors and whether costs and cost consequences were similar (Sakr et al., 2003). This was done using a sample of patients (n = 1315) from a nurse-led minor injury unit and a sample from the Accident and Emergency (A&E) department of the local hospital (n = 1500). All patients were similar demographically, either walk-in or with recent minor injury, and triage category four. It was found that there was no difference in the accuracy of radiological interpretation or treatment, inappropriate follow-up rates and that waiting times were significantly less for the nurse group (mean 19 minutes versus 56.4 minutes for the A&E group). Total time in the department was also less in the nurse group (mean 51.5 minutes versus 95.4 minutes). The MIU group also had fewer unplanned follow-up visits.

Cost analysis from a study using analysis of 34,751 A&E patients and 11,329 MIU patients showed the MIU was slightly more expensive per patient, but as the MIU was judged to be less pressured than the A&E, nurses spent longer with patients and spent more time explaining treatments plans. This was felt to be of benefit to patients, and worth the small extra cost (Sakr et al., 2003).

Locally, one disadvantage of a nurse practitioner run unit is that certain age groups or patient types need to be retained in the main emergency department for senior registrar education and experience. This needs to be reviewed as a separate issue, as the benefits to patients of such systems are manifest. Patient satisfaction with seeing one person who can attend to all their needs is also a benefit (Buchanan & Powers, 1996; Byrne et al., 2000; Mabrook & Dale, 1998). Streaming minor patients off also means there would be more space for sicker patients, with dedicated nurses and doctors to care for them.

For a minor injury or ambulatory care unit within the ED, apart from dedicated space, the requirement is a reasonably senior doctor and one nurse to run the unit eight to twelve hours per day. Theoretically, a doctor could deal with many patients without the assistance of a nurse, but from experience, doctors often expect nurses to apply dressings and splints, or fit crutches. This idea would need a radical change in attitude in this department. The staffing must be dedicated, that is, the doctor or nurse cannot be pulled off to other areas in other than exceptional circumstances (Beales, 1997). The room could be open with three to four curtained cubicles with chairs or plinths, storage carts and hand washing facilities.

Nurse-led initiatives

In some Australasian hospitals, the secondary triage processes differ, depending on department protocols. This is allowed by ACEM, as long as the assigning of categories is consistent with their protocols (Australasian College for Emergency Medicine, 2002). Some perform a quick triage assessment before the patient is immediately handed on to the treating nurse (no matter the patient may then languish in a corridor until the nurse has time for assessment). Some may actually start treatment at triage, performing ECGs, commencing IV therapy, ordering x-rays and dispensing pain relief, to name a few. Many hospitals have separate 'fast track' policies for specific groups of patients, such as those with fractured necks of femur, neutropenic patients, or children. Staffing levels, cost and safety are obviously factors in each department deciding on its policy.

The literature overwhelmingly supports the practice of nurse-initiated x-rays at triage (Allerston & Justham, 2000; Chudleigh, 2004; Fry, 2001, 2002; Lindley-Jones & Finlayson, 2000; Mann, Grant, Guly & Hughes 1998; Parris, McCarthy, Kelly & Richardson, 1997). This practice has been used for many years internationally, mainly in the United Kingdom (UK), Canada and Australia. The articles listed above report varying degrees of reductions in waiting times, increases in patient satisfaction (the patient feels something is being done), plus increases in doctor satisfaction (only sees the patient once) and nurse satisfaction (expansion of practice, improvement in patient flow leading to a happier waiting room). While this practice is not a cure-all for the

problem of long waiting times, enough satisfaction and efficiency is derived from it to warrant its use.

When this practice was being introduced overseas, one of the main concerns of medical staff and radiologists was that there would be an increase in the number of x-rays ordered. In reality this has not happened, as long as there is a formal education package in place, and rigorous auditing takes place (Chudleigh, 2004). In all the studies, it was shown that nurses are just as, or more capable, than doctors of accurate assessment of a limb injury. In Fry's study (2001), abnormalities were found in 43% of x-rays ordered by nurses compared to 33% ordered by doctors. Lindley-Jones and Finlayson (2000) found that nurses had a lower request rate and higher positive hit rate. Davies (1994) found the same. It must be remembered the triage nurse knows a doctor will eventually see the patient, so if there is any doubt when assessing, the nurse is more likely not to x-ray. However, the figures show that well educated nurses are very capable of ordering x-rays appropriately.

All studies suggested that experienced triage nurses took part. Differing levels of education were offered to nurses, from instruction on guidelines and injury and joint assessment (Davies, 1994), to an education package incorporating assessment, history, policy guidelines, Ottawa ankle rules⁶, pain assessment, x-ray views and radiation safety (Fry, 2001).

There is one dissenting voice amongst the overwhelmingly positive literature found. Interestingly, it is one of the first studies conducted, back in 1996 in which it evaluated trials in four different Accident and Emergency (A&E) departments in the UK, with a sample size of 2000 patients overall. The study found that nurses ordered 4% more x-rays, sometimes of the wrong area, and that waiting time was reduced by an average of only four minutes. However, only one hospital had in place a formal education program

⁶ The Ottawa Ankle rules are one of the most validated sets of rules on the decision to x-ray or not. They involve strict criteria in ankle assessment after many studies found only 15% of ankle injuries actually had a positive finding on x-ray (Heyworth, 2003).

for triage nurses, and here the rates were equivalent to doctor rates (Thurston & Field, 1996). It seems that education is crucial to the success of such a practice.

Nurses' perception of patient satisfaction in the process was very high in all studies. Davies (1994) showed an improvement in waiting times that was well received by patients. Fry (2001) found that although several nurses found the triage process had been lengthened, they also felt an increase in clinical confidence and job satisfaction as well as enhanced patient processing. They felt there was a decrease in patient aggression. Parris et al (1997) reported that patients were happy with something happening to them and that nurses felt flows were better. Medical staff enjoyed being able to do a full examination including the x-ray at the same time. Lindley-Jones and Finlayson (2000) report increased patient and staff satisfaction and a greater sense of teamwork.

Summary

There are advantages and disadvantages to each of the different patient flow systems in use around the world. Each department obviously has to make its own decisions, basing them on patient safety, comfort, cost, and staffing levels. Innovation and flexibility appear to be the key to emergency departments shortening waiting times.

'See and treat' and a doctor at triage offer many advantages, but bigger EDs would benefit the most because of the cost issues with employing extra consultants and registrars. A GP clinic within or close to the department sounds sensible but it has been found that the numbers of people presenting with GP type problems is small, these people contribute very little to departmental overcrowding, and that the cost of treating them is marginal. Waiting times may be reduced for them, but as they can wait in the waiting area, little difference would be made to the waiting times for sicker category three patients.

Minor injury units (MIU) within EDs appear to be effective in terms of cost to set up (alterations and the increase in staffing levels required), as well as increased efficiency in terms of improved triage compliance figures. Nurse practitioner-led MIUs are popular

in other countries, and while NZ has been slow to introduce emergency nurse practitioners, this innovation will undoubtedly come with time. Other practices such as nurse-initiated x-rays at triage also help to improve patient satisfaction and may decrease waiting times.

There are risks involved in referring minor patients away from EDs, in terms of patient safety, but also because of the consequences of reducing patient census. Reducing numbers of minor patients may impact on funding and staff experience.

Table III on the following page is a quick reference chart incorporating the alternative patient flow systems discussed in this section. The next section provides a snapshot of the local ED as it functions today. This will provide an insight into which of the alternative systems may work and why. Included is a case example on the journey of two patients through the current system.

Table III Quick reference chart for patient flow systems

System	Aim	Main points	Advantages	Disadvantages
'See & treat'	To see and treat those requiring self care or very minor problems only almost immediately on presentation	Need consultant or senior registrar at triage. Small number of patients suitable	Would reduce waiting time for lower triage category people	Big expense for small number of presentations
Doctor at triage	As above but also to start treatment on sicker patients	As above for minors, keeps sicker people at triage	As above for minors. Starts treatment on those trapped at triage	Danger of doubling up cares and treatments. No privacy or space for this at triage. Would happen in public corridor.
GP in ED	To see GP type presentations in the ED	Small number of presentations are truly GP type	Would remove these presentations from the main treatment area	Cost for small number of people. Maybe referred into ED
Nurse-initiated interventions	Interventions by nurses commence after primary triage	Already in operation apart from nurse-initiated x-rays	Nurse initiated x-rays while people waiting increases satisfaction	No space or privacy at triage for many interventions like ECGs
Ambulatory care	An area reserved to treat minor illnesses and injuries requiring limited diagnostics	Treats a larger number of presentations who still require hospital care	Takes minors out of main treatment area, freeing up space for sicker people. Reduces waiting times for minors. Should improve triage compliance figures for Category 3 patients and increase safety for all	Cost to set up and requires dedicated staff, but may be offset by larger numbers and improved triage compliance figures

Section III A ‘snapshot’ of the ED today

Since 2002, the ED attendances have risen from 37,583 per year to a projected 43,000 for the 2005 financial year. Three thousand of this rise is from 2004 alone. The estimate for 2005 is based on figures to date. This increase has put enormous pressure on the department. Figure II below presents this information, from which the rise in presentations over the last two years is obvious.

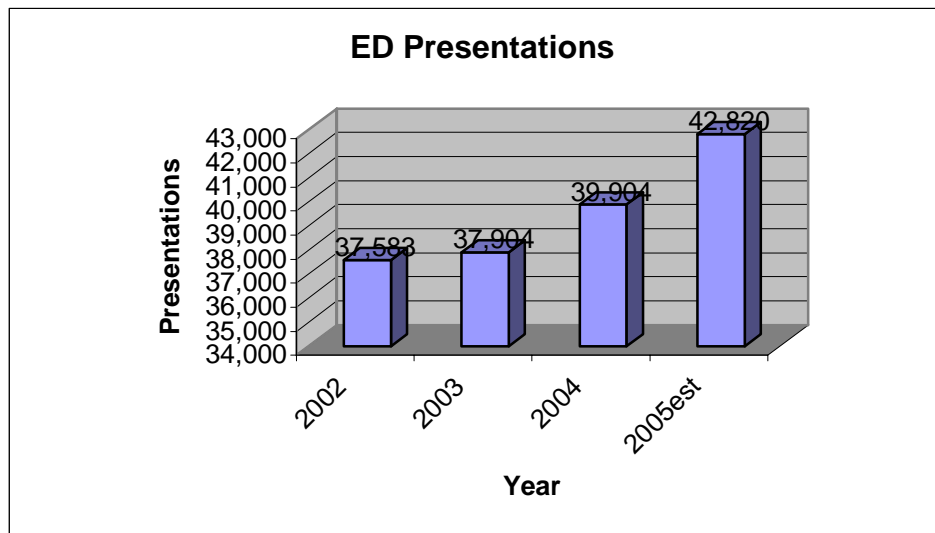


Figure II Presentations to the ED

The hospital is sited in a relatively low socio-economic area of the city. The ambulance service is free to the public for all callouts, unlike the rest of NZ where non-ACC⁷ patients are charged for the service. Over the last six months, all local primary care after-hours accident and urgent medical clinics have closed after 11pm, making the ED the only place to access health care after this time. There are no such clinics run privately in the city.

The ED is a five-year-old, purpose built facility, separate from, but co-located and joined to the main hospital, with reasonably easy access to operating theatres, Intensive

⁷ The Accident Corporation Commission (ACC) is a form of public insurance ensuring anyone suffering an injury in NZ has his or her care paid for.

and Cardiac Care Units and specialized radiological areas. The emergency building has its own radiology department for plain films (excludes computerised tomography, magnetic resonance imaging, angiography and ultrasound scans), as well as an overhead xray unit in the three resuscitation rooms and facility for chest xrays in the cardiac rooms. Because of budget restrictions and the imminence of a brand new hospital, no provision was made for a short stay unit, although one is being built now. This unit may also help take the strain off the ED by catering to patients needing observation for several hours or whose stay is predicted to be less than 24 hours. The department has 22 treatment spaces, far below the ACEM recommended one treatment space per 1100 attendances, (Richardson et al., 2004); a psychiatric area; decontamination unit and two negative pressure rooms for isolation of infectious patients. If the ACEM guidelines were instituted, we should have nearer 38 treatment spaces.

Triage was designed with the desk the first to be seen from the walk in doors. Behind the desk is a room that was to have been a triage assessment area. As the room is opposite the ambulance entrance, and there is nearly always a backlog of patients on trolleys waiting at triage, this room is often occupied. The result is lack of a private space for any patients to be properly assessed.

After triage, category four and five patients have details taken by a receptionist and in most cases are directed to sit in the waiting room. Here they wait, reassessed hourly by the triage nurse, or as time permits. On Saturday and Sunday afternoons, there are attempts to run a 'fast track' clinic in an effort to reduce the numbers waiting to be seen. This process requires a nurse and senior doctor, and is often impossible to run because of lack of staff or because the consultant is tied up with more serious cases. This highlights the fact that separate staffing is essential for any attempt to reduce waiting times for minor patients by utilizing a streaming system.

Figure III overleaf shows the number of presentations to the ED for each triage category over one tax year. It can be seen that category four patients make up the highest number

of presentations. Along with category five patients, they equate to about 63 patients per day, however, not all would be suitable for an ambulatory care area.

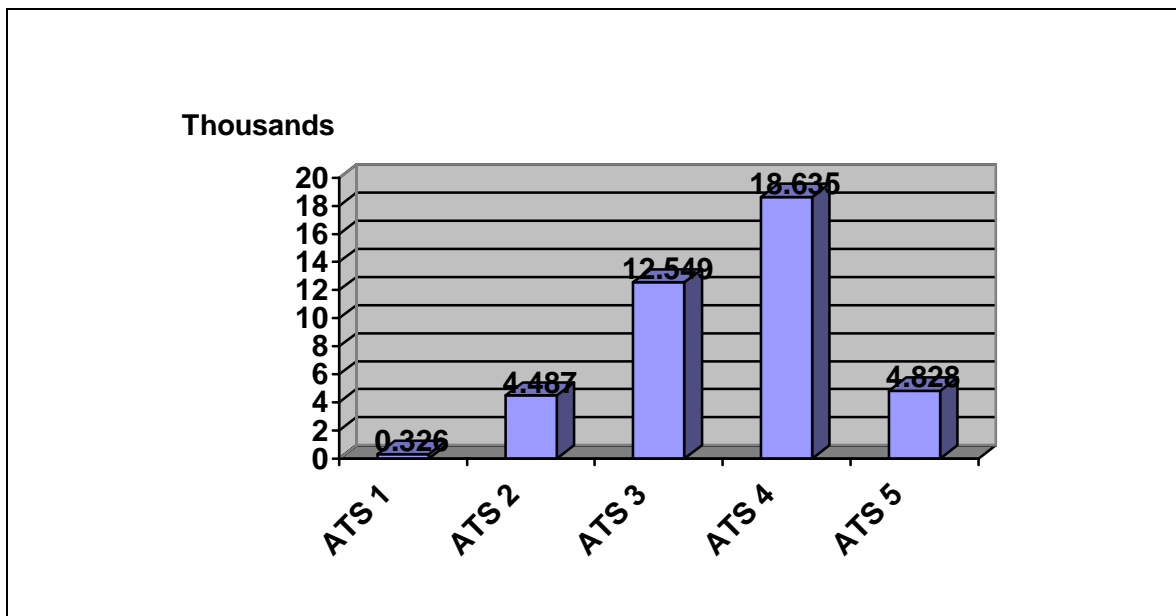


Figure III Presentations of each ATS category for year April 2004 to March 2005

Higher category patients on trolleys have details taken by receptionists in the triage corridor or at the bedside in the case of category one and two patients. The aim is to eventually provide mobile laptops for this purpose, to speed up the process for all patients. The ED then operates like most in NZ, with decisions made to refer, admit and discharge. Like elsewhere, there are long waits to see specialty registrars, even for patients referred directly by their GP. The senior ED consultants do not have authority to admit, although this may change in the future. All junior doctors in the department⁸ must refer to the on duty registrar or consultant before discharging their patients.

There are 'fast-track' streams for patients with cardiac chest pain, suspected neutropenic sepsis, fractured neck of femur, and category three unwell children. The first two are time critical conditions and the third is an attempt to prevent elderly patients lying on hard trolleys for extended periods. Unwell children are notified to the co-ordinator so the child has a prompt, full assessment within 30 minutes. Treatment spaces have to be

⁸ House officers and senior house officers are junior doctors with one-three years postgraduate experience.

made available for these patients, usually by moving stabilised patients out into the corridor. At busy times, category three patients, have a rougher time of it, often lying on trolleys in corridors until space becomes available. Until a primary nurse can be allocated, the triage nurses are responsible for these patients, increasing the stress and the risk to these nurses.

There is a well-developed education process within the department to ensure nurses become proficient in emergency nursing. Initial orientation is four weeks 'buddied' with an experienced nurse, with at least three study days of basic emergency skills provided in the first year. There are weekly education sessions, and fortnightly scenarios with medical staff and the nurse educator or specialist, with the aid of nurse co-ordinators, work closely with nurses requiring extra support. Appraisals are yearly, with nurses expected to develop professional development plans at this time. After 12-18 months ED experience, the nurses complete a triage course, either 'in-house' or the national College of Emergency Nurses (New Zealand Nurses' Organisation) course, and are then mentored to triage by senior nurses. This fits with ACEM recommendations.

The following case example offers insight into the experiences of two patients as they move through the department as it operates presently. Using this example ensures the problems are seen from a patient as well as a departmental perspective and it allows the reader to gain insight into the complexities of the ED experience. Case examples or scenarios are often used for teaching purposes and the story-telling within helps to reflect on practice for both nurses and doctors. The patients are composites of cases that could be seen in any ED in NZ and are therefore not actual patients. Pseudonyms are used.

Hannah, 22 years old, enters the waiting room of the ED on a busy Saturday afternoon. She is in a wheelchair, being pushed by her netball colleagues, having been brought straight from the netball court. She is grimacing at times but also laughing with her friends. The triage nurse asks her friends to push her over to a spare space in the waiting room and tells Hannah she will

be over as soon as she has finished triaging another patient brought in by ambulance.

The ambulance patient is a 54-year-old gentleman, Ted, who called the ambulance, as he was feeling unwell. He has type-two diabetes and has been unable to eat for two days because of nausea and fever. The paramedic reports his capillary blood sugar as being 22 millimoles per litre of blood, his heart rate is 100, respiratory rate 18 and temperature 37.9 degrees centigrade. He is pale but alert and complaining of some suprapubic and flank pain. The triage nurse quickly performs her own assessment and enters Ted onto the computer system with a triage category of three and a complaint of 'unwell adult - fever'. He joins the other two patients waiting on trolleys in the corridor, as the department is full. He is not particularly happy about being in a corridor and the nurse apologises but says there is no space elsewhere for him at this time. He wonders how long he will be there. The triage nurse knows it could be a long wait for Ted and feels just as helpless within the system. She promises she will keep in contact with him.

Four minutes later, the nurse approaches Hannah and asks her why she is here. Hannah says she has hurt her right ankle and can't walk on it. She gives a history of having jumped for the ball, and landing awkwardly with her foot inverted. She says she felt immediate pain on the outside of her ankle. The nurse gently examines the ankle and finds moderate swelling around the lateral malleolus and some bony pain on the distal fibula and at the head of the fifth metatarsal. Her toes are warm, pedal pulses are present and there is no evidence of gross deformity. The nurse asks Hannah to try and put some weight on the ankle but it is obvious she can't. The nurse decides there could well be a fracture, but as there is no evidence of neurovascular injury or gross deformity, and pain is not severe (four out of ten, on the numeric scale, 1 being the least pain and 10 being the worst pain

experienced), she allocates Hannah to category four. This category is in line with ACEM guidelines and the Manchester guideline for extremity injury. This means Hannah should be seen medically within one hour, as the injury is recent and pain will probably increase. She determines Hannah has no major medical problems or allergy to drugs, and apart from the oral contraceptive pill, is on no medication. Hannah has taken no pain relief since the accident happened.

At this ED, paracetamol is the only drug permitted to be given at triage without being prescribed by a doctor. Combined with ice and elevation, this is the extent of first aid for such an injury, and relates to the primary decisions of triage. For many minor injuries, paracetamol and first aid are enough to ensure the patient is reasonably comfortable while waiting.

The nurse enters Hannah's details into the computer system. Hannah is given Panadol for pain, she is sat with her leg elevated, ice is applied with instructions when to remove and replace it, and she is advised the wait could easily be two hours, depending on the number of more serious cases presenting. She is asked to inform the triage nurse if she has any concerns regarding pain and the waiting times. The nurse tells Hannah that she could be seen at the local after-hours clinic but there would be a part charge for an ACC problem and they may need to call in a radiographer. Hannah says she can't afford it as she is a student. She and her friends resign themselves to a long wait.

Meanwhile, Ted is still in the corridor after 30 minutes. The nurse reassesses him at this stage in line with the triage policy, including rechecking his blood sugar levels. She finds essentially no change in his condition, but he is becoming rather uncomfortable on the trolley, and there is no privacy. She reassures him and tells him she will try and find space for him as soon as

possible. One of the other corridor patients has gone to the treatment area but has been replaced with another two.

This is a very common scenario in the ED, particularly in the afternoons and evenings. One of the triage nurses becomes responsible for the corridor patients, trying to reassess and reassure. The nurse co-ordinator of the shift then decides if any patients in the clinical area can be taken out into a corridor to wait for test results or a bed in a ward, freeing up space for the undifferentiated patients in the triage corridor and waiting room.

Thirty minutes later, the triage nurse reassesses Ted again. She is concerned, as she knows patients with diabetes may have unclear signs and symptoms of infection. She communicates with the nurse co-ordinator, asking that Ted be the next patient to be assigned a nurse and a space, as she feels he is more urgent now than the other people waiting. Finally, after 90 minutes in the corridor, Ted goes through. He has so far waited three times longer than his triage category guideline stipulates, with no guarantee that a doctor will see him in the short term. The triage nurse is relieved though as at least he will have a more thorough nurse assessment in privacy and IV fluids commenced.

After two hours of waiting, one of Hannah's friends approaches the desk and asks how much longer the wait will be. The friend is told that Hannah is the next to be seen. However, five minutes later the ambulance radiotelephone informs the department of a major accident on the motorway with two seriously injured patients and three moderately injured. The triage nurse then informs the waiting room of the situation and thanks them for their patience.

Herein lies the problem with conventional triage processes. Patients with minor problems are always at the bottom of the list and frequently get 'bumped' back until a space can be found for them. To have waited patiently for two hours, only to be told the

wait may be that again, will induce anger and frustration in the most patient person. Triage nurses are encouraged to do rounds of the waiting room on a regular basis, partly to reassess and partly to relay information regarding waiting times. This continued contact also has the benefit of ‘getting to know’ the patients, making it easier to communicate with them, and making them feel someone does care and they have not been forgotten. If it is found that someone’s condition has changed, for example, pain has increased, or a change in neurovascular status of a limb, the patient can then be re-triaged to a higher level of urgency to reflect the change in clinical condition.

Ted, meanwhile, has had a brief assessment by an ED doctor and his nurse has commenced investigations and treatment. He will spend another six hours in the department before assessment by the medical registrar (who had another six patients queued up ahead of Ted) and another two hours before a bed is found in a medical ward.

This scenario reveals the other reasons for prolonged wait times in the ED which impact on triage times. As has been mentioned, access block to ward beds has the biggest impact on efficient ED care and waiting times.

After over three hours in the waiting room, Hannah is taken through to the treatment area but it is still over 30 minutes before a doctor sees her. She is then sent to x-ray, where she waits 15 minutes for her films before returning. Another 45 minutes passes before the doctor returns to tell her she has a severe sprain. Hannah’s nurse returns 15 minutes later (being busy with other patients), applies tubigrip for support and fits crutches. Hannah is given verbal and written advice on her injury and follow-up treatment before leaving the department five and a half hours after presenting.

The examples above typify the care often experienced by patients in the ED. It is obvious there are other problems unrelated to triage processes, for example, the overworked medical registrars, and access block to hospital beds. With all patients

queued up together, trying to get through one portal, the inefficiencies become even more pronounced. The stress levels of the triage nurses also intensify with too many calls on their time and the knowledge that patients could deteriorate in their care.

Summary

This is a typical metropolitan ED, with overcrowding, access block and a significant proportion of patients with minor problems who wait extended periods for treatment. Traditionally, staff attitudes to these patients have been poor as it was felt that as they were minor problems, they would just have to wait. These patients are the most amenable to treatment and quick discharge, but are the ones waiting the longest. Lack of staff and funding has limited efforts to reduce this problem in the past, but the recent significant increase in patient census and the closing of primary care after-hours centres has increased the urgency for a solution. Category three patients are also at risk as it can be difficult to move them into an area where they can be fully assessed.

The next section will focus on the best solution in terms of effectiveness and reduction in waiting times, for an ED seeing approximately 43,000 people a year.

Section IV The choices of patient flow systems

The real issues for this department, like many others in the Western world, are rising patient census and increasing access block, combined with a shortage of nursing staff and too few treatment spaces for the department census. These have created a department where people often wait unacceptable lengths of time for medical assessment, and indeed, a treatment space. This inevitably means category three patients lie on trolleys in a public corridor. These patients are at the most risk for deterioration as they are classified as ‘urgent – require medical assessment within 30 minutes’ (Australasian College for Emergency Medicine, 2002). In an effort to rectify this problem, stabilised patients are removed from rooms and placed in corridors to free up spaces but at peak times (which generally occur in the afternoons and evenings most days) there are still category three patients such as Ted in the triage corridor. Category four and five people in the waiting room like Hannah then encounter very long waits as nurses try and slot them between these sicker people. So what can we do to free up extra spaces and ensure waiting times are reduced?

After consideration of all the evidence, the nature of the department and the environment, a separate minors stream, or ambulatory care area, with a dedicated area and staffing, appears to be the best choice. Combined with other nurse-led initiatives, specifically nurse initiated x-rays, many of the delays at triage for minor patients could be alleviated. The benefits also include freeing up more treatment spaces for category three patients. The arguments for this choice will be discussed below.

To recap, the department is medium-sized, troubled with lack of space compared to our department census; has access block that is not being fully addressed by the organization; there is no primary care cover in the catchment area after 11pm; is sited within a lower socio-economic area; has a lack of nursing staff; and has problems meeting compliance figures for category three and four patients.

Category three patients are classed as urgent, with the potential to deteriorate. These people have the worst triage compliance figures (see Table III), and it is hoped that this will improve with the institution of an ambulatory care clinic, which will free up more spaces in the treatment area.

All the literature previously mentioned on minor streams is positive, but in reality, if it is not done with strict guidelines around dedicated staffing of the area, it cannot work efficiently. The problems with attempts at informal fast-track clinics on the weekends have already been discussed. Frequently, no staff can be freed up to run it. It is also run at one end of the department, taking up valuable space for sicker patients.

The answer is an initial investment (already estimated to be about \$10,000) to convert an existing space into a suitable area, and increase staffing to cover eight to twelve hours a day (midday until 8pm or 11am until 11pm), seven days a week. These financial costs could be countered by reduced waiting times, increased patient and staff satisfaction, fewer complaints, and increased number of treatment spaces. To ensure the process does work, auditing of triage compliance figures and number of complaints could be compared from a specified time before the opening of the ambulatory care unit, with a specified time after its opening.

The ED has one such room available, the current storeroom, which, with very little effort could be converted. When this idea was mooted previously, it was argued that a nurse from the treatment area could run it. I would argue against this for the following reasons.

On an afternoon shift (2.30pm-11pm), there should be ten nurses on the floor (there are often only eight or nine), including the nurse co-ordinator who does not take a patient load. One nurse is assigned to the resuscitation area, three to the acute end (one or two may have to help in the resuscitation area as required), three to the more minor end and two to triage. It has been suggested that a nurse from the minor end could run the minor clinic with a doctor (from off the floor). But if the minor patients were taken from the minor end, these nurses would then be accepting sicker category three patients into the

freed up spaces. There are 12 spaces at this end, far too many for two nurses to look after safely. For this reason, it is imperative that extra nurses are employed to run the ambulatory care area.

The same could be said of doctor staffing. As we have seen from the literature, the more senior the doctor running the ambulatory care area, the more efficient and safer it is. To place a junior doctor here opens up issues of risk and the fact that junior doctors will need advice on what to do with certain patients. To have to continually defer to the registrar or consultant on shift would defeat the purpose of fast and efficient treatment.

As the ambulatory care area would run for only eight to twelve hours per day, during the other times the institution of nurse initiated x-rays at triage can help alleviate the stress of waiting for minor patients. The implementation of this policy is well under way. In fact, even when the minor clinic is running, if waiting times are still more than 30 minutes, nurse-initiated x-rays could still be instituted.

Using the case examples from the previous section, how might Hannah and Ted progress through the system if these two options were in place?

Once Hannah has been triaged to category four and first aid has been instituted, she is identified on the computer-tracking screen as suitable for the ambulatory care clinic. The triage nurse tells Hannah that her wait time at this stage is likely to be 30 minutes, but that during this time, she will be sent to x-ray for views of her ankle.

Before the nurse can institute this, she triages Ted who has arrived by ambulance. After entering Ted onto the computer, she tells him that he will be assigned a nurse shortly but that meantime she will care for him.

The triage nurse, who has already done a thorough assessment of Hannah's ankle, based on the policy guidelines for nurse-initiated x-rays, orders the x-

ray electronically. The nurse used her own assessment combined with the Ottawa ankle rules for the decision to x-ray. She directs Hannah and her friends to the ED x-ray department and Hannah returns 15 minutes later with her films. Twenty minutes after returning, Hannah is called into the ambulatory care area where the doctor can examine her and the x-ray together. The doctor decides she has a severe sprain and the nurse assigned to the area applies tubigrip, fits crutches and gives Hannah verbal and written advice on the care of her injury. She ensures Hannah is safe on the crutches before discharging her, 80 minutes after arrival in the department.

Ted meanwhile, after 45 minutes in the corridor, has been assigned a room and a primary nurse. He has been thoroughly assessed by the nurse and an ED doctor and tests and treatment instituted. He still has to wait for the medical registrar and a ward bed (as these issues have not yet been addressed), but at least he is in a private room where his needs can be attended to. His nurse tells him that even though his wait for the medical registrar may be long, his treatment will continue as it would on the ward. Ted indicates he understands and settles down for the long wait. His nurse ensures his care continues and keeps him informed of his wait.

Although Ted will still spend many hours in the department waiting for a ward bed, at least his time in a public corridor is kept to a minimum. To recap, the literature on minor care areas has found that the care of sicker patients is not compromised, and indeed is usually improved (Cooke, Wilson et al., 2002; Rogers et al., 2004; Dancocks & Shrimpling, 2003). Hannah was able to get prompt care and treatment, even though the department was full with sicker patients. It is imperative the ED makes these changes to patient care and flow, to ensure the sickest people are seen promptly and those with more minor problems are facilitated to spend as little time there as possible. This system must be an improvement over what we have now, and will make for a happier waiting room and triage nurses.

Discussion and recommendations

The literature overwhelmingly supports the notion that conventional triage processes often extend waiting times for lower category patients unless secondary triage takes place. Secondary triage includes measures such as nurse-initiated xrays, initiation of investigations and initiation of intravenous fluids. Waiting times for category four and five patients are extended as they are ‘bumped’ further down the queue by sicker patients arriving. These patients are the most amenable to quick assessment and treatment but are at the mercy of the system. Category three patients are not being seen within the 30 minutes stated by the guidelines, languishing in public corridors until space is available. These patients are most at risk as they have the potential to deteriorate. It is obvious that conventional triage, with its ‘one portal’ system is disadvantaging many patients, particularly those with minor conditions and that patient flow systems after triage may alleviate this problem.

Working under these conditions is unpleasant and with the rapidly increasing census, closure of primary health facilities after 11pm and increasing access block problems, it can only get worse. Based on the current literature and the nature of the department, streaming off minors and instituting nurse-initiated x-rays appear to be the systems most suitable at this stage. The development of an emergency nurse practitioner role with a scope of minor injuries and illnesses should be encouraged.

The advantages are:

- It will be easier to give an approximate waiting time to minor patients
- Better quality of care for all categories, particularly category three patients
- Reduced waiting times for all categories
- Some patients will have x-rays during this waiting time
- Reduced complaints
- Reduced number of DNW patients
- Does not delay care for the sicker patients
- The development of Emergency Nurse Practitioner roles

The disadvantages envisaged are:

The training issues for doctors who may potentially miss out on assessing and treating minor problems. This could be resolved with careful rostering.

A potential increase in the number of minor patients seen as people hear they will be seen more quickly. As our funding is based on a set amount per patient, these patients are a main source of income.

There is the potential for other category four and five patients, not suitable for the ambulatory care area, to become upset when others are called through before them (this has happened when the informal fast track service has run). The problem could be alleviated by zoning the waiting room to have all ambulatory care patients sitting in one area, close to where they will be called through.

The logistics required to institute these new systems are relatively minor. The nurse-initiated x-ray policy is ready to roll out as soon as radiology gives its approval. For relatively little expenditure and disruption to the department, the minor area could be set up very quickly. The extra staff required for running it will require a business case. From experience, an emphasis on increased patient safety and improved efficiency (better triage compliance times) can be effective with business cases. Undoubtedly management will require evidence that such a process is workable and will produce the intended outcomes. Auditing of waiting times and the number of complaints after initiation of the ambulatory care area will be imperative to ensure continued funding. Based on the evidence, such systems do reduce waiting times, which must reduce the risks of undifferentiated patients waiting in corridors and waiting rooms without comprehensive assessment.

Summary

Conventional triage processes mean all patients enter the department through one portal, penalising those patients with lower triage categories, as sicker patients need treating first. Extended waiting times cause anger and anxiety in patients and nurses, and can lead to increased rates of violence from patients, and patients who leave without being

seen. This is a risk to all parties involved, including the organization. The work of the triage nurse is increased when having to care for undifferentiated trolley patients in a public corridor while carrying out the triage role.

Other systems studied do not suit the needs of the ED as most would work more efficiently in departments with a much larger patient census. Conditions in NZ, specifically the cost of primary health care, mean triaging people away from the department is more difficult, and ACEM considers it unsafe, denying people access to healthcare.

For this department, extending nursing practice by introducing nurse-initiated x-rays at triage, and the introduction of a separate stream for minor category patients in a dedicated ambulatory care area with dedicated staff, for at least eight hours a day, should improve waiting times for these patients. There would be the added advantage of improving triage compliance figures for category three patients, as more treatment spaces are freed up. The additional financial costs involved in such a process could be countered by the potential for improved waiting times, improved triage compliance figures, happier patients and clinical staff, as well as an emptier waiting room. It is hoped the opening of a short stay unit will also assist in freeing up treatment spaces.

The role of emergency nurse practitioner should be encouraged. While this may take several years to come to fruition as the training required is extensive, it is an obvious step along the path to multidisciplinary collaboration in the interests of the patient.

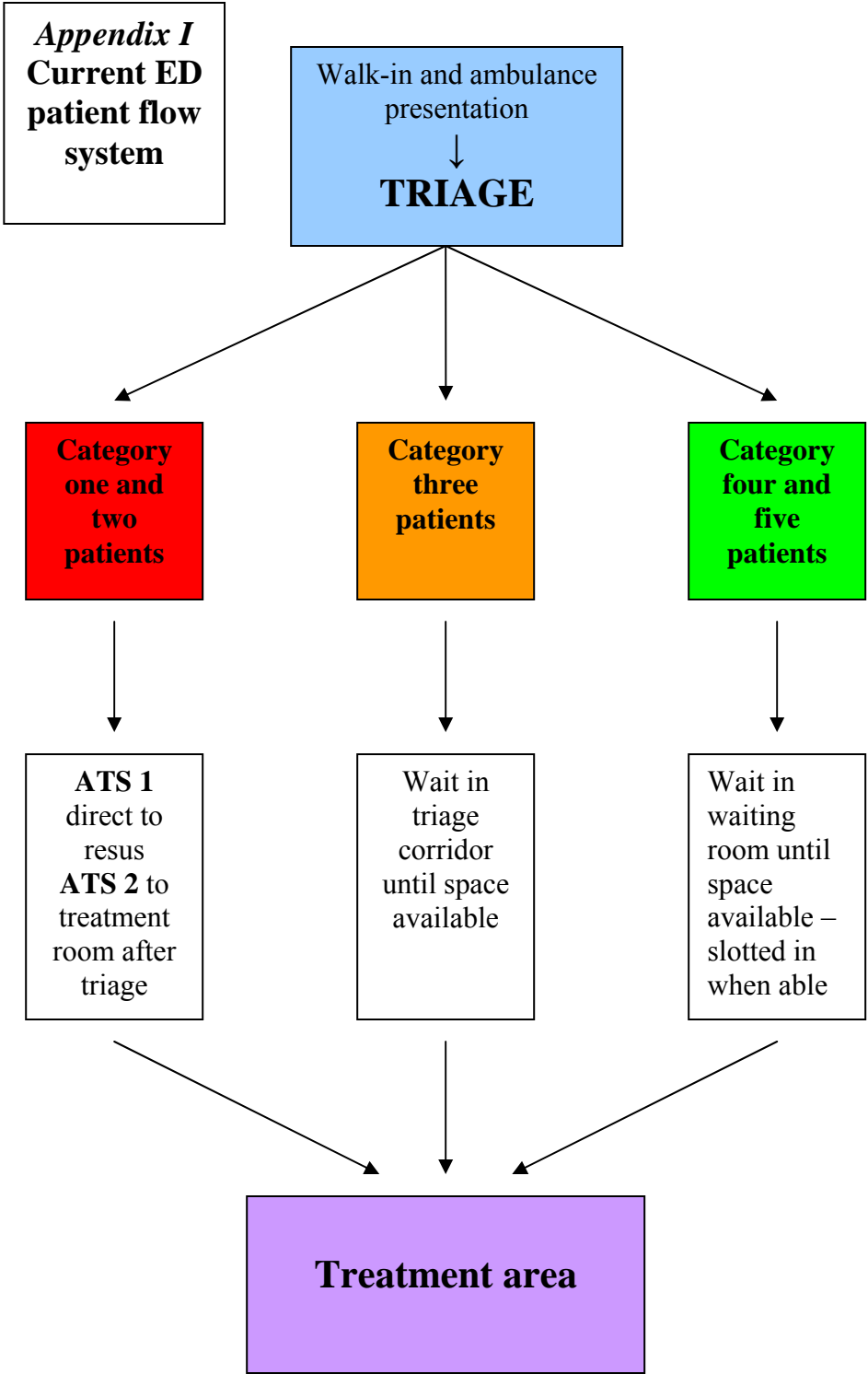
Future considerations

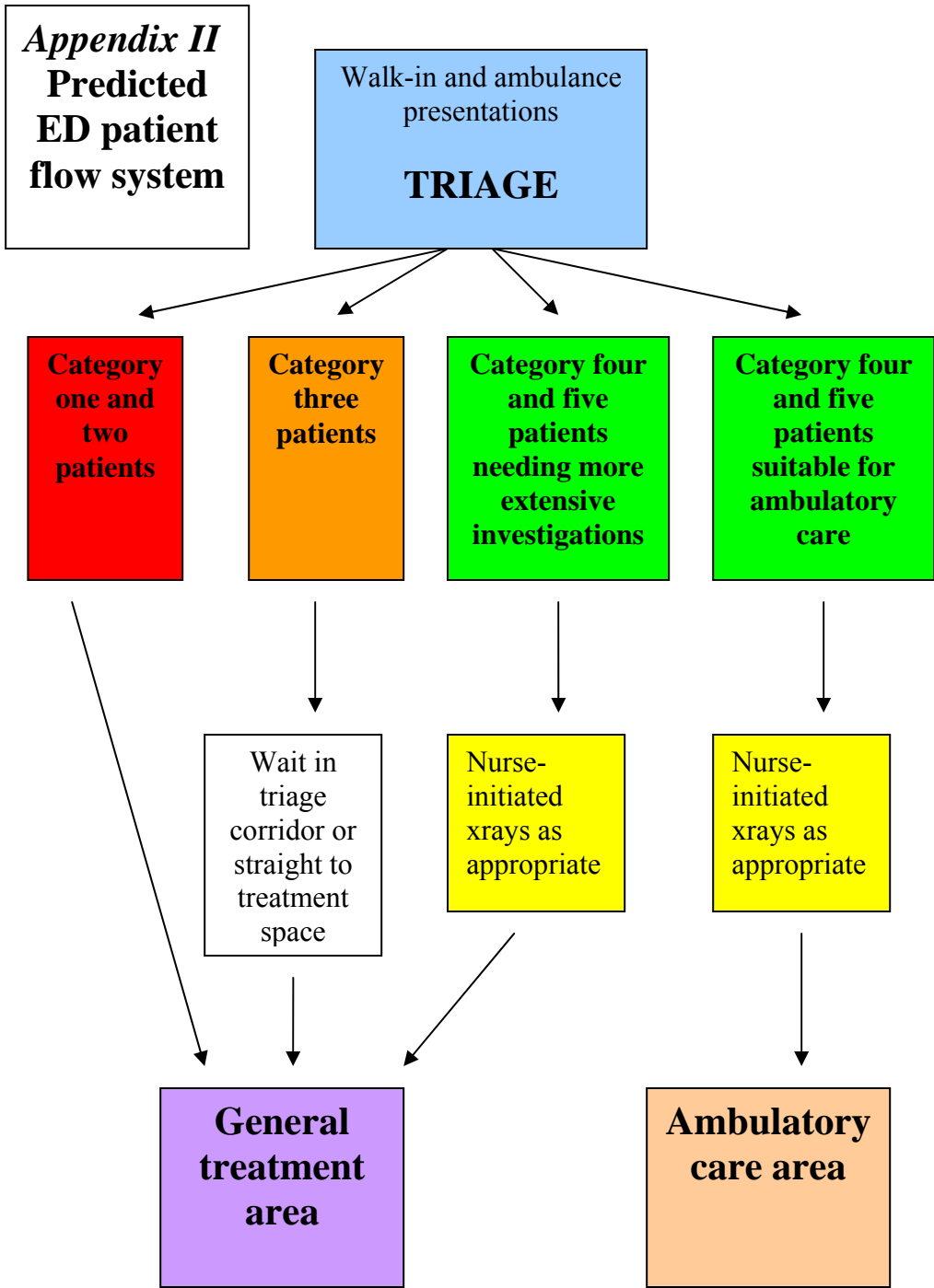
It must always be the quest of emergency nurses to find ways to improve the care they provide for their patients. The opportunities to work smarter, not harder, are always there, even within the financial constraints of today's health system.

Category three patients are always an issue when it comes to delivering timely care so there are opportunities for further research into alternative processes designed to improve this problem, both after triage and within the treatment area. There is also an opportunity to focus research on the way nurses are educated in EDs to encourage innovation and the embracing of positive change, in a dynamic environment.

Collaboration between doctors and nurses in response to increasing expectations from patients of faster and more efficient emergency care, is also worthy of study. Nurse-initiated xrays is one example of this but there are probably many more where the boundaries between nurses' and doctors' work can be blurred, without either party feeling threatened or compromised.

From the evidence provided in this research paper, a business case for the proposed changes can be developed. As has been discussed, the motivation for introducing these changes is about improving patient safety by improving triage compliance figures, improving patient satisfaction by decreasing waiting times and increasing efficiency by improving patient flow within the ED. The extra financial costs that will inevitably arise out of such changes must be offset by these considerations which are just as important as the fiscal ones.





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