Chapter 7 – Education and training

7. Education and training

7.1 Introduction

There are two contrasting world views that apply to information technology and its implementation. One is that computers and the modern communications infrastructure change everything. The other is that the really important developments in this field are the printing press and the typewriter, the telegraph, the telephone and broadcasting; these inventions represent step-changes and modern IT represents no more than refinement and development. As ever, the truth contains elements of both world views.

This section is about the education and training needs that flow from the introduction and implementation of paperless records in general practice. Reflecting the first world view, it considers how mass-storage, rapid retrieval and communication of information in the electronic record impact on different parts of the General Practice team. These are new phenomena and they require the development of new systems in practice and the acquisition of new skills. Reflecting the second world view, it also considers how the attention given to the importance of information quality and information flows in electronic media can be applied to traditional information handling too. In other words, along side the development of the new, there is a revision of the old.

These themes will be applied across three dimensions of clinical informatics. These are;

1. how to use the technology
2. data, information and meaning
3. integrating electronic and interpersonal communication of information

Finally, one of the main drivers supporting the implementation of electronic health records across the NHS is the notion that an integrated record system can be used to support multiple functions that may be clinical, administrative or educational. This notion will be examined in more detail in the section on data, information and meaning.

7.2 Three dimensions of clinical informatics

7.2.1 How to use the technology

The power of technology comes from the way in which it replicates many processes that have previously been done physically. Inasmuch as scanning in a hospital letter, or attaching a laboratory report to an individual's record, replicates the task of filing them in a records envelope all that needs to be learnt is the mechanical process. It's a question of learning to make the correct keystrokes in the right order.

A general training, such as ECDL(http://www.ecdl.com/) is appropriate here; there will also be the need for on-site system specific training too.

Clinical systems, like other software, are flexible and can be used in many different ways. Individual practices need to coordinate their training so that there is consistency. However, the electronic record, by virtue of its portability is part of a much wider system. This means that every member of staff who is able to create, update, or delete records understands the consequence of these actions. This understanding has to be in the context of the NHS as a whole, in the context of the locality (PCO/ Health Board) as well as in the local context of the practice.

7.2.2 Data, information and meaning

Data on their own are meaningless. Data only becomes useful as information when the context is known. For data and information to acquire meaning requires the addition of a social and a cognitive perspective. For example, “160/90” as written is a mathematical ratio. Most medical people may assume that it represents a blood pressure reading, but the numbers are only useful as information in the light of contextual factors such as what sort of sphygmomanometer was used, what was taken as the diastolic endpoint, who is the patient, in what condition, what are previous readings, what medication is s/he on? That information is then only meaningful in the context of medical scientific custom and knowledge.

7.2.3 One record, multiple uses

Records in health care have a number of different purposes. These include a variety of clinical, administrative and educational uses at a variety of levels; individual, practice, and locality. The Scope EPR report[1] outlines these in detail, and shows how a single EPR can (could possibly) fulfil all these functions. This contrasts with paper systems, where quite separate records are required to provide aides-memoire for clinicians and data for audit for example.

The EHR’s potential to support multiple functions underlies these extracts from Information for Health[2] in England,

‘NHS managers and planners at every level of the service must have information that helps them better target and use the considerable resources deployed in the NHS to improve the quality of life for patients…. Such information forms a natural by-product of the clinical systems required to support the day-to-day care of patients….

EPRs and EHRs provide the source of the base of anonymised and aggregated data to support the clinical audit process and over time they will contribute to the growing knowledge base informing the development of local and national guidelines.’

Information for Health 1998 p63 & p68

And in Scotland the white paper “Partnership for Care”[3] stated:

“Integrated Care Records will take time to reach, but each step in their development will bring immediate benefits to patients, carers and healthcare professionals by enabling:

greater patient involvement in their own care;

service redesign and the shift in the balance of care provided in different settings;

quicker exchange of information between professionals;

quicker access to patient records (with built-in patient confidentiality); and

continuous improvement by providing routine monitoring of quality standards.”

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[1] SCOPE EPR Report: http://www.schin.co.uk/rcgp/scopeEPR/report/index22.htm
Last Accessed 16th Feb 2006

[2] *Information For Health*. Department of Health. London. 1998 p63, 68.

[3] http://www.scotland.gov.uk/Resource/Doc/47032/0013898.pdf

Last Accessed September 2006

Which was expanded upon in the current eHealth Strategy (2004)[4]:

"The Integrated Care Record is a holistic patient record that is accessible to those who require the information, including patients and carers. Currently many professionals in many settings hold fragments of the record but none have access to the whole record. This does not mean that all information about a patient will be held in one place but it does mean that health professionals can access the information they need that is held about a patient. Such access will be within a secure environment and defining access rights of users will ensure that it is limited to what any given professional needs to know."

The following abstract from the International Journal of Medical Informatics[5] agrees that secondary information can flow from clinical systems, but that this process is active and requires work, rather than being a natural by product as claimed in Information for Health.

"Successful design of information systems in health care starts with a thorough understanding of the practices in which the systems are to function. In this paper, we discuss the nature of 'medical information' from a sociological perspective. We focus on the (im)possibilities of the utilization of primary health care data for secondary purposes such as research and administration. In much of the literature on EPRs, this secondary utilization is only seen to depend on the question whether the IT connections are in place. It is then simply a matter of selecting which information to transport and to where. In this article, we argue that this view of medical information is mistaken. Information should be conceptualized as always entangled with the context of its production. The disentangling of information from its production context is possible, but that entails work. We propose the following 'law of medical information': the further information has to be able to circulate (i.e. the more diverse contexts it has to be usable in), the more work is required to disentangle the information from the context of its production. The question that then becomes pertinent is; who has to do this work, and who reaps the benefits?"

These issues are highlighted by the GMS contract from 2004, which bases many practitioner payments on the basis of information derived from clinical records.

7.2.4 Context

The important element in the last few paragraphs is context. While data can be transmitted with ease in electronic systems, context is more problematic. This is particularly so as so much of social context is tacit. The sender of a message may not be aware of the assumptions they make about the content of the message, nor the receivers' abilities to decode it.

Data that is presented in tables and graphs that are produced by computers gives the appearance of being "hard". Much of the content of Primary Care is "soft". For example a Clinical code for depression may be applied to a record as the result of using a formal symptom rating scale, but is more likely to be applied in response to recognition by the GP of a pattern of symptoms and appearance of the patient. This judgement is bound to be affected by the GP's own mood and personality, among other factors. Whereas a close colleague may be able to interpret the coding correctly, based on knowledge of the GP, the practice and possibly the patient; a health (or

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[4] http://www.ehealth.scot.nhs.uk/pdfDocs/National%20eHealth%20IMT%20Strategy%20April%2004%20final%20draft.pdf
Last Accessed 16th Feb 2006

[5] Berg & Goorman. The contextual nature of medical information. *Int J Med Inf* 56 51-60, 1999

social) worker in a different discipline in a different part of the country may have more difficulty.

7.2.5 One record, multiple readers

A key difference between paper and electronic records is to do with the ease by which they may be read. Legibility, or rather illegibility, of doctors' handwriting is legendary. Combined with the physical constraints of the building and filing cabinet in which the record is stored the legibility of hand-written records severely restricted the potential readership of the record.

Electronic records are relatively legible and highly portable. As well as the issues of context described in the previous paragraphs, this also raises the questions of propriety that are explained in detail in chapter 3 of these guidelines (Information Governance).

7.3 Integrating electronic and interpersonal communication of information

The move towards electronic records has two different effects on the practitioner – client interaction. The first is largely due to the different medium, which allows rapid retrieval of diverse parts of the patient's medical record via a computer screen. That is the same information as is available in paper records, but now available in a different way. The second relates to decision support, guidance, and information support that may be embedded in the electronic record (for example in templates), may be triggered by entries into the electronic record (e.g. SPICE http://www.spice.scot.nhs.uk/index.htm, PRODIGY (http://www.prodigy.nhs.uk), or may be accessed from the desktop computer (e.g. eBNF (http://www.bnf.org) or internet resources such as NES e-library (http://www.elib.scot.nhs.uk/). This is a new range of information and knowledge that is available to the practitioner as a direct result of using electronic records rather than paper.

The iiCR project (http://www.schin.co.uk/iiCR/) has studied the effect of computer use in the consultation, and produced a teaching package that delivers the key messages from the project. It shows that computer use, even for "old" tasks such as looking up a test result on screen, can be distracting and engaging and carries the potential risk of losing rapport with the patient or not hearing what the patient says. The project also shows how the teaching of simple communication skills can minimise this risk. Using an electronic record makes it easier to share parts of the record with the patient. Again, it was found in iiCR that there is a set of communication skills that facilitate shared reading from a computer screen.

The huge range of accurate and context-sensitive information and knowledge that can be accessed in real time during the consultation is beginning to change the nature of the practitioner-patient relationship. Whereas the professional used to have knowledge that was not available to the layperson, useful knowledge now resides in the computer system; it is available to both, and the client may observe the professional in the process of learning. This changes relationships; it requires the practitioner to display educational and facilitative skills rather than knowledge and power. It makes it easier to involve the patient in the decision making process.

7.4 Learning needs

This list of learning needs is a high-level summary. It is mapped in more detail to the specific items raised earlier in this report in the table in appendix 3.

7.4.1 How to use the technology

Keyboard and mouse skills

Using office programmes

Using the clinical system

Conforming with local practice

How to get help if the system fails

Basic system management/maintenance

7.4.2 Data, information and meaning

How to use coded and free text entry appropriately

Understanding how context affects the interpretation of data

How to apply that understanding when receiving or sending messages

Awareness of the purposes to which a particular entry may be put

Understanding the issues of information governance, particularly relating to the law, consent and confidentiality

Understanding the importance of consistency and accuracy in data entry

Conforming with local practice

7.4.3 Integrating electronic and interpersonal communication of information

Awareness of how computer use affects the consultation

How to use communication skills to relate to the patient while using the computer

How to facilitate shared reading from the computer screen

How to incorporate outside knowledge (from the computer) into the consultation; learning, teaching, facilitating.

How to share information and decision making

7.5 Meeting these needs

The learning and training needs described above fall into four categories of skill;

4. Mechanical and technical; using the technology; general skills and system specific skills
5. Cognitive; data, information and meaning; accessing and interpreting knowledge from outside sources
6. Social; teamwork and working within the local system; doing things the way we do them
7. Communication and teaching; managing the inter-personal communication while using the computer; relating and sharing computer-derived information with the patient and with colleagues

These four domains of skill require different teaching and training methods, though this does not necessarily mean that they require different teachers or different providers. Mechanical and technical skills are best learnt in a hands-on environment. The important thing is for the learner to be doing and not just watching.

The cognitive skills referred to have, up to now, been offered to doctors in evidence based health courses, or modules on higher degrees such as an MSc. Here they are delivered through a combination of presented material, individual study and assignments. This is delivered either in taught courses or by distance learning. There is no reason why these approaches could not be used at a practice or PCT level.

The social skills referred to relate to social learning as described by Etienne Wenger[6] in his book “Communities of Practice”. This is closely related to knowledge management within an organisation and organisational learning. The learning is supported by facilitation and the provision of environments that enable the sharing of ideas by participants.

As the iiCR project has shown, standard methods of consultation and communication skills teaching can be adapted to deliver this training. The key messages can be dealt with in a 2-3 hour session in a facilitated group.

7.6 Conclusion

The need for education and training in the introduction and implementation of electronic records has been long recognised, but is not yet satisfactorily addressed. In the days of paper records little attention was paid to education and training in record keeping. While this is an opportunity missed, damage was limited by the lack of portability of the paper record.

Electronic records replicate the functions of paper records and offer many new additional uses. However, the nature of the electronic record – its portability and issues of context – means that it is not sufficient to replicate the previous methods of training. New skills are required both for traditional functions of records and the new functions that are specific to electronic records.

These learning needs apply across the different members of the primary care team. Everyone who works in a Practice needs to be able to operate the equipment, understand the consequences of making an entry in a record, be able to follow local practice, and be able to discuss with a patient or a colleague what is on their computer screen.

The penalties for failing to meet these needs are dire. The consequence of poor practice in terms of data quality is meaningless data. This would invalidate the considerable investment in IT infrastructure. The consequence of poor practice in terms of consultation skills is that computer use will hi-jack the consultation and impoverishes the doctor-patient relationship.

Finally, the issues of consistency, conformity and standards have been mentioned several times in this section. The communities of practice model, which seems most appropriate educationally, is by definition a local solution. By its nature the EHR is not local. There are, thus, three aspects of scale and scope to consider; the range of skills required to use electronic records effectively; the range of staff who need these skills; the local and national contexts.

Appendix 3 maps learning needs to various chapters and sections within these guidelines

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[6] Wenger E. Communities of Practice. Cambridge University Press, Cambridge. 1998

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Appendix 6 provides a list of learning resources to support para 4.43 of the New GP Contract

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