Impact of streaming "fast track" emergency department patients

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Abstract

Objective: Fast track systems to stream emergency department (ED) patients with low acuity conditions have been introduced widely, resulting in reduced waiting times and lengths of stay for these patients. We aimed to prospectively assess the impact on patient flows of a fast track system implemented in the emergency department of an Australian tertiary adult teaching hospital which deals with relatively few low acuity patients.

Methods: During the 12-week trial period, patients in Australasian Triage Scale (ATS) categories 3, 4 and 5 who were likely to be discharged were identified at triage and assessed and treated in a separate fast track area by ED medical and nursing staff rostered to work exclusively in the area.

Results: The fast track area managed 21.6% of all patients presenting during its hours of operation. There was a 20.3% (–18 min; 95%CI, –26 min to –10 min) relative reduction in the average waiting time and an 18.0% (–41 min; 95%CI, –52 min to –30 min) relative reduction in the average length of stay for *all* discharged patients compared with the same period the previous year. Compared with the 12-week period before the fast track trial, there was a 3.4% (–2.1 min; 95%CI, –8 min to 4 min) relative reduction in the average waiting time and a 9.7% (–20 min; 95%CI, –31 min to –9 min) relative reduction in the average length of stay for *all* discharged patients. There was no increase in the average waiting time for admitted patients. This was despite major increases in throughput and access block in the study period.

Conclusion: Streaming fast track patients in the emergency department of an Australian tertiary adult teaching hospital can reduce waiting times and length of stay for discharged patients without increasing waiting times for admitted patients, even in an ED with few low acuity patients.

Aust Health Rev 2006: 30(4): 525–532

What is known about the topic?

Australian public hospital emergency departments struggle to meet timelines for definitive treatment/admission, and have experimented with alternative approaches to triage and queueing.

What does this study add?

This study demonstrates that separate "fast tracking" of patients likely not to be admitted, using a dedicated treating team, can reduce waits for all discharged (ie, not-admitted) patients, and reduce the number of patients who choose not to wait for treatment.

What are the implications?

This approach has been proven internationally and in the Australian context and should be considered by all busy emergency departments. The Australasian College for Emergency Medicine and health authorities should consider the implications for some aspects of their current policies regarding the use of the Australasian Triage Scale. ◆

THE CONCEPT OF STREAMING patients with relatively low acuity conditions through a dedicated area, in order to reduce their waiting times and lengths of stay, was first trialled in the late 1980s in emergency departments (EDs) in North America.[1] The success of these "fast track" systems resulted in their wider introduction internationally and in trials of variations of the original model.

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Several fast track models are now in operation, but to date there has been no study detailing changes associated with their introduction in the Australian emergency department setting. In addition, with fast track systems mainly focused on low acuity presentations, it is unclear whether an emergency department with relatively few patients with minor illness or injury would benefit from the introduction of a fast track system.

This paper describes a prospective study undertaken to assess the impact of a fast track system in the emergency department of an Australian tertiary adult teaching hospital which deals with a predominantly complex medical casemix. Some emergency staff express concerns that while fast track areas reduce times for patients treated through those areas, this may be at the expense of patients in the remainder of the department. We hypothesised that streaming patients in this way would benefit all discharged patients, and would not adversely affect waiting times for admitted patients.

Aims

The aims of this study were therefore to assess the impact of the introduction of a fast track system in terms of the performance indicators:

- average length of stay for all discharged patients (time from triage to time of discharge);
- average waiting time for all discharged patients (time from triage to time seen by doctor);
- average waiting time for all admitted patients (time from triage to time seen by doctor).

Methods

Setting

The trial was conducted in the emergency department of a 500-bed metropolitan tertiary adult teaching hospital in Perth, Western Australia, over a 12-week period commencing in June 2004. At that time, the emergency department had 43 000 attendances per year, of whom 48% were admitted. There was a high proportion of elderly patients; 26% of patients presenting were over 70 years and 14% over 80 years old.

Fast track implementation

The fast track system operated between 09:00 and 22:00 on weekdays and 09:30 and 18:00 on weekends, using a three-bed treatment room located near the emergency department waiting room but separate from the main department. A junior ED doctor and a registered nurse were rostered to work exclusively in the fast track area, with an ED consultant rostered to supervise and assist with the patient load. When staffing numbers allowed, a second registered nurse was also rostered to assist. The total medical and nursing staff levels for the ED were unchanged during the study period compared with the previous 12 months.

The triage nurse allocated patients to one of two streams. The fast track stream consisted of patients in Australasian Triage Scale (ATS) categories 3, 4 and 5 who were likely to be discharged and could be managed in the fast track area. The second general stream consisted of all the other patients who were then seen and assessed in the main department as usual. Triage nurses underwent a 2-week training period before the commencement of the trial, during which time they received education and practised identifying patients most suitable for fast track.

To indicate which patients had been allocated to the fast track stream, the triage nurse placed "FTR" in the "Nurse" column next to the patient's name on the emergency department information system (EDIS) tracking screen and the patients then waited in a dedicated area of the ED waiting room. This enabled fast track patients to be readily identified in real time and later on the EDIS database. All the fast track patients' medical records and registration paperwork were kept separate from the main department, and investigation request forms were clearly stamped "Fast Track". This was aimed at speeding flow, allowing x-ray and the ED to know these were the fast track patients, and enabling later data analysis.

The fast track doctors and nurses worked as a team to assess, treat and discharge fast track

patients as efficiently as possible. This involved examining processes so that unnecessary delays in management were eliminated. Fast track only contained three cubicles, and one chair for ambulant patients, so the emphasis had to be on rapid patient turnover to avoid the area becoming blocked. For the same reason, patients needing admission or longer periods of treatment were quickly transferred to other parts of the ED.

Statistical analysis

Data were extracted from the HAS EDIS Version 9.1 database (Hospital Administrative Software Solutions Pty Ltd, Sydney, Australia). For the purpose of analysis, the patients were grouped as either admitted or discharged. While it is clearly not difficult to document decreased waiting times for a group of specifically targeted low acuity patients, we felt it was important to analyse the overall effect on all discharged patients to determine whether the intervention was really beneficial to the processes of the whole department. Patients were classified as "admitted" according to the Australian Council on Healthcare Standards definition — that is, those patients undergoing the formal admission process, transfers and deaths. No patients were excluded from the analysis. ED length of stay (LOS) was calculated as time of departure minus time of arrival. ED waiting times were calculated as time seen by the senior/treating doctor minus time of arrival. Both ED LOS and waiting times were monitored as an average weekly time.

Statistical process control (SPC) charts were also used throughout the project to monitor and report on progress. The advent of mass production of products in the early 1900s saw reproducibility of the size or shapes of a product become a quality issue. In 1931 Walter Shewhart championed statistical process control, a methodology for charting a given process and quickly determining when a process is out of control. The concept of process variability forms the heart of SPC. Control charts provide the ability to differentiate between variations that are normally expected as part of the process due to chance or common cause, and variation that changes over time due to assignable or special causes. Investigation and removal of variation is the key to process improvement.

The daily median LOS for all discharged patients was calculated and plotted on a run chart. The mean LOS was calculated for the period, and upper and lower control limits (UCL and LCL) set using 2.6 standard deviations. Applying Shewhart's run rules, seven or more consecutive points lying on one side of the mean indicates a significant shift in the mean of the process. At this point, the mean was recalculated as well as the upper and lower control limits. A narrowing of the control limits by reducing variation indicates process improvement.

Statistical and clinical significance of differences between key time intervals pre and post intervention were assessed using estimations. Mean differences and proportions were calculated and the 95% confidence intervals derived for these estimates.

Results

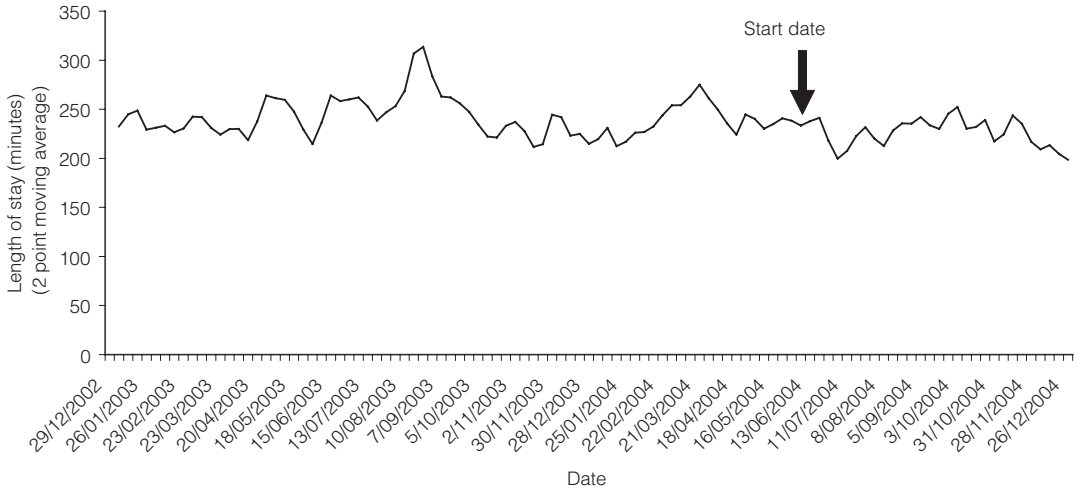
During the 12-week trial period, an average of 123.5 patients per week were streamed through the fast track area. This represented 21.6% of all cases presenting during fast track opening times and 29.8% of all discharged patients.

Length of stay

There was an 18.0% relative reduction in the average LOS (time from triage to time of discharge) for all discharged patients compared with the same period the previous year (227.5 min v 186.5 min). This represents a reduction in the mean LOS of 41 minutes (95%CI, –52 min to –30 min) in the time each discharged patient spent in the ED. This was achieved despite a 7.7% increase in total ED attendances during the study period compared with the same period the previous year (Box 1).

There was a 9.7% relative reduction in the average length of stay for all discharged patients compared with the 12-week period immediately before the introduction of the fast track system

1 Plot of the average length of stay for all patients discharged from the emergency department (ie, those streamed through "fast track" as well as those discharged from the main department) in 2003 and 2004



Arrow indicates the introduction of the 12-week "fast track" trial. ◆

(206.5 min v 186.5 min). This represents a clinically significant reduction of an average of 20 minutes (95%CI, –31 min to –9 min) in the time each discharged patient spent in the ED. This was achieved in the setting of a seasonal increase of 10.2% in total ED attendances during the study period compared with the 12-week period immediately prior the introduction of the fast track system. (Box 1 and Box 2)

Waiting time

The average waiting time (time from triage to time seen by doctor) for all discharged patients was reduced by 20.3% in relative terms, compared with the same period the previous year (Box 3), with a reduction in the average waiting time from 74.4 minutes to 59.4 minutes. This means that discharged patients waited on average 18 minutes less (95% CI, –26 min to –10 min) to be seen during the trial period.

There was a relative reduction of 37% in the mean number of patients who did not wait for treatment (DNW). During the intervention period an average of 18.3 patients per week DNW compared with 29.3 patients per week for the same period in 2003, a fall of 11 patients per week. (95% CI, –13 patients per week to –9 patients per week). Compared with the 12 weeks immediately before the study, DNW numbers dropped from 22.3 to 18.3 (4 patients per week; 95% CI, –6 patients per week to –2 patients per week), representing a 17% relative reduction.

There was a 3.4% relative reduction (2.1 min; 95% CI, –8 min to 4 min) in the average waiting time for all discharged patients compared with the 12-week period immediately prior to the introduction of the fast track system.

The average waiting time for admitted patients was not adversely affected (ie, did not increase) during the fast track trial period compared with both the same period the previous year and the 12-week period immediately prior (Box 4).

Discussion

Background

The use of fast track areas is not a new concept. The initial trials in the late 1980s in North American EDs used "fast track" areas staffed by

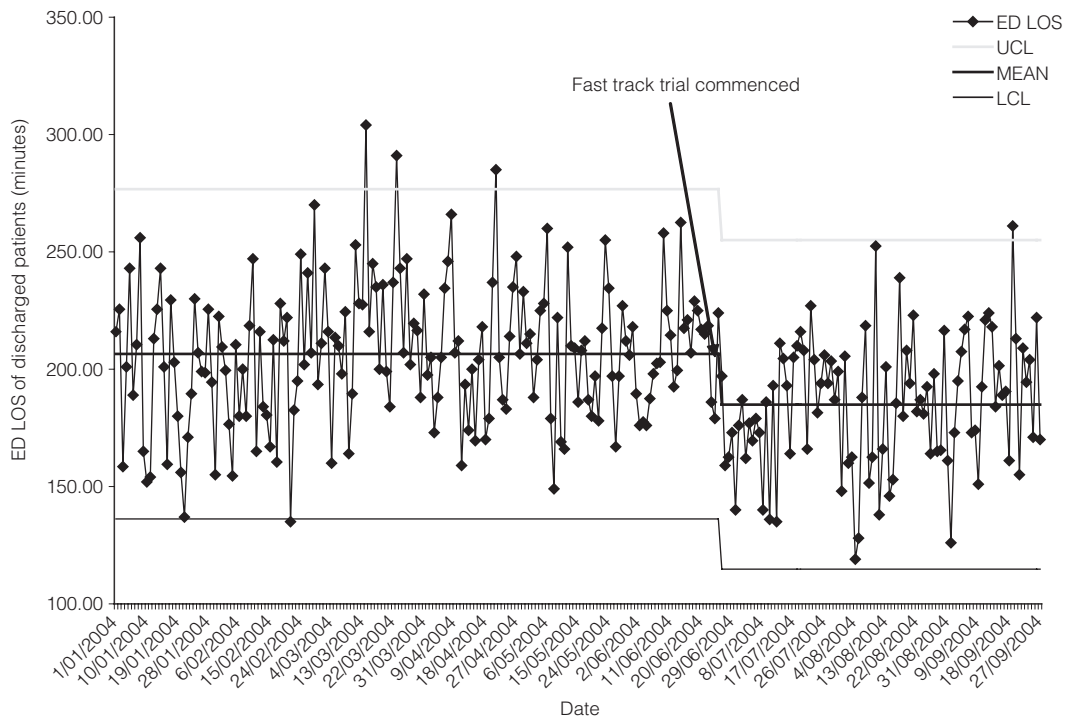
nurse practitioners, often, but not exclusively, dedicated to patients with minor injury.[1-4] These studies documented significant improvements in length of stay and patient and staff satisfaction. The concept was also successfully applied to a North American paediatric ED with similar improvements.[5]

This model of a nurse practitioner-staffed minor injury clinic in an ED was subsequently examined in the UK setting.[6] Beales confirmed reduced waiting times and improved patient satisfaction.

Fast track systems have since been more widely introduced. Further studies have examined other benefits of fast track systems. In one North American study, fast track, among other quality interventions, reduced the number of patients leaving before being seen.[7] The DNW rate fell from 2.4% to 1.1% of patients. Two North American studies in paediatric EDs showed that there were cost savings of US$25 per patient seen in fast track, as well as improved throughput.[8,9] A further North American study confirmed that patients were satisfied with the model of care where they are seen early by physician assistants rather than waiting longer for a physician.[10] Quality improvement principles have been applied to the fast track process to invigorate it and further reduce transit times and improve satisfaction.[11]

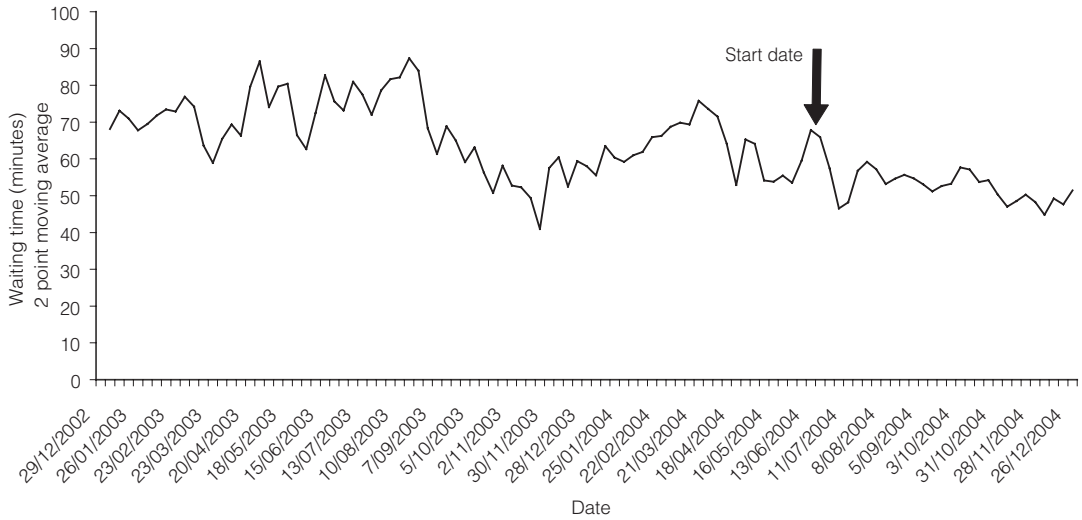
This model of nurse practitioner or physician assistant-staffed fast track areas has been further developed to incorporate medical staff. A New Zealand study of such a fast track system showed that a 20–25 minute improvement in LOS could be achieved for these patients without adversely affecting the throughput of more urgent patients.[12] More substantial improvements were made in such a fast track for minor injuries only

2 Statistical process control plot of median LOS from 1 January 2004 to the end of the 12-week fast track trial



ED = Emergency Department. LOS = length of stay. UCL = upper control limit. LCL = lower control limit. ◆

3 Average emergency department waiting times for all discharged patients, 2003–2004



Arrow indicates the introduction of the 12-week "fast track" trial. ◆

in a UK study.[13] The 2003 UK National Health Service Modernisation Agency report "Making see and treat work for patients and staff" reported that more than 160 of the 202 EDs in England by then were using or testing a variety of see and treat systems to reduce waiting and transit times for patients with minor illness or injury, some of these being essentially fast track systems.[14]

In Australia, there has been no study to date detailing changes associated with the introduction of a fast track system. Taylor et al, in a cross sectional survey of ED directors in Victoria in 2002, reported that, among other process improvements, fast track systems had been implemented in 10 of the 17 EDs surveyed.[15] However there have been no reports of any resultant improvements in transit times with these systems.

This study

This trial has demonstrated that streaming fast track patients in an Australian emergency department produces improvements in waiting times and length of stay similar to the successful models employed in the UK and North America. Even in an emergency department with relatively few patients with minor illness or injury, there are benefits from the introduction of this process.

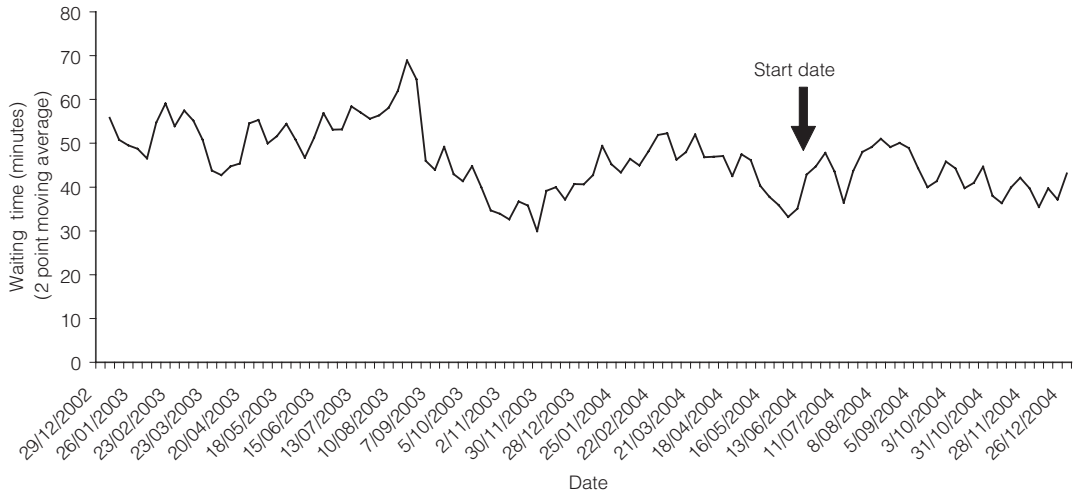
Importantly, it has also demonstrated that the allocation of a proportion of the ED's human resources to focus exclusively on discharged patients did not result in an increase in the waiting times or length of stay for admitted patients. In an era where there is increasing access block for admitted patients, with the associated unavoidable drain on ED resources, it is important that EDs look for initiatives such as fast track to improve aspects of efficiency that are within their control.

Study limitations

This study was limited by the difficulty in defining a true baseline or "before" period for comparison. Firstly, there was a seasonal increase in attendances from autumn to winter coinciding with the time of the introduction of the fast track system, with a 10.2% increase in attendances during the study period compared with the previous 12 weeks. This increase in the department's workload during the study period had a negative impact on the performance indicators, and so any measurable improvement in performance with the introduction of the fast track system is an even greater achievement.

Secondly, the department underwent a major refurbishment, which was completed in December

4 Average emergency department waiting times for all admitted patients, 2003–2004



Arrow indicates the introduction of the 12-week "fast track" trial. ◆

2003. This resulted in an increase in the size of the department, which could have had a positive impact on the department's efficiency, independent of any other change in work practice.

Comparisons with both the previous year and the previous 12 weeks have been made in consideration of these limitations. However, as with all emergency department performance indicators, factors such as access block and total number of patient attendances are difficult to control and inevitably will have a variable impact on patient flow in the emergency department. Assessing the impact due solely to a particular intervention is therefore extremely difficult. Arguably, system changes are among the most important interventions in ED patient management. The methodological difficulties inherent in systems research should not detract from the importance of the findings.

Conclusion

This trial has demonstrated that streaming fast track patients in the emergency department of an Australian tertiary adult teaching hospital reduces waiting times and length of stay for discharged patients.

Further, we have shown that even emergency departments which deal with a predominantly complex medical casemix can improve in these performance indicators for discharged patients without an adverse effect on the indicators for patients requiring admission.

Acknowledgements

We gratefully acknowledge the contribution of Liz Versluis of the Emergency Medicine Clinical Practice Improvement Unit who monitored the project and produced the graphs. We also thank all the ED staff who participated and made the project a success. We are grateful for the statistical advice and analysis by Associate Professor Ian Jacobs.

Competing interests

The authors declare that they have no competing interests.

References

1 Meislin HW, Coates SA, Cyr J, Valenzuela T. Fast Track: urgent care within a teaching hospital emergency department: can it work? *Ann Emerg Med* 1988; 17: 453-6.

2 Wright SW, Erwin TL, Blanton DM, Covington CM. Fast Track in the emergency department: a one-year experience with nurse practitioners. *J Emerg Med* 1992; 10: 367-73.

3 Fernandes CM, Christenson JM. Use of continuous quality improvement to facilitate patient flow through

the triage and fast-track areas of an emergency department. *J Emerg Med* 1995; 13: 847-55.

4 Fernandes CM, Christenson JM, Price A. Continuous quality improvement reduces length of stay for fast-track patients in an emergency department. *Acad Emerg Med* 1996; 3: 258-63.

5 Simon HK, McLario D, Daily R, et al. "Fast tracking" patients in an urban pediatric emergency department. *Am J Emerg Med* 1996; 14: 242-4.

6 Beales J. Innovation in accident and emergency management: establishing a nurse practitioner-run minor injuries/primary care unit. *Accid Emerg Nurs* 1997; 5: 71-5.

7 Fernandes CM, Price A, Christenson JM. Does reduced length of stay decrease the number of emergency department patients who leave without seeing a physician? *J Emerg Med* 1997; 15: 397-9.

8 Simon HK, Ledbetter DA, Wright J. Societal savings by "fast tracking" lower acuity patients in an urban pediatric emergency department. *Am J Emerg Med* 1997; 15: 551-4.

9 Hampers LC, Cha S, Gutglass DJ, et al. Fast track and the pediatric emergency department: resource utilization and patients outcomes. *Acad Emerg Med* 1999; 6: 1153-9.

10 Counselman FL, Graffeo CA, Hill JT. Patient satisfaction with physician assistants (PAs) in an ED fast track. *Am J Emerg Med* 2000; 18: 661-5.

11 Docimo AB, Pronovost PJ, Davis RO, et al. Using the online and offline change model to improve efficiency for fast-track patients in an emergency department. *Jt Comm J Qual Improv* 2000; 26: 503-14.

12 Ardagh MW, Wells JE, Cooper K, et al. Effect of a rapid assessment clinic on the waiting time to be seen by a doctor and the time spent in the department, for patients presenting to an urban emergency department: a controlled prospective trial. *N Z Med J* 2002; 115: U28.

13 Cooke MW, Wilson S, Pearson S. The effect of a separate stream for minor injuries on accident and emergency department waiting times. *Emerg Med J* 2002; 19: 28-30.

14 Parker L. Making see and treat work for patients and staff. *Emerg Nurse* 2004; 11: 16-7.

15 Taylor DMcD, Bennett DM, Cameron PA. A paradigm shift in the nature of care provision in emergency departments. *Emerg Med J* 2004; 21: 681-4.

(Received 19/09/05, revised 17/02/06, accepted 17/07/06) □