

# Electronic transfer of prescription-related information: comparing views of patients, general practitioners, and pharmacists

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## SUMMARY

**Background:** The National Health Service (NHS) intends to introduce a system of electronic transfer of prescription-related information between general practitioners (GPs) and community pharmacies. The NHS Plan describes how this will be achieved.

**Aim:** To gather opinions of patients, GPs, and community pharmacists on the development of a system of electronic transfer of prescription-related information between GPs and community pharmacies.

**Design of study:** Survey combining interviews, focus groups, and postal questionnaires.

**Setting:** General practitioners, opinion leaders, computing experts, pharmacists, and patients. Eight hundred members of the public, 200 GPs, and 200 community pharmacists, all living in Scotland.

**Method:** Content-setting interviews and focus groups were conducted with purposive samples of relevant groups. Postal questionnaires were developed and sent to random samples of members of the public selected from the electoral roll, GPs, and community pharmacists.

**Results:** The corrected postal response rates were: 69% (patients); 74% (GPs); and 74% (community pharmacists). All three groups were generally supportive of electronic transfer of prescription-related information. Different aspects appealed to each group: patients anticipated improved convenience; GPs, better repeat prescribing; and pharmacists, an enhanced professional role. Security of patient-identifiable information was the main concern. All groups acknowledged potential benefits of a full primary care information system, but GPs and patients had reservations about allowing community pharmacists to access parts of the medical record that did not concern medication.

**Conclusion:** Electronic transfer of prescription-related information is likely to be acceptable to all users, but concerns about patient confidentiality and an extended role for pharmacists in prescription management need to be addressed.

**Keywords:** electronic patient records; confidentiality; prescriptions; community pharmacies.

## Introduction

As the use of information technology continues to develop in primary care, there will be the possibility of electronic communication between general practitioners (GPs) and pharmacists. The NHS Plan has specified several areas for development.<sup>1</sup> For example, community pharmacies are to be linked to NHSnet,<sup>2,3</sup> enabling GPs to transfer prescription data electronically. In addition, community pharmacists are likely to take on new roles, such as medicines management.<sup>1,4,5</sup> Such roles would be optimised by real-time electronic communication between GP surgeries and community pharmacies, requiring integration of existing computer systems and two-way transfer of information. Previous work has demonstrated that sharing electronic databases has the potential to improve outcomes.<sup>6</sup>

Despite the imminent adoption of an electronic communication system, initially for transferring prescription data, surprisingly little is known about the acceptability of such systems to key stakeholders. A literature review conducted at the start of this project, using standard databases and comprehensive search strategies, revealed that most reports of these systems have appeared as news items, rather than as detailed evaluations in academic journals.<sup>7</sup> Four pilot electronic prescribing systems are currently being tested and evaluated in England and Scotland.<sup>8,9</sup> Earlier United Kingdom (UK) trials of electronic transfer of prescription data encountered such considerable technical difficulties that they could not be evaluated properly. Overseas, at least eight countries have piloted and sometimes implemented electronic transfer systems, but none are as comprehensive as those currently being tested in the UK.

Before implementing a large-scale system, the views of key stakeholders should be determined to identify areas of concern and to maximise the utility of that system. This paper reports the views of patients, GPs, and community pharmacists, focusing particularly on opinions about the type of data that should be transferred between general practice and community pharmacy, issues of access to specific data, and security issues. Elsewhere, a paper describing a discrete choice experiment reports the preferences of health professionals in terms of the functionality of a system for electronic transfer of prescription-related information.<sup>10</sup>

## Method

### Content setting

MEDLINE, PubMed and the World Wide Web were searched for references to electronic transfer of prescription information. Reports of relevant working parties were examined, and other groups working in the field, including some based

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### HOW THIS FITS IN

#### *What do we know?*

The UK Government is planning to introduce a system of electronic transfer of prescription information between general practitioners and pharmacies. Until now, little was known about the acceptability of such a system to key stakeholders.

#### *What does this paper add?*

Stakeholders generally support electronic transfer of prescription information but have concerns about confidentiality of patient-identifiable information.



abroad, were identified and contacted to gain an understanding of current thinking about systems involving electronic transfer of prescription-related information.<sup>7</sup>

Interviews and focus groups were conducted with purposive samples of relevant groups (Table 1). Open interviews concentrated on areas of particular relevance to individual interviewees, prompted by information gathered from the literature and World Wide Web searches. Semi-structured interviews and focus groups followed schedules developed through discussion within the project group and using information from searches and open interviews. Topics included: perceived advantages and disadvantages of electronic prescriptions, possible effects on practice, and attitudes towards sharing of patients' medical information by GPs and community pharmacists. Detailed written notes were taken during interviews. For most face-to-face interviews, two researchers were present to maximise accuracy of records. Focus groups were audiotape-recorded and summary transcripts prepared. All notes and transcripts were subject to content analysis to identify major issues.

### Postal questionnaires

Three group-specific postal questionnaires were developed as the principal tools of data collection. Topics for questions were identified from the content-setting exercise and included attitudes towards electronic transfer of prescription-related information, security and confidentiality issues, and views on sharing of information, such as subsets of the medical record or information about over-the-counter (OTC) purchases, between community pharmacists and GPs. It was proposed in the questionnaires that electronic prescribing might allow pharmacist-managed repeat prescriptions. Box 1 is an excerpt from the postal questionnaires describing such a system, which is based on one already evaluated.<sup>11</sup>

Closed questions were used to collect both factual and attitudinal data. Response formats included multiple choice and Likert scales; for example, a five-point scale ranging from 'strongly agree' to 'strongly disagree'. Space for open comments was provided in each section. Questionnaires were piloted on appropriate subjects and changes incorporated into final versions (the questionnaires are available online at: [www.abdn.ac.uk/general\\_practice/research/drugs.hti](http://www.abdn.ac.uk/general_practice/research/drugs.hti)).

### Sampling and distribution

Random samples of subjects from each of the three groups

### Commentary

This paper reports the results of questionnaires sent to GPs, pharmacists, and patients, exploring their views on electronic information sharing for repeat prescribing. At first sight, the conclusion drawn from this research, namely that new information technology needs the support of all interested parties to work and must be secure, seems simple.

The responses from the different groups show that all three groups share similar concerns about confidentiality and vulnerability of data. Each group welcomes better communication potential for its own reasons: doctors to decrease their workload, pharmacists to expand their role, and patients for convenience.

The information that each group wishes to share is dependent on these priorities. Patients wish the bare minimum of data to be used. In fact, their data is probably safer than that given to a bank or to book a holiday on the Internet, both of which are increasingly acceptable to the public. In my own experience, issues of confidentiality have been stalling points for several potentially beneficial IT projects. I am unaware of any reported example of patient confidentiality being breached by clinical information sharing. There is hard evidence of benefit in areas such as Dundee, where projects of this nature have been running for some time. Addressing this issue is important, because fears about confidentiality will stifle better use of IT for patient care, and this paper illustrates the problem well.

The professional groups have issues about professional boundaries. Where, for example, does medicine review begin to encroach on managing the patient's overall care? The GPs were quite clear that they wished to retain clinical information that the pharmacist group would like to access. This paper shows us that sharing information is not just about patient care — it is also about information as power.

Uncontrolled information exchange may help no-one. I have reviewed several projects for the *BJGP* in which pharmacists have reviewed all repeat prescribing. They have all been labour intensive for small improvements in care. I suspect community pharmacies would sink under the strain of going through a monthly repeat protocol. Similarly, I think unfiltered data for over-the-counter medicines would deluge most general practices for little benefit.

I also wanted to know if practical considerations were discussed. This is a Scottish paper, and in Scotland they have demonstrated a more coherent approach to IT strategy than other parts of the UK. The area I work in has been plagued by piecemeal investment, resulting in unreliable systems that do not communicate across professional divides. I wanted to ask: who is responsible when the system crashes the week before Christmas? How will the system account for pack size, holidays, alterations for hospital discharges, and the substantial minority of patients who complain about monthly charges?

The simple conclusions from this well-constructed paper underline many of the important questions that must be resolved if we are to harness improvements in information communication.

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were obtained and questionnaires posted to all subjects (Table 2). Up to two reminders were sent to non-responders. The survey was carried out between January and May 2000.

### Data management

Data from questionnaires were entered into the Statistical Package for Social Scientists (SPSS). Analyses included descriptive statistics (frequencies, means, standard deviation), and the  $\chi^2$  test to examine associations between variables.

Table 1. Content setting: interviews and focus groups.

Group	Representatives	Data collection methods
Opinion leaders ( <i>n</i> = 10)	Prescription pricing bodies, medical and pharmaceutical professional bodies, Scottish Executive, major pharmacy retail company	Face-to-face open interviews Telephone open interviews
Computing experts ( <i>n</i> = 6)	Pharmaceutical and medical software experts, IT security consultant, primary care trust IT manager	Face-to-face open interviews Telephone open interviews
General practitioners ( <i>n</i> = 6)	GPs from rural/city practices, male/female, enthusiastic/hostile towards IT (anecdotal)	Face-to-face semi-structured interviews using topic guide
Pharmacists ( <i>n</i> = 8)	Pharmacists from rural/city practices, male/female, owner/employee pharmacists, representatives of local pharmacy groups	Focus group using topic guide
Patients ( <i>n</i> = 12)	Older (>40 years of age) and younger (<40 years of age) users of prescriptions	Focus group using topic guide
Patient representative ( <i>n</i> = 1)	Chief Officer, Grampian Local Health Council	Face-to-face open interview

Electronic transfer of prescription data could allow changes in the way repeat prescriptions are issued. One example of a repeat prescribing system has been described below:

*The GP authorises a repeat prescription which lasts for 24 weeks but which can only be dispensed at intervals of no less than four weeks. Only one authorisation process is required at the GP surgery for each 24-week prescription (e.g. electronic signature). The patient has no need to visit the surgery for the 24-week period to collect or request further prescriptions. They can simply request each monthly instalment at the community pharmacy of their choice. Using an agreed protocol, the pharmacist interviews the patient at each monthly dispensing of the prescription to check for, e.g. compliance, adverse drug reactions, and for the need to supply each item on the prescription.*

Figure 1. Pharmacist-managed repeat prescriptions: excerpt from postal questionnaire.

### Ethics approval

At the time of this study, ethical approval was not required, since the samples used were of health professionals and of people drawn at random from the electoral roll, and not from GP or other NHS lists.

## Results

### Questionnaire responses

The corrected response rates varied between 69% and 74% (Table 2). More than 95% of responders from the electoral roll sample had received a prescription at some time, so their views are considered to represent those of patients. In this paper, they have been described as 'the patient group'.

Apart from individuals in the patient group aged less than 30 years, who were under-represented, there were no significant differences between responders in each group and national data on age, sex, socioeconomic group, and practice characteristics.

Responses to questionnaires are reported below. Answers to closed questions are given in numbers and percentages. Data from open comments are used to add depth to these.

### Electronic transfer of prescription-related information

Responders in all three groups (68% of patients [95% confi-

dence interval (CI) = 64% to 72%], 83% of GPs [95% CI = 77% to 89%], and 87% of community pharmacists [95% CI = 82% to 92%]) thought that electronic transfer of prescription-related information was a good idea in principle.

Benefits of electronic transfer of prescription-related information, suggested in open comments by patients, centred mostly on convenience; for example, less waiting time at the pharmacy, fewer visits to the GP surgery to collect repeat prescriptions, and less chance of running out of repeat medication. Patients' concerns included possible confusion for elderly patients, loss of personal service, and reduced flexibility.

Potential benefits of electronic transfer of prescription-related information put forward by GPs included improvements in repeat prescribing, fewer lost prescriptions, and reduction in fraud. Forty-one per cent (*n* = 59) of GPs agreed that the proposed pharmacist-managed repeat system would improve patient care, while 47% (*n* = 68) 'did not know'. Sixty-nine per cent (*n* = 100) of GPs thought that this type of system would reduce their own workload, and 81% (*n* = 117) thought it would reduce the workload of their staff. Some GPs raised concerns in open comments about possible technical problems, such as crashing of the system, corruption of data, and management of out-of-surgery prescriptions. Others were concerned about the level of financial investment that might be required.

Many pharmacists felt that electronic transfer of prescription-related information could enhance their role as health professionals. For example, 82% (*n* = 121) said that they would welcome the chance to become more involved in reviewing patients' medication if additional patient information were available to them. Seventy-two per cent (*n* = 106) of pharmacists felt that patient care would be improved by the proposed pharmacist-managed repeat prescribing system, although it would increase their workload. In common with GPs, some pharmacists raised concerns in open comments about technical reliability and how this new service would be funded. Others felt that electronic prescribing would compromise flexibility for patients or was unnecessary because the current system was adequate.

### Security

All three groups had concerns about security and

Table 2. Sampling and response.

Group	Sample size	Source of sample	Responders	Exclusions (reasons)	Corrected response rate (%)
Patients	800	Electoral roll sample of residents in Scotland provided by commercial sampling company	494	85 (incorrect address, deceased, patient in care)	69
General Practitioners	200	Information and Statistics Division of the Common Services Agency (division of the NHS in Scotland). Sample stratified by administrative health board, number of partners in practice, dispensing status, inducement allowance	145	3 (left practice, maternity leave)	74
Community pharmacists	200	Lists of all registered community pharmacy premises in Scotland (provided by health boards)	148	1 (incorrect address)	74

confidentiality issues associated with electronic transfer of prescription-related information. Forty-one per cent ( $n = 203$ ) of patients were 'not at all confident' that it would be possible to make the system secure, while another 45% ( $n = 221$ ) were 'quite confident'. Concerns expressed in open comments suggest that patients mostly feared unauthorised access to medical records, including by pharmacy assistants, but there was also awareness of potential fraudulent use of electronic prescriptions.

GPs' comments mostly concerned patient confidentiality and the effects of wider access to patient information on the doctor-patient relationship.

Pharmacists recognised that security of patient information within the dispensary would need to be addressed. Open comments also mentioned the threat from computer 'hackers', misuse of aggregated prescribing information for commercial gain, and problems associated with authentication of the 'sender' and 'recipient' of an electronic prescription.

### Sharing information

Figure 1 shows responders' attitudes towards community pharmacist access to different types of GP-held patient information. General practitioners and patients were asked if they would be happy for pharmacists to access particular information, while pharmacists were asked about information that would be useful when reviewing patients' prescriptions.

Just over half of patients were happy for pharmacists to access GP-held medication records. There was less support for access to other types of information, including diagnoses, blood pressure readings, and test results. Thirty-eight per cent ( $n = 190$ ) would not allow pharmacists to access any of their records.

Sixty-two per cent ( $n = 306$ ) of patients would agree to pharmacists informing GPs of problems with their medicines, such as side effects or adverse reactions. Only a minority would support pharmacists passing other information about them back to their GP: 45% ( $n = 222$ ) about pur-

chases of OTC medicines, and 46% ( $n = 226$ ) about general health information. Twenty-eight per cent ( $n = 139$ ) would not want any information passed to the GP by the pharmacist.

Twenty-six per cent ( $n = 38$ ) of GPs totally agreed, and 55% ( $n = 80$ ) partly agreed, that patient care would improve if pharmacists had access to certain patient information. Seventy-two per cent ( $n = 104$ ) of GPs were happy to allow pharmacists to access patients' drug histories, and 70% ( $n = 101$ ) information on allergies, but there was less support for access to other information. Fourteen per cent ( $n = 20$ ) of GPs opposed any access by pharmacists. Reasons given in open comments for reluctance to share information included potential adverse effects on the doctor-patient relationship, possible access by other non-pharmacist staff to patient data, problems of adherence to the Caldicott principles<sup>12</sup> and the Data Protection Act,<sup>13</sup> and lack of pharmacist training in the interpretation of medical data.

Ninety-one per cent ( $n = 132$ ) of GPs supported the receipt of pharmacy information about non-dispensed prescription medicines, and 77% ( $n = 112$ ) information about purchases of OTC medicines. Nevertheless, concerns were expressed about GPs' responsibilities and workload arising from this policy.

Most pharmacists thought that each type of information would be useful when reviewing patients' medication and they preferred to receive this information from GP-held records rather than from the patient. Eighty-nine per cent ( $n = 132$ ) of responders agreed that patient care would improve through pharmacist medication review if more information were available, although there were some concerns that current training was inadequate for the interpretation of some clinical data. Pharmacists also had concerns about potential increases in workload and adequacy of remuneration if such services were implemented.

Seventy-six per cent ( $n = 113$ ) of pharmacists were prepared to electronically transmit information about patients' purchases of OTC medicines to the GP. Suggestions for other information that could be transmitted to GP surgeries included: compliance issues; drug-related information, such



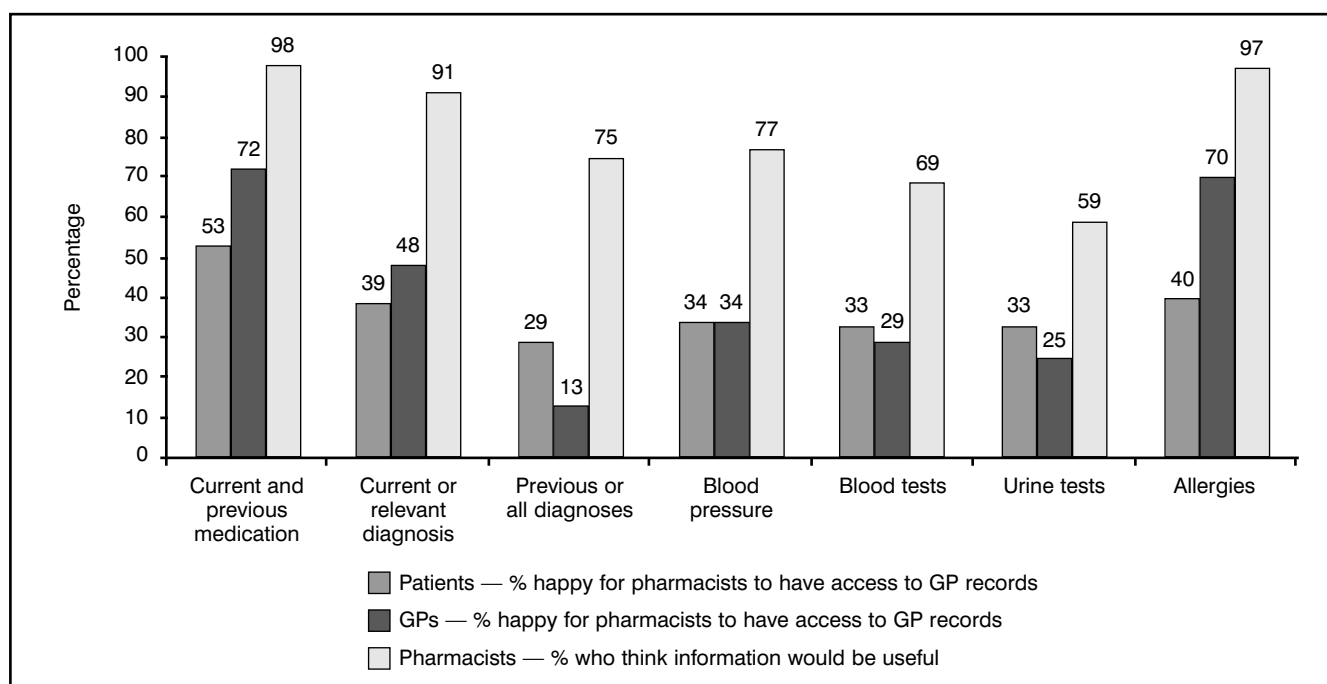


Figure 2. Comparison of views on types of information to be made available.

as side effects, adverse reactions, and effectiveness of treatment; abuse of OTC medicines, and possible fraud.

## Discussion

### Main findings

The overall attitude to electronic transfer of prescription-related information was positive among the three groups, with different aspects of the proposed system appealing to each. The concerns most commonly cited were about security of the system and issues surrounding the sharing of confidential patient information between GPs and community pharmacists. Access to patient data by pharmacy assistants also concerned some responders. Many of the benefits of electronic transfer of prescription-related information identified by responders were associated with repeat prescribing. There was general support from GPs and pharmacists for a system in which community pharmacists would have greater involvement in medicines management, particularly for chronic conditions.

### Study limitations

Response to this study was good, and perhaps indicates a strong interest in the proposed introduction of electronic transfer of prescription-related information. Responders were asked to give opinions about a hypothetical situation of which they had no experience. It is impossible to ascertain whether the reported responses reflect how responders would react in real life. Project funding only permitted the survey of stakeholders in Scotland, although there is no reason to suppose that their views would differ appreciably from their counterparts in other UK areas. It was not possible to tell whether the smaller response from patients aged less than 30 years significantly affected these findings. Ideally, reliability of the questionnaire should have been

established using a method such as the test-retest method. In this study, this was not possible because of time constraints.

### Implications for development of a future system of electronic transfer of prescription-related data

**Security.** Security and confidentiality of electronically transmitted patient data was a universal concern. Although hackers are the most obvious threat, insiders who abuse their access to the system are probably a bigger concern in practice. A system of electronic transfer of prescription-related data will need carefully thought out and rigorously enforced access control and logging procedures to minimise such abuse and to maximise detection of abusers. The role and professionalism of pharmacy dispensers and other counter staff must be transparent and clearly defined. Regulation of pharmacy support staff will be in place by 2005.<sup>14</sup>

**Repeat prescriptions.** Current repeat prescribing practices have been criticised.<sup>15,16</sup> It has been shown that minimal community pharmacist input at the point of dispensing can identify compliance and adverse event problems, and reduce costs.<sup>11</sup> An electronic prescribing system has the potential to support community pharmacists in managing repeat prescriptions by providing easy access to practice-based patient information. However, while GPs anticipated reductions in practice workload associated with repeat prescribing, and patients were generally in favour of flexible, more convenient prescriptions, neither group was necessarily supportive of the sharing of information between GPs and community pharmacists.

Delegating prescription management to community pharmacists is a relatively new concept, and inevitably, it raised concerns with each group. These concerns need to be explored more fully and addressed if the full potential of

transfer of confidential information between community pharmacists and GPs is to be realised.

**Sharing information.** Conferring additional responsibilities on community pharmacists for managing prescription medicines without providing access to information to ensure a safe, effective, and reliable review service could be counter-productive. In this survey, GPs were often willing to share prescription-related information, but they were less happy about allowing access to non-drug related information that might be necessary for effective prescription review. Interestingly, many GP practices now employ 'practice pharmacists' to review patients' medication, a service that has proven benefits.<sup>17,18</sup> Such pharmacists are usually given extensive access to confidential patient information, and in some cases they have a key role in managing repeat prescriptions. One reason for this apparent inconsistency may be that pharmacists employed by practices are probably considered an integral part of the primary care team, bound by practice confidentiality procedures. In addition, GPs may have reservations about patient information being available outside the confines of the practice.

These findings indicate that the public distinguishes between the pharmacist's role in medication-related matters and the GP's role in medical matters. The majority of patient responders did not want community pharmacists to access most of their medical records and did not want GPs to receive information about their use of pharmacy services other than those related to prescriptions. Current trends in the NHS seek to encourage closer working between all primary health care professionals, and the public needs to understand these changes in practice. Recent studies have shown that patients taking prescription drugs do not always use OTC medicines in an appropriate way,<sup>19</sup> and that GPs are often unaware of their patients' use of such products.<sup>20</sup> Increased collaboration between GPs and pharmacists has the potential to improve monitoring of patients' medication and, ultimately, quality of care. Future health education initiatives must address patients' concerns.

**Patient consent.** The issue of patient consent must be considered. Should patients be fully informed of all instances of access to their records by individuals, and all instances of electronic transfer of patient information between the GP surgery and the community pharmacy? Should community pharmacist access to patient records be seen as a new function for which specific consent must be obtained? It is unlikely that this consent is currently obtained for practice pharmacist involvement in medication review. The mechanisms for obtaining consent must be debated, and clarification of increasingly complex issues concerning data protection and patient confidentiality reached.

In conclusion, electronic transfer of prescription-related information is likely to be acceptable to all users, but concerns about patient confidentiality and an extended role for pharmacists in prescription management must be addressed.

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