major concern, as Stephen Leadbeatter and Bernard Knight point out.[2] Recent Australian research has developed and validated a method to distinguish between major errors in certification, which may affect the coding of underlying cause of death (16% of 430 certificates in a sample in 1990), and minor errors with no such significance.[3]

The challenge is to change knowledge, attitudes, and practice with respect to death certification. Experience with an educational intervention in a teaching hospital's quality assurance programme has been described.[4] Attitudinal factors are critical with respect to both death certification and necropsy practice.[5,6]

The Brodrick report also pointed out the mutual dependence of coroners and doctors with regard to accurate certification of the cause of death.[1] Non-medical coders extract and code the underlying cause of death from information on the death certificate, using the World Health Organisation's rules for selection and modification. Queries are made only when the content is inadequate for specific coding; checking of the narrative sequence and the accuracy of the cause of death should ideally be done beforehand by medical or coronial staff. It seems strange then that, at least in Australia, there is no requirement that coroners frame their findings on cause of death in the same fashion as the medical certificate.

Key steps to improving the current situation are that teaching hospitals should introduce a quality assurance programme (perhaps mandatory and linked to hospital accreditation processes) incorporating education about death certification and necropsies and monitoring of performance at certification and necropsies; coding staff should maintain a uniform programme regarding queries; and coronial and public health functions should be integrated into a single framework, as Leadbeatter and Knight suggest.

TARUN STEPHEN WEERAMANTHRI

Menzies School of Health Research,
Darwin,
Northern Territory,
Australia

1 Committee on Death Certification and Coroners. *Report*. London: HMSO, 1971. (Cmnd 4810.)
2 Leadbeatter S, Knight B. Reporting deaths to coroners. *BMJ* 1993;**306**:1018. (17 April.)
3 Weeramanthri TS, Beresford W. Death certification in Western Australia—classification of major errors in certificate completion. *Australian Journal of Public Health* 1992;**16**:431-4.
4 Weeramanthri TS, Sathianathan V, Beresford W. An evaluation of an educational intervention to improve death certification practice. *Aust Clin Rev* (in press).
5 Bell G, Cremona A. Alcohol and death certification: influencing current practice and attitudes. *Br J Addict* 1989;**84**:1523-5.
6 Start RD, Hector-Taylor MK, Cotton DWK, Startup M, Parsons MA, Kennedy A. Factors which influence necropsy requests: a psychological approach. *J Clin Pathol* 1992;**45**: 254-7.

24 hour rule unnecessary

EDITOR,—R D Start and colleagues' article about deaths that should be reported to the coroner may cause confusion.[1] Nowadays doctors are well trained and have many modern aids to rapid diagnosis. As a result it is superfluous and sometimes distressing for relatives to have local rules for reporting all deaths within 24 hours of admission to hospital or 24 hours after recovery from anaesthesia and, indeed, after detention under the Mental Health Act. Inevitably, a number of these deaths will be reported, but this will be because the death is believed to have been violent or unnatural or the cause is unknown. In Birmingham the 24 hour rule was abolished many years ago, and as far as I am aware this has caused no problems.

I therefore agree with Stephen Leadbeatter and Bernard Knight that the local rules cited by Start and colleagues put the coroner outside his or her jurisdiction.[2] My own experience is that the registrar of births, marriages, and deaths makes inquiries and studies the certificate given by the doctor and as a result makes many referrals to the coroner on the grounds that the death may have been unnatural or that the death certificate is incomplete or misleading.

In the crowded medical curriculum there is insufficient teaching on medicolegal matters and completing a death certificate. This may well need to be remedied. Leadbeatter and Knight also refer to the possible benefits of a "medical examiner" system. As most deaths referred to the coroner require a medical decision rather than a legal opinion in a court of law I conclude that a doctor is best able to judge the many pathological and other medical reports before deciding a course of action. It might reasonably be argued that all coroners should be medically qualified.

RICHARD M WHITTINGTON

Coroner's Court,
Birmingham B4 6NE

1 Start RD, Delargy-Aziz Y, Dorries CP, Silcocks PS, Cotton BWK. Clinicians and the coronial system: ability of clinicians to recognise reportable deaths. *BMJ* 1993;**306**:1038-41. (17 April.)
2 Leadbeatter S, Knight B. Reporting deaths to coroners. *BMJ* 1993;**306**:1018. (17 April.)

Pressure sores underreported

EDITOR,—R D Start and colleagues assessed clinicians' ability to recognise deaths that require referral to the coroner.[1] I believe that conditions that would be referred to the coroner if they were entered on death certificates are underreported, a good example being bed sores. In 1986, 171 death certificates recorded pressure sores as a cause of death, with 1229 mentions. This, however, is a very small number when one considers that 22-37% of about 60 000 patients are at risk of death due to pressure sores.[2] One would expect pressure sores to be recorded on several thousand certificates. This underreporting arises because pressure sores are commonly considered, including by coroners, to indicate a poor quality of care even though the clinical condition of the patient, including acute illness and age, increases susceptibility to pressure sores.

B J LIDDLE

Department of Geriatric Medicine,
St George's Hospital,
London SW17 0RE

1 Start RD, Delargy-Aziz Y, Dorries CP, Silcocks PB, Cotton DWK. Clinicians and the coronial system: ability of clinicians to recognise reportable deaths. *BMJ* 1993;**306**:1038-41. (17 April.)
2 Allman RM. Pressure sores among the elderly. *N Engl J Med* 1989;**320**:850-3.

Medical management of miscarriage

Psychological impact underestimated

EDITOR,—In their paper on the medical management of miscarriage R C Henshaw and colleagues state that women were reviewed 12-18 hours after treatment, when pelvic examination was repeated.[1] They do not mention, however, whether the patients were sent home during this time (which would have been inconvenient for the patients) or were kept in the hospital (which would have been expensive for the hospital, nullifying the economic benefits of medical treatment).

I would also like to draw attention to the psychological impact of medical treatment, which I observed while working in Northampton General Hospital, where medical management was routinely offered to all women requesting termination of pregnancy. The patients were admitted to the hospital 48 hours after taking mifepristone and were given vaginal prostaglandin; then they would collect in a bowl every blood clot or product of conception, which was later reviewed for completeness by nurse and doctor. Many patients were so distressed to see the fetus that they regretted their decision and felt guilty. Retrospectively, they said that they would have opted for surgical treatment, when they would not see anything. The nurses were also distressed to see the fetus, and two nurses, who were pregnant, refused to collect and examine the products. Patients with inevitable and incomplete miscarriage are already distressed, and asking them to collect all products and blood clots will make them even more so. At least with surgical treatment the uterus is evacuated under anaesthesia in one go and after the procedure patients feel normal.

Another important advantage of surgical treatment is that samples are obtained for histological examination in almost all cases, while in the present study products of conception could be identified in only 25 of 44 cases. This has important implications as some of the spontaneous miscarriages can be due to hydatidiform mole, especially partial mole, where histological diagnosis is of the utmost importance because follow up is needed.

Psychological aspects should be taken into consideration when randomised studies comparing medical and surgical management for incomplete and inevitable miscarriages are planned.

J B SHARMA

Department of Obstetrics and Gynaecology,
Kettering and District General Hospital,
Kettering,
Northamptonshire NN16 8UZ

1 Henshaw RC, Cooper K, El-Refaey H, Smith NC, Templeton AA. Medical management of miscarriage: non-surgical uterine evacuation of incomplete and inevitable spontaneous abortion. *BMJ* 1993;**306**:894-5. (3 April.)

Should we intervene in uncomplicated miscarriage?

EDITOR,—Both R C Henshaw and colleagues' paper[1] and Peter Macrow and Max Elstein's editorial[2] conclude that a prospective randomised trial is needed to compare active medical management of miscarriage with the traditional surgical curettage. Both articles fail to address the far more fundamental question of whether any intervention (medical or surgical) is necessary for uncomplicated spontaneous inevitable or incomplete abortion.

Where is the evidence from randomised controlled trials supporting "routine" dilatation and curettage, which is usually performed by a junior doctor? The editorial does not refer to any supporting evidence, and Henshaw and colleagues quote a paper published in 1944 supporting the traditional surgical intervention, which does not contain any scientific evidence or refer to any other papers that support surgical intervention. Indeed, the authors of both papers, although half a century apart, state that the uterus must be emptied as soon as possible without supporting scientific evidence.

So is it necessary to intervene at all in uncomplicated miscarriage to prevent complications? Much anecdotal evidence from general practice suggests that women do survive miscarriages safely without active intervention.

I agree with the authors that a randomised controlled trial is needed, but not of surgical versus active medical management but of no active intervention versus any intervention. Only then would the trial they propose be justified. It may well be found that a substantial number of women with uncomplicated miscarriage do no worse medically by avoiding intervention. They would certainly avoid the trauma and discomfort of separation from their family, admission to hospital, and potentially unnecessary surgical and anaesthetic procedures at a time when they need the support of their family and general practitioner. In

view of the great variation in management,[3] the results of such a trial would help women with bleeding in early pregnancy, and their general practitioners, decide what is best.

Women are dissatisfied with the care that they receive when they miscarry,[4] and the lack of effective treatment for threatened miscarriage probably contributes to their dissatisfaction. Perhaps, it is the medicalisation of miscarriage—a sad but common physiological event—that has greatly contributed to women's dissatisfaction. If so, we as doctors have only ourselves to blame.

LINDSAY F P SMITH

Ilchester,
Somerset

1 Henshaw RC, Cooper K, El-Refaey H, Smith NC, Templeton AA. Medical management of miscarriage: non-surgical uterine evacuation of incomplete and inevitable spontaneous abortion. *BMJ* 1993;**306**:894-5. (3 April.)
2 Macrow P, Elstein M. Managing miscarriage medically. *BMJ* 1993;**306**:876. (3 April.)
3 Everett C, Ashurst H, Chalmers I. Reported management of threatened miscarriage by general practitioners in Wessex. *BMJ* 1987;**295**:583-6.
4 Friedman T. Women's experiences of general practitioner management of miscarriage. *J R Coll Gen Pract* 1989;**39**:456-8.

Better quality data for Down's syndrome register

EDITOR,—We agree with Kevin Spencer[1] and M R Gaudoin[2] that the data on the national Down's syndrome register[3] depend on the quality of information provided to the cytogenetic laboratory by the referring clinicians. In about half of the cases on the register we obtain additional information from the clinicians that was not supplied to the laboratories, and we would of course welcome more. Perhaps the most pressing need in evaluating the current genetic service is data on the proportion of mothers who are offered different types of screening and the numbers of amniocenteses that follow. Some but not all of this information is held by local laboratories, and there is a need to aggregate these data. We also agree that it is not always easy to know whether ultrasound scanning for malformations preceded or followed serum testing, and there is certainly a problem with the terminology used to describe the tests performed.

We have, however, perceived a considerable and continuing improvement in the quality of data we have received over the four years that the register has been functioning, and the consistent nature of the trends we have reported is some evidence of their validity. Preliminary analysis of data entered on the register by February this year shows that referrals after positive results of serum screening rose from 7·8% of all diagnoses in 1991 to 11·7% for the first half of 1992. In the same period, cases in which ultrasound findings were reported as the prime indication for fetal karyotyping rose from 7·7% to 9·3%, and cytogenetic referrals said to be for raised maternal age fell from 20% to 16·5%.

DAVID MUTTON
EVA ALBERMAN
ROY IDE

Wolfson Institute of Preventive Medicine,
St Bartholomew's Hospital Medical College,
London EC1M 6BQ

MARTIN BOBROW

Paediatric Research Unit,
Division of Medical and Molecular Genetics,
United Medical and Dental Schools,
Guy's Hospital,
London SE1 9RT

1 Spencer K. Antenatal diagnosis of Down syndrome. *BMJ* 1993;**306**:650. (6 March.)
2 Gaudoin MR. Antenatal diagnosis of Down syndrome. *BMJ* 1993;**306**:791-2. (20 March.)
3 Mutton DE, Ide R, Alberman E, Bobrow M. Analysis of national register of Down's syndrome in England and Wales: trends in prenatal diagnosis. *BMJ* 1993;**306**:431-2. (13 February.)

Coding of clinical diagnoses

Clerical and medical errors contribute to inaccuracy

EDITOR,—C Yeoh and H Davies found that the accuracy of inpatient clinical coding improved when responsibility was transferred from clerical to medical staff.[1] Reasons for miscoding, however, are complex. We recently used data on inflammatory bowel disease of juvenile onset held in Scottish Hospital In-Patient Statistics to examine this subject.[2] We derived a geographically based sample of 255 patients aged 1-20 who had been coded in the statistics as having either Crohn's disease or ulcerative colitis,[3] and we examined the relevant hospital case records. We found that the coded diagnosis was incorrect in 47 (18·4%) instances.

In only 16 cases was the error clerical; in each of these cases the clinical records clearly showed that the doctors had made some other diagnosis but the summary form prepared by a coding clerk had the code number for Crohn's disease or ulcerative colitis. Most of these clerical errors were for patients with conditions with names similar to synonyms for Crohn's disease or ulcerative colitis.

In 24 cases the doctors' clinical diagnosis was subsequently shown to be wrong, although in most of these cases the available clinical information was compatible with the diagnosis made at the time. In 13 of these cases the diagnosis was revised when more clinical and laboratory information became available; in the 11 others symptoms settled and the patient was discharged from follow up without any firm alternative diagnosis being made. In seven other patients there was merely a misclassification within irritable bowel disease, in six because the clinical features in the early stages of disease did not allow definitive diagnosis and in one because of a clerk's miscoding.

In view of the implications of the diagnosis of incurable chronic but treatable illnesses such as irritable bowel disease we suggest that the degree of confidence in the clinical diagnosis (possible, probable, definite), or the absence of any firm diagnosis, might reasonably be incorporated in the coding system. A way of doing this should be considered when new decisions on coding policies are being made.

Finally, although prompt dictation and typing of a discharge letter may seem ideal, in some cases it may be sensible to delay final documentation until critical radiological or pathological reports are available. An early but incomplete discharge document may be administratively tidy but is clinically and epidemiologically meaningless.

ANNE FERGUSON
JOHN MURCHISON
J ROGER BARTON

Department of Medicine,
Western General Hospital,
University of Edinburgh,
Edinburgh EH4 2XU

1 Yeoh C, Davies H. Clinical coding: completeness and accuracy when doctors take it on. *BMJ* 1993;**306**:972. (10 April.)
2 Murchison J, Barton JR, Ferguson A. An analysis of cases incorrectly coded as inflammatory bowel disease in Scottish hospital in-patient statistics (SHIPS). *Scott Med J* 1991;**36**: 136-8.
3 Barton JR, Ferguson A. Clinical features, morbidity and mortality of Scottish children with inflammatory bowel disease. *Q J Med* 1990;75:423-39.

Persevere with Körner system

EDITOR,—Given the low quality of captured data on diagnosis reported by previous studies,[1] it is refreshing to read that C Yeoh and H Davies resolved this problem by purchasing a new information technology system and transferring the entire responsibility of clinical coding to medical staff.[2]

But given the already considerable workload of medical staff, which is likely to get even worse with the gradual implementation of the junior doctors' new deal on working hours,[3] it is doubtful whether doctors in most other hospitals could take on the burden of coding clinical material and entering the codes into the computer. New systems implemented by individual departments or hospitals incur additional costs and they are not uniform, thus making linkage and comparison with other units and hospitals more difficult. The Körner information system is superior in this regard because it was standardised across all regions in the country.[4] It would be preferable for hospitals to identify and rectify the reasons for inaccuracy of their existing Körner information system. Furthermore, there is provision within the system to expand data capture in order to include items of local interest or needs.

In a recent study at Leicester General Hospital (presented at the meeting of the Medical Research Society, April 1993) we found that completeness of Körner coding (performed by trained clerical staff) was virtually 100%, and recorded codes were correct in 75%, partially correct in 19%, and incorrect in only 6% of cases. These findings are more encouraging than in previous reports, but clearly there is room for improvement. The main source of error was insufficient information given by junior doctors in the document from which coding clerks derived the diagnoses. One way to improve doctors' contribution to clinical coding is to ensure that the appropriate diagnoses are entered on the coding document during the consultant and registrar ward rounds each time a patient discharge is arranged. As patients' details and diagnoses are usually reviewed by the more senior staff just before their discharge, correct entry of clinical data for coding can be achieved quickly and with minimal added effort. Coding clerks could then allocate the appropriate codes to the right diagnoses. Our study of 117 patients found that experienced coding clerks allocated an incorrect code despite thorough and clearly presented diagnoses in only two cases.

B PANAYIOTOU

Manor Hospital,
Walsall WS2 9PS

1 Bunch C. Developing a hospital information strategy: a clinician's view. *BMJ* 1992;**304**:1033-6.
2 Yeoh C, Davies H. Clinical coding: completeness and accuracy when doctors take it on. *BMJ* 1993;**306**:972. (10 April.)
3 Dillner L. Juniors' new deal meets its first deadline. *BMJ* 1993;**306**:807-8. (27 March.)
4 Windsor P. Introducing Körner: a critical guide to the work and recommendations of the Steering Group on Health Services Information. Weybridge: BJHC Publications, 1986.

Hepatitis C from immunoglobulin infusions

EDITOR,—In the Hammersmith staff round on chronic liver disease due to hepatitis C the discussion group thought it unlikely that the patient, who had common varied immunodeficiency, could have acquired hepatitis C after immunoglobulin infusions: Levi states that "immunoglobulin preparations . . . are treated to render viruses inactive."[1] Immunoglobulin preparations in present use are treated to inactivate viruses, and screening of blood donors for hepatitis C makes the chance of infection less likely. In the early 1980s, however, several commercial immunoglobulin preparations caused outbreaks of non-A, non-B hepatitis, most of which have since been confirmed as having been hepatitis C.[2]

In one of the best documented studies use of intravenous immunoglobulin prepared by the British Blood Products Laboratory with alcohol fractionation led to the development of non-A, non-B hepatitis in 12 patients with agamma-