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Medical Audit

Can medical audit be implemented by 1991?

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Introduction

The Government's proposals for the reform of the National Health Service[1] have met with a mixed response. Amidst the controversy one item has received widespread support. Increasingly it is recognized that medical audit is an essential component of high quality clinical practice, and the United Kingdom can no longer lag behind countries such as the United States, Australia and the Netherlands[2] in this important area.

Audit is the systematic, critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources, and the resulting outcome and quality of life for the patient.[1] Professional leadership of audit is central to the government's approach. A system of peer review is proposed, with evaluation of the quality of care using a specialized knowledge of current medical practice. Every doctor will participate in regular medical audit. Although individual results will remain confidential, general results will be available to managers.

It is accepted that several pre-conditions are necessary for medical audit to take place. These include access to medical records, adequate information, secretarial support, and the provision of time which will not then be available for other clinical work.

The time-scale for implementing audit is tight. It is envisaged that every Health Authority will have implemented a comprehensive audit programme by April 1991. The establishment of a district medical audit advisory committee is a principle requirement. The committee will be required to produce a forward programme for developing audit and reviewing clinical practice in each subsequent year as well as a report on the previous years results. The proposals in the forward programme must be agreed with the District General Manager. If necessary, managers will be able to initiate an external audit which would take the form of an external peer review or a joint professional and managerial appraisal.

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Medical audit has developed in pockets throughout the country[3] but it is not widespread. Although professional bodies such as the Royal Colleges have subsequently promoted it,[4] many clinicians are uncertain about how to get started. If they are to implement audit by 1991 they must start to plan their programmes now. This paper discusses some of the issues which must be tackled to achieve this target.

Criteria and standards

Medical audit is based upon criteria (things to be measured) and standards (levels to be achieved).[5] Each speciality is faced with a different situation. The criteria which can be measured will depend upon the nature and variety of the conditions which are managed and the information systems available. Inevitably clinicians have tailored their approaches to their individual circumstances.

Quality of care can be evaluated in terms of structure, process and outcome.[5] Structural criteria include the number of beds and staff, and the presence of technical support. The review of training posts is an example of this type of approach. It includes measures of the amount of clinical material available, the presence of a library and postgraduate meetings.

Examples of process criteria include the proportion of patients whose blood pressure is checked at each visit,[6] or diabetic patients whose retinas are examined each year.[7] Criteria of structure and process often are relatively easy to measure, but their use to evaluate effectiveness rests on the assumption, which is not always justified, that achievement of high standards in these areas will inevitably lead to a satisfactory outcome.

Criteria relating to outcome are the most appropriate for evaluating effectiveness but generally are more difficult to measure.[8] For conditions or procedures which are common and for which death is an occasional outcome it may be possible to calculate case fatality rates using aggregate data derived from com-

puterized patient administration systems. Results from all hospitals in England and Wales have been published, but this has generated considerable controversy.[9] The major drawback of this method is that deaths are a rare outcome, and concentration on them may obscure considerable variation in outcomes which are less serious, but nevertheless important. This is an unavoidable limitation of most routine sources of patient data. Although in certain circumstances it may be possible to use proxy measures of outcome, such as length of stay, for many conditions death is the only routinely collected outcome measure. A further difficulty arises from the exclusion of patients who are discharged and subsequently die as a result of treatment.[10]

The selection of criteria and standards is constrained by the sources of information available. The paucity of routine information which is available for audit is a consequence of the way in which information policy in the NHS has been implemented. Although the Korner recommendations[11] proposed both a minimum data set, required for central monitoring of the service, and an additional data set, some of which might be of use for health care providers, most Health Authorities have implemented the former and but not the latter. In addition, clinicians have become disillusioned with systems which fail to generate appropriate and timely information and they see no point in ensuring that the data input is accurate when the decisions based on it are remote and seemingly irrelevant. The planned expansion of resource management will have a major impact in this area.

These problems have been overcome in a few hospitals where the additional data sets have been used in association with ward terminals and user-friendly data analysis packages,[12] but many Health Authorities have installed remote mainframe computers using complex query languages which have failed to meet the needs of clinicians. Systems which fail to group together clinically coherent conditions are of little value. Increasingly it is being realised that the ICD-9 coding used on the vast majority of patient administration systems is totally inadequate to describe the case-mix in most specialities. There is an urgent need to adopt the ICD-9CM system which modifies the ICD-9 system by including data on the clinical manifestations of a condition. This permits the generation of diagnosis related groups (DRGs), each of which includes a number of conditions classified on the basis of diagnosis, age, and the presence of complications or co-existing conditions. Patients described by each DRG will be reasonably homogeneous with regard to the resources that they can be expected to consume and will have conditions which are recognized by clinicians as being similar. Ultimately it will be necessary to augment these with one of the many available indexes which overcome the problems which arise when some diagnoses may have widely varying degrees of severity, such as stroke or myocardial infarction.[13]

Because of the shortcomings of information technology in the NHS many clinicians have taken advantage of the vastly increased capabilities of modern micro-computers to develop their own systems.[6,14] Such systems have the advantage of flexibility. Clinicians can collect information which meets their individual needs, and which is available when needed. Micro-computer systems permit the development of additional outcome measures such as specific complications or wound infection rates. They also enable the use of alternative coding systems such as SNOMED.[15]

Computerized information systems have attracted most interest in surgery, where outcome measures are often relatively easy to define. They may also be useful in some branches of medicine. Case fatality is an indicator of outcome for gastrointestinal haemorrhage or myocardial infarction. Graft survival or creatinine clearance may be used to evaluate renal transplantation. Glycosylated haemoglobin and the presence of complications are widely used in diabetic medicine. However, many conditions are chronic and have ill defined outcomes, so that aggregate data are less useful. This has led to the development of case-note review.[16]

Case-note review

Case-note review should be seen as being complementary to the analysis of aggregate data. It can be used to evaluate the overall quality of care provided to the patient. In the United Kingdom criteria against which case-notes can be evaluated have been developed in general[17] and geriatric medicine.[18] These can be scored and used to evaluate the achievement of standards. In many cases the evaluation of treatment must be subjective, but now many hospitals are producing guidelines which can be used as a standard. In addition, the King's Fund hold regular consensus conferences which have produced guidelines on a wide variety of topics, such as the management of stroke, breast cancer and osteoporosis. Other consensus conferences have been held in countries such as the United States, Denmark and the Netherlands. Although foreign guidelines may not be applicable directly to the United Kingdom[19] they may be useful as a basis for local versions.

Case-note review usually assesses structure and process, and thus is based on the implicit assumption that high quality treatment will automatically lead to a satisfactory outcome. There is a need for more work to develop outcome measures. This is especially true in

medicine and psychiatry, and is a priority of the Royal College of Physicians research unit.

Audit in laboratory medicine and radiology

The approaches which have been developed in medicine and surgery are less applicable to laboratory medicine and radiology. In these specialities audit has developed along two separate paths. The first is internal audit of the quality of tests. Regional and national quality control schemes have been accepted by haematologists and clinical biochemists for many years.[20] These consist of a system in which laboratories analyse samples which have been checked by a reference laboratory and receive feedback on their results. An analogous programme of quality control exists for radiologists in the National Breast Cancer Screening Programme. The second approach has been developed more recently. This involves examination of the appropriateness of requests for investigations and has arisen as a consequence of concern about the use of resources for unnecessary investigations and, especially in radiology, realization of the harm which they may cause to patients.[21] The most effective method of implementing such a system is the adoption of guidelines with monitoring of the compliance with them by a utilization review committee.[22] Many hospitals have produced local guidelines for the use of laboratory tests, and the Royal College of Radiologists has designed a comprehensive package of guidelines for ordering radiological investigations (W.P. Ennis, personal communication).

Audit and improving practice

So far this paper has concentrated upon ways in which practice can be observed. Fowkes has pointed out that audit is a cyclical process, involving not only the observation of practice but also the comparison of what is observed with accepted standards, implementation of change, and further observation with, if necessary, amendment of the original standards.[23] Many programmes which are labelled as audit achieve only the first stage of this process. In many ways the subsequent stages are more difficult, but they are necessary for audit to achieve its principle objective of changing practice. They require a structural framework to review practice and set standards. This will be resolved partly by the government's proposal that each Health Authority will establish a district medical audit advisory committee. It can monitor the progress of specialities in establishing their own mechanisms for review. The larger specialities can use peer review within their own hospital, but there are considerable advantages in establishing collaboration with neighbouring hospitals.[24] The smaller specialities will have to look beyond their own hospitals for peer review. In the case of regional specialities it may be necessary to establish national[25] or international[26] review mechanisms.

Once appropriate structures have been established it is necessary to bring about a philosophy which accepts the principle of peer review. Many clinicians see themselves as working in what Handy has described as a person culture.[27] In this the organization exists only to serve the individuals within it. Control is impossible except by mutual consent, and doctors have clinical freedom to determine treatment in the context of each individual patient's circumstances, and as that patient's doctor they alone can judge if it was appropriate. Currently this situation is accepted by many clinical and non-clinical managers and has been endorsed by almost every previous report on the NHS.[28] It is now deeply ingrained in the culture of the organization. In reality, individual clinical freedom has always been largely illusory.[29] It has now been challenged by the government, which no longer accepts that an individual doctor has the right to do whatever he or she pleases when treating a patient. One of the main thrusts of the NHS review is to move to a culture in which accountability, at least to one's professional colleagues, is accepted. The individual freedom has been replaced by a corporate freedom in which the profession has the responsibility for monitoring standards. This is illustrated by the government's proposal that medical audit should be professionally led. This is partly a recognition that although, in theory, managers have had the power to influence clinicians since the introduction of general management, in most cases they have failed to do so. It is very questionable whether many of the current NHS managers have the skills required to implement audit even if doctors accepted them. Experience from other countries suggests that professional bodies, such as accreditation organizations, are more likely to be successful, but the difficulties in bringing about this cultural change should not be underestimated.

Management does have a role in medical audit. Many of the obstacles to effective and acceptable treatment lie in their hands. These include ensuring that notes are available, providing adequate secretarial support, and improving the environment within hospitals. When clinicians raise genuine concerns as a result of audit they have a right to expect that managers will respond. It is in this way that managers can demonstrate their support for audit.

Responsibility for audit

Given that the government have decided that audit will be introduced, who is to take the first step?

Although managers do not have the skills to implement audit, and are unlikely to achieve co-operation if they attempt to impose it, they are to be held accountable for its introduction. The Royal Colleges have taken the initiative, and the possibility of non-recognition of training posts is a powerful stimulus. Each medical executive committee should take advantage of the lead provided by the colleges and plan their local implementation before someone else does it for them. In doing so they will save a great deal of time and effort by adopting some of the many methods which have been tried and tested elsewhere.

Appropriate structures and a willingness to be reviewed by one's peers are pre-requisites for effective audit, but it is erroneous to assume that they will bring about improvements in clinical practice automatically. All elements of clinical practice should be subject to audit, including audit itself. It will be necessary to have a continuing programme of health service evaluation to monitor the changes which are brought about. This will involve assessing changes in effectiveness of treatment. The skills required are in short supply in the United Kingdom, and many treatment regimes and clinical policies have never been evaluated adequately. District audit committees will require support from the few academic departments of health services research, but in the longer term the medical profession in the United Kingdom must consider emulating the example of other countries and establish an accreditation organization to evaluate audit.

Medical audit can be implemented widely by 1991. Its success will depend on whether it comes about because of a firm commitment to evaluate practice or to an acceptance that professional review is inevitable and preferable to examination by managers. Implementation of audit will not be easy. In many hospitals the information systems are totally inadequate. High quality medical records staff are almost unobtainable in some areas. These problems are surmountable, but only with swift and concerted action by managers. It will be more difficult to change the culture of medicine in the UK to one in which all doctors accept that their work is open to peer review. This may take much longer.

References

1. Department of Health. *Working for patients*. HMSO, London, 1989.
2. Sketris, I. *Health Service Accreditation – An international overview*. King's Fund, London, 1989.
3. Van't Hoff, W. Audit reviewed: A report from the regions. *J R Coll Physicians* 1981, **15:** 135–136.
4. Royal College of Physicians. *Medical Audit a first report; what, why and how?* Royal College of Physicians, London, 1989.
5. Donabedian, A. *A Guide to Medical Care Administration*. Volume II: *Medical Care Appraisal*. American Public Health Association, Washington DC, 1969.
6. Young, D.W. Medical audit using a computer based medical records system. *J R Coll Physicians* 1984, **18:** 244–247.
7. Hurwitz, B. Getting started on diabetic care. *The Practitioner* 1987, **231:** 1525–1531.
8. Rosenfield, L.S. Quality of medical care in hospitals. *Am J Publ Health* 1957, **47:** 856–865.
9. Kind, P. *Hospital deaths – the missing link: measuring outcome in hospital activity data*. Centre for Health Economics, York, 1988.
10. Buck, N., Devlin, H.B. & Lunn, J.N. *Report of a Confidential Enquiry into Perioperative Deaths*. Nuffield Provincial Hospitals Trust/King's Fund, London, 1987.
11. NHS/DHSS. Steering Group on Health Services Information. Chairman: Mrs E. Korner. First Report to the Secretary of State. HMSO, London, 1982.
12. Wilson, D.H. The development of accident and emergency medicine. *Community Med* 1980, **2:** 28–35.
13. Bardsley, M., Coles, J. & Jenkins, L. *DRGs and health care: The management of case-mix*. King's Fund, London, 1987.
14. Black, N., Chapple, J., Dalziel, M. *et al.* Step by step to audit. *Health Service J* 1989, **99:** 140–141.
15. Earlam, R. Korner nomenclature and SNOMED. *Br Med J* 1988, **296:** 903–905.
16. Makover, H.B. The quality of medical care. *Am J Publ Health* 1951, **41:** 824–832.
17. Heath, D.A., Hoffenberg, R., Bishop, J.M. *et al.* Medical audits. *J R Coll Physicians* 1980, **14:** 200–201.
18. Dunn, R.B., Day, R.W. & Hall, M.R. Medical audit in geriatric medicine. *Age Ageing* 1987, **16:** 225–228.
19. Brook, R.H., Park, R.E., Wimslow, C.M. *et al.* Diagnosis and treatment of coronary disease: comparison of doctors' attitudes in the USA and the UK. *Lancet* 1988, **i:** 750–753.
20. Loeliger, E.A. & Lewis, S.M. Progress in laboratory control of oral anticoagulants. *Lancet* 1982, **ii:** 318–320.
21. *The Ionising Radiation (Protection of persons undergoing medical examination or treatment) Regulations* 1988. HMSO, London, 1988.
22. Fowkes, F.G.R., Evans, K.T. & Hartley, G. Multicentre trial of four strategies to reduce the use of a radiological test. *Lancet* 1986, **i:** 367–340.
23. Fowkes, F.G.R. Medical audit cycle. A review of methods and research in clinical practice. *Med Educ* 1982, **16:** 228–238.
24. Gruer, R., Gunn, A.A., Gordon, D.S. *et al.* Audit of surgical audit. *Lancet* 1986, **i:** 23–26.
25. Society of Cardiothoracic Surgeons of Great Britain and Ireland. Returns of the UK Cardiac Surgery Register. London, 1985.
26. Brunner, F.P., Broyer, M., Brynger, H. *et al.* Combined report on regular dialysis and transplantation in Europe, XV, 1984. *Proc EDTA-ERA* 1985, **22:** 5–53.

27. Handy, C.B. *Understanding organisations*. Harmandsworth Penguin, 1981, pp. 183–185.
28. Harrison, S., Hunter, D.J., Marnoch, G. *et al*. General management and medical autonomy in the National Health Service. *Health Services Management Res* 1989, **2**: 38–46.
29. Hoffenberg, R. *Clinical Freedom*. Nuffield Provincial Hospitals Trust, London, 1987.