PRACTICE OBSERVED

Practice Research

Simple computerised disease register

DAVID MELDRUM

Since the pioneering work by Elmet¹ and others general practitioners have been able to monitor their work load and recall groups of patients according to either age or disease. Age/sex registers have been widely used, but disease registers, particularly ones that register all diseases and all patients seen, have presented formidable problems of collecting and analysing data. The introduction of relatively cheap computers, however, has made it practical to have a simple system for recording and analysing information about diseases.²⁻⁴

General practitioners in routine teaching practices have been able to examine the overall work load of trainees using a manual system. But because of the difficulties of examining and sifting data, it has not been practical to monitor continuously the distribution of patients seen by trainees by age and sex and by disease. Although small computers can be bought for under £1000 they do not have adequate memories to store all the information required for an age/sex register and a disease index.⁵

To get around this problem I developed a combination of a manual age/sex index and a computerised disease register.

Method

We used the manual age and sex register to assign patient code numbers: YY for year of birth, S for sex, and NN for serial number. This coding was used because it has the information needed to analyse data by age, sex, and patient. Using only two digits for age may cause slight confusion between youngsters and centenarians, but the remote chance of this happening did not warrant typing in an extra number. The patient code numbers generated from the age/sex register were transferred to the front of the notes for each patient in a conspicuous place in distinctive lettering. Although we thought that these numbers might be confused with the date, this has not happened. By transposing the position of the year of birth and making the date

number 1 or 2 for sex (for very large practices it could be odd for male and even for female) it is obvious in the majority of cases that the code number is not a date. It took the practice staff about three months to mark the notes of the 5000 patients when an opportunity arose, and no extra staff were employed.

RECORDING INFORMATION

The receptionist writes the patient code number beside the patient's name on simple, duplicated encounter forms (fig 1). This probably adds marginally to the time it takes the receptionist to get out a morning's notes, but the time is not quantifiable—and it is small. At the end of each consultation the doctor writes the Royal College of General Practitioners code number (copyrighted by the RCGP) in the notes and on the encounter sheet using the RCGP plastic sheet or the Omsis problem code book.⁶ Though there are disadvantages in doctors doing the coding, the advantage is that the notes are released for filing after every surgery and the doctor decides the code when the diagnosis is difficult. After doing this for six months the two partners and the trainee remembered many of the code numbers, although some slight preference occurred. The doctor seems to spend only a few seconds coding for each consultation. Only diseases actually dealt with at the consultation are coded. If the patient has two diseases then two code numbers are entered by the patient's name.

At the end of each week all the encounter forms are collected by a typist who enters patient numbers and diagnostic code numbers into the computer. A simple routine check for errors on the computer ensures that the patient and diagnostic codes are entered in the right form and that they are in the right range; if they are not, the entries are rejected. As the typist enters the codes the last 20 entries are displayed on the screen so that each form can be checked quickly. Typing in the entries takes about one hour a week. The typist had no special training but has helped when needed.

HARDWARE AND PROGRAMING

The computer we use is the Commodore PET with 32 K RAM. It costs £695 plus VAT. We have had no problems with it in the year or so it has been in use. The printer was provided by Oki and cost £365 plus VAT, and produced the figures in this article.

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with diabetes and hypertension. Fig 7 shows part of our record of diabetic contacts with the code numbers of the patients that each doctor has seen each month (the patients' names have been removed). We hope that defaulters will be obvious and that we will be able to follow them up.

FIG 5—A section of the chronic disease register for diabetic patients (names have been removed).

FIG 6—A list of all the contacts with diabetic patients for one month.

FIG 7—A section of the chronic disease register for diabetic patients (names have been removed).

ANALYSIS OF TRAINEE WORK LOAD

A fuller account of the distribution of disease in patients by age and sex seen by the trainee is prepared. It is interesting that over three months the trainee saw no diabetic patients about diabetes, despite the trainee being aware of this problem and looking out for diabetes to send to the trainee.

Discussion

The system we use is a combination of a manual age/sex register, a computerised disease index, and a manual chronic disease register. It is essential that the age/sex register is kept accurately and up to date. We have found that for our practice with 5000 patients a half an hour a week is all that is needed to keep the age/sex register accurate so that it tallies with the family practitioner committee numbers. We found that it was easy to store data on the computer, and that typing takes about an hour a week. Each month's data are stored on a cassette tape, which takes roughly 10 minutes to do. Furthermore it is not necessary for a secretary to stand over a machine while it records data. The data are recorded twice on separate tapes (cost 60p each) to safeguard against damage to one tape. It takes a few minutes to analyse and print the results, but this is another task during which the machine can be left to its own devices. The system has minimal requirements, and the coding was made as simple as possible to make recording easy for the doctor and the typist. We think that the information we have retrieved has made efforts well worth while.

Other practices are starting to use the system, and other groups of trainees and trainees may also use it. We will then have more varied consultation patterns by disease to analyse. The system was started in October 1979 with 5000 patients; it is now being extended to 11 000 patients. Information on these patients will be recorded on cassette tapes, but the system has now been written to work on discs, which will give quicker access to the information and allow information about larger numbers of patient contacts to be stored.

REPEAT PRESCRIPTION PROGRAM

A simple repeat prescription program has been written that links the code number described above to a much fuller file on

Audit

We now have a record of all patient contacts classified by disease, and this has enabled us to recall the notes of groups of patients we are interested in. For a training project vertigo was analysed and the notes of all the patients who presented with vertigo were called up for three months. The computer gives code numbers for any disease listed by age and sex (fig 6), and using the code it took very little time to extract the notes needed. (The age/sex register is arranged with one page for each year.)

REGISTER OF CHRONIC DISEASES

Since we can recall all the patients who have contacted us with any disease, we keep a register of some chronic diseases. We have started

All programs were written in BASIC computer language. It may take months to develop efficient programming, and the programs described here took many hours of programming time.

ANALYSIS

At first the data were analysed and any information of interest was copied from the screen. But when we acquired the printer we could make permanent records. The analyses that we have made each month are as follows. (a) A complete breakdown of patient contact by disease, showing the number of patients seen by each partner and by the trainee, and the percentage of the work load represented by each disease (fig 2). These data are used mainly to give an accurate picture of the spectrum of disease seen by the partners and trainee. (b) The age and sex distribution of patient contacts between partners and trainee each month (fig 3). (c) A printout of the "top 30" diseases listed by frequency (fig 4). (d) Diseases analysed by age group.

FIG 1—The encounter slip that is used at each surgery.

FIG 2—A section of the patient contacts listed by disease. (Dr C is the trainee.)

FIG 3—A printout of the age and sex distribution of patient contacts for one month.

FIG 4—The "top 30" disease contacts, listed by frequency.

Health visitors are given a printout of all the diseases seen the previous month in infants and children aged 0 to 5 years, with code numbers that allow them to follow up the diseases they are particularly interested in (fig 5).

Accuracy

TYPING

The accuracy of the results depends on feeding correct figures into the computer. From the start we realised that careful handwriting was essential. We thought that it was inevitable that the typist would make some errors in transcribing data and attempted to find out how many errors were occurring. A check over 50 notes showed all the diagnoses to be correct and, although we do not have an accurate error rate, examining 97 contacts with diabetes showed one error and a check of 364 contacts with hypertension showed two errors. This error rate is probably an underestimate, for we would not have picked up diabetic patients who were coded to another disease, but overall it appears acceptable.

CODING

Doctors do the coding and use their own diagnostic criteria. Our figures show interesting differences, but these are inherent in any system of doctor coding, or, indeed, doctor diagnosis. In one of the first months one of the partners had a very high incidence of patients with coryzal-type illnesses and the trainee had coded very few coryzal illnesses but a large number of cases of acute bronchitis. At one of our regular meetings we discussed whether the diagnosis of acute bronchitis might have been an excuse for prescribing antibiotics to patients

each patient who is entitled to repeat prescriptions. When that code number is entered into the machine, a patient's age, name, and address, and a list of the drugs to which he or she is entitled appears on the screen along with the number of months for which the repeat prescription has been authorised against each drug. Pressing the appropriate key causes the computer to print out a prescription, and at the same time it ticks off in the computer's memory that one month's prescription has been issued. When only one month's prescription remains in the memory a reminder comes up to read: "Must see doctor next time." If no further authorisation has been entered, then further prescriptions will not be printed. Although this program has been written and works on cassette tapes, it can't be fully implemented unless the Department of Health authorises us to use computer-compatible prescription forms, and we purchase disc storage for the data files.

CONFIDENTIALITY

The machine is completely under our control. The secretary is a member of the practice staff and is used to dealing with confidential data. The data in the machine are numerically coded so they cannot be related to patients without referring to our age/sex register. The data on cassette tapes are also in a code from which patients and doctors cannot be directly identified. If the method of recording on cassette tapes was standardised, then it would seem possible to analyse these data centrally for epidemiological and other information without compromising patient confidentiality. In an expanded system with the patients' names and addresses recorded on the machine, in addition to the physical security of the machine being under our control, a password would be needed to gain access to any information.

Pitfalls in Practice

Any complaints?

III: Medical service committee procedure

JOHN OLDROYD

Complaints that a general practitioner has breached his terms of service are made to the family practitioner committee (FPC) under the Statutory Instrument No 495, National Health Service (Service Committees and Tribunal) Regulations 1974. These regulations also define the investigation procedure. A vocational trainee cannot become an expert on these regulations, but he should be aware of their existence and have some idea how they work.

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Conclusions

I have developed a combined manual age and sex index and a computerised disease register that we use in our practice of 5000 patients. After six months' use we found that the system was easy to operate within limited objectives. It has simplified two things particularly: monitoring the work load of trainees, and calling up groups of patients by disease.

I thank my partner Dr Joan Woodley, and my trainee, Dr Jane Pavitt, without whose enthusiasm and help this project would not have been possible. I also thank Professor David Metcalfe for his advice in preparing this paper.

Addendum

Since this article was prepared the data files have been transferred to floppy discs on a Commodore 340 disc drive (price £695 plus VAT). This has greatly reduced the time taken to store and recall information and has enabled registers of chronic diseases, as in fig 7, to be produced by the machine.

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Informal procedure

After receiving a complaint the FPC is allowed if it wants to start the investigation with an informal procedure. The FPC appoints a "negotiator" to mediate between the complainant and the doctor in the hope of reaching an amicable settlement. The negotiator is a member of the FPC, but not of the FPC medical service committee. He may appoint one of the doctors on the FPC to help him in his delicate task. Many committees find this informal procedure helpful, but it depends on the calibre of the negotiator, and it is said to be more successful in stable committees. It is not widely used by FPCs in Inner London.

Several FPCs also allow an informal exchange of letters between the parties in the hope that the complainant will withdraw his complaint if he receives a reasoned and sym-

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thetic explanation from the doctor. This procedure is not spelt out in the regulations, but it is helpful where the complaint is founded on misunderstanding, and it does result in many cases being withdrawn without the need of the formal procedure.

Formal procedure

If the informal procedure fails, the complainant's letter is presented to the chairman of the service committee to judge if there is evidence of a prima facie breach in the doctor's terms of service, and if so he starts the formal service committee investigation.

An FPC has to set up a service committee for each of its contractor services: medical, dental, pharmaceutical, and ophthalmic. The medical service committee consists of three nominated lay members of the FPC and three doctors nominated by the corresponding local medical committee (LMC) (these are usually doctors serving on the FPC). The six members then nominate their own chairman, who is usually another member of the FPC who has had experience on the service committee. A deputy chairman is also nominated, but he participates only if the chairman is absent. Most FPCs nominate deputies for the six principal members so that hearings are not held up if the principals are ill or on holiday.

When a complaint is dealt with formally, the regulations detail how the correspondence should proceed and also define such important items as who is allowed to complain and the time limits within which a complaint may be laid. Complaints should be made within eight weeks of an incident, but if a complaint is late the service committee may proceed if the doctor agrees and if it considers the complainant has a good reason for delaying. Even if the doctor does not agree, the service committee may ask for the Secretary of State's permission to proceed.

The service committee may decide when it has received the correspondence that it has sufficient information to decide without a hearing that the doctor was not in breach of his terms of service. This is unlikely if there is any dispute between the parties about the facts in the correspondence.

Hearings are held in private. The parties are informed of the date and time of the hearing and provided with copies of the correspondence. They are informed of their right to bring witnesses, their right to submit relevant documents, and their right to representation. They cannot be represented by a paid advocate or an official of an organisation to which they belong. This means that a doctor may not have legal representation—unless by an unpaid friend—or representation by an official of the defence unions or a paid LMC secretary. He may, however, have such a person present to advise him. Similar privileges and restrictions are applied to the complainant. The administrative handling and recording of the service committee are done by the FPC administrator or his staff.

The hearing

Although there are hard-and-fast rules on certain points—for example, the introduction of new evidence—the chairman has some latitude in how he conducts the hearing. It is not as formal as a court of law, and most chairmen do not allow overbearing or threatening behaviour. He will have been strongly influenced by the Department of Health and Social Security document—*Notes on Service Committee Procedure*. Before the hearing starts the members present make a declaration that they have no interest in the matter to be heard or association with the parties. Generally, the complainant and respondent are introduced to the committee at the same time. The members sit on each side of the chairman and his secretary staff. Even if not advising the respondent, the LMC secretary is entitled to be present at the hearing as an observer.

The complainant is invited to present his complaint, bearing in mind that all present have read the correspondence. He can introduce witnesses and question them to obtain information. Rules of evidence are not as rigid as in a court of law, but no chairman allows this part of the proceedings to become completely unstructured; indeed, many chairmen help the nervous and less competent complainant and witness by helpful advice and questions. After each witness and the complainant have presented their evidence, the respondent doctor is invited to ask questions. This is followed by questions from the members of the service committee.

The procedure is then reversed, the respondent doctor presenting his evidence and being questioned in his turn. Both parties then have the opportunity to sum up and then retire.

The service committee then has to decide whether or not the doctor is in breach of his terms of service. If no breach is found the case finishes at this stage. If, however, a breach is found the service committee then has to recommend how the respondent doctor should be dealt with. At one extreme, it may recommend that he be cautioned to conform with his terms of service; at the other, it may recommend that a tribunal be called to consider whether the doctor should be allowed to continue to practice in the NHS. (The regulations for such a tribunal are beyond the scope of this article, but will be found in the Statutory Instrument.) In between it may recommend a financial withholding—anything from £50 to £1000. In cases where it thinks that the doctor has too big a list it may recommend a compulsory reduction.

Report of the findings

These findings and recommendations are not reported directly to the parties, but are reported in the confidential part of the FPC agenda at its next meeting. Anonymity of the parties is respected. The FPC receives the report presented by the service committee chairman. The FPC does not usually question the finding of whether or not there was a breach, but it may discuss the recommendation, and, indeed, in rare cases ask that recommendation. This decision of the FPC is then passed to each of the parties and to the Secretary of State. Both parties have the right of appeal to the Secretary of State within one month; they must give the reasons on which they intend to base their appeal. The Secretary of State may also in considering the report alter the recommendation. He usually does this in cases where the recommendation is out of line with the usual recommendation for similar breaches. Again both parties can appeal against such alterations by the Secretary of State.

The Secretary of State reports those cases he considers necessary to the General Medical Council. Should no appeal be received within the statutory period, the FPC is notified and it institutes the appropriate action. In cases where one party does appeal, the other party is invited to send his observations to the Secretary of State, who may decide not to have a hearing on appeal after considering all the representations and the FPC report. If, however, he considers the grounds for appeal adequate he will order a rehearing. This is heard by his own nominees, who are usually a chairman, a legal officer of the DHSS sitting with a senior medical officer of the Department, and a senior general practitioner from a panel approved by the General Medical Services Committee.

It is unrealistic to expect any general practitioner to be aware of the intricacies of the service committee procedure. The narrative hints at only some of the complexities. The lesson to be learnt is that by the law of averages a general practitioner may expect to receive a complaint against him in his professional life. He should be aware that there is such a procedure, and he should treat each complaint, however famous or innocent it seems, as a serious threat and obtain advice at the earliest stage from those experienced in the intricacies.

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for many years I have never ceased to be impressed by their inquest. For example, of 5000 cases a year that are reported to the Southwark Coroner's Court 10% will proceed to inquest—that is an average of 10 inquests a week.

Coroner's work

Training for the work requires sitting with the coroner on inquests and listening, examining witnesses, and dealing with counsel's questions. The whole control and conduct of the inquest needs expertise, judgment, and sound commonsense. From a maze of facts, opinions, and the truth often emerges with a pristine elegance of sincerity. It is for the coroner to display this and the most likely probability of what happened in a short summing up to the Court. If a jury is involved he will explain to the jury what verdicts apply. Unfortunately the principal witness is not present—namely the deceased. He or she could have said why 50 Numbat were swallowed when the family were out or why and how the fire started. At the end of the day the relatives and participants come to understand why and how it all happened. Blame

fades, consciences are eased, tragedy is accepted. I have always found this the most satisfying aspect of the work of the coroner. Sometimes an inquest will highlight a particular danger which the public should know about to prevent similar tragedies. It is for the coroner to speak out and say so. The Court is not concerned with apportioning blame or criminal liability but with recording five main facts and these facts alone. Who was the deceased? Where did he die? When did he die? What was the cause of death? What was the manner and means of death?

Pathologists play an important part in every case reported to a Coroner's Court. Their evidence and their evidence alone very often alters the whole structure of a case. Today with all the sophisticated tests and investigations at their disposal the cause of death is indeed very rarely in doubt.

There will always be criticism of every legal system. The Coroner's Court is no exception. I think the system works very well and is eminently fair. It reflects the best endeavours of a free society; an important safeguard and watchdog for us all. I think it will always make a satisfying job for a medical practitioner who sees disease, human frailty, and tragedy as part of his work.

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Emergencies in the Home

Haemorrhage and shock

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Severe haemorrhage, even when it occurs in the relatively well-ordered surroundings of a large hospital, may be dramatic and sometimes frightening for all concerned. Indeed, haemorrhage and fire traditionally give the hospital nurse her only two excuses for running while on duty. When such bleeding occurs in the world outside hospital, perhaps many miles from the nearest skilled help, the drama and fear are multiplied many times over. Unless the correct measures are taken promptly hypovolaemic shock may occur and may well become irreversible. The general practitioner must be prepared to give prompt treatment and to use the skills and equipment that in the past have too often been confined to the hospital.

Although there is nothing particularly remarkable about the following case, it illustrates a typical problem and some of the difficulties a general practitioner may experience.

Case report

Early one morning the wife of a 37-year-old gamekeeper telephoned to say that her husband had just vomited a large quantity of fresh blood. He had a history of indigestion, and although the features strongly suggested peptic ulcer disease, this had never actually been confirmed. He had taken aspirin 24 hours earlier for a "cold" and

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during the next 24 hours had passed a meles stool and had vomited two or three times. His vomit contained a small quantity of blood. His isolated house was about seven miles from the practice surgery and 70 miles from the district hospital.

When the call came it seemed wise to alert the ambulance service, and a message was passed to ambulance control requesting an immediate ambulance with a nurse escort. When I arrived at the patient's home it was obvious from rapid examination of the vomit and bedding that he had indeed had a major bleed. He was fully conscious but pale and sweating, with a pulse rate of 110 per minute and a blood pressure of 100/60 mm Hg. I reassured both the patient and his worried family, and started an intravenous infusion of Haemacel (a colloidal solution of polygeline with electrolytes) after having first taken blood for cross-matching. The contents of one 500 ml bottle were given rapidly, and the next bottle was run in as a fast drip. As the patient was still sweating and retching I gave 10 mg metoclopramide intravenously. I then arranged for him to go to hospital and asked the ambulance driver to drive steadily rather than make a high-speed journey. During the journey oxygen was given by facemask (at 2 l/min). When the patient arrived at hospital about 1½ hours later his pulse rate was still 110 per minute and his blood pressure 110/70 mm Hg. He subsequently required 8 units of blood but made an uneventful recovery. Gastroscopy in hospital showed a duodenal ulcer, which was treated successfully with cimetidine.

Two categories of bleeding

For practical purposes haemorrhage can be divided into two categories:

- (1) Bleeding that can be stopped by measures such as direct

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Beyond the Surgery

General practitioner as coroner

MONTAGUE B LEVINE

When I qualified the words "Coroner's Court" seemed to strike fear into the hearts of us newly-qualified doctors. It conjured up a picture of grief-stricken relatives, future trials involving litigation, grim-faced pathologists, and the all-powerful, ever-wise inquiring coroner. One sincerely hoped that one would be able to survive the whole of professional life with no contact whatsoever with the Coroner's Court. It was only many years later, after much work as a police surgeon and dabbling in many matters forensic, that the Coroner's Court took on a new appeal. It was only then that I felt that work in a Coroner's Court could prove a fascinating and interesting adjunct to general practice. It had assumed a new role and much of the fear had disappeared.

To those general practitioners who aspire to become coroners, deputy coroners, or assistant deputy coroners it is as well to have an interest in forensic medicine and the law. On the whole the medical practitioner shuns the atmosphere of the Law Courts; the cut and thrust of verbal battle is not for him. Marcus Welby, MD and his colleagues on TV make excellent recreation after a tiring day, but he wants no part of murder, rape, or mayhem in his professional life.

To those who find the science of these subjects a challenge, the prerequisites necessary are a medical qualification or a legal qualification of five years' standing. You would have the best of both worlds if you had a double qualification. I will remember a colleague lamenting, "There are enough problems qualifying and getting the odd higher examination, but when do you find time to obtain an entirely unrelated degree?" A DMJ—diploma in medical jurisprudence—is a valuable asset. This course and the examinations are run by many of the doctors of the forensic world. They all seem to become excellent raconteurs, and the histories of their cases with the sophisticated scientific investigations make the TV portrayals seem like Goldilocks and the Three Bears. It is an excellent course and England and Wales are unique in providing this special qualification.

The number of coroners in England and Wales shrinks yearly. The tendency now is to amalgamate the part-time coroner's jurisdictions, making much larger jurisdictions necessitating a full-time coroner who will need a deputy and an assistant deputy. There are now in England and Wales 22 full-time coroners and 180 part-time coroners. Appointments are made by the local authority and submitted to the Lord Chancellor.

Criminals and treasure trove

The office of coroner goes back to the twelfth century, and he was most important in the County during the thirteenth and fourteenth centuries. The coroner was the principal agent of the

Crown in bringing criminals to justice. As well as being an investigator of violent death (and there have been many at that time), he also acted as a judge on charges of rape, burglary, and robbery. He was also a great source of revenue for the Crown; the forfeiture of sureties, the seizure of the possessions of felons, and the confiscation of deadlocks, wrecks, and treasure trove were a good source of revenue. Who knows what manner of skulluggery and chicanery went on in those days? Coroners were selected from the landed gentry, and it has been suggested that if they failed in their revenue collecting duties, the deficiency could be made good out of their own possessions—a sobering thought indeed!

Today the Coroner's Court inquires into suspicious, violent, or unexplained deaths, deaths in prison, removal of dead bodies out of England and Wales, and ownership of treasure trove. The Criminal Law Act of 1977 abolished the criminal jurisdiction of the coroner. This has brought an end to the duty of the coroner with jury to name any person it finds guilty of causing a death. Gone are the days when the newspapers and news media waited with bated breath for the jury to name someone they found guilty of murder, manslaughter, or infanticide. The only pleasant duty of a Coroner's Court is the finding of treasure trove. I have not had the good fortune to sit on such a case as yet. The thought of some 15-year-old boy working for his "O" levels who suddenly finds gold bullion, precious stones, and silver plate from the home of the Sheriff of Nottingham while poking the ground near his house is a most intriguing imagination. Oh, those magical questions: "Of what did such finds consist?" "Where was the find deposited?" "Was it intentionally hidden or concealed, or accidentally lost, or purposely abandoned?" If lost or abandoned it is treasure trove, and the finder is entitled against everyone but the true owner—and the Sheriff of Nottingham is not around to make his claim. And Mum and Dad sitting in Court beaming, "I always knew our John would make some money!"

Coroner's officers

The first time I ever spoke to a coroner's officer was some 20 years ago. I spoke to him at the dead of night with some ghastly problem. "Leave this to us, Sir, and we will let you know the outcome in a few days," the voice said at the end of the phone. "I will notify the police and arrange everything," he continued. He sounded as though he had said this one hundred times before, as indeed he had. The coroner's officer is a rare breed. He is usually a policeman who has entered the coroner's service. As he grows into the job he develops a unique diplomacy of dealing with the surroundings of death and bereavement. Relatively few are at their best when confronted with tragedy. They own remorse and on occasion their conscience of guilt, very often misplaced, imposes many problems on the preparation of a case. There is need for gentle tact and understanding. Having worked with coroners' officers

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pressure and elevation—for example, lacerations and wounds, nose bleeds, bleeding varicose veins, tooth sockets, etc.

(2) Bleeding that cannot be stopped by simple means—for example, internal bleeding from trauma, gastrointestinal bleeding, or bleeding associated with fractures. A fractured femur may cause the loss of as much as a litre of blood, and multiple fractures may also lead to considerable blood loss. Menorrhagia and the haemorrhages associated with miscarriage or pregnancy can also be included in this group.

Diagnosing the cause of the bleeding

The source of bleeding is usually all too obvious, and it is the "unrevealed" internal bleed that may cause diagnostic problems. Internal bleeding should always be suspected as a possible cause of shock, especially in an unconscious patient, and its presence must always be assumed in cases of long bone fracture or multiple fractures.

How to treat a patient who is bleeding

Treatment can often start as soon as the call is received. The doctor can give simple, concise instructions by telephone for direct pressure and for raising the bleeding part. Receptionists should always try to pass this type of call directly to the doctor if he is in the surgery. When a reliable message suggests the possibility of a serious incident it is always as well to alert the ambulance service. Not only does this save valuable time, especially when long distances have to be covered, but it also provides welcome and skilled help at an early stage. Members of immediate-care schemes know only too well the inestimable value of having an ambulance-linked radio-telephone in their car on such occasions.

REASSURE

On arriving at the patient's home the doctor may be greeted by a scene resembling something from a horror film and by a frightened, distressed patient. The doctor must not forget to give the first vital words of reassurance to all concerned, even though he himself may need as much reassurance as they do. These words of comfort can do much to allay the development of early shock.

STOP THE BLEEDING

Bleeding must be stopped whenever possible either by using pressure dressings or by direct finger pressure. Very occasionally artery forceps are required to secure haemostasis, and sometimes it is necessary for the doctor to travel to hospital with the patient to maintain the necessary direct pressure. Tourniquets are dangerous and have little or no place in controlling haemorrhage. Their use is justified only in the most extreme circumstances for alternative life-saving measures to be taken. Raising the legs is a simple measure that helps to increase venous return, and oxygen should always be given if available.

INTRAVENOUS INFUSION

All cases of serious haemorrhage require an intravenous infusion. It is best to start this early except in cases such as serious intracranial bleeding, when the need for immediate transfer outweighs the need for infusion. Infusion equipment is cheap, easily obtained, and easy to use, and few doctors entering general practice these days have not had experience in infusion techniques. When a long journey is necessary an infusion should always be set up. It is technically much easier to do before veins

have collapsed, and it will help to prevent or delay the onset of shock. It also gives access to the circulation for drugs, plasma expanders, and so on. The literature is sometimes advanced that early infusion outside hospital may restart bleeding which has stopped, but in practice this does not seem to happen, and infusion should never be delayed on account of this (theoretical) fear.

Infusion equipment—I suggest that general practitioners should carry the following infusion equipment at all times:

- (1) Intravenous giving-set. Models such as the Baxter Set incorporate a pump chamber that is valuable when rapid infusion is needed.
- (2) Intravenous needle/cannula. The Venflon or Argyle Medicut are suitable types. The latter is easiest as simple to use as a conventional syringe and needle, and the attached syringe simplifies taking a blood sample for cross-matching.
- (3) Cross-matching blood sample tubes, swabs, and strapping.
- (4) Cut-down set. It should be possible to arrange with one's local hospital to have this in a sterile pack.
- (5) Infusion fluid—for example, normal saline, Ringier-lactate, or Haemacel. The type of fluid used is of secondary importance; it is the restoration of circulation blood volume that is all important in the early stages. Haemacel is cheap, has a long shelf life, is supplied in unbreakable plastic containers, and, unlike other large-molecule plasma expanders, does not interfere with subsequent cross-matching, which when bringing the extremities of temperature that may occur in the car boot. The use of whole blood should be considered only when the patient cannot be moved for some considerable time, as when, for instance, an injured person is trapped.

PAIN RELIEF

Small incremental doses of drugs such as pentazocine and diazepam given intravenously will most easily achieve relief of pain and sedation. Morphine may cause vomiting and if used should be combined with cyclizine. Pethidine may cause a considerable fall in blood pressure. Nausea or vomiting can usually be controlled with metoclopramide or cyclizine. When transporting patients they must be kept flat or in a head-down position. Fallot's sign is a warning that when bringing a shocked patient downstairs by stretcher may cause severe hypotension. Patients must not be allowed to become cold to the point of shivering because the necessary muscle activity consumes large amounts of oxygen that the body cannot well do with elsewhere; nor should they be overwarmed as the resulting vasodilation may precipitate circulatory failure.

Serious haemorrhage shock, or both, are life-threatening emergencies that a general practitioner may face at any time and to which he must be prepared to respond promptly and efficiently. Doctors should ensure that they are adequately equipped and trained in resuscitation techniques. The successful handling of these patients presents a challenge to both clinical and administrative skills and gives the general practitioner an opportunity to use his hospital training to the full.

Those who read or write much, should be very attentive to their posture. They ought to sit and read or write with their feet on an erect posture as possible. Those who dictate, may do it walking. It has an excellent effect frequently to read or speak aloud. This not only exercises the lungs, but also the whole body. Hence the importance of posture, and the importance of the doctor as a public speaker, indeed, sometimes hurt themselves by over-acting their part; but this is their own fault. The martyr to mere vocalisation merits not our sympathy.

(Bachan's Domestic Medicine, 1786.)

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