ORIGINAL ARTICLE

Discharge from triage: modelling the potential in different types of emergency department

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Emerg Med J 2003;**20**:131–133

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Accepted for publication 4 November 2002

Objective: To assess the potential for patients to be assessed and discharged directly from triage in an emergency department (ED).

Methods: Modelling was undertaken by collection of retrospective electronic data from four different EDs. Serial removal of groups was undertaken using data from coding systems related to patients details of admission/treatment/investigations and procedure undertaken. The final group left were analysed for ambulance usage, prior primary care consultation, and age group.

Results: 29.4% patients were discharged after clinical assessment but without any specific treatment or investigation. It was seen that of the patients who can be considered for discharge from triage, 15.5% were brought to the ED by ambulance, 3.5% were patients who had already consulted primary care, and 11% were children.

Conclusions: This study suggests that a large percentage of patients seen in EDs may not require the extra facilities of that department. There is potential for a large number to be discharged within a few minutes of arrival if appropriate assessment skills are available at first contact. This may require more senior assessment than is currently used. This study has not assessed safety of such a system or the times of day when it is best deployed.

Excessive waiting is the commonest cause of complaint in an emergency department (ED). The Audit Commission recently highlighted that the delays to see a doctor seem to be increasing.[1] The government strategy *Reforming emergency care*[2] promotes "streaming" of patients in the ED. One of the streams proposed is those requiring advice on self care after assessment. These patients often wait a prolonged period to see a doctor for a short consultation with no requirement for investigation or procedure. It has been suggested that if this process could be undertaken earlier then this group of patients would spend only a few minutes in the ED, replacing the present triage system with a See and Treat concept where those not requiring investigations or observations are seen and treated by the first clinician they see. This may not only be more acceptable to this group of patients, but would have the added advantage of improving the flow of other patients by reducing the burden on the subsequent elements of the system. A recent survey of adults attending the ED estimated that 13% of non-urgent attenders could be directed away from the ED to self care.[3] Lowy and colleagues also performed a retrospective analysis of ED notes based on factual information about the processes of care to decide on appropriateness of attendance.[4] They found that 23% of attenders could have been treated in primary care (overlapping with the self care group).

This study aims to determine the potential of a system of "see and treat" to discharge patients from the ED after a single clinical assessment process. See and Treat entails assessment by a senior clinician at the triage stage to allow those with minor conditions to be treated in one step and discharged having only seen one clinician.

METHODS

Modelling was undertaken using retrospective analysis of electronic medical records from four EDs over a 12 month period. The four departments had different characteristics

- semi-urban district general hospital seeing all types of cases—hospital A
- urban teaching hospital seeing only adults—hospital B
- urban teaching hospital seeing only children—hospital C
- urban teaching hospital seeing mainly trauma cases (medical emergencies are seen at another hospital in the city)—hospital D

These four different types of hospital were chosen to reflect different types of EDs and to illustrate the varying impact of discharge from triage in these departments.

Modelling was undertaken by serial subtraction of groups who would need to have some investigation, procedure, or treatment before they could be discharged.

Therefore the following groups were excluded as shown in the flow chart in figure 1.

Group A Total number of attendances,

Group B Total number of patients admitted or died

Group C Number of patients from triage category 1or 2*

Group D Number of patients who had a radiological investigation*

Group E Number of patients who underwent other investigations*

Group F Number of patients who underwent a procedure under general anaesthetic/local anaesthetic/sedation*.

Group G Number of patients on whom procedures carried out without general anaesthetic or local anaesthetic*

Group H Number of patients who were given a prescription*

- (a) prescription excluding ibuprofen and paracetamol
- (b) ibuprofen or paracetamol prescription only

Group I Number of patients who were given tetanus toxoid treatment*

Group X Number of patients discharged without any investigations or any specific treatment except simple advice

*excludes any patients in previously stated groups (except for Group A)

This technique demonstrated the maximum number of patients (Group X) who could be discharged without investigation, or observation.

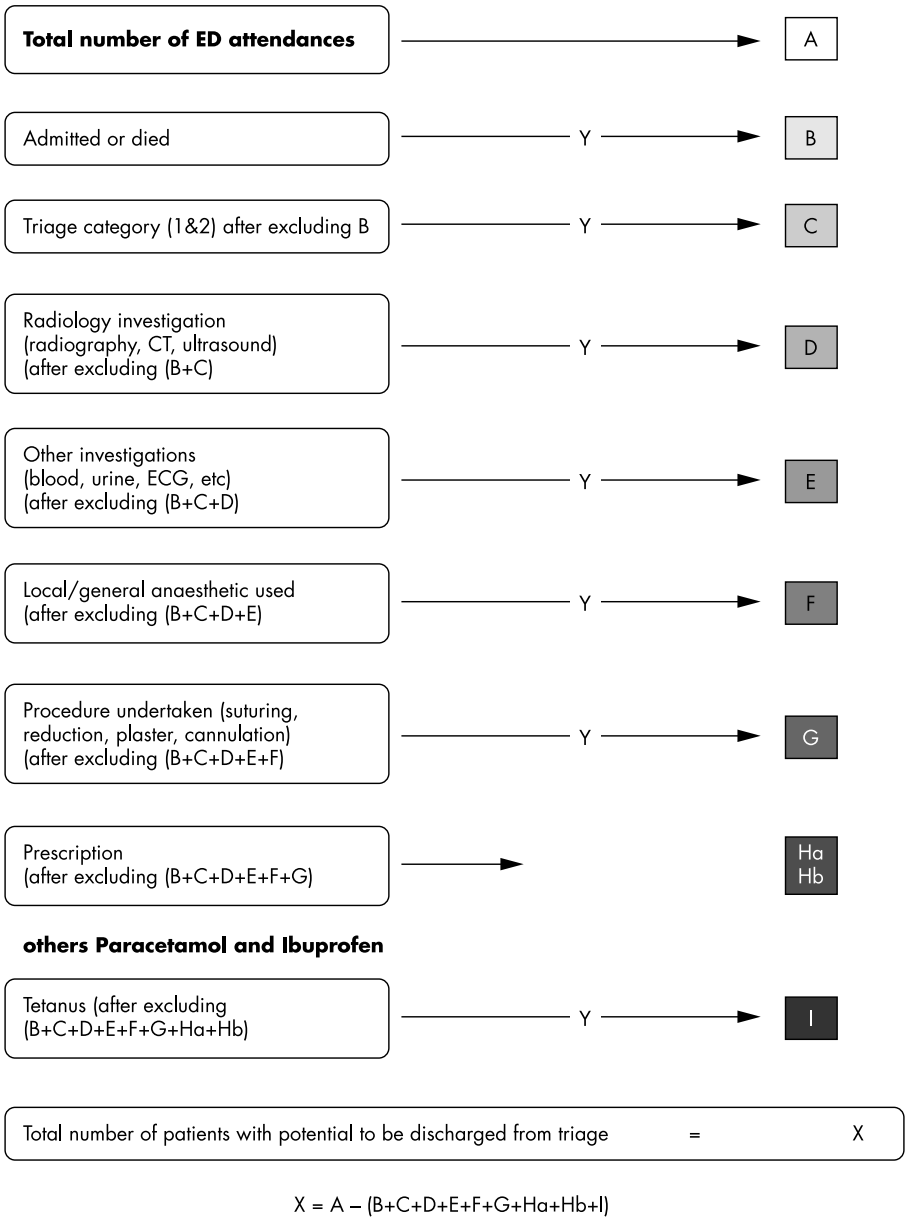

Figure 1 Methodology of serial subtraction.

Hospital D could only provide three months of data. This was therefore multiplied to produce an annual figure.

RESULTS

A total of 252 111 patients were included in the study over one year from four different EDs, 74 068 (29.37%) patients were discharged without any treatment or investigation (see fig 1).

The children's hospital (C) had the highest proportion of patients (37.9%) with potential for discharge from triage. Of those hospitals recording it, an additional 1.9% of patients could be discharged if they were given paracetamol and/or ibuprofen at triage or advised to purchase it at a chemist. Only 0.2% had a tetanus injection as their only intervention.

Details of the reasons for excluding cases from possible discharge are given in table 1. This is a serial subtraction process so the number in the column does not represent the total number in that category for that hospital, for example, number of procedures will be higher as many will have been excluded because they have had a radiograph, which is an earlier exclusion in the subtraction process. It was seen that of the patients who could be considered for discharge from triage, 15.4% arrived by emergency ambulance, 3.5% had consulted primary care before attending and 7.6% were children. (see table 2).

DISCUSSION

This study is a modelling exercise. It therefore assesses potential for change. Any conclusions drawn need to be tested for safety and efficacy in a clinical environment before firm conclusions can be drawn.

Some 20.5% to 37.9% of patients visiting the four different EDs did not actually use any departmental resources except for examination and advice. It is acknowledged that some of those with no investigation or procedure may need a specialist clinical opinion or period of observation to determine that they do not require any further care, resulting in an over-estimate. Use of senior staff may reveal that many people currently having investigations do not require them, resulting in an under-estimate.

If this group could receive their full assessment at an early stage (either in the prehospital setting or at first contact in

Table 1 Details of serial subtraction to determine potential for discharge from triage

Group		Hospital A	Hospital B	Hospital C	Hospital D* (12 month equivalent)	Combined of all four hospitals (of all attendees)
A	ED attendance	59419	90531	36381	65780	252111
B	Admitted or died	12144 (20%)	20052 (22%)	2806 (7.7%)	2768 (4.2%)	37770 (15.0%)
C	Triage category (1 or 2)	811 (1.4%)	449 (0.4%)	63 (0.2%)	1332 (2.0%)	2655 (1.1%)
D	Radio logic investigation	15790 (26.6%)	29504 (32.5%)	8768 (24.1%)	22184 (33.7%)	76246 (30.2%)
E	Other investigation	2554 (4.3%)	4413 (4.9%)	1071 (2.9%)	568 (0.86%)	8606 (3.4%)
F	Anaesthetic/sedation	32 (0.05%)	3 (0.003%)	697 (1.9%)	000 (0.0%)	732 (0.3%)
G	Procedure undertaken	4752 (8.0%)	11008 (12.1%)	4850 (13.3%)	8436 (12.8%)	29046 (11.5%)
Ha	Prescription	5314 (8.9%)	2716 (3.0%)	4295 (11.0%)	5380 (8.2%)	17705 (7.0%)
Hb	Ibuprofen and paracetamol	NR	3556 (3.9%)	NR	1164 (2.1%)	4720 (1.9%)
I	Tetanus	312 (0.5%)	236 (0.3%)	15 (0.04%)	00??NR	563 (0.2%)
X	Possible triage discharges	17710 (29.8%)	18594 (20.5%)	13816 (37.9%)	23948 (36.4%)	74068 (29.4%)

NR, not recorded. *Data received from hospital D were over three months and extrapolated to annual figure for comparison.

Table 2 Details of patients who could potentially be discharged from triage

	Hospital A	Hospital B	Hospital C	Hospital D* (12 month equivalent)	Combined of three hospitals (of all attendees)
Ambulance calls	2709 (15.3)	3346 (18.0)	NR	3224 (13.5)	9279 (15.4)
GP referrals	425 (2.42)	558 (3.0)	NR	1276 (5.32)	3066 (3.5)
Under age of 5	2036 (11.5)	93 (0.5)	NR	2548 (10.6)	4587 (7.6)

NR, not recorded. *Data received from hospital D were over three months and extrapolated to annual figure for comparison. Percentages shown in parentheses.

ED), then their total departmental time could potentially be reduced. This type of process is in line with the principles of See and Treat.[5] At times when patients have this full assessment within 15 minutes of arrival then prioritisation (triage) would not be required. This assessment must have a level of history taking, examination, and advice giving at least equivalent to the level given in the full ED consultation. Use of staff with little experience or restricted in their decision by protocols may reduce this number. Use of senior clinicians may increase this percentage further. Additional resources may be required to facilitate earlier assessment, as it may take longer than present triage processes. The different rate of discharge needs further study, including factors such as the different role of observation. By front loading the system and facilitating early discharge of self care patients resources could be made available for those needing additional care. It is also anticipated that this approach would have an impact on the total departmental times for patients who do require intervention for their condition. Some 13.3% to 18% of patients arrived by ambulance. It may be possible that these patients could avoid attendance at hospital if paramedics were trained to deal with these cases.

The lack of follow up data on these patients means that this study highlights a potential for redesign of the way in which patients are initially assessed on arrival in the ED, which needs further exploration in a prospective study measuring clinical outcome. Further studies are required to assess the effects such changes would have on departmental performance such as waiting times, the need for senior staff in this role, the resource implications, hours of operation, and the safety of such a system. It is also important to ensure that such changes acceptable to the general public. The numbers we have identified are lower than those published by Redmond[6] using consultant triage. They are comparable to those in North Tyneside using a system of nurse assessment assisted by decision support software (personal communication, A Jones). Future challenges include assessing the cost effectiveness of different early intervention strategies, such as nurse discharge, nurse discharge with the aid of decision support software, doctor triage, and prehospital assessment and treatment.

More work is needed to explore the full potential of discharge of See and Treat and the practical aspects of its implementation.

ACKNOWLEDGEMENTS

We would like to acknowledge the assistance of the staff in the hospitals concerned in particular Mark Floyd, Francis Heyes, Derek Burke, and Professor Jeremy Dale for reviewing the manuscript.

Contributors

The initial idea of the study was produced by Dr Matthew Cooke. All three authors developed the methodology. Suzanne Mason, Matthew Cooke and Pankaj Arora undertook data analysis. Pankaj Arora wrote the initial draft, which was then modified by all three authors. Matthew Cooke is the guarantor of the paper.

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Funding: none.

Conflicts of interest: none.

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