

## Primary care in the accident and emergency department: I. Prospective identification of patients

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See p427

### Abstract

**Objective**—To compare patient characteristics and consultation activities for attenders at accident and emergency departments assessed by nurse triage as presenting with “primary care” or “accident and emergency” type problems.

**Design**—One year prospective study.

**Setting**—A busy, inner city accident and emergency department in south London.

**Subjects**—Of the 5658 patients treated for new problems during a stratified random sample of 204 three hour sessions between 10 am and 9 pm during June 1989 to May 1990, all “primary care” (2065 patients) and a 10% random sample of “accident and emergency” (291 patients) were included in the analysis.

**Main outcome measures**—Patient’s age, sex, duration of presenting problem, diagnosis, laboratory and radiographic investigations, treatments, and referrals.

**Results**—40.9% of attenders with new problems were classified by triage as presenting with “primary care” problems (95% confidence interval 39.6% to 42.2%). Primary care attenders were more likely than accident and emergency patients to be young adults, to have symptoms with a duration of longer than 24 hours, and to present problems not related to injury (all  $P < 0.001$ ). Accident and emergency patients were considerably more likely to be referred to on call teams and to be admitted. Even so, 9.7% of primary care patients were referred to on call teams and a further 8.9% were referred to the fracture clinic or advised to return to the accident and emergency department for follow up.

**Conclusion**—Accident and emergency triage can be developed to identify patients with problems that are more likely to be of a primary care type, and these patients are less likely to receive an investigation, minor surgical procedure, or referral. Many patients in this category, however, receive interventions likely to support their decision to attend accident and emergency rather than general practice. This may reflect limitations in the sensitivity of triage practice or a clinical approach of junior medical staff that includes a propensity to intervene.

### Introduction

The problems patients present to hospital accident and emergency departments overlap considerably with those that are commonplace in general practice. Numerous studies have analysed attendances retrospectively and suggested that one third to two thirds of patients attend accident and emergency departments with problems that could have been managed appropriately in general practice<sup>1-7</sup>; this pattern of accident and emergency usage seems to be international.<sup>8-13</sup>

From the perspective of the accident and emergency

service this has been portrayed as problematic, contributing to “inappropriate” utilisation of hospital resources and expertise, prolonged waiting times, and staff stress. The attitudes of staff may be openly or covertly hostile.<sup>14</sup> Local general practitioners receive blame for failing to provide sufficiently comprehensive and accessible services,<sup>15</sup> and patients may be censured for misusing the accident and emergency service.<sup>16</sup>

The report of the Royal Commission on the National Health Service stated that “where the tradition of using [accident and emergency departments for primary care] is strong, it may be preferable for the hospital to accept this role and make specific arrangements for fulfilling it, rather than to try and resist established local preferences.”<sup>17</sup> More recently, developing accident and emergency departments’ role as primary care providers has been supported by the National Audit Office and the Tomlinson Inquiry.<sup>18,19</sup> Outside Britain, general practitioners have been appointed in Australian accident and emergency departments,<sup>8</sup> and many emergency departments in the United States include walk in facilities staffed by physicians on family practice residency programmes.

In 1988 a project was initiated at King’s College Hospital to study the provision of primary care in the accident and emergency department and to develop a more integrated model of service. The development of a prospective method for identifying patients attending accident and emergency with problems likely to be of a primary care type was a necessary step towards implementing service developments. Nurse triage was modified for this purpose to include classification of patients’ presentations into “primary care” and “accident and emergency” categories. The main question addressed in this paper is, how does the triage classification of patients relate to the consultation process that follows? The primary care patients included in this study were part of one arm of a prospective, controlled intervention study to compare consultations made by medical staff in the accident and emergency department and vocationally trained local general practitioners for patients assessed by nurse triage as having primary care needs.<sup>20</sup>

### Subjects and methods

#### SETTING

King’s College Hospital is a teaching hospital in a multiethnic, socially deprived inner city area in south-east London. The accident and emergency department saw about 70 000 new attendances in 1990. The study was undertaken between 1 June 1989 and 31 May 1990, excluding bank holidays and the first two weeks of both August and February (when senior house officers are changing employment). During this period 18 nurses (plus occasional staff from the nursing bank) carried out triage. Medical staffing at any one time consisted of nine senior house officers, two registrars, a senior

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registrar, and a consultant. The turnover of staff resulted in the inclusion of consultations by a total of 27 senior house officers, three registrars, and one senior registrar.

#### TRIAGE

"Primary care" was defined to include self referred, non-emergency problems that could have been managed in an "average local general practice" (box). Patients requiring immediate or urgent care, or those formally referred to the accident and emergency department by a general practitioner's letter or telephone call, were deemed "accident and emergency." Triage assessments were recorded on the front page of accident and emergency records. Medical staff, therefore, were aware of the triage status of patients. Patients were not informed routinely.

Nurses performing triage had at least six months' experience of the accident and emergency department and underwent training that included practical supervision and learning about the expertise and skills of local general practitioners. This included training sessions run by senior nurses as well as a local general practitioner (JD).

#### SAMPLING PROCEDURE AND DATA COLLECTION

Using a table of random numbers we selected a stratified sample of three hour sessions to include two or three weekday sessions running from 10 00 to 13 00 or 14 00 to 17 00, one weekday evening session from 18 00 to 21 00, and one weekend session from 10 00 to 13 00 or 14 00 to 17 00 for each week of the study period. All patients treated during sampled sessions were identified from the accident and emergency register, and the records of all those identified as primary care and a random 10% sample of those identified as accident and emergency were retrieved during the following week. (All those identified as primary care were included because they also formed one arm of the prospective, controlled intervention study to compare consultations made by accident and emergency medical staff and vocationally trained local general practitioners.<sup>20</sup>)

A weekly rota allocated responsibility for primary care patients to one particular doctor for every three hour session. Medical staff remained blind to whether any session was part of the study sample.

The variables collected and coded included the sociodemographic characteristics of patients; duration of presenting problems; final diagnoses (coded using the Royal College of General Practitioners' classification system<sup>21</sup> up to the fifth digit, and then recoded according to chapter headings); and consultation process (investigations, treatment, and referrals). The results of investigations were obtained from laboratory and radiology reports.

#### STATISTICAL ANALYSIS

Data were analysed by using frequencies and  $\chi^2$  tests to investigate the association between variables. The single senior registrar included in the study was placed within the registrar group for the purposes of data analysis. Owing to the number of exploratory comparisons being made, a P value of 0.01 was taken to indicate statistical significance.

#### Results

##### POPULATION SAMPLE

A total of 204 sessions were sampled. Of the 5658 patients attending accident and emergency who underwent triage during these sessions and were treated for new problems, 2314 (40.9%; 95% confidence interval 39.6% to 42.2%) were identified as primary care. All the primary care and 334 (10.0%) of the accident and

#### Triage criteria for "primary care" and "accident and emergency" attenders

##### Primary care attenders:

- Self referred patients with symptoms likely to be caused by conditions not in need of immediate resuscitations or urgent care, and unlikely to require hospital admission
- Self referred patients with non-urgent complications of chronic conditions

##### Accident and emergency attenders:

- All patients referred by letter or phone by a general practitioner
- All emergency presentations in need of immediate care or likely to require hospital admission
- Trauma requiring urgent hospital assessment (for example, fractured bones and dislocations, head injuries with loss of consciousness)

emergency patients were included in the study sample. A total of 184 (7.9%) primary care patients and six (1.8%) accident and emergency patients left after triage without waiting to see a doctor. In accordance with departmental policy, 44 (1.9%) primary care and 23 (6.9%) accident and emergency patients were referred directly by the triage nurse to the paediatric team. The notes of 14 (4.2%) accident and emergency and 21 (0.9%) primary care patients were missing. As a result, there remained a total of 2065 primary care and 291 accident and emergency patients. Senior house officers saw 1667 (80.8%) of the primary care patients and 221 (75.9%) of the accident and emergency patients; the remainder were seen by accident and emergency registrars. Not all records were complete; percentages given below and in the tables refer to proportions of patients for whom data were retrieved.

#### PATIENT CHARACTERISTICS AND PRESENTING PROBLEMS

Primary care and accident and emergency attenders differed in many respects (table 1). Primary care patients were more likely to be young adults (851 (41.3%) v 77 (26.5%) accident and emergency patients aged 17-30 years;  $\chi^2=23.0$ ,  $P<0.001$ ). Their problems were more likely to be of longer duration, and they were more likely to have had contact with their general practitioner or another member of practice staff (a receptionist or practice nurse, for example) before attending the hospital. Accident and emergency presentations were more likely to be injury related,

TABLE 1—Characteristics of primary care and accident and emergency attenders

	No (%) of consultations		$\chi^2$ (df)	P value
	Primary care (n=2065)	Accident and emergency (n=291)		
Age (years):				
0-5	197 (9.5)	26 (9.0)		
6-16	232 (11.2)	42 (14.5)		
17-20	189 (9.2)	15 (5.2)		
21-25	373 (18.1)	30 (10.3)		
26-30	289 (14.0)	32 (11.0)		
31-50	491 (23.8)	66 (22.8)		
51-60	117 (5.7)	23 (7.9)		
>60	175 (8.5)	56 (19.3)	50.2 (7)	<0.001
Sex:				
Male	1060 (51.4)	159 (55.8)	1.95 (1)	0.163
Female	1005 (48.6)	126 (44.2)		
Duration of presenting problem:				
0-24 Hours	708 (36.6)	147 (72.8)		
1-7 Days	743 (39.4)	42 (20.8)		
≥ 1 Week	435 (23.1)	13 (6.4)	95.6 (2)	<0.001
Previous contact with general practitioner or practice staff	328 (22.3)	20 (11.4)	11.08 (1)	<0.001

Data not available for some patients.

whereas there was a higher proportion of infectious diseases and disorders affecting the skin in primary care presentations (table II). The odds ratio for injury related problems was 0.43 (0.34 to 0.56) for primary care versus accident and emergency presentations.

TABLE II—Problems diagnosed in primary care and accident and emergency consultations

	No (%) of consultations		$\chi^2$ (df=1)	P value
	Primary care (n=2065)	Accident and emergency (n=291)		
Injury related	903 (43.8)	187 (64.3)	43.3	<0.001
Non-injury,				
musculoskeletal	288 (14.0)	27 (9.3)	4.8	0.028
Infectious conditions	104 (5.1)	3 (1.0)	9.4	0.002
Skin diseases	114 (5.6)	2 (0.7)	12.7	<0.001
Cardiac or vascular diseases	61 (3.0)	14 (4.8)	2.9	0.091
Genitourinary diseases	116 (5.7)	8 (2.7)	4.2	0.040
Respiratory diseases	131 (6.4)	12 (4.1)	2.2	0.138
Obstetric or contraception	41 (2.0)	3 (1.0)	1.3	0.260
Eye diseases	65 (3.2)	11 (3.8)	0.3	0.567
Psychiatric	34 (1.7)	10 (3.4)	4.5	0.035
Gastrointestinal	110 (5.4)	10 (3.4)	1.9	0.170

Data not available for some patients.

The severity of injuries differed. For example, 40 (21.4%) of the accident and emergency patients' injuries were fractures or dislocations of the upper and lower limbs (other than toes) compared with 70 (7.8%) of the primary care injuries ( $\chi^2=31.8$ ,  $P<0.001$ ); none of the primary care patients' injuries were compound or required manipulation or fixation. Lacerations or abrasions accounted for 88 (40.0%) of the accident and emergency patients' injuries compared with 249 (19.8%) of primary care patients' injuries ( $\chi^2=27.5$ ,  $P<0.001$ ). Accident and emergency patients' wounds were more likely to require wound closure (table III).

TABLE III—Treatment provided for lacerations and abrasions in primary care and accident and emergency groups

	No (%) of consultations		$\chi^2$ (df=3)	P value
	Primary care (n=249)	Accident and emergency (n=88)		
Suturing	42 (17)	50 (57)		
Steri-strips or glue	58 (23)	23 (26)		
Dressing	94 (38)	15 (17)		
No dressing	55 (22)	0	66.3	<0.001

Data not available for some patients.

#### INVESTIGATIONS AND REFERRALS

The odds ratio for x ray investigation was 0.39 (0.30 to 0.50) for primary care compared with accident and emergency presentations (table IV). Accident and emergency patients were more likely to have radiography, and their radiographs were more likely to show abnormalities. For example, for patients presenting with injuries, the proportion of abnormal radiographic findings was 40/88 (46%) for accident and emergency investigations compared with 70/345 (20%) in the primary care group ( $\chi^2=23.4$ ,  $P=0.001$ ). The odds ratios for haematology and chemical pathology investigations were 0.22 (0.15 to 0.33) and 0.18 (0.11 to 0.28) respectively for primary care compared with accident and emergency presentations.

Referrals to on call teams and outpatient clinics (including the fracture clinic) occurred for 357 (17.3%) primary care attenders compared with 121 (42.3%) accident and emergency attenders. The odds ratio for being discharged from accident and emergency to home or a community based service was 3.34 (2.59 to 4.31) for primary care compared with accident and emergency presentations. The likelihood of primary care patients being referred was related to the duration

of their presentation. For example, referrals to on call teams and outpatient clinics occurred in 105/432 (24.3%) of primary care patients with problems of greater than one week's duration compared with 236/1438 (16.4%) of those presenting more acutely ( $\chi^2=28.7$ ,  $P<0.001$ ).

Overall, 993 (48.1%) primary care compared with 234 (80.4%) accident and emergency patients received at least one of the following: laboratory and radiographic investigations, minor surgical procedures and dressings; referral to on call teams or outpatient clinics. For patients with injuries, this applied to 527 (58.4%) primary care and 155 (82.9%) accident and emergency patients ( $\chi^2=39.8$ ,  $P<0.001$ ), while for problems not related to injuries this applied to 464 (40.0%) primary care and 73 (74.5%) accident and emergency patients ( $\chi^2=43.9$ ,  $P<0.001$ ).

#### Discussion

This is the first study in the United Kingdom to include a prospective method of classifying the primary care content of problems presented by attenders at accident and emergency departments. The main purpose of implementing this system of triage was to facilitate more appropriate responses to patients attending accident and emergency departments with problems of a primary care type. The criteria used were concise, comprehensive, and straightforward to apply, so making them suitable for ready integration into triage practice. They resulted in 41% of attenders with new problems being categorised as "primary care." This compares with the 27% of attenders reported as being identified by triage nurses at the Huddinge Hospital, Stockholm, as presenting with non-urgent needs ("not requiring the resources of the emergency department... being of a minor or non-acute nature")<sup>22</sup> and the 40-50% classified at the Westmead Centre in Australia.<sup>8</sup>

Several differences were found in patient characteristics and consultation activities between presentations classified as primary care and accident and emergency. Primary care presentations were less severe and tended to be problems of longer duration, and over half were not related to injury. Patients classified as having accident and emergency presentations received radiographic investigations about twice as commonly as those who were classified as primary care; they were referred to on call teams and had haematology and chemical pathology tests more than three times as commonly.

#### SENSITIVITY AND SPECIFICITY OF TRIAGE

It has been argued that nurses should be given the authority to turn patients away from accident and

TABLE IV—Interventions and referrals included in consultations for primary care and accident and emergency problems

	No (%) of consultations		$\chi^2$ (df)	P value
	Primary care (n=2065)	Accident and emergency (n=291)		
Radiographic investigation	527 (25.5)	136 (46.7)	58.9 (1)	<0.001
Haematology investigation	77 (3.7)	43 (14.8)	64.8 (1)	<0.001
Chemical pathology test	50 (2.4)	36 (12.4)	71.8 (1)	<0.001
Microbiology test	77 (4.3)	3 (1.0)	7.2 (1)	0.007
Prescription*	820 (44.5)	73 (38.4)	2.6 (1)	0.108
Disposal:				
Community or general practitioner	1584 (76.9)	142 (49.8)		
On call specialist team	200 (9.7)	95 (33.3)		
Outpatient clinic	94 (4.6)	8 (2.8)		
Fracture clinic	63 (3.1)	18 (6.3)		
Accident and emergency follow up	120 (5.8)	22 (7.7)	147 (4)	<0.001

Data not available for some patients

\*Excluding patients referred to on call teams.

## Key messages

- A prospective method of classifying the "primary care" content of patients' presentations at accident and emergency departments is needed for assessment of the quality of care received
- Triage can be adapted to fulfil this purpose and differentiate patients into primary care and accident and emergency groups
- The differences in the characteristics and care received by the two groups are not as distinct as expected
- This may reflect limitations in the sensitivity of triage practice or aspects of the clinical approach of junior medical staff resulting in a propensity to intervene

emergency departments after triage assessment alone.<sup>23</sup> The incongruence between the triage assessment of patients' needs and the care that patients actually received in terms of investigations, treatments, and referrals may reflect the difficulty of accurately appraising patients' needs during a brief, preliminary assessment. It points to the risks that such an approach might entail.

The criteria for classifying primary care problems in this study did not preclude ordering investigations or prescriptions as part of the consultation, but they specifically excluded patients likely to require hospital admission or referral to on call teams. In practice, 9.7% of primary care patients were referred to on call specialist teams and a further 8.9% were referred to the fracture clinic or advised to return to the accident and emergency department for follow up. These consultation outcomes run counter to these patients' triage classifications and so cast some doubt on the sensitivity of triage decisions. Likewise, the consultations for many patients assessed by triage as presenting with accident and emergency problems consisted of interventions that could all have been provided in general practice without requiring referral to an accident and emergency department; this might indicate limitations of specificity.

Triage is essentially a screening procedure, and perfect differentiation between primary care and accident and emergency attenders is not to be expected. Consultation process data do not provide a reliable standard against which to measure the sensitivity of triage as clinical indications alone do not support the frequency with which patients receive investigations and referrals.<sup>24-26</sup> For example, the conditions in which the consultation is occurring and the concerns and expectations of the patient also influence the consultation process. The experience and uncertainty of the clinician, together with anxiety about the medicolegal consequences of missed diagnoses, is also of importance. The lack of a gold standard against which the assessment of the primary care content of presentations can be measured means that the sensitivity and specificity of triage practice cannot be precisely stated.

An aspect not considered in the analysis of data was variation among the nurses performing triage, an issue that is likely to be relevant in the development of training programmes for triage. The degree to which the efficacy of triage can be improved through further training and experience is the subject of current work at King's.<sup>27</sup>

## Conclusion

Nurse triage can be developed to classify patients into those with problems that are of a primary care type

and those with accident and emergency needs who are more likely to require investigations, procedures, referral, or admission. Categorical criteria for distinguishing between primary care and accident and emergency presentations are lacking, so a pragmatic definition of a primary care problem based on perceived need for care, rather than diagnosis or duration of the symptoms, was developed for this study. Important clinical and statistical differences were observed between the two groups of patients. However, the overlap in characteristics and consultation process measures suggests either limitations in the sensitivity and specificity of triage practice (which might be amenable to further staff training) or a clinical approach of junior medical staff that includes a propensity to intervene, or both. The latter possibility is studied in the accompanying paper.<sup>20</sup>

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