**Refereed papers**

**A survey of computer use in Scottish primary care: general practitioners are no longer technophobic but other primary care staff need better computer access**

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**ABSTRACT**

**Objective** To describe the use of computing systems by primary care staff in Scotland.  
**Participants** Practice managers in Scotland on behalf of their practice teams.  
**Methods** A survey of computer use in Scottish general practices was carried out by the Scottish Clinical Information Management in Primary Care (SCIMP) group in April 2001. Every practice was sent an electronic copy of a questionnaire using NHSnet. Practices that did not respond to the electronic version were sent a paper version of the questionnaire.  
**Main outcome measures** Access to computers, use during consultations, links to laboratories, problems experienced by users.  
**Results** A total of 308 practices (30%) replied to the electronic questionnaire and 346 practices (33%) to a paper version, giving an overall response rate of 63% (654 practices). A total of 296 (29%) of practices could not receive the electronic version. It was reported that 94% of general practitioners and 74% of practice nurses frequently used a computer; 72% of practices used their computer for chronic disease management. There was great variability in links to laboratories for lab results (range 1–30% by region). Of responding practices, 16% had plans for a unified patient record, but access to a computer is still a major problem for community nurses. Satisfaction was expressed for all systems and many practices also use third-party programs.  
**Conclusions** Most Scottish doctors make frequent use of computers for a variety of clinical and practice management activities. Many other staff want to make greater use of computers, but are often unable to obtain access.

**Keywords:** computer use, health informatics, primary care, Scotland

**Introduction**

Plans to improve the National Health Service (NHS) recognise that clinicians need excellent communication systems today. Primary care teams that have taken advantage of information technology (IT) advances have demonstrated that it is possible to save time and improve patient care by 10–20%. The NHS information technology strategy has recognised these
opportunities for more effective care and proposed a strategy designed to act as a framework for effective computing.\textsuperscript{1,4,5} It is often difficult, however, for clinicians and policymakers to know to what extent the different components of the strategy are already in place. There are many reports that clinicians are afraid to use computer technology or perceive that they have inadequate training to make the best use of it.\textsuperscript{6,7} In the past, failure to harness optimum technologies has led to unhelpful features of information systems being continued and other useful functionality being discarded prematurely.\textsuperscript{8} Despite the national strategy, computer use in primary care is unlikely to achieve its potential until this ‘evaluation paradox’ is addressed and clinicians see clear benefits to their patients, or themselves, from computer use. All practices in Scotland were linked electronically to the NHSnet in 1998, so it should be possible to implement much of the national strategy.\textsuperscript{9}

The Scottish Programme for Improving Clinical Effectiveness in Primary Care (SPICE-PC) is part of the Royal College of General Practitioners’ (RCGP’s) quality initiatives programme.\textsuperscript{10} The SPICE program identifies essential criteria of chronic disease management which are designed to act as reminders to the clinician during the consultation and make it easier to do the right thing. It is vital that data can be entered quickly and easily during the consultation, reminders be provided where needed and the data easily extracted by practices for their own use where required. The data, which is entered on practice databases, can be extracted by disc or sent by email to Aberdeen University where it is analysed by the Primary Care Clinical Informatics Unit (PCCIU) to produce reports for individual practices or local health care co-operatives (LHCCs).\textsuperscript{11}

The last national survey by the Department of Health was in 1993.\textsuperscript{12} The number of GPs and practice nurses currently using their computer in the consulting room for clinical management of patients is not currently known. Scottish Clinical Information Management in Primary Care (SCIMP) was set up in September 1999 by a group of Scottish general practitioners (GPs) in order to provide a central body to co-ordinate and standardise the management of clinical information in primary care.\textsuperscript{13} The aims of the group were to publicise the benefits of a co-ordinated Scottish approach, encourage minimum datasets and common standards of clinical activity, facilitate audit, implement guidelines and demonstrate clinical effectiveness. SCIMP undertook to carry out a survey to establish accurately how many GPs, practice nurses and other practice staff were making use of the technology currently available, and to establish the problems they face.

### Methods

A questionnaire was designed to ask relevant questions about the use of computers by doctors, nurses and administrative staff working in primary care. The questions were developed by content experts who were members of SCIMP. These included representatives of the RCGP, the Scottish General Practice Committee of the British Medical Association (BMA), Scottish Intercollegiate Guidelines Network (SIGN) guidelines and users of all five clinical systems currently used in Scottish practices. A pilot version of the questionnaire was tested by sending it electronically to ten practices. The pilot version was intended to ensure that practices could open the electronic document, and either complete and return it or print it off and post it back. Two questions were found to be ambiguous and were removed, but all of the test practices received the electronic document successfully and were able to send it back by email.

An electronic version of the questionnaire was developed to automatically populate a database when it was returned. This was sent by email on NHSnet to every practice in Scotland (1036 in total) in April 2001 by the Information Services Division (ISD) of the NHS in Scotland, which holds a list of email addresses for every practice. The questionnaire was addressed to the practice manager or administrator, who was asked to reply on behalf of the whole practice.

Those practices that did not reply to the electronic questionnaire were sent a paper version, with an additional question asking why they had not returned the electronic version. All of the electronic responses were collated automatically by ISD. The remaining paper replies were added into the database manually.

Fifty randomly selected practices which had not responded were telephoned and asked why they had not done so. Of these 50, many gave lack of time or interest as reasons for not replying, but the most common was that practices had not received the original questionnaire. Fifteen of these non-respondents agreed to fill in the questionnaire so that we could ensure there was no bias in the respondents versus non-respondents. These were sent out in December 2001 and analysed separately, and were found to be representative of the main database when comparing clinical systems used, number of GPs and practice nurses using the computer and practice demographics.

Responses were analysed by descriptive statistics and cross-tabulation. All analyses were implemented using the Statistical Package for Social Sciences (SPSS version 10).
Results

A total of 308 (30%) practices replied electronically, but 296 more questionnaires were returned to ISD as 'undeliverable'. Of the 728 paper questionnaires sent, 346 further replies were received (Figure 1), giving a final total of 654 completed questionnaires (63% response rate). The figure describes the reasons for failure to respond to the initial electronic questionnaire. The main reason for non-response was that the email containing the questionnaire was not received (78%). The reasons for this were problems with NHSnet and some local problems. Of the 22% who did receive the email, 64% were unable to open it. Forty-six percent of practices stated that they had problems with their NHSnet email, including 75 (64%) practices which stated that their NHSnet link was not working or unreliable, 17 (14%) which were not connected to NHSnet and 27 (18%) which had specific hardware/software issues (e.g. 'can’t open attachments', ‘can’t receive email from outside NHS', ‘can’t print', ‘router held together with sellotape’).

The characteristics of responding practices and their geographical locations are shown in Table 1. This shows a wide geographical spread, almost half of respondents were in teaching practices and a third in training practices. Almost all practice systems were networked.

Respondents indicated that 94% of GPs used the computer, and only 4% of the total never switched their computer on at all. The usual reasons for not using one were technophobia and lack of motivation. The numbers using a computer for different activities are: in the consulting room 91%; acute prescribing 84%; repeat prescribing 83%; to record clinical information 63%; to record the whole consultation 26%; to use their own formularies 39%; to use area-based formularies 37%. Only 3% of practices claimed they were completely paperless. However, 79% of GPs had access to email from their consulting room, 63% frequently sent emails from the practice, 23% accessed journals and publications electronically and 27% accessed Scottish Health on the Web (SHOW) – the NHS in Scotland’s official website.

Table 2 shows the use of some more advanced features by practices. Only 7% of responding practices use email to access the website of their system support. One of the most consistent requests from practices for new developments in recent years has been for electronic links to hospital laboratories for test results. It has been top of the list of requests by General Practice Administration System for Scotland (GPASS)

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**Figure 1** Paper questionnaire responses describing why practices did not send an electronic reply

<table>
<thead>
<tr>
<th>Did you receive an electronic copy of the questionnaire?</th>
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<tr>
<td>Yes 22%</td>
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<tr>
<td>No 78%</td>
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<table>
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<tr>
<th>Were you able to open the questionnaire?</th>
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<tbody>
<tr>
<td>No 64%</td>
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<table>
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<tr>
<th>Do you have problems with your NHSnet email?</th>
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<tbody>
<tr>
<td>Yes 46%</td>
</tr>
<tr>
<td>No 94%</td>
</tr>
<tr>
<td>Unknown 20%</td>
</tr>
</tbody>
</table>

| NHSnet link not working/unreliable 64%     |
| Not connected to NHSnet 14%               |
| Server problems 4%                        |
| Specific hardware/software issues 18%     |
users for the past three years. Despite this, only 16% of responding practices have direct electronic links with labs for results, and 31% record lab results on the computer. Five different clinical systems were in use with 78% of practices using GPASS. Most respondents reported general satisfaction with the system they used, though this varied from 48–80%, and 67% of practices were happy with the support provided by their local health board.

Table 3 describes the use of computers by community nurses, the allied health professions (AHPs) and social work staff. Practice nurses are the only group where a majority have access to computers though a majority of other community nurses, AHPs and social work staff would like to do so.

### Discussion

This is a survey, completed by practice managers, reporting the activity and attitudes of practice teams. We know that they consulted with other staff when completing this, but have no information on the extent to which these responses accurately reflect
the situation of their colleagues, though other studies have reported accurate representation of views.\textsuperscript{14} The initial response rate to the electronic questionnaire was disappointing compared with studies elsewhere which have reported response rates of up to 75%.\textsuperscript{15} This may have been partly due to incomplete or inaccurate addresses being used by the ISD:308 practices returned to the ISD as ‘undeliverable’. This is an important consideration for the future of electronic communications between primary and secondary care. There are significant resource implications for maintaining and updating accurate databases of practice details at national and regional levels.

Paperless practices

The far lower prevalence of paperless practices in Scotland compared to England is a notable feature of the survey.\textsuperscript{16} This may be partly because 80\% of Scottish practices use GPASS, which is predominantly an administrative system (although seven GPASS practices were nevertheless paperless), but mainly because Scotland moved to A4 notes 15 years ago. The resulting quality of notes is excellent, compared to England where many practices still employ Lloyd George envelopes.\textsuperscript{17} The impetus for becoming paperless in England has thus been driven by factors other than choice of clinical system.

Electronic laboratory links

Some health board areas are well advanced in their development of electronic laboratory links, and the crucial factor determining whether or not electronic transmission of lab results occurs is not the clinical system used, but health board area. One of the aims of the Electronic Clinical Communications Implementation (ECCI) programme is to solve the problems of linking different primary care systems and multiple lab systems.\textsuperscript{18} A pilot phase is currently underway in the Highlands to find a solution and, if the results are positive, this important development will be implemented across Scotland in the near future. The requirement is not simply for electronic lists to be sent to practices, but results to be sent electronically which can automatically populate the patient record.

Clinical governance

There are 65 LHCCs in Scotland, and only three of them share a single clinical system in use by all their practices. As more LHCCs set up their programme

<table>
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<tr>
<th>Table 3 Use of computers by other members of the practice team</th>
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<tr>
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<tr>
<td>Does the practice nurse use the computer?</td>
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<tr>
<td>Does the community nurse use the computer?</td>
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<tr>
<td>Does the health visitor use the computer?</td>
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<tr>
<td>Would any like to be linked in the future?</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Unknown</td>
</tr>
<tr>
<td>Does they all have full read and write access to patient records?</td>
</tr>
<tr>
<td>Frequent</td>
</tr>
<tr>
<td>Occasionally</td>
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<tr>
<td>Never</td>
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<tr>
<td>Unknown</td>
</tr>
<tr>
<td>General comments:</td>
</tr>
<tr>
<td>Do your AHPs use the computer?</td>
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<tr>
<td>Do your social work staff use the computer?</td>
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for audit and clinical governance, it becomes more important to standardise the recording of clinical information and minimise the extra effort required to collect this manually. The 2003 GP contract, with its increased emphasis on demonstrating the achievement of high-quality care, will also make increased demands on high-quality electronic data.

Primary care team use of general practice systems

Community and primary care nursing use of general practice information systems varies both across and within NHS board areas. Practice nurses, being employed by general practices, have so far been the largest group of non-GP primary care team members to use GP systems. The use of GP systems by district nurses, health visitors and AHPs has mainly been negotiated with their employers, island health boards (HBs) and primary care trusts (PCTs). Although often practice attached, these groups of healthcare professions usually have a remit for the health care of communities within a geographical area as well as the general practice population, some not being based within a general practice. The information needs of the island HBs and PCTs in terms of governance and service planning are met by these groups using their computer or other paper-based systems. These systems also help community nurses and AHPs in direct patient care by supporting continuity of care, caseload planning and management. Community nurses and AHPs may use GP systems as well as other systems, dependent upon local protocols. Computer usage has also largely been dependent upon access to computers and networks, training and support.

In September 2000, the Scottish Executive Health Department (SEHD) invited proposals from island HBs and PCTs for investment in community nursing IT infrastructure. In response, £3.5 million was made available. An additional £1 million was also made available for the upgrading of GP information management and technology infrastructure. As a result of this investment many community nurses and practice nurses now have access to GP systems, email and the Internet as well as training and support. The effect of this investment is currently being audited in order to identify gaps and make plans to meet this need. Integration of patient information into an electronic patient record is an objective of both local and national strategy. Work is underway to promote and further develop general practice system functionality for use by the wider primary care team and to enable virtual sharing of patient information across services and organisations. Recent surveys within island HBs and PCTs show that community nurses feel the electronic sharing of patient information in a secure way with social care should be given the highest priority for development.

This survey has demonstrated the widespread use of computers in Scottish primary care by GPs and practice nurses. Networked computers are available but not yet accessible to other members of the extended primary care teams. More training and time during consultations will be needed if full implementation of national policies is to be achieved.

ACKNOWLEDGEMENTS

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