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Refereed papers

How will practices cope with information for the new GMS contract? Coronary heart disease data recording in five Scottish practices

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ABSTRACT

Objectives To investigate whether practices will be ready for the data reporting requirements for the new General Medical Services (GMS) contract, using coronary heart disease (CHD) as an example.
Design Cross-sectional survey.
Data sources Electronic general practitioner (GP) records of all CHD patients in five Scottish practices, validated by manual searches in 50 randomly selected patients in each practice.
Main outcome measures Recording of family history, smoking status, blood pressure (BP), diabetes testing, aspirin therapy and cholesterol measurement.
Results It is extremely easy for practices with completely electronic patient records to extract a disease register (mean 10 min, range 38 sec to 3 hr 6 min). Extraction of a complete dataset takes several days if it involves checking through paper records, whereas setting up and running a search from electronic records is possible in less than two hours. If practices use the same clinical system and identical data entry templates, the data can be directly compared. Some items that are easily recorded as part of routine clinical practice, such as prescribing of aspirin, are well recorded, but others, such as BP recording, are more of a problem. One hundred percent of the CHD patients sampled had a BP recording within the previous year, but some practices had these data in the paper records where they were not readily accessible.
Conclusions We have shown that in Scotland there is a high level of testing and recording of all the important information regarding patients with recorded CHD, irrespective of whether practices have fully electronic records, paper-based records, or a mixture of the two. If practices have fully electronic patient records, the information can be extracted easily, but unless there is a standard template, the information can only be viewed in isolation and is of little value for comparative purposes.

Keywords: coronary heart disease, electronic patient records, GMS contract

Introduction

The new General Medical Services (GMS) contract for general practice will radically change the way general practitioners (GPs) are remunerated.[1] It introduces markers of quality that GPs will have to achieve and demonstrate in order to attain the highest levels of reimbursement. Most practices will have been delivering a high standard of clinical care over the years and in order to demonstrate this under the terms of the new contract, they will have to have a reliable system for recording and retrieving information. Individual practices must demonstrate that they have achieved the quality demanded, but it is recognised that for clinical criteria such as blood pressure (BP) levels, cholesterol testing, medication and so on, the only practical way of handling the data is to record information on a clinical system, ideally at the point of contact with the patient.

Most practices have a clinical computer system, but there are varying degrees of computerisation of the medical records.[2] There is wide variation in the accuracy, recording and coverage of clinical information, ranging from fully computerised electronic records to simple repeat prescribing systems, the remainder of the patient record being kept in a paper file or 'Lloyd George' envelope. For the new contract reports, standardised monitoring templates and Read codes will have to be in place so that high-quality information can be recorded easily as part of the routine clinical process, not as an extra activity. Practices wishing to prepare for the new contract need to ensure that their electronic patient data are accurate and complete, in order to produce disease registers and monitor relevant quality parameters.

The Scottish Executive Coronary Heart Disease (CHD) Taskforce has produced a minimum dataset for the recording of information on patients with CHD (see Table 1). This study explored the differences in the use of paper-based records as compared with electronic, by comparing the current extent of recording of CHD dataset items (family history, smoking status, BP, diabetes testing, aspirin therapy and cholesterol measurement) and the time taken to extract the relevant information from patient records.

Methods

In order to investigate whether practices are ready for the data reporting requirements for the new GMS contract, Scottish Clinical Information Management in Primary Care (SCIMP) recruited five practices to take part in a pilot study to test whether they could produce a register of their patients with CHD, and ascertain whether they could easily report on the relevant clinical dataset for these patients. The practices were purposefully sampled because they use different software systems and represent differing degrees of 'computerisation', ranging from completely paperless to minimally computerised. We also explored the differences between practices and clinical systems in terms of availability of information from electronic and paper records. SCIMP asked the five practices to produce a CHD register of their practice population and look in detail at 50 of those patients. Of the data items in the CHD dataset, the most important factors for primary care to record are smoking, BP, family history, cholesterol, blood glucose measurement and aspirin therapy. The datasets required for the new GMS contract consist of a small number of clinical markers which can act as proxies for the quality of care. For example, the CHD criteria set requires practices to produce a report that includes:

- an accurate register of patients with CHD
- a record of smoking status
- a record of smoking cessation advice to smokers
- a record of a BP recording in the preceding 15 months
- a record of the most recent BP
- a record of cholesterol measurement in the previous 15 months
- the percentage of patients with CHD who are prescribed aspirin or antiplatelet therapy.

Quality payments will be paid to practices based on the proportion of patients with the criteria recorded and an outcome payment for the proportion of patients with the most recent blood pressure $\leqslant$150/90.

In the study, participating practices were asked to produce a register of all their CHD patients, defined as patients with at least one diagnosis in the ischaemic heart disease (IHD) Read code chapter (G3). It was thought that some practices would be able to do this very quickly by using electronic patient summaries whilst others would have to go through paper records manually. The practices were then asked to randomly select 50 patients from the register and look at their records in more detail. They had to determine how many of the CHD dataset items could be collected for the 50 IHD patients by looking at the patient's record (paper and electronic) and extracting the relevant data, recording time taken and the level of skill required. Practices did not need to see patients or add to their records, but merely ascertain how much information was already recorded by the practice as part of the normal clinical processes. Finally, practices were asked to record the time taken to compile and extract this dataset and note any comments on the difficulties experienced. To take into account users with different information technology (IT)

Table 1 CHD Taskforce minimum dataset

Data recorded	Information	Read code	Comments
1 General information	Name, address etc.		
Diagnostic fields			
2 Myocardial infarction	Y/N; date (of most recent)	G30z. etc	
3 Symptomatic CHD	Y/N; date of diagnosis	Angina G33.. G33z.	
4 Asymptomatic CHD	Y/N; date of diagnosis	G58.. or G581. or G58z.	
5 Heart failure	Y/N; date		
6 Valvular disease	Y/N; date of diagnosis	Mitral Stenosis G110.	
Risk factor fields			
7 Smoking	Never Current smoker Current non-smoker Current amount and date	1371. 137R. 137L.	
8 Hypertension	Y/N	G20z. or G20..	
9 Diabetes	Y/N	C10.. or C108. or C109.	
10 Hyperlipidaemia	Y/N and date of last lipid check	C324.	Please state value if possible
11 Family history	Y/N	CVA/Stroke 12C4. Hypertension 12C1. or IHD ZV173	
Treatment or intervention fields			
12 Aspirin	Y/N/Contraindicated (and OTC and side-effects all recordable)		Only use for regular aspirin users
13 Beta-blocker	Y/N/Contraindicated		
14 Statin	Y/N/Contraindicated		
15 ACE inhibitor	Y/N/Contraindicated		
16 Exercise test	Date and result: normal/abnormal/inconclusive	32130 32131	
17 Echocardiography	Date and result: normal/abnormal	58530 58531	
18 Angiography	Date and result: normal/abnormal	Cardiac Cath. 3159. or 7939.	
19 PCTA (percutaneous transluminal angioplasty)	Y/N; date	Angioplasty ZV458	
20 CABG (coronary artery bypass grafting)	Y/N	ZV45K	
21 Thrombolysis given	Y/N/Contraindicated and date and preparation		
22 Cardiac rehabilitation	Referred/Completed/Defaulted		

Read codes contained in the SCIMP list have been included as examples, as these will be recorded automatically if practices use standard data entry templates or screens.

expertise, other indicators of IT competence of the practice were collected.

A 'computerisation score' was calculated by allocating one point each for email use, appointments, summaries, chronic disease management and extras, and five points for fully computerised patient records (see Table 2).*

No patient identifiers were included within results in order to preserve patient confidentiality. The data were recorded in an Excel™ spreadsheet and returned electronically.

Results

Disease register

The results of this study are displayed in three tables. Table 2 characterises the practices' information systems and involvement with quality initiatives in Scotland, namely the Scottish Programme for Improving Clinical Effectiveness in Primary Care (SPICE-pc), Practice Accreditation (PA) and Quality Practice Award (QPA) of the Royal College of General Practitioners of Scotland.[3] We scored the practices to show the extent of computerisation of the practice records. Table 3 records the details regarding production of the CHD register and the time taken to collate the data by the practice. It is extremely easy for practices with completely electronic patient records to extract a disease register (practice 4), on average taking ten minutes (range 38 sec to 3 hr 6 min). Conversely, it takes considerable time and effort for practices with paper records to compile a disease register, usually involving a search of prescribing records, discussion with clinicians who know the patients and final checking from the paper notes. For a disease register with 50–100 patients, it can take a total of several hours, and the results in our study varied from 10 hours 30 minutes to 18 hours of work for the practice.

Extraction of dataset

As with disease registers, extraction of a complete dataset can take several days if it involves checking through paper records, whereas setting up and running a search from electronic records can be done in less than two hours (see Table 4). What we found with our practices was that if practices used the same clinical system and identical data entry templates, the data could be directly compared. One practice (practice 4) spent longer than average for a practice with electronic records to extract their disease register, as they devised a special search to present their data in a spreadsheet that could be directly compared with the others. The extra time spent meant that the data could be used for comparative purposes (see Figures 1 to 6). It is impossible to compare the results from different practices unless the searches have been completely standardised and identical data fields selected in an identical way. The only way of producing data that can be compared or amalgamated in a meaningful way is to have electronic records, with a standard mechanism for entering data, and automatic generation of standardised reports.

Table 2 Computerisation score of practices

Practice number	1	2	3	4	5
Practice patient list size	3908	1958	8676	10250	2300
Clinical system name	GPASS	GPASS	GPASS	InPractice Vision	GPASS
Do you have an electronic appointment system?	Y	Y	Y	Y	Y
Does the practice use email at least once daily?	Y	Y	Y	Y	N
Do you record electronic patient summaries?	Y	Y	Y	Y	N
Current records system (paper or electronic)	P	P	P	E	P
Current method of recording data for chronic disease management	P/E	P/E	P/E	E	E
If you use GPASS do you use SPICE-pc/CDSS?	Y	Y	Y	N	Y
Have you done PA or QPA?	Y	N	Y	Y	Y
Computerisation score*	50	40	50	100	30

P = paper; E = electronic; P/E = combined paper and electronic

Table 3 Production of register

Practice no. Patient list size	Description of process	No. of patients on CHD register	Times	Total time
1	Search by practice staff	83	1 hr	12 hr
3908	Check by practice nurse		6 hr	
	Check by GP		1 hr	
	Check through patient notes		4 hr	
2	Practice nurse	72	15 hr	18 hr
1958	Check by GP		3 hr	
3	Initial search (879 patients)	256	8 hr	10 hr 30 min
8676	Checking of queries		2 hr	
	Collation of list		30 min	
4	Search design	514	10 min	3hr 6 min
10 250	Designing data extract screen		45 min	
	Extract data		2hr 11 min	
5	CHD register already installed	135	30 min	30 min
2300	Rerun of CDSS report			

Table 4 Time for extraction of dataset from patient records

Practice	Total time for 50 patients (min)	Mean time per patient	Extra time for electronic data entry from paper notes	Total time in minutes
1	352	11	207	560
2	306	8	94	400
3	298	8	114	412
4	176	4	0	176
5	504	11	30	534

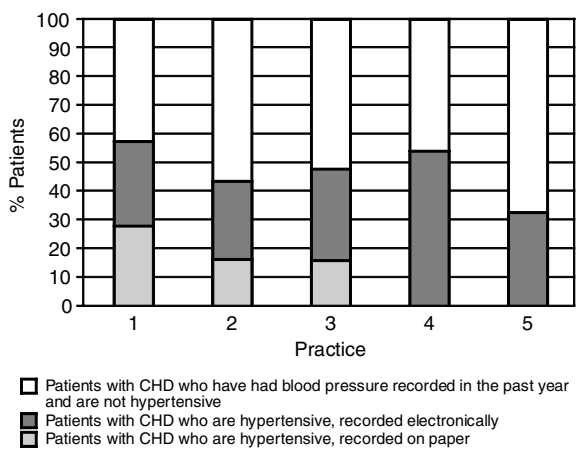

Figure 1 Blood pressure recording

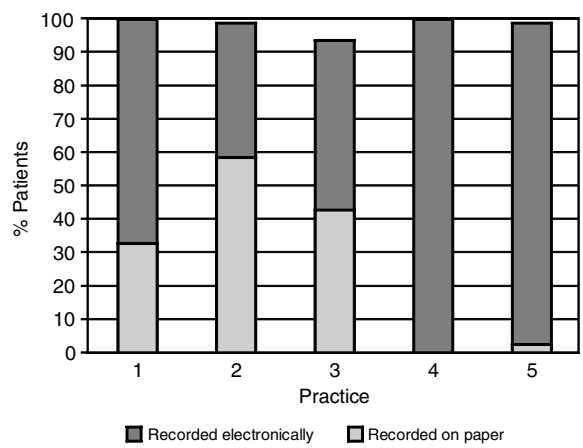

Figure 2 Smoking status

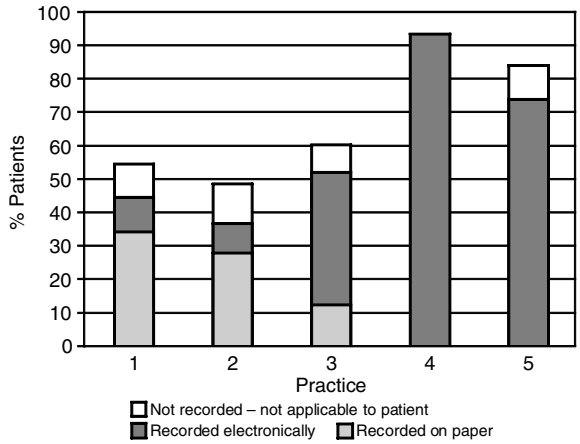

Figure 3 Cholesterol measured

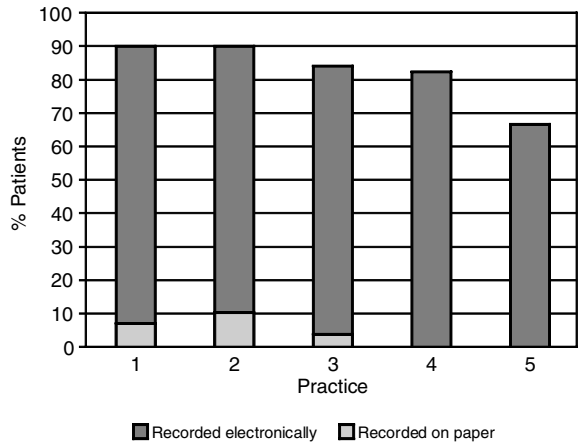

Figure 5 Aspirin prescribed

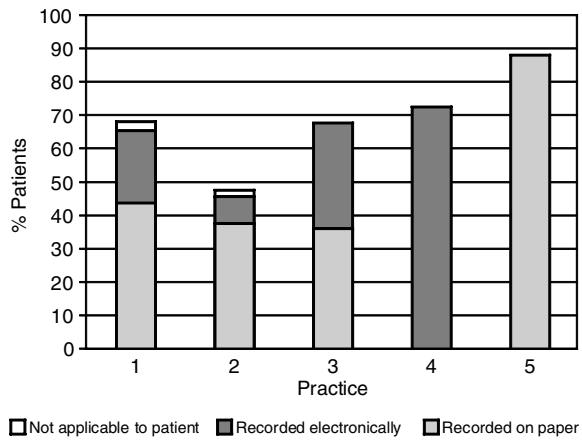

Figure 4 Family history

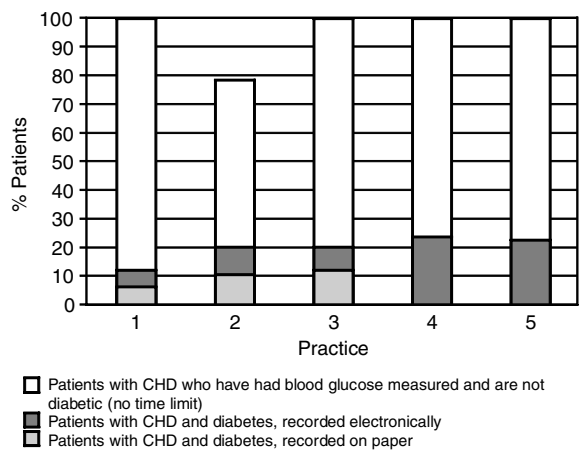

Figure 6 Blood glucose measurement

The figures were compiled from the data extracted from the 50 patients with CHD from practices 1–5. They show that there is a very high level of testing and recording of quality markers, but it takes considerable time to produce a report of the items unless electronic records are used by the practice. Some items that are easily recorded as part of routine clinical practice, such as prescribing of aspirin, are well demonstrated, but others, such as BP recording, are more of a problem. It was shown that 100% of the CHD patients sampled had a BP recording within the previous year, but some practices had the data in the paper records where it was not readily accessible. It has been shown in other studies that over a period of time, data quality can be improved by feeding back results to practices and improving the patterns of electronic recording of clinical data.[4]

Discussion

We have shown that in Scotland there is a high level of testing and recording of all the important information regarding patients with recorded CHD, irrespective of whether practices have fully electronic records, paper-based records, or a mixture of the two. If practices have fully electronic patient records, the information can be extracted easily, but unless there is a standard template, the information can only be viewed in isolation and is of little value for comparative purposes.

The findings from this study have been derived from five practices that may not be representative of the situation nationally. Computerisation in Scotland is well advanced with only seven practices out of a total of 1243 not having a computer, the majority (80%) of practices in Scotland using the General Practice Administration System for Scotland (GPASS).[5] A number of initiatives, including the SPICE-pc electronic questionnaire, have collected anonymised data and provided feedback from Scottish practices on a regular basis.[3] A previous study in 1996 found that GPASS computer records had a high level of specificity and sensitivity when compared with paper records and patient surveys.[6] In England, the most commonly used method of extraction of comparable data is MIQUEST,[7] a search engine which extracts clinical Read-coded

data that have been entered into the system, and is implemented in all the major clinical systems in use in England. Its main user is Primary Care Information Services (PRIMIS), which provides a data analysis and feedback service in support of its education and training programme to improve data quality and information management in English general practices.[8]

The new GMS contract will have huge implications for practices. It will mean a totally different way of remunerating GPs, focusing on quality and patient benefit; however, the time spent on recording and extracting information in practices will be considerable if they are to prove that they qualify for quality payments. The only practicable way to do this is for practices to develop accurate and thorough electronic registers for all their patients suffering from chronic diseases such as diabetes and CHD.[9] All practices will need to have simple standards for the recording of data that are agreed by every member of the practice team. Processes have to be in place to gather information from hospital letters, update computer information and ensure it is accurate. The message for policy makers is to provide computer systems to enable entry of data by clinicians at the time of clinical contact, and to ensure that data items and methods of extraction are identical across all computer systems. Unless the searches have been completely standardised and identical data items extracted in an identical way, it will be impossible to compare the results from different practices. Furthermore, diagnostic rates will need to be standardised for practice demographics (age, sex and deprivation), which affect the prevalence of the chronic disease under consideration.

Exception reporting will be essential to record patient choice if they wish to refuse treatment or follow-up. Practices wishing to prepare for the new GMS contract should ensure that their electronic patient data are accurate and standardised in order to produce disease registers and confirm diagnoses. Work is under way to agree consistent recording of outcomes, as values, referrals or exceptions.

SPICE-pc provides data entry screens with accurate but hidden Read codes and a central data collection and feedback system.[3] This makes data retrieval quick and straightforward, enabling clinicians to concentrate on clinical care while having the ability to monitor the practice performance.

The information from this pilot study has been collated into a report to help other practices to compile their own CHD register.[10] The framework for the new GMS contract may be a catalyst for moving the IT and informatics agenda forward, and will be a means of demonstrating the high standard of care already being delivered by primary care.

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CONFLICTS OF INTEREST

None.

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