potentially missed because of normal auditory brain stem responses.

Acoustic reflexes have the advantages of being cheap, easy to perform, and usually immediately available. Despite their poor specificity their routine use would mean that about a third of patients could be reassured at their initial clinic visit and not require further investigation. However, the criteria used by us for normality are much stricter than those usually quoted, and they have not been widely used for this purpose. Further evaluation of sensitivity is necessary in a large group of patients with tumours.

This study shows that there are economic and clinical justifications for including tests of auditory brain stem responses and acoustic reflex thresholds in serial protocols for investigating suspected lesions of the cerebellopontine angle. With escalating health care costs many areas of clinical practice justify the close inspection that can generate such conclusions. Clinical audit should always take precedence over financial audit; when there are various options which are equally acceptable clinically, however, economic considerations may show some procedures to be more efficient than others, and these should be preferred.

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Audit in Person

A clinician's guide to setting up audit

Brian W Ellis, Tom Sensky

By April 1991 the Department of Health expects medical audit to be implemented in every hospital. The implementation of some district audit programmes has already been described.^{1,2} In Hounslow and Spelthorne the district audit advisory committee was concerned with the need to disseminate an understanding of audit, dispel a fear of the process, and provide sufficient guidance to enable clinicians to implement audit. To that end it produced a guide of its plans and the necessary actions, which was sent to every consultant in the district. (The districts have two general hospitals: Ashford and West Middlesex University Hospitals.) A covering letter requested the consultants to complete a confidential questionnaire designed to help identify current strengths and deficiencies in audit, which is essential in planning how to share expertise and resources throughout the district. Within three weeks completed questionnaires had been received from more than 60% of the recipients. This paper is a synopsis of the circulated document.

How to set up audit

Intended for guidance rather than as a rulebook, the document had three principal aims.

- To review the background and basic principles of clinical audit
- To illustrate some of the methods of audit
- To give general guidance on implementing audit.

BACKGROUND AND BASIC PRINCIPLES

What is clinical audit?—The Department of Health defines audit as: "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

Educational value of audit*

- Critical review of current practice and comparisons against predefined standards encourages acquisition and updating of knowledge
- Identification of key features of clinical practice allows relevant lessons to be learnt
- Through audit, it is possible to identify particular areas where knowledge could be improved or is deficient, suggesting the need for research
- Self evaluation and peer review are important components of postgraduate education

*Standing Committee on Postgraduate Medical Education³

patient," and states that "an effective programme of medical audit will help to provide reassurance to doctors, their patients, and managers that the best quality of service is being achieved, *having regard to the resources available*."³ Clinical audit and resource management have much in common. The data required for both overlap considerably and the information derived in each is relevant to the other.⁴ However, clinical audit is the responsibility of clinicians and must be led by them.⁵ The district committee views audit as safeguarding the clinical care of patients against inappropriate change dictated by economy.

Educational aspects—The educational benefits of clinical audit (box) have been considered in depth by Batstone.⁶ The committee believes that reviewing the lessons arising from previous audit meetings and ensuring that the conclusions of those meetings have been acted on is fundamentally important.⁷ Some departments have found it necessary to devote a whole meeting every six to 12 months to this purpose alone; it

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District medical audit implementation plan

- A strategy and timetable for developing audit
- Organisation of audit and a description of types of audit to be used
- Requirements for information and information technology
- Staffing requirements (audit coordinator and assistants)
- Training and educational strategies
- Policy on confidentiality
- Identification of a budget holder
- Explicit mechanisms for regular reporting of audit results to management

is essential that the educational potential of clinical audit is realised.

Responsibilities for clinical audit—Regional health authorities are responsible for ensuring that all doctors are participating in medical audit by April 1991: they will also facilitate cooperative audit between hospital and community authorities and coordinate global audit (see below), which entails collecting regional data, setting regional standards, and comparing against these the practice of individual units or clinicians. Our regional health authority has accepted the district medical audit implementation plan (box) produced by the district committee, which is now being implemented.

District audit advisory committee—Within the district this committee will supervise audit. Four clinicians representing a range of clinical and service specialties from each of the acute units and representatives from the community health unit and from management will make up the committee. They will be helped by an audit coordinator. The committee will report to the district medical advisory committee.

Unit audit committee—The four district committee representatives from each unit will themselves form the unit audit committee, together with the clinical tutor, a senior nurse, and a local general practitioner. Their objectives are broadly similar to those of the district audit advisory committee (box). In addition they include:

- Communicating between firms or groups of doctors and the advisory committee, each clinical representative being responsible for several departments or clinical specialties
- Identifying a lead clinician within each specialty and through him or her encouraging audit for every doctor in the unit and receiving the results of audit
- Liaising with and directing audit assistants locally
- Liaising with their medical staff committees.

Planning audit in your unit—The person responsible for audit in a department will need to consider:

- Who should be involved in the audit process
- What method(s) of audit to use
- How and by whom data will be collected
- How often to meet and for how long
- What to do with the results
- The educational aspects
- What resources will be needed
- How to preserve confidentiality.

A complete system of audit should not be attempted in a single step; it would be an advantage to plan several stages in the development of the audit process starting, for example, with case note review. The evolution of the process will require regular monitoring.

Who should participate?—All doctors must partici-

pate, but for audit to succeed a *clear commitment to it is required by senior medical staff*. In most specialties audit will be done independently at each hospital, but in specialties in which the number of consultants are small, joint input from staff at both district hospitals would be better. Involving health care professionals other than doctors in audit is considered valuable to the audit process and to the improvement of education and communication.^{5,8} Most specialties require interdisciplinary collaboration, and a fundamental principle of audit should be to encourage the development of multidisciplinary audit procedures. Thus surgeons should meet with anaesthetists and psychiatrists with social workers, etc. Because of their close working relation nurses should be closely involved in most aspects of audit; they should also consider independently how to audit their care. A good case can be made for involving clinicians in the same specialty from another hospital, which should permit a different perspective on clinical problems—with potential educational and clinical benefits. Regular participation, however, is probably impracticable. Because the chief aim of audit is to improve the service for patients, their participation also needs to be considered⁹; this is a longer term aim, to be used under clearly defined circumstances.

METHODS OF AUDIT

The district committee classified audit activities as follows in order to have a clear definition of terms. The first two categories are the essential audit activities of any department offering clinical services; the third (case note review) is considered mandatory for any department offering continuing inpatient care. The committee intends to review the proposed audit plans

Objectives of the district audit advisory committee

- Coordinate and foster clinical audit for every doctor in the district
- Determine existing audit practice in all clinical departments
- Assist clinicians in all departments in implementing audit methods (see text)
- Monitor results and conclusions of the audit process
- Monitor validity of data and reporting
- Encourage more elaborate forms of audit, when appropriate
- Ensure that changes, when indicated by the outcome of audit, are implemented
- Ensure that audit is an integral part of education
 - That the outcome of audit is perceived as educational
 - That doctors are educated in the practice and process of audit
- Endeavour to minimise the perception that audit is threatening and to highlight the benefits of the audit process to doctors and patients
- Train and direct audit assistants
- Ensure effective liaison with
 - district medical advisory committee
 - management
 - general practitioners
 - the community unit
- Maintain confidentiality
- Estimate funding required for audit
- Prepare annual report
- Prepare forward programme

For a further perspective on the role of a district audit committee see Gumpert and Lyons²

for each specialty to formulate agreed schemes, from which will emerge the degree of support required from audit assistants and the structure of reporting. We hope that some departments will bid for the use of audit assistants for well defined projects.

Basic clinical audit entails an analysis of throughput and a broad analysis of case type, complications, and morbidity and mortality. Such data should be reviewed by each clinical firm at intervals of about three months. When possible, the results should be contrasted with previous periods of time, other clinical firms, other hospitals, or information derived from global audit (see below).

Incident review entails discussing strategies for clinical scenarios. An incident may be taken to be anything from a patient having a cardiac arrest to the use of a department for an investigation—for example, emergency intravenous urography. Such discussions are expected to lead to clear policies. This method is particularly suitable for multidisciplinary or interdisciplinary audit.

Clinical record review—A clinical firm invites a member of another firm of the same or similar specialty to review a random selection of case notes, against established criteria when possible. Such audit has the advantage of simplicity and requires little additional time or other resources. A potential disadvantage, however, is too much concentration on the quality of record keeping and not enough on patient care—both of which are distinct, though related facets of the clinical process. In practice, a balance between the two might be encouraged by the audit meetings being chaired by a third clinician who is neither auditing nor being audited.

Criterion audit is a more advanced and structured form of incident audit. Various incidents are analysed retrospectively against several carefully chosen criteria, which should encapsulate the key elements in management and be discernible from the medical record by a non-medical audit assistant. All cases falling within the scope of the topic are screened, and those failing to meet any one of the criteria are selected for further clinical review. The criteria may relate to administrative elements (for example, waiting time), investigations, treatments considered, outcome, follow up strategies, etc. This form of audit entails much preliminary discussion and research by audit assistants. Experience suggests that it is usually worthwhile.¹⁰

Screening of adverse occurrences—A clinical firm decides on a shortlist of events that should be avoided—for example, wound infections, bedsores, suicides, etc. The frequency and factors leading up to each case at the occurrence of these events is analysed.¹¹

Focused audit studies—The outcome of any audit may require a more closely focused area of research, which is similar to an academic research exercise.

Global audit—Commonly, in any hospital few departments perform similar work. The case mix even between the mainstream physicians or surgeons may be sufficiently different to negate the value of a comparative audit. In other specialties there may not be others in the hospital with whom to compare results. Global audit implies collecting and comparing data across units, districts, and even throughout a region.^{12 13} Surgeons in this district already contribute data to the regional surgical audit global audit programme; the obstetricians and gynaecologists participate in global audit of obstetric and perinatal data; and four accident and emergency departments (including both at our acute units) are active in global audit. The committee's view is that global audit should be encouraged, particularly among smaller specialties.

Audit of outcome is probably the most difficult, controversial, and time consuming exercise. Generally, outcome will probably depend on the whole process of

health care delivery during an episode of a patient's treatment in hospital and as such is a measure of the range of skills of the medical and nursing staff, the administration, and, indeed, every person or department the patient has contact with. More simply, aspects of outcome may be measured by a criterion audit approach. The committee will propose studies to assess the contrast between the perspectives on outcome between the patient, the general practitioner, and the clinician and also to measure the patient's perspective on outcome at the end of hospital admission and several months later.

Patients and communications—As audit is concerned with improving the service to patients the committee will develop techniques to test service provision from the patients' perspective. There will be emphasis on ensuring good communication between doctors, all health care professionals, and especially their patients.

Many of these audit methods will be applied generally; investigations will also be targeted on treatments or conditions that are either common or associated with high morbidity, high mortality, or long stay. Many departments are actively implementing audit; some have been running audit for many years, and in some specialties audit is an absolute requirement for accreditation for higher training.

IMPLEMENTING AUDIT

The time required for audit will be appreciable for all concerned. Clinicians responsible for particular elements of audit work will require even more time, but such responsibility should rotate. The frequency of audit meetings will depend on the type of audit being performed; a monthly meeting of about 60-90 minutes is recommended as a minimum. *It is important that the clinician charged with organising audit within the specialty produces a clear plan and timetable so that all doctors in the specialty know precisely what is expected of them.* Firms that run clinical information systems may need internal weekly meetings to discuss the previous week's discharges and validate their data entry; such meetings are important but are no substitute for a structured audit meeting.

Reporting results—Detailed minutes of audit meetings are not appropriate, but the nature and outcome of every audit must be recorded.¹⁰ The person responsible for audit within a department must agree with his or her colleagues who is responsible for documentation; this may be whoever is chairing the meeting. A report must be prepared and marked as confidential. It should be kept by the person with lead responsibility for audit in the unit and a copy sent to the district committee representative for the specialty. If audit results are considered relevant to another service or professional group you may determine how the information is to be shared.

Staffing—Initially, it is important to plan audit activity that can be realistically achieved with existing staff. By April 1991 at least basic audit activity (see above) and results from every department are expected. More elaborate forms of audit may require the help of audit assistants, and implementing computerised audit systems entails much effort in collecting and validating data to achieve complete data capture.¹⁴ Clinical and non-clinical staff in each department will need to participate in audit, and part of their time will need to be so allocated. This commitment must be recognised in resources and funding. An audit coordinator and two audit assistants have been appointed, and the district committee hopes that departments will submit protocols for audit involving these assistants. By contrast, the committee may approach departments with proposals for districtwide projects with help from audit assistants.

Clinical information systems—Specialties already

running computerised information systems will have rapid access to data analysed in a fashion suitable for audit.¹⁵ Some regional funding will be used to help more firms install such systems. Clinical audit, however, is not entirely dependent on computers and computerised databases; implementing those audit methods not dependent on computers—audit involving patients' records, some form of incident audit, etc—should not be delayed.

Confidentiality—Information about patients used in audit must protect their confidentiality and that of the professionals. The district committee has drafted guidelines on confidentiality. A consistent policy on confidentiality across the district is vital, particularly when audit activities cross boundaries between specialties or professional disciplines. The same principles are involved in patient confidentiality as in the clinical conferences that form part of any academic programme. The matter becomes more complex if professionals other than doctors are involved in audit. It will be important to secure a commitment from all those concerned not to discuss the content of an audit meeting elsewhere. Unless an explicit and convincing case can be made for including details that identify a patient in verbal or written presentations, they should be excluded. Protecting the confidentiality of the professionals will probably prove difficult in some types of audit—for example, when one consultant reviews the clinical records of another consultant's patient or when reviewing patients who have been in hospital longer than three months. Nevertheless, this type of audit can be successful, provided that the necessary atmosphere of trust and collaboration is fostered. Some types of audit are more likely to precipitate interpersonal conflict than others. What

should happen if audit discloses problems or deficiencies in an individual doctor's practice? The person performing the audit is responsible for feedback to the individual clinician and to the person to whom he or she is professionally responsible (for example, the consultant in the case of junior staff). Only when evidence exists of persistent problems or deficiencies in practice, despite such feedback, should others such as the district committee become involved. In the case of consultants the committee must consider what action should be suggested. The district committee's representative will be able to let you see the guidelines on confidentiality.

We thank colleagues of the district audit advisory committee for their support and guidance; this paper is submitted with their approval.

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News and Information

Two independent assessors thought that 15-20% of admissions to paediatric wards in an inner city district were unnecessary (*Postgraduate Medical Journal* 1991;67:50-4). They could not agree, however, about 18% of the 620 admissions, which suggests that many were doctor rather than illness dependent. Local guidelines might help to alter doctors' prejudices as well as preventing much emotional distress and saving money.

When 768 patients were questioned about their views on general practice provision those who were elderly or in poor health were likely to value early referral for a second opinion, an attentive doctor and kindly staff, routine home visits, and freedom in prescribing. Younger and healthier patients emphasised the importance of regular check ups, screening, and health promotion (*British Journal of General Practice* 1991;41:6-8). Hardly surprising perhaps, but the new contract rewards prevention and health promotion with extra money; practices could recruit "healthy" patients to the detriment of sick and elderly patients.

Two expert clinical coders and four members of the surgical staff recorded diagnoses and operations in 50 patients who had undergone plastic surgery (*British Journal of Plastic Surgery* 1991;44:62-4). With the International Classification of Diseases (ICD) and Office of Population Census Studies (OPCS 4)—the standard systems for generating Hospital Activity Analysis data—agreement on one code in each category was no more than 60%; when three or more codes were needed there was no agreement. Alternative coding systems are available and should be evaluated.

Twenty one hospital pathology departments that took part in a pilot accreditation visit by the Royal College of Pathologists (*BMJ* 1990;300:653) were inspected a year later to see whether recommendations had been

implemented (*Journal of Clinical Pathology* 1991;44:172-3). The process of review had itself brought about improvements in 18 departments, but in some laboratories cash rather than peer review was thought to be the only answer to deficiencies.

Pacemakers, bypass surgery, and thrombolytic treatment make cardiology an expensive specialty. In the United States it has not been possible to reduce demand appreciably by pointing to clinical trials and consensus conferences indicating that up to a third of procedures are inappropriate, by showing wide regional variations, or by requiring prior approval for Medicare payment (*Journal of the American Medical Association* 1991;265:482-5). If the profession cannot regulate practice by peer review governments will be forced to ration services.

When the skull radiographs of 822 patients at Moorfields Eye Hospital were reviewed 86% were normal and a further 13% showed abnormalities which did not contribute to clinical management (*Journal of the Royal Society of Medicine* 1991;84:76-80). Even when unequivocal findings were present, other imaging techniques would have been more appropriate; and in some cases reliance on a normal radiograph might have been potentially dangerous. In the author's words, "No patient's treatment would have been adversely affected if none of the skull radiographs had been obtained."

A monthly audit of all aspects of work in a histopathology laboratory showed that, although standards were generally high, there were deficiencies in description of microscopic and macroscopic appearances, careless coding, and delays in completing reports (*Journal of Clinical Pathology* 1991;44:10-6). Improvements were shown after a few months, and the considerable time devoted to monitoring was thought to be worth while and educational.