
REVIEW ARTICLE:

Approaches to medical audit

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The last two or three years have seen an explosion of interest in medical audit, a phrase hitherto barely used in the UK except by a few hardy pioneers (for references, see^{1 2}). Then in quick succession in the last two years appeared the Confidential Enquiry on Perioperative Deaths,³ the Report of the Royal College of Physicians on Medical Audit,⁴ and the White Paper "Working for patients".⁵ The White Paper provided a helpful definition of audit: "a systematic critical analysis of the quality of medical care, including the procedures used in diagnosis and treatment, the use of resources, and the resulting outcome for the patient". Since the publication of these documents, there have been several conferences about medical audit, and local health authorities in the UK should by now have established "District Audit Committees". It is perhaps a useful time to take stock of the situation, and of the different approaches to medical audit, and attempt to predict the way in which matters are likely to develop over the next few years.

Conceptually, perhaps the simplest form of audit is a review of the medical record. The lessons learnt from the 12 years' experience in the Departments of Medicine and Clinical Pharmacology at Birmingham University are described in a recent article by Heath.¹ The advantages of such an audit are that no complex information systems are required, and that a review of records, best selected randomly, or of patients with a single diagnosis or undergoing a single procedure, can be accomplished in a friendly non-confrontational manner that is enjoyed by many participants. The physicians at Birmingham found that the recording of the initial symptoms of the illness and of the patient's subsequent progress rapidly improved, as did the record of what had been said to the patient. However, once the meetings were well established and the problem of poor quality notes tackled, a difficulty arose due to the repetitive nature of the procedure. It became apparent that for audit to continue to be valuable it had to be supported by senior consultants who believed in its benefit and who were regular attenders at audit meetings.

The Royal College of Physicians now requires that when a visiting team from the Training Office reviews a post for suitability for General Professional or Higher Medical Training, a random sample of records is drawn from the hospital by the visiting Regional Adviser, and the quality of the records inspected in this way. The Regional Advisers have reported after the first

year of this procedure that there are considerable deficiencies in recording what is said to the patient, although in general the quality of the initial history and the record of progress appear to be adequate.

There seems little doubt from the Birmingham experience that such a record review does improve the quality of record keeping, which is essential bearing in mind the increasing fragmentation of care amongst different specialist teams, and the shortening of hours of junior doctors in recent years, so that patients are often looked after for long periods by young doctors who are not on the team responsible for that patient's primary care. However, a review of a small sample of clinical records by a senior physician, however distinguished, can only give a general impression of the quality of care in an institution.

In the United States medical record (chart) review is more formal. Peer Review organisations are contracted to the Health Care Financing Administration to fulfil a statutory obligation that care to Medicare patients will be provided economically and only to the extent medically necessary, will be of a quality which meets professionally recognised standards of health care, and will be supported by evidence of medical necessity "in such form and fashion and at such time as may reasonably be required by a reviewing Peer Review organisation in the exercise of its duties and responsibilities." As may be expected from this last clause, a vast bureaucratic organisation has grown up to review medical records by registered chart reviewers. The Peer Review organisation for the State of Massachusetts, for example, draws a sample of 3% of all Medicare discharges for chart review, employs a full time medical director, four associate directors, 70 chart reviewers who are registered nurses, and has a budget of \$7m. The chart reviewers look at the medical record against so called "generic quality screens", an example of which is published elsewhere.⁶ Many of the screening items are comparatively trivial, but the Peer Review organisation system does often reveal misuse of antibiotics, particularly lack of care in prescribing aminoglycosides, a failure to use antibiotics in accord with laboratory determined sensitivities, and a failure to seek specialist advice when appropriate. The Peer Review organisations have powerful legal sanctions, including withholding Medicare payments on occasion. However, many physicians in the United States are not convinced that the system uses resources

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wisely and efficiently. It is also recognised that many failures of quality are random, and as such do not appear in the “screens” and may remain undetected by the chart reviewer, however experienced.

There are other arguments against review of medical records as a primary tool in audit. Retrospective review is untimely insofar as it cannot influence the care of the patient whose record is under review. The standards by which a physician reviews a medical record in hospital in the United Kingdom are not explicit and uniform. The narrative account and different ways of binding hospital records makes it difficult to retrieve speedily information about items of care. Then there is the argument that excellent humane care can be given by physicians who write appalling records, whereas the converse is also observed. For all these reasons, therefore, medical record review is only one form of audit, and it is most unlikely that any purchaser or provider of care in the United Kingdom is going to spend large sums of money on the salaries of record reviewers as a way of assuring quality of care by health providers.

Over the past few years physicians in Canada, the United States, and more recently the United Kingdom, have developed an interest in the promulgation of guidelines of good practice, and in consensus statements.⁷ The original aim of the National Institutes of Health Consensus Conferences⁸ seems to have been to pull together from published sources all the available evidence about significant problems, so that an authoritative statement could be produced for educational purposes. However, the promulgation of guidelines of good practice does not necessarily change practice. For example, in Ontario, a concerted attempt was made to reduce the rate of caesarean section from what was felt to be an inappropriately high level. About 90% of all obstetricians agreed with guidelines about the indications for caesarean section, which, if followed, would result in a substantial reduction in the section rate. However, two years after dissemination of the guidelines, the rate had changed so little that if the reduction were maintained it would take more than 30 years for the rate in Ontario to fall to the rate for England and Wales, which is generally considered to be more appropriate.⁹

The Research Unit of the Royal College of Physicians has a major programme in developing guidelines of good practice in certain common conditions, in association with the relevant specialist societies. Personal experience of running the workshops during which guidelines are developed has led me to realise that a guideline for good practice is absolutely valueless unless the guideline statements can be audited. For example, no physician would quarrel with a guideline statement that “a physician should be sensitive to his patient’s anxieties about a possible diagnosis of multiple sclerosis”, but it is almost impossible to imagine how that guideline might be audited. However, to take another example, good practice clearly requires that in the presence of a urinary tract infection in childhood, the antibiotic should be changed, if appropriate, in response to the reported organism’s microbiological sensitivities.

This sound clear enough—one could look at the medical record and compare the date of the laboratory report and the date of the prescription. However, not only is it time consuming to extract this information from the medical record, but, to take an extreme example, there could be a delay of 23 hours before the antibiotic was changed, even though the dates on the prescription and report were the same. The advantage of guidelines, however, is that standards of good practice, against which clinical records can be audited, are at least made explicit. However, the problems of record review remain.

What alternatives are there? The UK Department of Health seems to be hoping that the introduction of large scale information systems will in some way “do” audit. For example, the sum allocated to my own Health Region for salaries for audit for the next three years is only slightly more than the sum allocated for non-recurring costs for computer systems. The Department and Regions are issuing advice on the best types of hardware and software.^{10–12} The Department of Health has also purchased the copyright of the Read code. Throwing all this money at information systems will almost certainly improve the quality of recording of hospital activity, including length of stay, throughput, waiting list information, operating theatre usage, and rates of readmission. However, there is as yet no generally accepted view about what data sets are required to reflect usefully the quality of clinical care.

Two concrete examples will illustrate reasons for concern. It can now reasonably be said that good care of many patients with myocardial infarction includes early thrombolysis. Time to thrombolysis therefore could be taken as an audit measure. However, unless a hospital record can record accurately the time of arrival of the patient, time of diagnosis, time of injection etc, and unless these timings are themselves subject to quality control, then time to thrombolysis is unlikely to be a successful audit measure, although possibly the most crucial factor in salvaging myocardium. Another example is the occurrence of postoperative wound infection. Unless there is national agreement on what constitutes a wound infection (does a little redness around the wound mean an infection, how much oozing is allowed before a “serous” discharge is classified as “infected”? etc), and unless all nurses are trained to record infections in an absolutely standard way, it is going to be hopeless to compare interdistrict wound infection rates. The use of extended coding and large scale information systems is entirely valueless unless the data are collected in a sound epidemiological way.

This review has concentrated on the process of care. It is the outcome of care which is the primary interest of physicians: the relief of symptoms, the cure of disease, and the avoidance for the time being of mortality, all achieved in a manner that satisfies the patient. However, the characteristics of patients (“case mix severity”) have more effect on variation of outcome between hospitals than does the quality of care. It is only by using the very large Medicare data bases of the Health Care Financing Administration that Hartz and colleagues¹³ were able to show that there was some

association between structural characteristics of hospitals and adjusted mortality rates, such that mortality rates tended to be associated with the percentage of physicians in a hospital who were Board Certified, and with the general payroll expenses per hospital bed. These macro studies are useful, but provide little information about the quality of care in an individual hospital, or given to an individual patient. With the very sophisticated scoring systems for illness severity in intensive care units,^{14 15} it may in future be practical to audit with particular care the records of those who die with low scores of severity of illness—patients who “should have” survived.

Avoidable mortality is the theme of the UK Confidential Enquiry into Perioperative Deaths (CEPOD), currently under way. The pilot study³ showed clearly that some probably avoidable deaths were associated with young surgeons operating at night beyond their level of experience, and without consulting senior colleagues. A similar survey on perioperative deaths in children showed that apparently avoidable deaths were often associated with operations by surgeons without specialised paediatric training.¹⁶ Such deaths are examples of the general class of “adverse outcomes” monitoring, which provides another way into audit. For example, a death from status epilepticus or diabetic ketoacidosis should certainly be reviewed, as should a transfusion reaction, and the events leading up to the development of a pressure sore.

As death in the short term is inevitable for many hospital patients, such as those with disseminated malignancy, and as much medical practice is concerned with the relief of symptoms for chronic illnesses such as angina, Parkinson's disease, and rheumatoid arthritis, mortality is not a very useful measure of quality. There is understandably a need for detecting improvements in health, or change in health status, as a measure of the effectiveness of our care. A number of measures such as the Sickness Impact Profile and the Nottingham Health Profile are available, and there is now a major initiative in the United States named the Medical Outcomes Study.¹⁷ However, there is a trade off between the sensitivity of the instrument used for detecting changes in health status, and the time taken to complete the instrument. The Sickness Impact Profile and Nottingham Health Profile may be excellent measures for research purposes,^{eg18} but they are too time consuming to be used in everyday practice, and simple measures are unlikely to be sufficiently sensitive to reveal differences between hospitals in the quality of their care.

Finally, the outcome of patient satisfaction is difficult to measure in a routine way that is also sufficiently sensitive. Most studies show that more than three quarters of all patients are satisfied or very satisfied with their care, so that interunit assessment is bedevilled by working on small margins above this. Those who are experienced in questionnaire techniques are well aware that responses vary according to how and when the questionnaire is administered, and it is most unlikely that sufficient detail will be paid on a routine basis to these experimental variables, which have been shown to be so important in determining patterns of response.

This review has taken a somewhat gloomy approach to the difficulties of medical audit, but insufficient attention has been paid to the experimental and practical difficulties of introducing audit. It is easy enough to collect data of various kinds about patient care. It is much more difficult to determine how much information those data convey about the quality of care given to the patient. In my view the best audit package that a health district can at present institute maybe a regular case record review by an assessor, probably from a neighbouring district. For all its drawbacks, such reviews have been shown to improve and maintain the quality of the written record (so important in continuity of care). A district should also mount a number of audit projects which are, in effect, mini research projects into the process and outcome of care delivered within the district, usually on a topic that is already causing some concern to staff or to the local community. Suitable examples might be the relief of postoperative pain, urinary infections in catheterised patients, suicides, and medication in the elderly. Meanwhile, the Colleges and other interested parties can develop the methodology for audit protocols that can be used nationally, which will allow simple data to be collected in a standardised way, using sound epidemiological principles for sampling and for data collection. Only then will we be in a position to compare the quality of care between different institutions, and learn the lessons which will allow the quality of care to improve.

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