

The effect of a separate stream for minor injuries on accident and emergency department waiting times

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Emerg Med J 2002;19:28–30

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Accepted for publication
11 June 2001

Introduction: To decrease waiting times within accident and emergency (A&E) departments, various initiatives have been suggested including the use of a separate stream of care for minor injuries ("fast track"). This study aimed to assess whether a separate stream of minor injuries care in a UK A&E department decreases the waiting time, without delaying the care of those with more serious injury.

Intervention: A doctor saw any ambulant patients with injuries not requiring an examination couch or an urgent intervention. Any patients requiring further treatment were returned to the sub-wait area until a nurse could see them in another cubicle.

Method: Data were retrospectively extracted from the routine hospital information systems for all patients attending the A&E department for five weeks before the institution of the separate stream system and for five weeks after.

Results: 13 918 new patients were seen during the 10 week study period; 7117 (51.1%) in the first five week period and 6801 (49.9%) in the second five week period when a separate stream was operational. Recorded time to see a doctor ranged from 0–850 minutes. Comparison of the two five week periods demonstrated that the proportion of patients waiting less than 30 and less than 60 minutes both improved ($p < 0.0001$). The relative risk of waiting more than one hour decreased by 32%. The improvements in waiting times were not at the expense of patients with more urgent needs.

Conclusions: The introduction of a separate stream for minor injuries can produce an improvement in the number of trauma patients waiting over an hour of about 30%. If this is associated with an increase in consultant presence on the shop floor it may be possible to achieve a 50% improvement. It is recommended that departments use a separate stream for minor injuries to decrease the number of patients enduring long waits in A&E departments.

In order to decrease waiting times within A&E departments, various initiatives have been introduced. The use of a separate stream of care for minor injuries has been suggested as a way of decreasing the waiting time for a group of patients who make up a large number of cases who, by definition, are less urgent than other cases.¹ This separate stream of patients is often referred to as "fast track".

A recent survey of accident and emergency (A&E) departments for the Department of Health has demonstrated that 41% have a system whereby "quick cases" are seen in a separate area or by separate staff.² Where such separate stream systems are operating, patients are seen by a variety of staff: any grade of staff (3% of departments), senior/middle grade medical staff (19%), nurse practitioners (36%), or SHOs (42%). Separate stream systems are often not used consistently but brought into operation when busy or for specific conditions such as fractured neck of femur (68% of departments), suspected myocardial infarction (68%), for critically ill/traumatised patients (46%) and 30% of departments have separate stream systems for other conditions such as meningococcal disease, epistaxis and retention of urine.

Separate stream systems have been demonstrated to help patients with several conditions, such as myocardial infarction³ and fractured neck of femur.⁴ These studies have not looked for any deleterious effect on other patients. Minor injury separate streams have been shown to decrease waiting time for specific groups of patients⁵ and to decrease the number of complaints^{6,7} but were ineffective when there were a lot of seriously ill patients in the department. None of the previous studies identified were based in a UK system.

There have been no studies showing that a separate stream of minor injuries care in a UK A&E department does decrease the waiting time or any studies to demonstrate that it does not

delay the care of those with more serious injury. This study aimed to determine the effect of introducing a separate stream for minor injuries on the waiting time for all patients in the A&E department, according to triage category.

INTERVENTION

The separate minor injuries stream system involved the conversion of one cubicle to a desk type consulting room. One doctor (an SHO of at least four months experience, staff grade or consultant following the same profile as seen by other patients) was based in this room and saw any ambulant patients with injuries not requiring an examination couch or an urgent intervention (that is, triage category 4 or 5). The aim was to have the next two patients sitting in a sub-wait area immediately outside the room, so the doctor could call them in without any delay. Any patients requiring further treatment were returned to the sub-wait area until a nurse could see them in another cubicle. In this way, the doctor in the "fast track room" was continuously seeing patients. The system was operational during the time period 0900 to 2300 (when there were at least three doctors in the department). It was only stopped when the department was exceptionally quiet and doctors were seeing patients immediately after triage.

In the first week of the separate stream system, there was a deliberately increased consultant presence in the clinical areas of the A&E department. The consultants ensured that the system was being used. They did not specifically screen the separate stream cases or oversee the selection of cases. Cases that were seen in the separate stream system but were then found to need care that could not be given in that consulting room were transferred to another area.

Table 1 Week of attendance and waiting time to treatment

Week	Time from attendance to treatment							Total	Relative risk of waiting >60 min	
	Spoiled	<30 min	30–60 min	>60 min						
w/c 27.04.99	13	0.9%	379	27.5%	398	28.9%	587	42.6%	1377	
w/c 04.05.99	1	0.1%	509	36.8%	373	27.0%	501	36.2%	1384	
w/c 11.05.99	5	0.3%	562	38.7%	426	29.3%	460	31.7%	1453	
w/c 18.05.99	1	0.1%	439	30.7%	459	32.1%	533	37.2%	1432	
w/c 25.05.99	11	0.7%	628	42.7%	437	29.7%	395	26.9%	1471	1.00
w/c 01.06.99	1	0.1%	744	57.3%	346	26.7%	207	15.9%	1298	0.46
w/c 08.06.99	5	0.4%	609	44.0%	481	34.8%	289	20.9%	1384	0.60
w/c 15.06.99	7	0.5%	603	40.6%	446	30.0%	429	28.9%	1485	0.83
w/c 22.06.99	7	0.5%	552	39.7%	507	36.4%	326	23.4%	1392	0.67
w/c 29.06.99	6	0.5%	471	37.9%	405	32.6%	360	29.0%	1242	0.83
Total	57		5496		4278		4087		13918	
		0.4%		39.5%		30.7%		29.4%		100.0%

The staff in the department were aware that the new system had been introduced but were not aware that this evaluation was being undertaken.

METHODS

Data were retrospectively extracted from the routine hospital information systems and comprised the date and time of arrival in the A&E department, the time seen by a doctor (known as treatment time), the time of finishing the episode (known as conclusion time), the time of departure and the triage category allocated to the patient. These data were collected for all patients attending the A&E department during the 10 week study period—that is, for five weeks before the institution of the separate stream and for five weeks after. Data validation comprised checking for missing data, correlating data items and checking for outliers (or negative) waiting times. Excessive or invalid waiting times were double checked against manual records. Waiting time was defined as the time from arrival to time of seeing the doctor in minutes. Where the time of first seeing the doctor was missing, but the time of finishing the episode was available (for example, cases where no treatment was given), waiting time was defined as the time from arrival to finishing the episode. Cases were defined as spoiled if waiting time could not be calculated from the computerised or manual records.

Data were transferred to SPSS for the purpose of analysis. Statistical analyses comprised tests of association and the χ^2 test for linear trend. The 95% confidence intervals were calculated and a critical ratio (Z) test on the difference between two independent proportions calculated, given the proportion (expressed as a percentage) and sample size in each sample, in EpiCalc 2000 Version 1.02.⁸

RESULTS

A total of 13 918 new patients were seen during the 10 week study period; 7117 (51.1%) in the first five week period and 6801 (49.9%) in the second five week period when the separate stream was operational. Time to seeing a doctor was missing for 1148 cases (8.2%), ranging from 9.0% in the first five week period to 7.4% in the second five week period ($\chi^2_{(1df)}=12.33$, $p<0.001$). Altogether 162 (1.2%) cases were identified as having excessive or invalid waiting times and the notes were found and checked for all but six of these cases. Waiting time was available for 13 861 (99.6%) of patients. A total of 57 cases had incomplete data relating to waiting time; ranging by week from 0.1% to 0.9% (table 1); 31 (0.4%) patients in the first time period and 26 (0.4%) patients in the second time period. 312 (2.2%) cases had incomplete data relating to triage category.

The recorded time to see a doctor ranged from 0 to 850 minutes (mode 10 minutes, median 36 minutes, SD= 44.52,

Table 2 Triage category

Triage category	Frequency	%
Immediate	1	0.3
See within 10 min	2	1.9
See within 60 min	3	38.7
See within 120 min	4	58.0
See within 240 min	5	1.2
Total	13606	100.0
Missing	312	2.2
Total	13918	

interquartile range, 5th and 95th percentile values: 5–133 minutes). Comparison of the two five week periods demonstrated that the proportion of patients waiting less than 30 minutes improved from 35.4% (n=2517) to 44.0% (n=2979) ($\chi^2_{(1df)}=103.34$, $p<0.0001$). Similarly, the proportion waiting less than 60 minutes increased from 65.1% (n=4610) to 76.2% (n=5164) ($\chi^2_{(1df)}=207.6$, $p<0.0001$). Using data for the first five week period as the standard, the relative risk of waiting over one hour is shown for each subsequent week (table 1). During the first week that the separate stream was introduced, the relative risk of waiting for more than one hour fell by 54%. In the following four weeks, the relative risk of waiting more than one hour fell by 32%.

Triage category was available for 13 606 (97.8%) patients and only 2.1% of these received a triage category of 1 or 2 (table 2). No difference in the proportion of patients seen within the target time was noted for triage categories 1, 2 or 5 (table 3). Statistically significant improvements in the proportion of patients seen within the target time were observed for triage categories 3 and 4.

LIMITATIONS

The unit studied only sees trauma patients and a separate unit in the city sees medical, paediatric, and surgical emergencies. This has implications for the generalisability of these results as medical cases are likely to take longer to treat and are usually more serious. Some people do, however, self present with non-trauma cases to this centre. It is not likely that the reduced waiting times observed relate only to those patients who would more appropriately attend a GP walk in centre as a previous audit, undertaken in the department, has demonstrated that less than 5% of patients are suitable for care by general practitioners. Nevertheless a system is now in place to refer such patients to the out of hours centre.

Data relating to the time seen by a doctor were missing from the computerised records in 1148 cases (9.2%). The proportion of cases missing varied between the two time periods and was

Table 3 Percentage of patients seen within target time by triage category

Triage category	Before separate stream started		After separate stream started*		Z†	p‡
	N	% (95% CI)	N	% (95% CI)		
1 Immediate	11	52.4 (30.4 to 73.6)	9	56.3 (30.6 to 79.28)	-0.01	0.46
2 <10 min	48	41.0 (32.1 to 50.5)	36	32.1 (23.8 to 41.7)	1.26	0.10
3 <60 min	2012	72.8 (71.1 to 74.4)	1576	78.6 (76.7 to 80.4)	4.55	<0.0001
4 <120 min	3442	87.6 (86.5 to 88.6)	3022	94.1 (93.2 to 94.9)	9.29	<0.0001
5 <240 min	98	96.1 (89.7 to 98.8)	44	100.0 (90.0 to 100.0)	0.77	0.22

*Data have been used for the four week period where the only intervention was the introduction of the separate stream system (that is, 8 June to 6 July); †critical ratio (Z) test and one sided p value.

greater (9.0%) in the first five week period than in the second five week period (7.4%). Using the time of finishing the episode to calculate waiting time for those cases where time seen by a doctor was missing, may marginally inflate our estimates of waiting time. Given the uneven distribution of missing values this could have a greater effect in the first five week period.

The first week, starting 1 June 1999, during which the new separate stream for minor injuries was introduced, was also associated with a greater number of hours of consultant presence within the A&E department. The consultants were not only seeing patients as per normal practice but also ensuring that the new system was adhered to and used at all times required. In the following weeks (week starting 8 June 1999 onwards) the only intervention under assessment was the new separate stream system.

DISCUSSION

This study shows that introduction of a separate stream for minor injuries can produce an improvement in the number of trauma patients waiting over an hour by about 30%. If this is associated with an increase in consultant presence on the shop floor it may be possible to achieve a 50% decrease. The greater decrease in patients' waiting times that was observed when a consultant was present may be related to several factors such as an extra pair of hands, greater adherence to and use of the new system and less wasted time by other staff because there was a senior watching over them.

It has been suggested previously that although separate stream systems may result in patients being seen more quickly, this could be at the expense of those with more urgent needs (triage categories 1, 2 and 3). However, we have demonstrated that this is not the case and statistically significant improvements in the proportions of patients seen within target times are demonstrated for patients in triage categories 3 and 4. These improvements have been achieved with no increase in the number of medical or nursing staff. This study used a cubicle within the present A&E department area. Use of a separate area to see minor injuries may however require extra staff.

Data were not collected concerning either patient or staff satisfaction with the separate stream system. The effect of a separate stream on satisfaction should be considered by future studies, however, as one of the commonest sources of complaint in A&E is the waiting time⁹ it seems probable that a substantial improvement in waiting times will be associated with improved patient satisfaction.

We recommend that departments use a separate stream for minor injuries to decrease the number of patients enduring long waits in the A&E department. This separate stream could be run equally well by nurse practitioners, as care has been

shown to be equal to that of junior doctors.¹¹ Such a system is now routinely used in University Hospitals Coventry and Warwickshire whenever the waiting time exceeds one hour. The use of a dedicated nurse to undertake treatment for this stream of patients has now also been introduced. This study did not investigate the use of trigger points to determine when separate streams should be used. In this study, separate stream use was undertaken at all times when there was a wait to see a doctor and there were more than three doctors on duty. Further work is required to determine the most appropriate times for operating a separate stream system.

ACKNOWLEDGEMENTS

Particular thanks are due to Andrew Heyes of University Hospitals Coventry and Warwickshire IT Department for downloading the data and Pam Bridge, Department of Primary Care and General Practice, University of Birmingham for her help and support.

Funding: none.

Conflicts of interest: none.

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