Refereed papers

Paperless practices: a report from a research network

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ABSTRACT

- The availability and use of clinical information and communication technologies vary markedly between practices.
- Practices do not inevitably become paperless after a certain number of years of computerisation.
- Most sampled practices wish to embrace information and communication technologies.
- There is no set definition of a 'paperless' practice. Practices with varying degrees of computerisation define themselves as being paperless.
- Understanding between clinicians and managers on the in-house use of paper notes and electronic data gathering can and should be improved.

Keywords: computerisation, information and communication technology

Introduction

Within the UK, the NHS information strategy expects management data to be derived from operational data. As yet the conundrum of how to collect clinical information for one purpose (care), and then how to reuse it for another (management), remains unsolved. Both The NHS Plan and Building the Information Core attempt to clarify and set a timescale for solving these modernisation challenges.

Consequently, there is both a strategic and operational need within primary care to migrate from paper-based consulting to computerised consulting. This process of change has come to be termed 'moving towards paperless practice'. A consensus view of what steps should be taken in what order suggests how practices should go about this. Sequential studies indicate that increasing numbers of practices are defining themselves as 'paperless'. This report describes what moves towards paperless status are occurring within a research network, and the differing professional views when a 'paperless' state is reached.

Methods

Following a pilot study, the former NHS South Thames Region’s research practices (South Thames Research Network or STaRNet) were surveyed using two bespoke questionnaires. The questionnaires, one for practice managers (or equivalents) and the second for clinicians, were developed with a multiprofessional primary care research group. The managers’ questionnaire aimed to collect information about the practice as well as managers’ use of clinical information and communications technologies (ICTs), whilst the clinicians’ questionnaire collected data on
personal ICT use. Managers were also asked to record if their practice consultations were paperless or not. During the last quarter of 1999, 133 practices were sent one managers’ questionnaire and six clinicians’ questionnaires. A reminder was sent with additional questionnaires to non-responding practices approximately three months later.

Results

In total, 334 clinicians’ questionnaires were returned from the 90 practices, giving a response rate of 68% (90/133). The mean number of clinician responses from each practice was 3.6, with a standard deviation (SD) of 2.3. Five questionnaires were excluded due to lack of identification. Sixty-one percent (81/133) of practices responded with a managers’ questionnaire. Of these, seven were not analysed due to insufficient data. All responding practices were computerised and had clinical information systems.

The study practices have on average had computerised clinical information systems (CISs) for nine years (SD = 3.1). Twenty percent (n = 15) of managers defined their practice as paperless. Of the remainder, 70% (38/57) intended to become paperless. The two groups of practices did not vary significantly in the number of sites within which they practise (P = 0.07). Using the independent sample t test assuming equal variances, there is no significant difference (P = 0.358) between the mean times that the paperless practices and the non-paperless practices have had clinical computer systems (paperless practices mean = 9.7 years, SD 4.5, median = 10 years; non-paperless practices mean = 8.7, SD 2.7, median = 9 years).

There are considerable differences in the availability and use of clinical ICT between the practices that considered themselves paperless and those that did not (see Figures 1 and 3). Electronic pathology result messaging was the commonest additional functionality installed, over and above that provided by the basic clinical system. Approximately 90% (n = 13) of paperless practices have electronic pathology links, whilst only 25% of paper-based practices had the same facility (Fisher’s exact test P = 0.00). Significant differences (Fisher’s exact test P values) are also seen between paper-based and paperless practices in the use of electronic spirometry (P = 0.002), electronic anticoagulation service data (P = 0.00), electronic electrocardiogram (ECG) (P = 0.008) and the use of scanners to save clinical letters electronically (Pearson chi-square P = 0.00). Figures 2 and 3 illustrate that, within the sampled group, paper-based practices consistently use fewer of the technologies available to them for data gathering (for example, recording consultation data, coding house calls) and data processing (such as clinical audit).

Practice managers had different perceptions from clinicians about the availability of notes and whether data were written into paper notes or entered into the computer during consultations. Our results indicate that managers overestimate availability and use of paper notes during consultation within paper-based practices, when compared to their clinician-reported notes use. By way of contrast, managers of paperless practices underestimate paper notes availability and use within their practices (see Figure 2). This view is also reflected in managers’ perception of clinicians’ diagnostic coding activities. Statistical calculations were not attempted due to the small sample size.

Of the responding practices, 20% (13/72) have PRODIGY (Prescribing RatiOnally with Decision Support In General practice studY), with no significant difference between paperless and paper-based practices (Fisher’s exact test P = 0.45).9 Morbidity Index Query Export Syntax (MIQUEST) is available at approximately the same level (14/72), again with no significant difference between the two groups of practices (Fisher’s exact test P = 0.07).10 Availability of access to electronic information to support clinical practice did not vary consistently between the paperless and paper-based practices. Information applications to support prescribing were used almost twice as much in paperless practices as those that were not. eBNF (electronic British National Formulary) was used in 52% of paperless practices and 26% of paper-based ones, and eMIMS (Monthly Index of Medical Specialities) in 42% and 28% respectively.11,12 An evidence-based medicine resource (the Cochrane Library) was used equally by the two groups, 24% and 28% respectively.
Figure 2 Differences between practice managers’ awareness of clinical data-gathering procedures within their practices and clinicians’ responses

Figure 3 Proportions of clinicians who ‘mostly’ use the listed facilities in paperless and paper-based practices
Discussion

‘Paperless’ status was not self-awarded within our study group of practices, even after almost ten years of computerisation. Practices that are defined as ‘paperless’ by their managers make greater use of available NHS technologies to enhance the content of their electronic patient record (EPR) (see Figures 1 and 3). Though ICT use is greater, variation in the use of technologies (see Figures 1 and 3) and data-recording practices (see Figures 2 and 3) indicate that a ‘paperless’ status is adopted without a clear definition in mind.

The lack of clarity in what the term ‘paperless’ means has the potential to cause considerable confusion. A quarter of the practices regarding themselves as paperless continue to provide paper notes during consultations. Practice managers who have greater access to general computer facilities (see Table 1) are shown to be reliant on computerised clinical data, whilst acknowledging its inadequacies. That 70% of managers in paper-based practices wish to implement national policy and commit to addressing issues of data quality by becoming paperless is encouraging for change management. However, without detailed definition of what this goal constitutes, their aspirations remain unfocused. The absence of such plans to become paperless by around 30% of paper-based practices can be seen as a cause for concern, given the aims of Information for Health.

Figure 2 highlights the difference in the opinions of managers within the two settings about where clinical data are stored. Though lacking statistical support, the overall trend is strongly suggestive that managers’ self-awarding of paperless status to practices may bias their perspectives on clinical data management during consultations. Once technologies are established within a general practice, Read coding of consultation data by clinician would seem to exceed managers’ expectations within the self-defined paperless practices, while falling short of managers’ expectations within the paper-based settings.

Point-of-service facilities, such as repeat and acute prescribing facilities, which enable data to be routinely collected, whilst also assisting the consultation process, have favourable uptake in both groups (see Figure 3). Data-acquisition processes, such as coding symptoms, coding house calls and examinations results, are less thoroughly conducted in paper-based practices than in paperless practices, and such data-reliant options (the use of the clinical information systems for research and audit) are also proportionately underused. Much ‘add on’ technology is now being made available through the practices’ clinical information systems under Department of Health Requirements for Accreditation (PRODIGY and MIQUEST); consequently these facilities are similarly distributed across paperless and paper-based practices. However, when their basic functionality is not being adequately used, and computerised medical records are not being sufficiently filled with Read coded consultation data, then it is hard to see how the NHS will be able to monitor whether practices are meeting the clinical standards set out in The NHS Plan.

This study was conducted over the New Year period on a self-selected group of research-active practices within one region. Such practices are recognised as being larger in terms of the population they serve, as well as the number of partners employed. Research practices are also considered to be more amenable to change in that they are more likely to be training practices than general practices at large. In addition, research practices have been encouraged to accept and use ICT ahead of practices at large. It is expected that the proportion of ‘paperless’ practices in this sample is larger than in the United Kingdom as a whole. Though an attempt was made to improve response rate by increasing the time before a reminder

| Table 1 Disparities: the availability of ICT for practice managers and clinicians |
|---------------------------------|-----------------|-----------------|
|                                | Practice managers with facilities | Clinicians with facilities |
|                                | \( n = 74 \) | \( n = 330 \) |
| NHSnet                         | 41% | 30 | 18% | 58 |
| Internet                       | 61% | 45 | 43% | 142 |
| Email                          | 69% | 51 | 47% | 155 |
| Personal computer              | 85% | 62 | 66% | 213 |
| Word processing                | 75% | 54 | 52% | 173 |
was sent, its timing (the study straddled both the Christmas and New Year period) may have reduced the response rate. It is possible that the non-responding practices are less computer orientated than the respondents and therefore likely to increase the disparities highlighted already. In addition, this study occurred at a time when much change has occurred in UK primary care informatics. Though computerisation would have increased above the limits indicated in Table 1, many of the discrepancies in ICT use and beliefs are likely to persist whilst primary care acclimatises to the available technologies.

Although self-defined paperless status may be vague, it is notable that these practices favour specific ICTs. The technologies that are embraced, and the relative magnitudes of uptake, indicate not just what is feasible through the NHSnet but also what routine data are prioritised within general practices. The ‘3 Rs’ definition of routine data (registration, repeat prescriptions and recalls) mentioned by Daniels is expanding to include coding of diagnosis and other clinical data, the scanning of clinical correspondence and the results of clinical measurements and investigations. The electronic provision of investigation results is illustrated in this study by pathology links, electronic spirometry and ECG. They offer the possibility of automatically increasing the completeness and correctness of the computerised medical record that primary care needs for quality assurance purposes. It would seem that it is indeed the automatic population of the electronic patient record with routine data as represented in Figure 1, and the ever broadening definition of ‘routine data’, that will encourage the change to a truly paperless status.

**Conclusion**

**Going Paperless** gives a pragmatic definition of what paperless practice means. Very few documents address the policy issue. PRIMIS Guidelines and the Lambeth, Southwark and Lewisham report are notable exceptions. A recent proposal by the General Practitioners’ Committee for approving paperless practices explains that there is ‘no clear answer’ to the question, ‘At what point should a practice seek approval to become officially paperless?’ This lack of definition and direction has not prevented practices taking advantage of the new terms and conditions (regulations 36(2)) and using options available to them to different extents. Our results indicate that many practices are in a transient state between traditional paper-based data collection and more comprehensive use of their clinical information systems. Nonetheless, the prioritisation of ICT use is evident with anticoagulation, spirometry and letter scanning being considered important data worthy of electronic access. Further investigation of this process may enable us to encourage the less computer-orientated practices to come on board.

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