



An effective electronic surgical referral system

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ABSTRACT

INTRODUCTION Electronic booking of out-patient appointments is being rolled out in England under the 'Choose and Book' programme. We set up and ran a local electronic surgical referral service before this. This paper assesses the effect of the electronic surgical referral service on patient waiting times and attendance rates.

PATIENTS AND METHODS The study included 54 patients referred electronically and 189 referred on paper to a single colorectal surgical service over the same period.

RESULTS The appointment booking was achieved on the same day as the referral was made for the majority of electronic referrals whereas it took an average of 7 days for paper referrals. There was no significant difference in the time from referral to being seen in clinic between the two groups. Patients referred electronically were much more likely to attend for their appointment.

CONCLUSIONS This study shows that an electronic surgical referral system can improve efficiency. This may be because this system allows enhanced patient choice of appointment date and time.

KEYWORDS

Medical informatics – Out-patient clinics – Surgical referrals – Electronic booking

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The national 'Choose and Book' programme is intended to achieve direct booking of all first out-patient appointments by the end of 2005.¹ This means that all patients will be offered a choice of date for their appointment. It is intended that this will be achieved increasingly by electronic means so that a general practitioner (GP) can offer a patient a choice of hospitals and appointment dates. This increases patient choice both in terms of dates and hospital. It is anticipated that it will also reduce non-attendance (DNA) rates since the patient has selected their appointment and may feel greater responsibility to attend.²

Before the national electronic booking programme was set up, we devised and implemented a pilot electronic referral system from primary care to the colorectal and gastro-enterology out-patient clinics at the Whittington Hospital. Our intention in doing this was to facilitate access for patients with lower gastrointestinal symptoms to the correct clinic with the appropriate degree of urgency.

Our aim in this study was to demonstrate the effect of this service on patient waiting times and patient attendance rates. We also assessed the accuracy of GPs' provisional diagnoses.

Patients and Methods

This study included 22 GPs in four practices. The primary care trust selected the practices on the basis that they were

already using electronic health records and they volunteered to take part in the study. Jointly with the GPs, we constructed an electronic referral *pro forma* to facilitate referral of patients with colorectal surgical problems. This was done in conjunction with a similar pilot for patients with medical gastro-enterology symptoms, and one outcome we hoped for was that patients could be streamed more appropriately to the correct clinic for their first visit.

The referral *pro forma* included the following data fields:

- patient name, age, address, telephone number, hospital number and NHS number
- primary symptom
- associated symptoms
- GP assigned to urgent or routine clinic appointment or to telephone advice to GP
- GP's provisional diagnosis
- free text box for further information.

The electronic referrals and the paper colorectal referrals were all triaged by one consultant surgeon. Electronic referrals were flagged up on the consultant's desktop computer by the bookings project manager. Paper referrals were brought to the consultant in the out-patient clinic, twice weekly. All patients were booked into the next available urgent or routine appointment as appropriate.

Electronic bookings were automatic but their priority could then be altered by the consultant. Paper bookings were not made until after consultant triage.

We collected all the electronic referrals to the colorectal service prospectively over a 1-year period, and compared this group of patients with all other patients referred by GPs to the same colorectal surgical service over the same period. We compared the two groups with respect to:

1. *Waiting time from GP referral until appointment booked.*
2. *Waiting time from GP referral to actual clinic appointment.*
3. *Patient attendance rate in clinic.*

Statistical analysis was made using a chi-squared test for DNA rates and a Mann-Whitney U-test for waiting times. We also assessed the information provided by the GPs, including the accuracy of their provisional diagnosis.

Results

During the study, 54 patients were referred electronically and 189 patients were referred on paper (Table 1).

We also found that patients were 21% less likely to telephone to change their appointment when it had been booked electronically (with their choice) rather than when it had been booked by the traditional method. In both types of referral, any later patient or hospital changes to the appointment date resulted in a doubling of the non-attendance rate. In 75% of the patients referred the GP, provisional diagnosis matched the final hospital diagnosis. Two patients were re-categorised by the consultant from routine to urgent appointments, based on the symptoms described by their GP. One patient was re-directed to the medical gastro-enterology clinic for their first appointment since their symptoms suggested this would be more appropriate.

Discussion

We have demonstrated a more rapid process for booking appointments electronically in this pilot, associated with a major decrease in patient non-attendance rate. This may be partly because the patient is present during the booking and thus has a choice of dates. This is more convenient for them, but also gives them greater responsibility to attend. More rapid booking is to be expected by avoiding the complexities of the conventional system that involves reliance on the postal service and then paper referrals in the hospital being physically brought to the consultant twice weekly rather than being flagged electronically on a daily basis. Despite the more rapid booking process, there was no significant reduction in the time from referral to appointment showing that neither group was offered

Table 1 Comparison of electronic and paper bookings

	Electronic	Paper
Delay from referral to booking (median days)	0	7*
Delay from referral to appointment (median weeks)	8	10
Non-attendance rate	8.5%	22.5%*

*Significant difference.

preferential appointment dates. Electronic booking also reduces patient-initiated cancellation of appointments, probably because the patient has been able to select a convenient date in the first place. This confirms findings in previous studies where patient non-attendance and cancellation have been reduced by direct booking.^{5,4}

Patients referred electronically were also less likely than others to change their appointment date; patients who changed their appointment are more likely to DNA. The time taken for the consultant to triage a referral was similar for both groups. Because the study group of GPs was not randomly selected, it is possible that the groups of patients referred electronically and on paper were not similar, and this might affect their behaviour in terms of attendance. However, there were no significant differences in the age sex or diagnostic profile between the two groups.

As the national 'Choose and Book' programme is rolled out, GPs should be able to book patients directly into all clinics. The improved efficiency associated with a lower non-attendance rate should help to shorten waiting times further. One of the strengths of the system used in this pilot is that the GP has to select their provisional diagnosis from an option menu and to give the symptoms. The GP's provisional diagnosis was accurate in three-quarters of the patients referred, and 90% of the patients were thought to have been referred appropriately to the colorectal clinic. The symptoms and provisional diagnosis can be used to ensure that: (i) the patient is being sent to the most appropriate clinic; and (ii) patients with worrying symptoms that might represent an underlying cancer can be switched from a routine to an urgent clinic appointment. In a patient with rectal bleeding, the GP was expected to give the provisional diagnosis of haemorrhoids when they thought that was most likely. Where patients' symptoms suggested that they might be better first seen in a gastro-enterology clinic than a colorectal clinic (or *vice versa*), our system allowed for the patient's appointment to be transferred accordingly. Previous authors have confirmed the advantage of consultants

grading referrals to identify possible cancer patients not identified by GPs.⁵ However, those authors also expressed caution that open access for GPs to hospital appointments could disempower consultants and may overwhelm clinic capacity. There is no evidence to support this in the current study, but it was limited to a single specialty service and a limited group of GPs. Recent work on demand and capacity done by the Modernisation Agency suggests that, fortunately, there is not an infinite demand for out-patient appointments.⁶ GPs generally handle the responsibility for deciding the urgency of an out-patient referral well, and understand that inappropriate urgent referrals will disadvantage the truly urgent patient. As out-patient waiting lists fall, the divide between urgent and routine waits is shrinking fast. In our unit, most routine patients are now being seen within 6 weeks and the national electronic booking programme, *Connecting for Health*,⁷ is being rolled out in all specialties.

Conclusions

This study shows that electronic referral to surgical out-patient clinics can work in practice and can improve the efficiency of the service by reducing non-attendance rates as well as providing patient choice. Following the success of this pilot, we are now going forward as an 'early adopter' in the national electronic booking service for out-patient appointments.

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