

Retrospective review of hospital patient records

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Since March 1989 the medical division in West Glamorgan has held monthly district wide audit meetings, which are attended by the staff of all medical specialties from three district general hospitals. The chairman changes with each meeting, and the office rotates through all the consultants who attend. The chairman is responsible for researching and presenting an audit exercise of his or her choice. This system has resulted in much useful discussion of a broad range of topics.

Several criterion based studies, entailing retrospective reviews of hospital patient records, have been performed. These projects have provided insight into the difficulties associated with retrospective audit of case notes, and the lessons we have learnt are outlined below, with examples taken from an audit of the management of acute stroke.

Definition of objectives, criteria, and standards

A fundamental priority is to obtain agreement on the objectives of the project. A clear boundary and framework within which to work will help to keep the exercise manageable. The emphasis at this stage is on what to achieve, not on how to do it. Time spent on clear identification of the criteria to be assessed will be well used as mistakes are often made early and are difficult to correct later. Definition of standards may be difficult at this stage, and agreement may need to await discussion of the findings.

Objective—To audit retrospectively the current management of acute stroke in West Glamorgan.

Boundaries—All patients admitted to an acute medical or geriatric bed with a primary diagnosis of acute stroke from 1 October 1988 to a total sample of 200 patients.

Criteria—Delay to admission, selected findings on admission, use of computed tomography, recording of management decisions after investigation, treatment with aspirin, information given to patients' relatives before discharge, length of stay, and mortality.

Standards—Not defined at this stage.

Sample size

A brief feasibility exercise will show the time required to analyse each set of notes and will indicate the overall sample size that can be examined in the time available. If the population to be studied is large a limited sample (for example, by age or time) or random sample (for example, every 10th case note) may need to be selected.

Retrieval of case notes

A list of the identifying details of all patients falling within the boundaries of the study is compiled from administrative records or requested from an appro-

priate authority. Written permission will probably be required from all the consultants concerned.

The name, hospital number, date of birth, admission and discharge dates, and name of consultant in charge of patients admitted with a diagnosis of acute stroke were requested from Hospital Activity Analysis records held at the Welsh Office. Codes 436 and 342 of the International Classification of Diseases (ninth revision) were used.

A computer printout was received, with patients listed alphabetically and grouped by consultant. This created difficulties when requesting the case notes from medical records departments. Notes are filed numerically, in terminal digit order, and more efficient retrieval of the notes would have been achieved if the list had also been presented in this sequence.

Failure to retrieve some notes will be inevitable. This may cause a reduction in the total sample to be surveyed and will introduce bias if poor retrieval reflects different organisation, procedures, or efficiency among clinical firms. The notes of patients looked after by less efficient firms may be coded and returned to medical records less quickly and may therefore be underrepresented in the sample.

A few firms looked after most of the patients but yielded a minority of the notes retrieved because some patients were transferred to long term rehabilitation and a coded discharge summary was not produced until final discharge.

If a search is to be made according to diagnosis it is important to be clear whether this will be according to primary diagnosis alone or will include secondary diagnoses. Some notes may be wrongly coded on discharge. Elimination of such records may make the final target more difficult to achieve.

Of the notes retrieved, a fifth were inappropriate for the study: the diagnosis was from a previous admission (50% of these), a stroke had occurred after admission (30%), or in the wrong time period (18%), or the notes were wrongly coded (2%). A search according to primary diagnosis alone should have been stipulated. These factors and constraints of time necessitated a reduction of the sample size to 100 records.

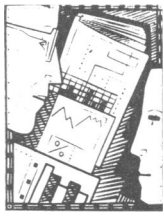
Extraction of data

The order in which data are to be extracted from the notes should be logical and reflect the order in which

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information is recorded in clinical practice. Care must be taken not to make subjective judgments when information is assessed. This is best avoided by careful, agreed definition of the data to be extracted and strict categorisation of answers (for example, yes, no, insufficient information, or not recorded).

The overall clinical state of the patient was poorly recorded in many cases, both on admission and on discharge, and there was a tendency for the reviewers to try to infer the clinical state from other information in the notes. In such circumstances clinical state should be recorded as "insufficient information" or "not recorded."

Time

A study of this type is labour intensive and takes time. Delays must be expected while awaiting authorising signatures from consultants and the list of patients. The time taken to find notes will vary among hospitals.

It took nine days to collect signatures from the 14 consultants concerned and a further 32 days for the computer printout to arrive. Time taken to retrieve notes from medical records departments in the three participating hospitals varied from two to 16 days.

Bias

Incorrect coding on discharge, failure to retrieve notes, and differing rates of retrieval all contribute to bias the sample. If the patient list is in order of consultant and a fixed number of notes is to be assessed the differing rates of retrieval may be very important. Similarly, if notes are selected at random to limit numbers a high proportion of patients identified from smaller groups (for example, specialised clinic lists) will skew the sample.

One of the criteria to be studied was length of stay, comparing care under general physicians and geriatricians. The Welsh Office printout showed that 30% were admitted under physicians and 70% under geriatricians. These proportions were reversed in the notes actually retrieved, invalidating any such comparison.

Analysis of data

Use of a computer with database, spreadsheet, and statistical or graphics software, or both, may greatly reduce time spent collecting, analysing, and presenting data, though smaller studies can be done without such help. If the questions to be answered have been

Standards were not predefined in this study. It was found that 30% of patients had had computed tomography, in some cases without clear indications. In itself this was not a useful statistic, but it was subsequently agreed that all patients meeting modified King's Fund criteria should be so examined.

carefully planned at an early stage final analysis and statistical testing should be straightforward.

Predefinition of criteria and standards will allow rapid filtering of those cases that do not require further examination. If standards have not been defined the exercise is more an evaluation of current practice, which, hopefully, will lead to consensus agreement on standards.

Checking for errors

There may be errors of subjective judgment, clerical transcription, or entry of data. If a computer system is used and the software is tailored for the project the degree of sophistication built into the human/computer interface is unlikely to be high as it would be difficult to justify the development time required to support a limited one off project. Consequently, it is vital to validate data and check for errors in extracting data, coding, and keyboard entry on a random sample.

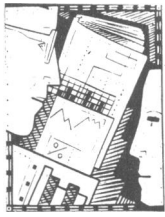
Ten sets of notes (a tenth of the total) were cross checked for errors. Considerable variation was found in the assessment of clinical state on admission and discharge due to subjective interpretation of inadequate clinical information. Coding and keyboard errors were not found.

Presentation and feedback

When the study is complete the results are presented for peer review. Simple overhead projector films or photographic slides are essential to summarise the data and provide prompts for discussion. The study protocol must be described clearly and the limitations of the method and areas of bias pointed out. A general overview of the results will need to be repeated with detailed discussion of each stage. Junior staff should be actively encouraged to participate in this discussion, which may require specific questions. Agreement of essential details will be easier if an independent chairman can mediate between the presenter and the discussants. Up to date, comprehensive knowledge of published work will permit an authoritative view of the subjects under discussion; without this there will be too much room for unsubstantiated comments that could prevent achievement of a consensus view. The meeting will need to be run at this stage with enough discipline to cover each item and then move on with at least majority agreement. The end result should be broad agreement on all the essentials of management, not forgetting those aspects that have not been discussed because they were not controversial. Ideally, the discussion should be minuted.

Written comments should be invited at the end of the meeting. The more shy, reserved, or polite members of staff may not speak. These written

The results of this exercise were presented at a district audit meeting attended by 45 people from across the medical disciplines. There was controversy over several aspects of management (for example, use of computed tomography, treatment with aspirin), which could not be resolved during the meeting without reviewing published reports. Subsequent feedback on paper added to the discussion, and final guidelines were issued at the next meeting. These will form the basis for criteria and standards for a future audit of acute stroke.



comments should be taken into account in producing a definitive protocol, which should be discussed with other affected parties (for example, radiologists) before its presentation, agreement, and distribution at the beginning of the next audit meeting.

Conclusions

Retrospective review of hospital patient records can be a valuable audit exercise. It is time consuming, but

careful preparation and analysis of requirements will ensure that this time is used effectively. It is important to acknowledge that the population of available records may not be representative of the true population, and recognition of causes of potential bias and allowance for them is more important than achieving a large, seriously skewed sample. A good retrospective study can also be a useful and cost effective feasibility exercise before setting up a long term prospective audit.

News and Information

Patients with severe head injuries may require transfer to special units or to be transported within a hospital for special investigations. Such movements can be injurious, and the lesson from two recent studies in Edinburgh and Glasgow (*Lancet* 1990;335:327-30,330-3) is that every effort should be made to stabilise the patient's condition before transfer, especially in patients with multiple injuries. Otherwise there is a serious risk of hypoxia, hypotension, or a rise in intracranial pressure. An adequate airway, appropriate treatment of blood loss and shock, and stabilisation of injuries and fractures will help to prevent these complications. Staff in general hospitals will find the checklist of actions to be taken valuable when they are confronted with a decision to transfer such patients.

In general practices that organise their own care for patients with diabetes lower hospital admission rates might be expected. Some evidence for this was found in 40% of 278 Oxford practices that had special arrangements such as eye testing, nurses and doctors with a special interest in diabetes, chiropodists and dietitians, and facilities for blood glucose estimations (*British Journal of General Practice* 1990;40:56-8). A lower admission rate for patients with diabetes correlated with each of 16 facilities tested, though not all were significant. Caution is necessary in assuming cause and effect because the number of admissions during the two years was small, no information was available on the reason for admission (an interesting study in itself), and hospital admission policy was not investigated.

Conferences on tumours have been popular in continuing medical education in the United States for over 50 years, but their benefits for patient management and doctor training do not seem to have been analysed. A two part nationwide study is under way to examine the extent of the activity and its usefulness. In the first part (*Surgery, Gynecology and Obstetrics* 1990;170:1-6) questionnaires were sent to 1700 hospitals: 95% of respondents held conferences, usually weekly, often because they were required for accreditation of the cancer programme; most said that they would continue to hold them if this requirement no longer operated. Information about the conferences was obtained: composition (whether open to physicians and non-medical staff), types of case considered (often more difficult), presence of outside consultants, and whether cases were followed up (only 7.4%). Evaluation against nine desirable criteria showed that these were met in only 1% of conferences.

Despite seemingly obvious advantages the case for orthopaedic geriatric units remains unproved. Such a unit was established at Poole General Hospital in 1983 because of the increasing number of elderly patients with a fractured femur who had to be accommodated in outlying wards. A prospective study was mounted to compare outcome with closely matched patients treated in the orthopaedic ward (*Journal of the Royal College of Physicians* 1990;24:47-50). Outcome measures were length of stay; mortality at 30 days, six months, and one year; mobility; dependency; and residential status at six months. The most striking finding was that length of stay in the geriatric orthopaedic unit averaged 9.5 days less than that in the orthopaedic wards, attributed to facilitation of discharge by social workers and geriatricians with community links and to fewer serious medical problems. Other outcomes were not significantly different, though patients from the orthopaedic ward tended to be in a more supportive environment at one year and there was a gratifying fall in the number of patients in outlying wards.

Doctors who are confused by terms used to describe the process of audit should look at D H Stone's article on taxonomical analysis in the *Journal of the Royal College of Physicians* (1990;24:30-1). Depending on the nature of the activity, he divides the whole thing into three categories each with two components—ad hoc and continuing. Thus if the purpose is clinical a one off activity is a review whereas continuing review is audit. In the same way evaluation and surveillance represent the activities of epidemiology and public health, and appraisal and monitoring represent the activities of managers. Boundaries between the three are not rigid nor are the terms mutually exclusive, but keeping them separate may help for purposes of debate. Is there a comprehensive word to cover all this industry?

The influx of newly qualified doctors into the United States' teaching hospitals, called the July phenomenon, is widely thought to have an adverse effect on the cost and quality of patient care. Total charges, length of stay, readmission rates, mortality, and nursing home placement (a responsibility of junior staff) were assessed during the year after appointment at St Paul's Hospital, Minnesota (*Journal of the American Medical Association* 1990;263:953-7). Charges fell by 11% and length of stay by half a day when the interns had been in post for a year, but there was no significant change in the other measures of outcome. A gratifyingly small effect, no doubt, but extrapolation nationwide would represent a saving of \$800m and 900 000 hospital days.

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College of Ophthalmologists—The college has received funding from the Department of Health for three years from April 1990 to establish a medical audit unit. This will include the development of practical audit methods, initially in cataract surgery, postoperative infections, and eye trauma. Dr Parul Courtney, an ophthalmic epidemiologist, has been appointed to assist the project for three years. Contact Dr Courtney at the College of Ophthalmologists, Bramber Court, 2 Bramber

Road, London W14 9PQ (tel 071 385 6281; fax 071 381 1799).

National Trauma Study—The Department of Health is to support for three years the United Kingdom major trauma outcome study directed by Professor D W Yates in Manchester. Already 28 hospitals have been enrolled in the study; they provide details about the care they give to injured patients from the time of their collection by ambulance to the time of discharge or death. Feed-

back is given to staff of the participating hospitals, who compare their results with those of the United States major trauma outcome study, based in Washington, which has data on 120 000 patients. The United Kingdom study now holds data on 6000 patients. Details of how to collaborate with this study from Maralyn Woodford, MTOS, North Western Injury Research Centre, Stopford Building, Oxford Road, Manchester M13 9PT (tel 061 789 1421; fax 061 787 7432).