Audit of the Quality of Medical Records in a District General Medicine Unit

SWANSEA PHYSICIANS’ AUDIT GROUP

The quality of hospital medical records is a frequent source of frustration to clinicians. The need to improve medical records is well recognised and has been emphasised over the years in governmental reports[1, 2] as well as by individual physicians[3, 4]. Innovations in medical records[4, 5], such as the use of problem orientated records[6] and computers[5, 7], are occurring sporadically throughout the UK, but most hospitals have seen little change in their medical records in recent years.

In 1980 the Swansea Physicians’ Audit Group was established[8] as a collaborative venture between the general physicians in Swansea, the West Glamorgan Health Authority and the Welsh National School of Medicine, with the aim of improving the effectiveness and efficiency of medical care through audit. The Group decided that their first major audit should be an evaluation of the quality of hospital medical records because of a perceived need for improvement in this aspect of clinical care. This article describes the method and results of that audit.

Method

The audit was carried out in two district general hospitals in the same city. There were 101 general medical beds in one hospital and 55 in the other. All six consultant physicians in general medicine were involved in the audit. The house officers changed posts in February and August during the year covered by the audit, so although there were only seven established posts, the records of 21 house officers were audited.

Setting a Standard

Before the audit, an attempt was made by the physicians to set an ideal standard for their records. Each consultant was asked, by means of a questionnaire, to decide whether certain aspects of the structure and content of medical records were ‘essential’, ‘important’, ‘desirable’ or ‘unimportant’ features. For example, should a front identification sheet (HMRI) be present in the case notes for each admission? Should a patient’s allergies be mentioned in every case history? The physicians disagreed quite considerably in their gradings of importance and so a decision was made to collect data only on those features which were generally agreed to be ‘essential’ or ‘important’. The medical records were thus to be compared against a minimal standard which had been reached by the consensus agreement of the physicians in the Audit Group.

Training the Audit Assistant

The data from each medical record were abstracted by an audit assistant who was not medically qualified and required training in the review of case notes. It was essential that the assistant had an understanding of the elements of a clinical history and physical examination and knew the meaning of the common abbreviations found in the records. During a pilot study the assistant, under supervision, abstracted data from over 150 case notes. Intra-observer variation was tested during the main study by repeat abstractions from 20 randomly selected case notes. The assistant’s ability to abstract data was also tested against that of a medically qualified observer. Over 65 items of information were abstracted from each record. Variation both within and between observers occurred in approximately two items per record, but no single item varied in more than two of the 20 records examined.

Data Collection

A computer printout listing the 652 patients discharged from the adult medical wards of both hospitals in one year with a principal diagnosis of acute myocardial infarction (International Classification of Diseases (ICD) code 410), bronchitis (ICD codes 490-492) and cerebrovascular accident (ICD codes 431, 433, 434, 436, 437.0-1)[9], was obtained from Hospital Activity Analysis (HAA). For patients discharged more than once during the year, only the first discharge was included in the sample frame. Discharges by diagnosis were then stratified by consultant and random samples of 20 patients with myocardial infarction, 15 patients with bronchitis and 15 patients with cerebrovascular accident were chosen from each consultant’s list of discharges.

In the HAA listing, the name of the consultant in charge was incorrect in a few cases; these patients were re-allocated to the appropriate consultant. The HAA diagnosis, when checked against the diagnosis in the discharge summary and in-patient progress notes, was incorrect for one admission; this case was excluded from
the sample. The record of one patient could not be traced. The numbers in the sample frame were less than the desired sample number for bronchitis patients (two consultants) and for cerebrovascular accident patients (one consultant). The final sample consisted of 285 discharges (120 patients with myocardial infarction, 79 with bronchitis, and 86 with a cerebrovascular accident). Of the admissions 97 per cent were emergencies and 12 per cent had had a medical admission in the previous six months.

Data on the admission in question were abstracted retrospectively from the medical records by the audit assistant at least one year after the discharge or death of the patient. Information was obtained only on the quality of recording for the admissions (discharges) sampled from the HAA listing and not for other admissions in the same medical records.

### Results

**Filing within Records**

The medical record consists of a folder with two internal spines and one pouch inside the back cover. Each hospital has a standard method of filing the forms and correspondence on the spines. Table 1 shows the accuracy of filing within the records: this ranged from 94 per cent of records in Hospital I having correct filing of admission and progress notes to 44 per cent of records in Hospital II having correct filing of discharge summaries and correspondence. The accuracy of filing of discharge summaries and correspondence was significantly worse than the filing of other forms ($P<0.001$). This may have been related to delay in filing these items following a patient’s discharge from hospital.

During the pilot audit it was noted that there were relatively few X-ray reports in the medical records, although there was little doubt that on clinical grounds most patients would have had at least one radiological examination. In the main audit the number of times that patients had radiological investigations during the admission studied was obtained from the register in the radiology department. A radiology report was present in the case notes (either correctly or incorrectly filed) on only 24 per cent of the occasions that diagnostic radiology had been performed; the number of reports and X-rays performed matched correctly in 40 per cent of case notes.

### Completion of Forms

The front identification sheet (HMRI) for the admission studied was present in over 99 per cent of records and there were extremely few omissions in the completion of items by the admission clerks. The only substantial error found was an absence of the address or telephone number of the patient’s general practitioner on 30 per cent of identification sheets in one hospital, whereas this item was omitted on just 1 per cent of the sheets in the other hospital.

A standard discharge summary form was completed for 85 per cent of the admissions. Although a date was stated on 93 per cent of the forms, it was not possible to determine at what stage after discharge the summary was completed because most were dated by month and not by day. There appeared to be some reluctance to complete specific sections of the discharge form in that the special boxes for stating the diagnosis and treatment were completed on only 24 per cent of forms, whereas the diagnosis appeared in the main text on 96 per cent of forms. A reference to discharge treatment of any type (including no treatment) was mentioned in the text or in the treatment box on only 53 per cent of occasions. Where drug treatment was mentioned on the discharge form, the names of the drugs were stated on 89 per cent of forms and the dose and frequency of administration on 79 per cent.

Ninety-nine per cent of records contained an in-patient medication sheet pertaining to the study admission. On 8 per cent of medication sheets the dose of one or more drugs was omitted. The route and frequency of administration were missing on 7 per cent and 0.4 per cent of forms respectively. The doctor had not signed a drug entry on 2 per cent of sheets. According to annotations on the medication sheets, however, all the above omissions were detected by the hospital pharmacist.

### Medical Clerking on Admission

As the time of clerking was rarely stated, it was impossible to determine precisely the time between admission and clerking, but if the dates stated were correct, all patients had their history taken and were given a physical examination on the day of admission or on the subsequent day.

In analysing the content of the medical history, the records of 34 patients who had had admission to hospital within the previous six months were excluded. Thirty-two patients who were unconscious on admission or unable to provide a history for some other reason were also excluded. In the remaining records the presence or absence of those categories of history into which a medical history is traditionally divided (present medical history, family history, drug history, and so on) were examined. If one of these was stated to be negative (e.g. ‘drugs: nil’) that
category was considered for the purposes of this audit to have been recorded in the case notes. As shown in Table 2, most categories of history were recorded in over three-

Table 2. Categories of history mentioned in house officers' admission records (excluding records of patients with admission in previous six months and/or patients unable to provide complete history).

| Category of history           | % records (n = 219) | Drug history | % records with mention of drug(s) (n = 156) |
|-------------------------------|---------------------|--------------|---------------------------------------------|
| Present medical history       | 100                 | Drug: name   | 94                                          |
| Past medical history          | 95                  | dose         | 55                                          |
| Drug history                  | 90                  | frequency    | 60                                          |
| Systematic enquiry            | 86                  |              |                                              |
| Social history                | 84                  |              |                                              |
| Family history                | 78                  |              |                                              |
| Listing of principal complaints| 76                  |              |                                              |
| Allergy history               | 53                  |              |                                              |

quarters of the case notes, except for a history of allergies, which was included only in 53 per cent of records. The information in all categories, other than the present or past history, was brief in the majority of records. Drugs were usually named, but omissions in the dose or frequency of administration of at least one drug occurred in over 40 per cent of the records of patients who were stated to be receiving drugs.

Data on the recording of certain aspects of the physical examination are shown in Table 3. In almost one quarter of patients with myocardial infarction no statement was made about the general state of health of the patient (such as ‘in severe pain’, ‘shocked’, ‘comfortable’). Although over 90 per cent of records contained further information on the pulse other than the rate, this information was usually less than one word (for example, ‘irreg.’) or was simply a tick. There was no reference to the apex beat in 59 per cent of records and in 20 per cent the presence or absence of added heart sounds was not stated. In patients with bronchitis, the presence or absence of finger clubbing and the position of the trachea were the respiratory signs most commonly omitted from the record. In patients with a cerebrovascular accident, the presence or absence of carotid bruits was recorded only in 7 per cent of case notes. An examination of the cranial nerves and an assessment of sensation were mentioned in about 60 per cent of records, but this low figure may have been due partly to the inability of some patients to co-operate with the examination. A few patients may also have had their cerebrovascular accident while in hospital and if a neurological problem was not suspected on admission, the house officer may have been less likely to carry out a detailed neurological examination.

On concluding the history and physical examination, a provisional diagnosis was stated and the proposed investigations were listed in 88 per cent of cases. The initial treatment of the patients was stated only in 16 per cent of records. During the five days following admission a progress note was written on at least two days in the majority of records; the medical staff signed all the progress notes in only 12 per cent of the records.

The number of patients in each diagnostic category was insufficient to justify conclusions about the variation in recording between house officers. There were omissions in the records of all house officers and the available data did not support the notion of extremes of variation consistent with the labelling of house officers as ‘excellent’ or ‘very poor’ recorders.

Discussion

Reports that are missing or misfiled within the record may not be vital to the immediate management of the patient in hospital, but do lead to considerable frustration for the physician when trying to recall information at a later date. Lost results can lead to unnecessary repetition of tests. The most notable omission shown in this audit was that, for three-quarters of the occasions on which X-rays were performed, no report was present in the case notes. This situation could have arisen for several reasons: emergency X-rays might have been sent to the wards without reporting, results might have been transmitted by telephone and not by written report, or copies

Table 3. Selected physical signs by diagnosis mentioned in house officers' admission records.

| Myocardial Infarction (n = 120) | % records | Bronchitis (n = 79) | % records | Cerebrovascular Accident (n = 86) | % records |
|---------------------------------|-----------|---------------------|-----------|----------------------------------|-----------|
| Heart sounds                    | 99        | Cyanosis            | 87        | Pulse rate                       | 94        |
| Pulse rate                      | 98        | Percussion          | 83        | Reflexes                         | 92        |
| Pulse information               | 92        | Chest movement/expansion | 82    | Pulse information                | 82        |
| Blood pressure                  | 91        | Breath sounds       | 81        | Pupils                           | 80        |
| Cardiac failure                 | 85        | Added breath sounds | 77        | Limb tone                        | 72        |
| JVP                             | 85        | Respiration/dyspnoea | 74    | Limb movement/power              | 71        |
| Oedema                          | 82        | Trachea             | 69        | Sensation                        | 60        |
| Cyanosis                        | 81        | Finger clubbing     | 58        | Cranial nerves (except pupils)   | 59        |
| Added heart sounds              | 80        |                     |           | Carotid bruits                   | 7         |
| General state of health         | 77        |                     |           |                                  |           |
| Apex beat                       | 41        |                     |           |                                  |           |
of reports might have been filed in the X-ray folders instead of the medical records.

How might the filing of forms and reports within the record be improved? These tasks are essentially administrative and should be nearly perfect if the appropriate procedures and responsibilities are clearly stated and staff are adequately trained and monitored. District medical records committees and records officers have an important role to play in this respect. Unfortunately, such committees and their officers have relatively low status in the NHS; greater authority and an improved career structure for medical records personnel may be required if a higher quality of records is to be assured[4]. Improvements in administrative procedures may, however, be initiated at the clinical level. As a result of this audit, for example, the physicians and radiologists are reviewing the methods of communicating X-ray results within the hospitals.

The quality of recording of the medical clerking did not reach the standard decided by the consultants before the audit. It should be noted that the level of recording was dependent on the extent of both the history and the physical examination performed and the completeness of recording. The consultants considered, however, that the events which were audited should have been carried out in practice and recorded in the case notes. A 100 per cent level of recording of even ‘essential’ data may be unrealistic especially since much of the recording may occur when house officers are tired and under pressure, but it is interesting to note that a few items were recorded in over 90 per cent of records (for example, the pulse rate and heart sounds in patients with a myocardial infarction and the reflexes in patients with a cerebrovascular accident (Table 3)).

In abstracting the data from the records, no attention was paid to the quality of the recording of an event. For example, if the house officer had written no more than ‘VII intac’ in describing a cranial nerve examination, this was accepted as a positive recording of a cranial nerve examination. Thus the results of this audit depict the level of recording against a minimal standard of recording of events. Our subjective impression was that the recording of events was frequently inadequate, and that the overall quality of recording was worse than that shown explicitly in the audit.

The house officers working in the medical wards during the period covered by the audit were all trained in medical schools in the UK and their standard of recording may in part reflect some deficiency in their undergraduate education. Indeed, in a survey of student opinion at the Royal Free Hospital[10] 64 per cent of students indicated that they wished to be given more instruction in the writing of medical records and 81 per cent thought that teachers should pay more attention to students’ notes. Medical recording by both students and house officers might also be improved by entering admission notes on standard forms containing detailed checklists or by using problem orientated records[5, 11].

Although most of the information in hospital case notes is written by junior staff, the quality of medical records is ultimately the responsibility of the consultant who should monitor the recording in individual case notes and educate junior staff as necessary. When a patient is discharged, the consultant could check the medical records for completion against a set list of standard criteria[12].

In a medical unit in the Western Infirmary in Glasgow, a regular monthly surveillance of discharge documents in the case records resulted in an improvement in some aspects of recording practice. For example, the interval from the patient leaving the ward to the discharge letter being sent to the general practitioner was halved from 20 to 10 days[13]. A regular audit of medical records in a department of medicine at the Queen Elizabeth Hospital, Birmingham, has led to an improvement in the signing of entries in the case notes and in the recording of information given to the patients and relatives[14].

In the USA, the Joint Commission on Accreditation of Hospitals evaluates the quality of medical records when assessing whether a hospital should be accredited[15]. A hospital’s accreditation status is extremely important in determining its success in attracting junior staff, so there is an incentive for the hospital to ensure the maintenance of good records. In the UK, although the royal colleges expect an adequate but undefined standard of records, there is no such external incentive or sanction and any improvements must be initiated voluntarily at local level.

Innovations in medical records will undoubtedly enhance quality, but identifying and correcting deficiencies in established systems through audit may also be beneficial. The results of this audit are currently being discussed with the District Health Authority and the medical, nursing and medical records personnel, with the aim of developing initiatives to improve the quality of the records in the two hospitals. Such initiatives may, however, be hampered by difficulties in reaching an agreement on acceptable standards[16]. Medical records have multiple uses[3, 4, 12] and much of their value is open to debate, which makes the setting of standards a difficult process. The Association of GP Hospitals has recently taken up the challenge and published standards for medical records used in GP hospitals[17]. Perhaps the royal colleges, District Health Authorities and other groups within the Health Service should also consider setting appropriate standards as a yardstick for assessing the quality of medical records.

Acknowledgements

We are grateful for the generous support of the West Glamorgan Health Authority, for the computer analysis performed by Ms H. Dale and Ms L. Burrell-Davis of University College, Swansea, and for the useful advice of Dr C. D. Shaw, Ms M. W. Mitchell and Professor C. J. Roberts of the Department of Epidemiology and Community Medicine, Welsh National School of Medicine.

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is scarcely another shire in all England that can show more good townes in so small a compass’ as Hertfordshire. ‘Middle-sex taketh the name of the Middle-Saxons, because the inhabitants thereof were in the mids between East-Saxons, West-Saxons and South-Saxons and those whom that age called Mercians. . . . For aire passing temperat and for soile fertile, with sumptuous houses and pretty townes on all sides pleasantly beautifield.’ In the account of London there is no mention of the College of Physicians, only of Gresham College; the re-founding of St Thomas’s Hospital by the City of London ‘for the sustenance of feeble and impotent persons’ is recorded and the fact that there are 121 churches—‘more than Rome itself can shew’.

If not the first English historian (in the modern sense), topographer and antiquarian, Camden was certainly the first to relate all three studies. He was the founder of the chair of modern history at Oxford, known as the Camden professorship, and the first at any university in the country. His name was distinguished in his life-time, and his works enjoyed a long popularity after his death. The first English edition of the Britannia is in the College library, in which the author’s preface concludes with the quotation from an obscure Latin poet ‘Books receive their doome according to the Readers capacity.’

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