

The heaviest repeat users of an inner city emergency department are not general practice patients

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Abstract

Objective: To test the hypothesis that frequent attenders to the ED are suitable for diversion to general practice.

Methods: A retrospective review of a computerized database for the top 500 frequent presenters to an inner city adult teaching hospital ED.

Results: Five hundred patients presented 12 940 times, an average of 26 times per patient, accounting for (8.4% [8.3, 8.6]) of total ED presentations over 64 months. There were 7699 (59.5% [58.7, 60.4]) presentations deemed appropriate for ED. Of the remaining 5241 presentations, 1553 (29.6% [28.4, 30.9]) were between 22.00 and 07.00 hours, outside the hours of most actual or proposed primary care clinics. This left 3688 (28.5% [27.7, 29.3]) presentations by the heaviest users of the ED as potentially appropriate for general practice. Of these presentations 1507 (40.9% [39.3, 42.5]) were by people who were homeless. A total of 2574 (69.8% [68.3, 71.3]) had pre-existing case management, either by the hospital or another service. Nine hundred and seventy-eight (26.5% [25.1, 28.0]) had primary psychiatric or altered conscious states due to drugs and alcohol as the presenting problem. At least 90 of these 500 frequently presenting patients died during the study period.

Conclusion: The majority of the presentations by the heaviest users of an ED in a city teaching hospital are not suitable for general practice. Attempting diversion of the heaviest repeat ED users to a general practice in this setting may not be successful due to the severity, acuity and nature of casemix of the presentations and would have minimal impact on crowding in similar emergency departments.

Key words: *access, crowding, emergency departments, frequent attenders, general practice.*

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Introduction

Much attention has been paid in recent years to over crowding in ED in Australia and around the world.¹⁻³ One hypothesis has been that ED crowding is caused by patients who could be better managed in a primary care setting.⁴ Repeated users of the ED have been perceived to have low acuity of illness.^{5,6} This perception is at variance with opinions of some people working within some ED.⁷⁻⁹ Various emergency demand diversion strategies have evolved, amongst them the opening of extended hours general practice (GP) clinics adjacent to or within an ED.¹⁰

To test the hypothesis that high-use repeat ED presenters could be diverted to a general practitioner, we examined the characteristics of the 500 most frequent ED presenters over a period of 5 years and 4 months.

Methods

St Vincent's Hospital Melbourne (SVHM) is an inner city adult teaching hospital with approximately 26 000 (1996) rising to 31 000 (2001) ED presentations per year during the study period. Melbourne has a population of approximately 3.4 million.

This study is a retrospective review of information stored in a computerized database. A computer programme extracted patient details from the SVHM Victorian Emergency Minimum Database (VEMD) between 1 December 1996 and 31 March 2002, in order of frequency of attendance, identifying the top 500 most frequently presenting patients (for the purpose of this study 'frequent attenders' are defined as these 500 patients). This period was chosen as it would give a large data base sample over time and corresponded to a single reliable ED electronic clinical information system.

Data examined along with demographics included the presence or absence of hospital alerts indicating case management, homelessness (as defined by the Victorian Council to Homeless Persons),¹¹ presenting problem as recorded by the triage nurse, referral source, Australasian Triage Scale (ATS) triage category,¹² time of presentation, and the outcome of each visit. Outcomes were categorized into admission or transfer to a hospital inpatient unit, ED observation for greater than 4 hours, discharge home within 4 hours from the time of being seen and self-discharge either before or after being seen by a doctor. In addition the patients' electronic records were searched to examine their use of inpatient and outpatient services and identify deaths

during the same period. Neighbouring hospitals, Coroners records for the State of Victoria as well as the Registry for Births, Deaths and Marriages were searched to exclude death where patients appeared lost to follow up.

Emergency department attendances by the frequent attenders were compared with attendances by all remaining SVHM patients, and also with a 1 year sample from 1999 (mid study period) of 493 000 patients attending all ED in the State of Victoria which collect the VEMD.¹³ The information on all attenders at SVHM was collected in real time at each presentation on a preformatted data sheet.

The comparison group of SVHM emergency presentations excluding the frequent attendees was a non-continuous sample. This was because the clinical information system was decommissioned in April 2002, and some report periods were inadequately archived before the decommissioning. This very large sample, used only for comparison with the frequently presenting group studied, represented 110 905 or 72.2% of all presentations over the entire study period.

The data for frequent attenders was also analysed for the potential to be seen by a GP at presentation. For the purposes of this study ED appropriate attendances were defined as presentations:

1. referred by a GP or other community provider (including police, case managers and Crisis Assessment Teams)
2. in triage category 1, 2 or 3
3. requiring more than 4 hours of treatment or observation time (after initial assessment by a doctor)
4. requiring admission, hospital transfer or who died
5. between the hours of 22.00 and 07.00 (outside the hours of most suggested primary care clinics).

All remaining presentations were considered to be potentially appropriate for a GP.

Potential GP presentations (not fitting into any of the above categories) were then analysed for casemix, homelessness, case management (either in the community or by a hospital department) and whether the patient stayed for treatment or self discharged, to determine if in fact these presentations were likely to be suitable for GP diversion.

Statistical analysis

Proportions of categorical variables (such as triage categories) among presentations by frequent attenders versus other patients were compared using two-sample comparisons of proportion. Continuous variables such as age were compared by mean values, using the two sample *t*-test.

In a few cases (noted in the text), we were only able to compare frequent presenters with the entire ED population (i.e. including the frequent presenters), resulting in an under estimate of the magnitude of the true between-group difference in each case.

Mean values and proportions are given with 95% confidence intervals (CI) where appropriate. Statistical analysis was performed with Stata 7.0 (Stata statistical software version 7.0, College Station, TX, USA).

Results

General

The 500 most frequently presenting patients (referred to as 'frequent attenders') attended the ED on 12 940 occasions, a mean of 26 and median of 20 presentations per patient, with a range from 170 to 15. These 500 patients accounted for 8.4% [8.3, 8.6] of the 153 546 emergency presentations over this period.

A comparison of the frequent attenders with all other SVHM ED patients for age, gender, referral source and disposition is in Table 1. The frequent attenders were slightly older than the average SVHM patient and less likely to be referred to the ED ($P < 0.001$). They were slightly less likely to be admitted but much more likely to remain in the ED for > 4 h observation. They were much more likely than the average SVHM patient to discharge themselves against advice ($P < 0.001$). (Two people who attended 26 and 91 times each changed gender during the study period and are included in the gender at the time of presentation).

Data comparing the frequent attenders to all other SVHM ED patients and statewide data for triage category is in Table 2.

Other health service utilization

Outpatient episodes

The frequent attenders generated 14 241 outpatient appointments over 64 months but did not attend on

Table 1. Demographic data and characteristics of frequent and non-frequent attenders

Characteristic	Frequent attenders ($n = 12\ 940$)	Other patients ($n = 110\ 905$) (non-frequent attenders)	<i>P</i> -value
Demographic data			
Age median (range)	50 years (21–95)	43 years (0–103)	< 0.001
Sex % female [95% CI]	43.5 [42.6, 44.3]	38.5 [38.2, 38.8]	< 0.001
Characteristics (percent [95% CI])			
Referred by GP or community provider	11.4 [10.9, 12.0]	22.0 [21.7, 22.2]	< 0.001
Admitted/transferred	20.1 [19.4, 20.8]	26.4 [26.2, 26.7]	< 0.001
ED observation > 4 h	17.1 [16.5, 17.8]	2.3 [2.2, 2.4]	< 0.001
Home within 4 h from time seen	48.3 [47.4, 49.2]	64.5 [64.2, 64.8]	< 0.001
Self discharge (includes left before being seen)	14.5 [13.9, 15.1]	6.7 [6.5, 6.8]	< 0.001

Table 2. Percentage of patients in each triage category: frequent attenders compared to all other St. Vincent's Hospital Melbourne (SVHM) ED patients and statewide averages. Percentages shown with 95% confidence intervals

Triage category*	% of presentations by frequent attenders (12 940 presentations)	Percent of presentations by remaining patients (153 546 presentations)	Statewide ED triage category†
1	1.0 [0.8, 1.1]	1.6 [1.54, 1.66]	0.90 [0.87, 0.92]
2	6.0 [5.6, 6.4]	7.6 [7.47, 7.73]	5.2 [5.14, 5.26]
3	28.1 [27.3, 28.9]	38.1 [37.9, 38.3]	25.3 [25.2, 25.4]
4	48.7 [47.8, 49.6]	46.3 [46.1, 46.5]	47.6 [47.5, 47.7]
5	16.2 [15.6, 16.8]	6.4 [6.28, 6.52]	21.0 [20.9, 21.1]

*Australasian Triage Scale; †Source: Department of Human Services. Hospital Services Reports, 1999 State of Victoria sample of 483 389. Available from URL: <http://dhs.vic.gov.au/ahs/pub.htm/>

4960 or 34.8% [34.1, 35.6] of these appointments made, compared with the usual failure to attend rate of 17.5% at SVHM ($P < 0.001$). Appointments were spread across more than 30 outpatient or allied health clinics, but general medical and specialist medical clinics accounted for 74% of appointments, with most of the remainder being orthopaedic and fracture clinics, plastics and general surgery.

Inpatient episodes

There were 13 951 inpatient episodes from the frequent attenders. Of these, 7347 were same day admissions for chemotherapy or renal dialysis. Of the remaining 6604 inpatient episodes 2585 (39.1% [38.0, 40.3]) were admissions through ED. The leading admission units for emergency presentations were general medical, psychiatric and medical specialities.

Deaths

Ninety (56 males, 34 females) of the 500 frequent attenders (18% [14.7, 21.7]) died during the study period, generating 2280 or 17.6% [17.0, 18.3] of the visits studied before their deaths. Sixty-eight (35 males, 33 females) of these people had chronic medical conditions, including cancers, liver disease, cardiac and chronic airways disease. These chronic medical deaths had a mean age of 71 (range 34–95), with an average of 36 months between first presentation and death. There were 22 (21 male and one female) other deaths where the primary reason for most attendances was alcohol, drug-related or psychiatric. This group was younger with a mean age of 46 (range 23–63). Although the final cause of death was not available in all these 22 cases, at least four had suicided or died of overdose, one was thought to have been murdered and two had died from other trauma. Other known causes of death were sepsis, pancreatitis and hepatitis.

Characteristics of frequent attenders' 'potential GP' presentations

Of a total of 12 940 presentations by frequent attenders, 3688 (28.5% [27.7, 29.3]) (or less than two presentations per day), could possibly have been 'potentially suitable' for diversion to a GP (i.e. triage 4 or 5, not referred in, or admitted and presenting between 07.00 and 22.00 hours) (Figure 1).

However, of the 3688 potential GP presentations of the frequent attenders, many were already case managed in some form, were homeless or presented

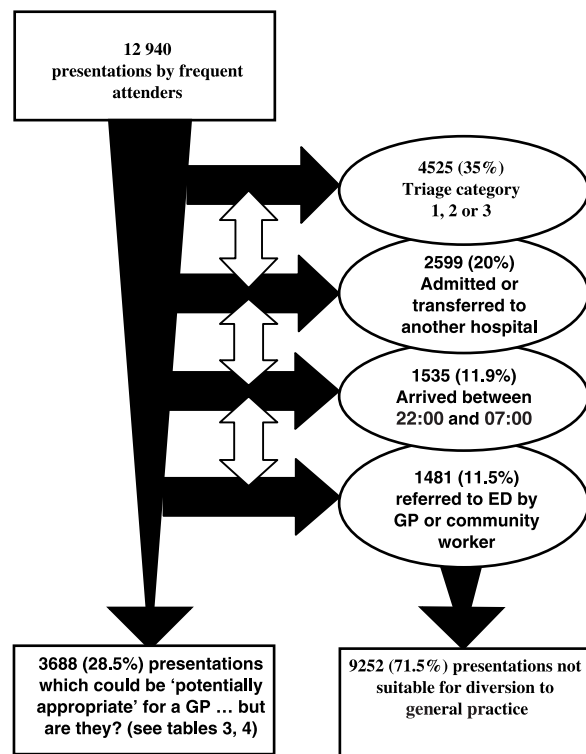


Figure 1. Analysis of 12 940 presentations by frequent attenders for potential for diversion to general practice.

with psychiatric problems and altered conscious state, including alcohol and drug intoxication, seizure and 'collapse' (Table 3).

Data for homelessness, case management and self discharge is in Table 4.

Discussion

Workers in the ED often attribute crowding to lack of access to beds, nursing and medical shortages and ambulance arrivals.¹⁴ Nevertheless, some media, politicians and other groups continue to consider a principal reason for ED crowding is due to lack of access to primary care. In particular there is a perception that there is a large group of people with minor ailments who repeatedly use the ED as a source of free health care who could be diverted to a general practitioner.¹⁵

Accordingly, much attention has been given to the possibility of decreasing emergency demand by increasing the availability of primary care. Various hospitals have established GP clinics in the ED and

Table 3. Presenting problem in 3688 potential 'general practice' presentations

Presenting problem (triage diagnosis)	Number	%	[95% CI]
Psychiatric complaint	520	14.1	[13.0, 15.3]
Altered conscious state, including alcohol and drug intoxication, seizure and 'collapse'	458	12.4	[11.4, 13.5]
Abdominal pain	319	8.7	[7.8, 9.6]
Limb pain, including single limb trauma	333	9.0	[8.1, 10.0]
Assault, minor trauma, laceration	202	5.5	[4.8, 6.3]
Shortness of breath	183	5.0	[4.3, 5.7]
Chest pain	99	2.7	[2.2, 3.3]
Back pain	94	2.6	[2.1, 3.1]
Weakness	68	1.8	[1.4, 2.3]
Dizziness	63	1.7	[1.3, 2.2]
Catheter problems (urinary, feeding, extra-anatomic)	52	1.4	[1.1, 1.8]
Others	1297	35.2	[33.6, 36.7]
Total	3688	100	

Table 4. Some characteristics of 3688 presentations by frequent attenders potentially suitable for diversion to a GP

Characteristic	Number	%	[95% CI]
Self-discharge from ED (total)	873	23.7*	[22.3, 25.1]
Did not wait to be seen by a doctor	686	18.6	[17.4, 19.9]
Discharged themselves 'at own risk' after being seen	187	5.1	[4.4, 5.8]
Homeless	1507	40.9†	[39.3, 42.5]
Case-managed	2574	69.8‡	[68.3, 71.3]

*Self discharge rate of 6.7% for all ED patients ($P < 0.001$); †Homeless presentation rate of 5.6% for all ED patients ($P < 0.001$); ‡Presentations by people who at the time of presentation had a hospital alert indicating either case management in the community or case management alerts on the ED information system.

have found considerable patient satisfaction with the service provided.¹⁶ While such an approach may increase satisfaction for patients with non-emergency problems, many ED do not find that GP patients cause overcrowding, as they do not require a trolley, usually require brief intervention, are ambulant and can wait in the waiting room. Furthermore, if given an explanation of their low triage category they may seek alternative care.

Defining what is a GP patient is not an easy task, as general practitioners, like emergency physicians, are broadly skilled and see a diverse range of patients. However, they are also constrained by their working environment.¹⁷ We started with the premise that notwithstanding the skills of GPs, patients who used facilities not usually available in GP consulting rooms could be deemed suitable for an ED. Thus, patients kept for more than 4 hours for whatever reason after having been seen by a doctor would mean that the condition required observation and investigation beyond what is easily provided in a GP clinic. Any patient

eventually admitted to an inpatient bed or transferred to another hospital was deemed appropriate. Presentations with triage 3 or above were also counted as appropriate for the ED. Although triage 4 patients have an admission rate of up to 30% in urban hospitals and can contribute more hospital deaths after admission than any other triage group, we decided to include triage four and five not admitted as 'potential' GP cases, as managers sometimes hold the perception that these lower categories could be GP patients.¹⁸

We also included 61 presentations (1.7% [1.3, 2.1]) which had been scheduled for review in the ED as potential GP presentations. In general, ED reviews are discouraged, but about five patients per week of all presentations are requested to return for scheduled review by individual doctors.

Ambulance paramedics can refuse to transport in Victoria and do not transport patients to GP surgeries. We did not include presentations by ambulance as criteria for ED assessment, as we were not satisfied that our data was accurate in this area over the study

period. However, from samples, the residual 28.5% of presentations perhaps suitable for GPs would have been further decreased to less than 20% of the total.

Helliwell in Christchurch classified frequent users as those with 10 attendances or more a year. This group accounted for 2% of their visit population.¹⁹ In Rochester, USA, a study using the same definition found 1.9% of presentations were by frequent users.²⁰ Using the same definition of more than 10 visits a year for our patients gave a similar figure of about 1.6% of total ED visits for any one year.

In order to test the hypothesis that frequent presenters could be diverted to general practice, we looked at a larger group of frequent presenters as we thought it might be more likely to pick up lower acuity repeat GP patients over a period of time. By doing this we ended up by coincidence examining all patients who had attended 15 times or more over the 64 months, an average of three or more presentations per year. Even by casting this wider net, at most one quarter of our frequent presentations, or less than two per day were possibly suitable for diversion to general practice, notwithstanding the predominant casemix of alcohol, drugs, psychiatry, etc.

The 'problem' of repeat attenders has been reported from ED in the US, UK, Canada, Ireland, France, Spain, Italy and Sweden.^{21,22} Causes for repeat ED attenders may not be the same between and within countries and caution is required when comparing health systems. Europeans have found that 'greater trust in the hospital system' than primary care, and indeed 'inappropriate' referral by primary care physician were two of the most important contributors to frequent ED use.²³ However, in many European countries there is not a long history of an ED triage system, and many lack a specialist college for emergency medicine or career clinicians in emergency. Most Victorian and Australian ED have well established triage systems which discourage non-urgent presentations, are experienced at referring away from the ED at triage, and have employed other diversionary measures. Establishing GP clinics within ED may even increase demand as patient satisfaction for the non-urgent categories increases.

It could be that SVHM is not a typical inner city hospital and our findings will not apply to other city teaching hospitals, or other hospitals at all, i.e. our most frequent attenders may not represent frequent presenters of other ED. However, examination of measurables such as casemix, ambulance attendances, admission rates and triage proportions for other urban

hospitals in Victoria are comparable, with minor exceptions. St Vincent's Hospital Melbourne has a higher triage 1, 2 and 3 rate than the state average, perhaps due to the high rate of presentation by ambulance (about 34%), and fewer triage category 5, perhaps due to there being no general clinics and a minimalist review process.²⁴ In addition, SVHM has had a general practice (the Primary Care Clinic) located within 200 m of the ED, and being in the city centre patients may have greater access to alternatives for primary care. This primary care clinic was open in office hours during the week and limited hours (10 am–6 pm) on Saturdays, and most Sundays during the study period. Although referrals to this clinic from ED are less than three per day, the presence of this clinic could have prevented some people from becoming frequent ED attenders, despite its limited hours of operation. The clinic has since closed on Sundays.

Identifying specific problems of high frequency users puts the onus on health service providers to find appropriate good care for these people who have health care needs.²⁵

Intervention has been tried since at least 1984 with mixed success.²⁶ Case management has not consistently been shown to prevent re-attendance.^{27,28} In one Veterans study, increasing the availability of primary care post hospital discharge to a sick group of frequent medical attenders *increased* readmission rate compared to controls, although patient satisfaction was higher with more available primary care.²⁹ In another controlled study, monthly group meetings (i.e. patients with each other and a physician) of those with chronic illness did significantly decrease readmission and attendance.³⁰ We actively identify patients suitable for case management and institute it from the ED. While there were rewarding experiences to the benefit of individual patients, most of our heaviest presenters had been case managed to some degree at some time. However a further prospective study would be required to assess the quality and benefits of case management.

Murphy *et al.* in Ireland, although originally proposing that GP contact in the ED could be an effective means for diverting subsequent re-attendance, found no lasting change in patient attendance patterns when this was implemented.^{31,32}

In our group, 1876 presentations (14.5% [13.9, 15.1]) resulted in self-discharge. While this is unsatisfactory from the patient's perspective, self-discharge could indicate long waiting times and/or low acuity. Having

extra staff or GPs may have meant these patients were seen and improved their satisfaction but may have made little difference to ED crowding.

The number of deaths in our group over time indicates the high physical and mental disease burden carried by this group. Although extensive effort was made to track down frequent presenters who had stopped presenting, we did not search interstate records: it is possible that people moved interstate or overseas and there were more deaths than those we identified.

People who access health care with chronic recurrent problems tend to use multiple health facilities.³³ Our top two frequent presenters, with over 300 presentations between them, were well known at neighbouring hospitals, were both case managed and were known to various GPs. Our group of 500 patients generated more outpatient appointments than ED presentations during the same period and more than a third of the time did not attend scheduled appointments. This could be due to poor awareness of their health requirements, inconvenience or difficulties with the appointment system, or may reflect for many a disorganized and crisis driven lifestyle. We are unable to access the number of GP visits over the same period.

Conclusion

The hypothesis that frequent attenders to the ED are suitable for diversion to general practice is not consistent with the findings of this research. The most frequent presenters to our inner city teaching hospital usually come to the ED with problems that could not easily be managed in a conventional GP setting. This group of heavy ED users has significant morbidity and mortality, and may have significant social, drug and alcohol and psychiatric problems. Successful diversion of a small subset of at best 25% of these presentations to a GP may be possible, and could increase patient satisfaction, but would have a minimal impact on ED overcrowding.

Before establishing GP clinics to control emergency demand, individual hospitals should look closely at the group of patients they wish to divert and assess the real reasons for emergency crowding. Similarly, for want of a suitable alternative, ED need to accept their role in the care of frequent presenters and be resourced to provide a satisfactory service and environment for the heaviest repeat users of ED.

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