THE "PAPERLESS" CONSULTATION RECORD

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INTRODUCTION

When the Lloyd George medical record was introduced it offered a neat, convenient home for all the patient information that a GP needed to keep. It was accessible, easy to use, and simple to send to the next GP if the patient moved. But what can be said for it eighty years later when any patient with a moderately interesting medical history is likely to have a two-inch thick, crumbling packet of documents, held together by tape and rubber bands, and stuffed with dog-eared letters and laboratory results? Summary cards have been developed but if you want to be sure that your repeat prescription system works safely, maintain a disease register, or audit something, then you will not get much help. Gradually GPs are turning to computer systems for the solution. In ten years the prevalence of computers in primary care has risen from 10% to 96% of practices⁽¹⁾. The first target for computerisation is usually the repeat prescribing system followed by the administrative tasks of patient registration, and appointments, but the real benefits of modern information technology are realised when it takes over from the Lloyd George record.

Figure 1 - Percentage of practices computerised¹

The market place for general practice computer systems is wide and varied. There are about two dozen systems on the market, though 70% of systems are supplied by the three main companies, EMIS, Reuters and AAH Meditel. The systems' capabilities vary but the best are designed around their clinical software. The 1996 National Survey carried out for the NHS Executive reported that 92% of GPs use their computer system for clinical records to some extent and 33% record information in every consultation. It also showed that:

- 78% of GPs thought that clinical computer systems would enhance their ability to deliver best practice to their patients.
- 63% felt that patients would consider the addition of computers to the consultation to be beneficial.
- 66% felt that they required training to help them consult effectively with a computer present.

Table 1 compares the results from the 1993 and 1996 national surveys of computerisation in general practice. There was an important difference between the two surveys. In 1993 questions were asked about practice use of the computer, in 1996 the questions were about personal use.

This article is a personal tour of the information technology currently used in the consulting room. In Bentham we have had an EMIS system for eight years and we began recording consultation information seven years ago. My article is bound to reflect that this. I apologise in advance for any omissions that I have made of other systems' capabilities.

PROBLEM-ORIENTATED MEDICAL RECORD

Clinical software systems can accept consultation records that retain exactly the same structure and content as the old Lloyd George entries. The computer will record and issue acute and repeat prescriptions, with warnings of contraindications and allergies. Records can be viewed on a terminal screen anywhere in the practice, including branch surgeries linked by landlines. Confidentiality is protected by password control. One small drawback of the text-based systems that prevail in primary care at the moment is that they will not accept drawings, but in all other essentials they will duplicate the Lloyd George record. The problem with drawings may be overcome by the graphical systems such as Windows networks that are beginning to appear, but on the rare occasion that an illustration is needed, a photograph would probably do better.

In the meantime the text-based systems can offer much more than the Lloyd George. The best designs use the model of the problem-orientated medical record (POMR), in which the main reason for the consultation is picked out and called the problem title, and can be carried through to every consultation on the problem. The elements of the consultation, the symptoms, signs, investigations, actions and future plan are separated as well. The records are easier to follow, so saving time and avoiding misunderstandings. It also concentrates the mind to have to give each problem a title⁽²⁾.

In the electronic patient record (EPR) the problem titles are chosen from a hierarchical classification of terms carried in the computer memory. It is the coding system that makes the electronic consultation record such a powerful clinical tool. Codes exist to cover almost all diagnoses, symptoms, signs, clinical activities and administrative processes. There are codes that carry values to record laboratory results or numerical examination data such as blood pressure or peak flow. All the systems on the market use the Read classification, the NHS standard coding system. For the

Task		Percentage of practices which use a computer for the task in 1993	Percentage of GPs who use a computer for the task in 1996
Clinical Report	Total:	90%	91.5%
	Partial	42%	49.8%
	Partial, but eventually full	19%	19.4%
	Full, retaining manual records	29%	15.8%
	Full, replacing manual records		6.5%
Repeat prescribing		94%	91.3%
Use during consultation: Entry of clinical data	Total:	66%	81.1%
	Some consultations	32%	48%
	All consultations	34%	33.1%
Use during consultation: Viewing clinical data		63%	76.7%
Data collection for annual report		80%	75.9%
Use during collection: Acute prescribing		58%	72.9%
Call and recall (e.g. cervical cytology)		84%	72.8%
Medical audit			68.2%
Flagging of tasks (e.g. opportunistic screening)		63%	60.0%
Referral letters		51%	48.9%
Appointments			35.9%
Workload analysis			31.4%
Guidelines/protocols		29%	27.7%

Table 1

technically minded, GP systems use the four or five character sets of version 2. Version 3 is a long way from being adopted by the software suppliers. There are many advantages to the POMR that can only be fully realised by the using a computer:

- Coding the problem title automatically produces a complete summary of the patient's health and maintains the practice disease register.
- Past consultation records can be filtered to pick out the records of one problem for display.
- The coded database can be searched to make complex practice audits quickly and easily, and, because a standard set of codes is used throughout general practice, inter-practice audits of clinical care can be carried out.

In at least one supplier's system it is possible to audit prescribing for specific conditions by correlating the prescription of an index drug to the problem title of the consultation in which it was prescribed.

TEMPLATES AND PROTOCOLS

The Read codes can be used in other parts of the consultation record. A hallmark of a good GP computer system is that

coded information can be recorded easily and found again at a later date without difficulty, in many different ways, each configurable by the user. A GP, nurse or health visitor can add coded information at any time to record details like blood pressure or an adverse drug reaction in the middle of the free text part of the consultation. Some consultations follow a consistent pattern with the same information recorded each time, in which case it is useful to have a template to help record the data. Family planning consultations and child development examinations are good examples of this. The template works a like small spreadsheet. The cursor is guided from one cell to the next and labels cue the entry of specific information in each cell. Complex templates can perform automatic calculations such as the body mass index or predicted peak flow and display the result. Templates encourage good recordkeeping through consistent choice of codes and offer timely reminders of tasks that might otherwise be missed.

Other actions such as a prescription may be linked to data entry. Some suppliers' systems have the facility to let the GP write small routines which take this principle even further. EMIS calls them protocols and Meditel calls them SOPHIE. They can operate behind the scenes to read the coded data held by the computer, issue warnings, print documents or

issue prescriptions. They can record codes automatically or display templates. They can be complicated to write but it is possible to make use of protocols created in another practice. They can be downloaded onto a floppy disk and transferred electronically from one computer to another.

My favourite protocol covers maternity care and is based on the local guidelines⁽³⁾. At booking I use it to record the LMP, which allows the protocol to calculate the EDC. It reminds me to prescribe folic acid and will print an information leaflet about it for the patient. It presents a template where I can record all the referral and past obstetric history information I need. At follow-up appointments the protocol calculates the stage of pregnancy, and checks the computer record for tests such as FBC, red cell antibodies and blood glucose at the appropriate times. It will warn me if they have been missed or the results are abnormal. It presents a template that matches the stage of pregnancy.

There are also branches of the protocol for miscarriages and post-natal care. Practice teamwork benefits if doctors and midwives share ownership of the protocol and make sure that the protocol is kept up to date.

INCOMING PATIENT DATA

It follows that it is impossible to make full use of the EPR if important patient information is missing from the record. Nothing is worse than an incomplete database, especially when you do not know what is missing. Copy-typing from paper records into the computer is laborious and prone to error, so practices are keen to receive hospital reports and letters electronically.

Both Lancaster Royal Infirmary and Westmorland General Hospital are able to transmit laboratory results and WGH also transmits radiology and accident and emergency reports to local practices. They use the Racial Healthlink, which is the system used for GP/HA registration and item of service links. The practice uses a password to extract the information deposited in their Racial "pigeon hole" by the hospital computer, usually once or twice a day. The information messages are transmitted in a standard format so that the practice computer can identify the patient and the GP who should receive the information. If there is a problem because the name is misspelt or the date of birth is wrong, a member of staff can make the match manually. When the results arrive, they are displayed in a buffer file, a convenient place for the doctor to go through them and take any action that is needed before archiving them. We have been receiving laboratory results over the telephone wires for almost three years. The system is safe and accurate and the advantages to the practice are huge.

Laboratory results can be coded and filed directly into the patient's record. Radiology reports can only be transmitted as free text, the name of the x-ray is not coded. This will be overcome when the messaging format is upgraded to the NHS standard EDIFACT. The code for the name of the x-ray will then be filed in the EPR with the free text of the report attached.

Practices can receive inpatient and outpatient haematology and biochemistry results from the Lancaster laboratory. The computer can identify our practice's patients from an extract of our patient registration details. The results appear separately in the incoming buffer and they have the consultant's name and ward or out-patient department on

them to distinguish them from investigations requested by the practice. There is no risk of looking back at the results without appreciating their context. It gives us important information quickly and saves us duplicating the tests.

Although there is no satisfactory way to transmit out-patient reports and discharge letters, practices are beginning to scan the letters as they arrive and transfer the text into the word processor where it is available during the consultation. This is still a time-consuming and boring process, but is the best way to complete the computer's clinical database until the problems of electronic transfer of clinical information across the NHS-wide net are resolved.

WHAT ELSE CAN THE ELECTRONIC PATIENT RECORD DO?

Access to the practice word processor and a second printer mean that a library of patient information becomes available at the touch of a button. The patient information leaflets (PILs), written by Drs Tim and Beverley Kenny, are extremely useful. They are written in plain English, and give information on common clinical situations. They can be useful in situations where a prescription may not be appropriate. There are also leaflets on a wide variety of self-help groups that interest patients.

The computer system can provide medical information to support clinical decisions. Several systems exist. I am most familiar with Prodigy and Mentor. A text-based version of Mentor is integrated with the EMIS system. This is an electronic medical textbook, based on the Oxford Handbook of Clinical Medicine. Details on disease and clinical terms can be found by links to the Read code system or by making use of the sophisticated search engine. A combination of symptoms, signs or investigation results can be entered as search criteria and the results are presented into three groups based on the likelihood that they are the correct diagnosis. Like PILs, Mentor is available as a standalone Windows package. There are many other programs that will run on a desktop PC or network, designed to help the GP. The electronic BNF and Drugs and Therapeutics Bulletin will integrate with Mentor. Traveller and Travax provide up-to-date authoritative information on foreign travel advice. The number of medical CD-ROMs is increasing.

Of course the consulting doctor has access to the rest of the practice computer system from the desktop terminal. He or she can make or cancel appointments, find out if a patient has arrived in the waiting room, or call the patient in via an LED display. Dispensed prescriptions can be transmitted to the dispensary. Non-dispensing practices can make use of this function to record personally administered items. Item of service claims are integrated with the medical record so they are easier to make and less likely to be missed. Electronic messaging systems exist to transmit single line messages to other terminals on the practice "intranet" such as "Patient X will be late" or "Aarrghh, coffee needed urgently!!!". There are also more complex e-mail systems that make paperless communication within the practice team, and beyond via the Racial Healthlink, a very useful tool.

You can take the electronic patient record with you when you leave the consulting room. "Portable EMIS" is a program that is designed to operate on a laptop computer and mimic the consultation module of the full EMIS system. A selection of patients' records can be downloaded onto the laptop temporarily so that they are available during visits, or when

you want to do paperwork at home. It is also quite easy to set up a laptop to dial into the practice system via a modem and telephone line, or a portable telephone. Security is maintained by a system of passwords and a "dial-back" facility, which means that the practice computer will only take outside calls from one telephone number. An encrypted copy of the essential registration and clinical information of all the patient's practice can be transferred onto a Psion handheld computer. This is very useful to carry around for unexpected calls and is also cheaper and fits in to a doctor's bag more easily than a laptop.

THE FUTURE

Functional improvements are always in the pipeline. Some can be achieved with the current dumb terminal/text-based systems that predominate in general practice. Coming soon to a practice near you are:

- Electronic 'yellow cards', transmitting adverse drug reaction information via e-mail
- Integration of the Community Care dataset recording and transmission with the clinical system increasingly shared with the district nurses and health visitors
- Differential display of practice formularies in the prescribing module. These will be transferable

electronically between practices and open the way for easy sharing of district formularies

- Improved macros to automate the use of the consultation system

There are still substantive issues to be faced. Choice of code, use of standard subsets, and integration of Read version 3 (or 4?) in general practice are all unresolved. Work is being done on the narrative context of consultation records. Further improvements are likely to be linked to the adoption of graphical computer systems by general practice. At the moment this means a considerable investment in hardware to run a Windows NT or Novell network. The NHS-wide net is also taking a long time to extend into primary care. There are serious concerns over data security to be overcome. But ultimately this is the direction in which primary care information technology is heading.

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