

## The state of British medicine – 11

### Medical audit

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Medical audit involves not only assessing the quality of patient care but also making the information available in an acceptable fashion. The subject has been of increasing interest in the United Kingdom during the past decade, but within the medical profession there has always been a tradition of criticizing its own performance in various informal ways. The present concern is to find a system of measuring the quality of care which actually benefits the patient. The purpose of this paper is to describe the informal methods of audit currently being used, the reasons for developing more systematic methods, and some systems already under trial.

#### **Informal methods of audit**

Most of the clinical meetings held in hospitals involve presentation of cases and detailed discussions of the results of treatment, clinical trials and reasons for complications and disasters. Many hours a week are spent ruminating on the mistakes in diagnosis and treatment. Death and complication meetings have been conducted in some centres for many years and are now becoming widespread (McColl *et al.* 1976). The important feature of these weekly meetings is a frank and friendly discussion of all the complications and deaths; there is no attempt to apportion blame, but only to profit from common experience. Unexpected clinical problems come to light and can be studied later by detailed surveys and clinical trials. These death and complication meetings are encouraged by those who are responsible for accrediting hospitals as training centres for junior staff. They are an invaluable part of continuing education.

It is reasonable to assume that improving the medical records improves the quality of patient care. One of the important duties of a consultant with preregistration house officers is to ensure that they keep good medical records. Problem-orientated medical records have helped in this respect (Fernow *et al.* 1977) and make it easier for the consultant to audit the logic of the decisions being made about diagnosis and treatment.

It has proved difficult to obtain the views of the patients about their treatment. If questionnaires are distributed to the patients in hospital the replies are almost invariably complimentary and if they are encouraged to complete them at home, insufficient replies are received. Nevertheless, this kind of exercise acknowledges that the professional in the National Health Service is accountable to the consumer. Part of this accountability is that we are seen to audit ourselves.

#### **Why do we need more formal systems of audit?**

There are many reasons why there is now a search for more formal and systematic methods of auditing medical care. Looking after a patient is becoming more complicated and expensive and involves an increasing number of clinical and paramedical staff. Informal methods of audit

were probably adequate when only one clinician was involved but now we need to find techniques to audit the performance of the team. Good care for the majority of patients may depend more on the thoroughness of routine performance than on the management of the unusual case which tends to dominate as the subject of informal meetings.

It is essential that standards of patient care should be set by the medical profession. For instance, there is increasing pressure on doctors to reduce costs and length of stay by people who tend to equate efficiency with greater output. Defined standards of care would help to solve these problems more rationally and lead to the most appropriate length of stay (Simpson 1978) and optimum workload for those who work in the hospital and in the district.

A further reason for the profession experimenting with methods of medical audit is the wish to avoid the pitfalls encountered by American medical audit. In 1974, it became law in the United States that any hospital accepting funding from the Federal Government must demonstrate that it is monitoring the quality of care provided. Unfortunately, the law provided no blueprint for how the monitoring was to be done, and this has resulted in considerable chaos. Monitoring the quality of care is an exceptionally difficult task.

### **Developing a system of audit**

Objective evaluation of the quality of care began at Guy's Hospital in 1974, when the hospital officially converted to the use of problem-orientated medical records (POMR). The King's Fund made a grant to facilitate the change and to study whether it improved the quality of care. This method of recording in the patients' notes is a radical departure from the traditional method. Instead of the chronological diary style in which each clinician records in his own way, POMR requires that all contributions to patients' notes be entered in a specific format. The key feature of this format is heading each entry according to the clinical or social problem to which the comment relates. The theory behind this grouping is that important information on a specific problem can be effectively retrieved and that relatively minor problems which may affect recovery are not lost in the shuffle of papers. In principle, better communication among clinicians should enable them to make better use of their joint knowledge for the patient's benefit, thus improving the quality of the care. Our mandate was to try to find out whether this is true.

In measuring ways in which POMR had improved the quality of care a 'before and after' design seemed obvious (Fernow *et al.* 1978). Additional practical considerations were that the study should not disrupt hospital routine by requiring staff to fill out additional forms; nor should it require the expensive techniques of locating former patients in the community, relying on their dubious recollections of previous care. Although the existing records were not ideal they provided the best data source. In view of the expense it was not considered justifiable to employ clinical staff, especially as the use of trained clerical staff to abstract specific information from medical records had proved reliable both in the United States and in the United Kingdom. Even if we were unable to demonstrate that POMR improved the quality of care we hoped that the method might help in the problem of measuring quality. We therefore imposed upon ourselves the additional constraints that the method would be reproducible and applicable in hospital settings other than the teaching hospital.

The Commission on Professional and Hospital Activities (CPHA) in the United States had for several years been collecting data on patients admitted to hospital, using the record as the data source. Like our Hospital Activity Analysis, CPHA collects information on principal diagnosis, secondary diagnosis, consultant in charge, age of patient, source of admission. They also collect information on a variety of vital signs, laboratory results and investigations and have shown that clerical staff can do this accurately. To simplify data collection and processing and to minimize clerical error we decided to collect the same data on all patients.

Briefly, the study plan was to measure the change in the clinical performance of general medical and surgical firms from 1972, before POMR was introduced at Guy's, to 1975 after it had been introduced there. The firms at two other teaching hospitals where POMR was not used served as controls. Seven well defined diseases which occur frequently enough to provide

respectable sample sizes were chosen. The medical diseases were hypertension, myocardial infarction, cerebrovascular disease, and bronchitis and emphysema. The surgical patients had been operated on for peptic ulcers, unilateral inguinal hernias, and gallstones. In order to foster homogeneity in each disease group, patients with malignancy, patients who died during the admission, patients who took their own discharge and patients with a recurrent hernia were excluded, as were patients under 15 years.

We devised a method for awarding scores for the clinical management of each patient in the following way. Given the large number of vital signs, examinations, drugs, procedures, chemical and histological investigations for which data were being collected, a physician and a surgeon (who did not have patients in the study) selected the items of information or therapy that they believed were important for the care of patients with the diseases under study. A separate list was prepared for each disease. These lists were submitted to a panel of clinicians at another hospital – not one of the control hospitals. At a later meeting each clinician was canvassed for (a) the appropriateness of the item; and (b) the weight that he would give the item – a ‘3’ if he deemed it essential to the management of that disease, a ‘2’ if desirable but not absolutely essential, and a ‘1’ if desirable. A clinical management score for each patient was compiled which represented the sum of the weighted items done for each patient. A linear multiple regression model was used to express the size of the change in clinical management scores occurring between 1972 and 1975 in each firm. The details of the statistical model have already been published (Fernow *et al.* 1978), but for present purposes suffice it to say that by measuring the change in each firm in the before and after periods we took account of the fact that there would be a range of good, better and best firms in each hospital. We hoped, of course, to find that the most improvement had occurred at Guy’s.

### **Patient risk variables**

We had excluded patients from the study who were different in obvious ways, and we had selected control hospitals that were similar to Guy’s Hospital – London teaching hospitals that served a similar kind of mix of populations. For this reason we did not expect that the risks that the patient brought to his illness would be important in this particular study but we did believe that devising some measure of the risks that patients brought to their own care, some measure of the clinical challenge that some patients present, was essential if quality of care in general was to be measured. The resistance of some clinicians to evaluation of their work may be based in the belief that ‘my patients are different’. Even with a single hospital that may be true. Because of the referral system in which general practitioners tend to refer to consultants whom they know it is quite likely that older GPs with older patients on their panels refer these patients to older consultants. When comparisons of quality of clinical performance are made between hospitals serving middle-class populations and hospitals serving inner city people, some account should be taken of the difficulty of the clinical task in the second group of hospitals. Thus for experimental purposes and to improve the precision of the analysis, 12 patient risk variables representing social as well as physiological and constitutional risks were a part of the basic design of the POMR effect study. These variables included hypertension, anaemia, obesity and the number of cigarettes smoked; they were entered into the regressions for each disease as independent variables. The analysis of the POMR effect was based upon the change in each firm between the two study years when modified by the patient risk variables significantly associated with the management of each disease. This is a way of standardizing different populations before making comparisons between them.

The validity of this method depends upon whether or not the clinical management criteria and their weights were valid in the first place. Although they were created by the consensus of a panel of clinicians, they are based upon expert opinion but were nevertheless subjective judgments. It must be remembered that practical considerations required that the criteria be selected from the extensive but still limited kinds of variables about which information is generally available from patients’ notes. By way of illustration, the items used to construct the management scores for inguinal hernia, with their weights, were as follows:

**Inguinal hernia without obstruction:**

Hb preoperative	(3)
Chest X-ray	(3)
Electrolytes and urea	(1)
Blood pressure on admission	(3)
Urinalysis	(1)
Weight	(1)
Rectal examination	(2)

Our measurements, controlling for patient risk variables, are straightforward and we think that most clinicians would agree that our criteria are acceptable for judging thoroughness in the management of each disease. It remains to be seen whether thoroughness is a valid indicator of the quality of care process. We are asking clinicians to make subjective independent evaluations of a sample of the cases that we have scored but the inconsistency of subjective evaluations by clinicians is well documented and should not be relied upon too much. We anticipate that when subjective and objective scores are compared we will find that the two sets of scores will be significantly correlated in the group as a whole. This will tell us that in general, our objective method corresponds reasonably well to the subjective assessment. At the same time the correspondence will probably not be good enough to allow us to be confident about any individual score. If this is so, the method can only be used as an audit tool when applied to groups of cases. We can envisage it working thus: for each diagnosis the management scores of each firm's patients and the patient risk variables are entered into a regression model. The regression statistic compares the scores of each firm with those of the whole group and identifies firms in which the general performance is significantly below the group performance.

We are experimenting with feedback of confidential information to each surgical firm at Guy's about performance in the diseases that we have been studying. One part presents the number and percentage of times that clinical procedures have been carried out in that firm compared to the group as a whole. Another part lists each patient number and in successive columns lists patient risks, adverse occurrences during admission, and outcome. When an adverse event might have been prevented by early investigation of a symptom or by following up an abnormal result, this too is noted. What has been the response to this service? It is too soon to tell but speaking for the clinical author, the information about the performance in his firm alerted him to a frequency of clinical oversights that had escaped notice because they were so elementary. He only hears about the big mistakes!

Another important aspect of medical audit is the study of outcome. As death is an unusual outcome for most hospital diseases it is impractical to use death rates as indicators of the quality of care. In trying to arrive at a score for the outcome of a repair of an inguinal hernia for instance, how does one score a complication such as a haematoma? Is it the result of poor clinical care? What percentage of hernia repairs can be reasonably expected to develop a haematoma? The answer to these questions is not known. This is just a sample of the kind of issue which must be considered in using outcome as an audit measure.

**Conclusion**

Medical audit is a natural part of a clinician's work and continuing education. He is constantly trying to improve the quality of his work and any logical system of audit which helps him to this end is bound to command his cooperation provided it is tried and found to work. The medical profession has everything to gain from medical audit and nothing to lose.

**References**

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