



'Care in a chair' – The impact of an overcrowded Emergency Department on the time to treatment and length of stay of self-presenting patients with abdominal pain



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ABSTRACT

Objectives: The aim in this study was to investigate the impact of overcrowding on the Australasian Triage Score's (ATS) time to treatment target and the National Emergency Access Target (NEAT) for patients who self-present to the Emergency Department (ED) with abdominal pain.

Background: The causes and effects of ED overcrowding have been well described in the literature. It is a widespread phenomenon throughout the world and it can cause serious harm to patients and have a negative impact on access to emergency care. There is however, little research investigating the effect of overcrowding when patients self-present to the ED and experience a delay in being allocated a cubicle.

Methods: A retrospective analysis of 12-months of computerised records was carried out in order to determine if self-presenting patients with abdominal pain allocated a category 3 triage score who were required to 'queue' for a cubicle would meet ATS target and NEAT requirements. A multiple regression analysis was used to determine whether or not queuing for an ED cubicle, age and gender were predictors of meeting the ATS guidelines and NEAT requirements.

Results: Three hundred and five patients met the inclusion criteria and were included in the study. Of these 149 patients waited more than 15 min to be allocated a cubicle while 156 did not experience any delay. A multiple regression analysis revealed that gender and age were not predictive of meeting the ATS target and NEAT requirements, while delay in allocation to a cubicle was a significant predictor of not being assessed within 30 min and discharged within 4 h. Furthermore, 61.2% of patients allocated to the waiting room queue for any amount of time were admitted to the ward.

Conclusion: Queuing in the waiting room for an ED bed was a significant predictor of whether or not category three patients with abdominal pain had treatment commenced within 30 min of presentation and was associated with a longer total ED length of stay.

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1. Introduction

Emergency Department (ED) overcrowding has been documented in the literature for over 20 years, and has been identified as a worldwide problem [11,13,31]. Overcrowding can be described as a situation where the number of patients waiting to be seen, undergoing assessment or waiting for discharge from the ED exceeds the physical or staffing capacity of the ED [5,10]. The Australasian College for Emergency Medicine (ACEM) reported that presentations to ED increased by an average of 4.3% per year,

while the number of hospital beds decreased by one third between 1983 and 2010 [3].

Overcrowding can be the result of several factors. One such factor is access block. In Australia, access block is defined as the situation when ED patients are unable to access appropriate hospital beds within a time no greater than eight hours [1]. Access block has been associated with an excess mortality of 20–30% [23]. In large EDs it is estimated that more than 40% of staff's time is spent providing care to patients experiencing access block rather than attending to new emergency presentations [1]. With increasing demand on health services, hospital overcrowding is regarded as one of the most avoidable cause of harm to patients in the hospital system [27]. Overcrowding can result in patients waiting in temporary locations before being allocated a cubicle for emergency care.

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Patients present to EDs by two means: via ambulance or they self-present. Ambulance “ramping” is a consequence of overcrowding and is an example of the disruption to patient flow that occurs when patients arrive to an overcrowded ED. Ambulance ramping refers to the situation where paramedics are made to queue in corridors, waiting for EDs staff to allocate the patient to a cubicle, a situation that is frequently seen in Australian EDs [14,25]. Hitchcock et al. [14] found that ambulance ramping resulted in an increased length of stay for ambulance patients and as such warranted “close attention by health service providers” (p. 22). While ambulance ramping results in patients being cared for by paramedics in corridors waiting for a cubicle to be allocated, self-presenting patients who require a cubicle do not have access to this level of care.

The situation in which self-presenting patients cannot access ED cubicles in an appropriate timeframe is mentioned in the literature, but not well described. Boyle et al. [4] referred to patients requiring ED trolleys as ‘trolley patients’ and reported that if the number of patients requiring trolleys exceeds the number of ED cubicles then an ED is overcrowded.

Another consequence of long waiting time is patient dissatisfaction. Patient dissatisfaction can result in an increased rate of patients leaving without being seen [9]. Kulstad et al. [20] found an association between rates of leaving without being seen and the rate of ED cubicle occupancy. The ACEM [2] suggested that delays in ambulance patient transfer greater than 30 min are symptomatic of ED system failures and delays greater than 1 h should initiate an incident review.

Emergency Departments are under increasing pressure to assess, treat and discharge patients more efficiently. Wiler et al. [30] highlighted the importance of “identifying and mitigating impediments to efficient patient flow” (p. 142) and report that streamlining ED operations has a valuable effect on patient outcomes. Similar streaming approaches have been implemented in Australian EDs [6,19]. An Australian response to ED overcrowding was the introduction of the National Emergency Access Targets (NEAT) in 2008, after the United Kingdom found that time based targets reduced overcrowding and access block [24]. NEAT have been adopted Australia wide and by 2015, all public hospitals were required to discharge 90% of their patients to a ward, another hospital or home within four hours of initial triage [12].

The aim in this study was to investigate the impact on the Australasian Triage Score’s (ATS) time to treatment target and the National Emergency Access Target (NEAT) for patients with abdominal pain self-presenting to the ED arriving at times of overcrowding.

2. Methods

2.1. Design

A retrospective review of electronic medical records over a 12-month period (from May 2012 to April 2013) was conducted in order to evaluate the impact of the delayed allocation of a cubicle when arriving in an ED in an overcrowding situation. Electronic ED records were extracted, de-identified, from the patient management system (Symphony™). Full ethical clearance was obtained from the study site and the University prior to the start of data collection.

2.2. Setting

The study took place in the ED of a major Australian metropolitan tertiary referral centre, which is also a University teaching hospital. This facility provides specialist services to the metropolitan

centre as well as to regional Victoria and Tasmania. The centre is a designated level 1 adult trauma service for Victoria and the ED receives in excess of 60,000 attendances each year and service a population of around one million people. The location a patient must wait for a cubicle for assessment and treatment when ED is overcrowded, is determined by their mode of arrival (Fig. 1).

Patients who arrive by ambulance remain in the care of ambulance paramedic until a cubicle becomes available. ACEM [2] recommended that handover to hospital staff should take no more than 30 min. Patients who self-present and are assessed by the triage nurse as needing treatment in an ED cubicle are required to queue in the waiting room until a cubicle is available. These patients might require intravenous analgesia and/or close monitoring and are temporarily cared for by the triage nurse.

2.3. Participants

In order to examine overcrowding over a full year, the study was conducted in two phases. Initially, all patients that attended the ED over the one-year period were included and the data from this group was subjected to descriptive statistics, although patients who had been allocated a triage category of one were excluded as they are seen immediately and would not have experienced any delays. Data collected for analysis included the number of attendances per month, triage categories, age, incidents of queuing for a cubicle and ambulance ramping, presenting complaints, discharge diagnosis and discharge disposition. For the second phase, of the 12 months of data, all patients with an allocated World Health Organization (WHO) International Classification of Disease version 10 (ICD-10) discharge diagnosis classified as R104 (abdominal, flank pain, cramps, intestinal colic) were selected for a subgroup analysis of the impact of prolonged waiting room time. These attendances were selected due to abdominal pain being the most common presenting complaint during the examined period. In this subgroup, the analysis was focussed on all patients with an ATS category of three, as it was the most common triage score allocated. Category three patients are considered ‘urgent’ presentations and may benefit from a cubicle allocation at the time of triage.

Patients who arrived by ambulance and initially deemed appropriate for the waiting room, were excluded from the analysis even if they ended up in an ED cubicle, because it was not possible to ascertain whether they had received any treatment prior to arrival into the ED. The first group consisted of patients allocated to the waiting room for a time shorter than 15 min were included with the non-waiting group. The 15-min cut off time was decided upon to account for logistical decision-making between the nurse in charge and the triage nurse. A time greater than 15 min may indicate that an ED cubicle was not available. It is also the timeframe by which an ambulance patient should be routinely allocated to an ED cubicle after triage has occurred [2].

The second group was the waiting group, which consisted of patients that self-presented and had a waiting room time greater than 15 min before cubicle allocation. The two outcome measures were adherence to NEAT and time to treatment. It was therefore important to match the patients presenting problem and discharge diagnosis. Patients who were discharged with an ICD-10 code of R104 were excluded if their presenting problem was thought to influence time to treatment. These patients may have been triaged as having chest pain, spinal problems or immunosuppression related problems but were allocated a discharge code of R104 and were therefore excluded. These patients may have been prioritised over patients triaged as having abdominal pain and this could have influenced their time to treatment.

Emergency Department presentations are known to fluctuate seasonally, with higher numbers of presentations in the winter

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