measurement of bone mineral content combined with a biochemical assessment of bone loss can identify menopausal women at highest risk of bone loss.[1] As they indicate, newer markers of bone formation might further improve the diagnostic value of their biochemical model. We suggest substituting measurement of the bone derived isoform of alkaline phosphatase in serum for that of total alkaline phosphatase activity.

Bone derived alkaline phosphatase in serum is now readily measured in diagnostic laboratories by the techniques of wheat germ lectin affinity electrophoresis and wheat germ lectin precipitation of the bone isoform, which we have developed.[2] Wheat germ lectin precipitation of the bone isoform is particularly simple, and a commercial kit is available.[3]

In a study of 60 healthy perimenopausal women we have shown significant inverse correlation between the activity in serum of the bone derived isoform of alkaline phosphatase and bone vertebral mineral density measured by dual photon absorptiometry ($r=0{\cdot}55$, $p<0{\cdot}001$ for affinity electrophoresis; $r=0{\cdot}32$, $p=0{\cdot}012$ for lectin precipitation), whereas serum total alkaline phosphatase activity and bone mineral density showed no significant correlation.[4] Substituting measurement of the bone isoform for that of total alkaline phosphatase would therefore be expected to improve significantly the biochemical assessment of bone loss.

J D JOHNSTON
A Y FOO
S B ROSALKI

Department of Chemical Pathology and Human Metabolism,
Royal Free Hospital and School of Medicine,
London NW3 2QG

1 Hansen MA, Overgaard K, Riis BJ, Christiansen C. Role of peak bone mass and bone loss in postmenopausal osteoporosis: 12 year study. *BMJ* 1991;**303**:961-4. (19 October.)
2 Rosalki SB, Foo AY. Two new methods for separating and quantifying serum and liver alkaline phosphatase isoenzymes in plasma. *Clin Chem* 1981;**30**:1182-6.
3 Rosalki SB, Foo AY, Barlina A, Prellwitz W, Fateh-Maghadam A, Klein G, *et al.* Evaluation of a new iso-ALP test kit in four clinical centres in Europe. *Clin Chem* 1990;**36**:1179-80.
4 Johnston JD, Koneru S, Kuwana T, Rosalki SB. Bone-derived serum enzymes and bone density in perimenopausal Caucasian women. *Clin Chem* (in press).

Orthopaedic surgeons and thromboprophylaxis

SIR,—The correction[1] of the dose of heparin cited in P F Leyvraz and colleagues' report on the relative merits of low molecular weight heparin and adjusted standard heparin[2] allows us to comment on the adequacy of the dosage used in the study. The mean daily heparin dose was never greater than 4500 units eight hourly, the overall mean dose being between 3527 IU (in patients with deep vein thrombosis) and 3704 IU (in those without deep vein thrombosis) eight hourly. Although this study used sodium heparin rather than calcium heparin and the bioavailability of calcium heparin is greater,[3] the mean adjusted dose was lower than the usual fixed dose of 5000 IU eight hourly. This may account for the inferior degree of protection achieved against proximal vein thrombosis.

In an earlier dose adjustment study we compared adjusted and fixed dose regimens of standard calcium heparin in hip surgery, obtaining complete protection against proximal vein thrombosis by using an adjusted dose regimen.[4] The mean adjusted dosage was 93·5 IU/kg eight hourly (≈6500 units eight hourly). Unlike in the collaborative study of Leyvraz and colleagues, in which a slight (2·5 s) prolongation within the normal range was the target, we aimed at marginally prolonging the activated partial thromboplastin time by 5-10 s above the upper limit of the normal range (1·1 to 1·2 activated partial thromboplastin time ratio), using a reagent responsive to heparin. Parallel observation with an anti-IIa heparin assay showed the heparin concentrations to be 0·05-0·09 IU/ml in patients with an activated partial thromboplastin time in the desired range. The therapeutic range we used for dose adjustment was not empirical but was derived from previous observations of the activated partial thromboplastin time in patients receiving fixed and adjusted regimens.[5,6]

We believe that adjusted dose standard heparin is effective in preventing proximal vein thrombosis after hip surgery provided that monitoring of the activated partial thromboplastin time ensures measurable circulating heparin. The target range used in adjusting the dose of heparin is therefore a critical factor for the success or failure of the exercise.

L POLLER
D A TABERNER

UK Reference Laboratory for Anticoagulant Reagents and Control,
Withington Hospital,
Manchester M20 8LR

1 Correction. *BMJ* 1991;**303**:1243. (16 November.)
2 Leyvraz PF, Bachmann F, Hoek J, Buller HR, Postel M, Samama M, *et al.* Prevention of deep vein thrombosis after hip replacement: randomised comparison between unfractionated heparin and low molecular weight heparin. *BMJ* 1991;**303**: 543-8. (7 September.)
3 Thomas DP, Sagar S, Starkatakis JD, Malei FHA, Erdi A, Kakkar VV. Plasma heparin levels after administration of calcium and sodium salts of heparin. *Thromb Res* 1976;**9**:241-8.
4 Taberner DA, Poller L, Thomson JM, Lemon G, Weighill FJ. Randomised study of adjusted versus fixed low dose heparin prophylaxis of deep vein thrombosis in hip surgery. *Br J Surg* 1989;**76**:933-5.
5 Taberner DA, Norman C, Poller L, Burslem RW, Jones JB. The value of the standardised partial thromboplastin time in detection of heparin during low dose prophylaxis. *Br J Haematol* 1979;**43**:317-22.
6 Poller L, Taberner DA, Sandilands DG, Galasko CSB. An evaluation of APTT monitoring of low dose heparin dosage in hip surgery. *Thromb Haemost* 1982;**47**:50-3.

Profit and loss account

SIR,—J E Marley's otherwise very reasonable piece was unfortunately marred by a reference in dispensing practice to which we at the Dispensing Doctors' Association take great exception.

Dr Marley should supply the evidence on which he has based his claim that "some dispensing practices are obviously fraudulent" or, alternatively, should withdraw the offensive remark. The statement is all the more damaging as it comes from a colleague and is published in an international publication of great repute.

It could be said that "many pharmacies are obviously fraudulent" as indeed they are, according to successive disciplinary pages of the *Pharmaceutical Journal*. That being so would he equally and fairly raise the question "of whether the NHS can afford to allow many of these (pharmacies) to continue dispensing"? If so, from whom will patients then receive their medication?

DAVID ROBERTS

Chairman,
The Dispensing Doctors' Association,
Northampton NN6 7HG

1 Marley JE. Profit and loss account. *BMJ* 1991;**303**:1071. (26 October.)

AUTHOR'S REPLY,—Many dispensing general practices obviously provide an excellent service to their patients, and if I gave the impression that most are fraudulent then I unreservedly apologise.

I am concerned that David Roberts believes that colleagues should be constrained from mentioning abuses that may occur within a profession. The potential for exploitation within dispensing is present because an expert seller is selling a complex commodity to an inexpert buyer, whose account is settled by a third party. It may be justified with claims of clinical freedom. Some examples of fraud were described in the British television programme *First Tuesday* ("Sweetening the Medicine," 6 Nov 1990, Yorkshire Television), which reached a far greater international audience than the readership of the *BMJ*. I have not so far seen evidence of any retraction of the statements made there. One may wish to dismiss this "as only television journalism," but personal experience and reports from pharmaceutical representatives suggest that this is not so. Representatives are often popularly portrayed as being of doubtful integrity, so they understandably feel aggrieved when faced with doctors whose behaviour is questionable or even corrupt. Many would be willing to provide the evidence that Dr Roberts requests.

I am sure that pharmacists are quite able to defend themselves from Roberts's intimation. The fact that disciplinary pages are published in the *Pharmaceutical Journal* may, however, mean that pharmacists are capable of better regulation than doctors and not afraid of being publicly accountable. Perhaps, as doctors, we should be prepared to follow their example.

J E MARLEY

Department of Community Medicine,
University of Adelaide,
GPO Box 498,
Adelaide,
South Australia 5001

Randomised clinical trials in clinical practice

SIR,—We have encountered similar problems, although to a lesser degree, to those found by G Tognoni and colleagues concerning what general practitioners agree to do for a study and what they actually do.[1]

In our study of outcomes of treatment for menorrhagia participating general practitioners are asked to recruit any patient aged 30 to 49 who consults with symptoms of menorrhagia and no serious concurrent illness. Recruitment entails telling the patient about the study and handing her a questionnaire. In addition, the general practitioners complete a simple one page form about the current consultation. Advice was sought from general practitioners over the design of this form, which is easy and quick to complete. Contact with general practitioners is maintained by progress reports every six weeks.

To obtain a cohort of 1000 patients we anticipated a recruitment period of three to six months involving 250 general practitioners, each recruiting at the rate of at least one patient a month.[2] We approached about 1000 and 281 agreed to participate, joining the study at various times since February this year. To date only 107 have recruited any patients and only 62 have recruited more than one patient. We have therefore been forced to extend the recruitment phase of the study.

We asked 73 non-active general practitioners who had been in the study for six months why they had not recruited anyone. The most common reason given was that no eligible patients had consulted. Short of our checking through all the general practitioners' notes, this apparent dearth of patients consulting for menorrhagia is difficult to establish. The next most common reasons were that the general practitioners forgot and that they were too busy.

Unlike the relatively rare condition studied by Tognoni and colleagues, menorrhagia is one of the most frequent reasons why general practitioners refer women to hospital. The protocol for this observational study is uncomplicated and requires no more than 10 minutes of a general practitioner's time each month. Prospective studies such as ours that start in general practitioners' surgeries are important as they include data collected from

patients not referred to hospital, who would be missed by hospital based research. Such information is essential for developing guidelines for referral and treatment.[3] It is therefore of concern that general practitioners who initially seem willing to help often fail to do so. We agree with Tognoni and colleagues that reliance on financial incentives to persuade general practitioners to participate in research would be counterproductive. Are there any other incentives that could be invoked?

VIV PETO
ANGELA COULTER

Health Services Research Unit,
University Department of Public Health and Primary Care,
Radcliffe Infirmary,
Oxford OX2 6HE

1 Tognoni G, Alli C, Avanzini F, Bettelli G, Colombo F, Corso R, *et al.* Randomised clinical trials in general practice: lessons from a failure. *BMJ* 1991;**303**:969-71. (19 October.)
2 Royal College of General Practitioners, Office of Population Censuses and Surveys, Department of Health and Social Security. *1981-1982 Morbidity statistics from general practice.* London: HMSO, 1986.
3 Coulter A, Bradlow J, Agass M, Martin-Bates C, Tulloch A. Outcomes of referrals to gynaecology outpatients clinics for menstrual problems: an audit of general practice records. *Br J Obstet Gynaecol* 1991;**98**:789-96.

Manslaughter convictions for making mistakes

SIR,—In her editorial on the two doctors recently convicted of manslaughter Clare Dyer writes: "Bringing the full weight of the criminal law on two fledgling doctors will do little to remedy a system which lets juniors loose on patients with too little training, too little support, and too little sleep."[1] She is correct in this but, perhaps constrained by her position as legal correspondent, does not go far enough. It is a disgrace that a recently qualified house officer and a senior house officer, both in general medical training, should carry out a specialised invasive procedure—intrathecal injection of cytotoxic drugs in this instance—without experienced supervision and instruction, if indeed they should have been allowed to perform such a procedure at all.

Reasons and excuses will be advanced for this sad mistake, but neither of these two doctors is culpable of doing more than mistakenly carrying out a procedure, in good faith and in understandable ignorance. The truth is that in many district general hospitals and units the number of junior staff is inadequate. These staff are inadequately supervised, instructed, and educated; overworked; and expected to cover absences and deficiencies in resources in specialised units. They have to make decisions and judgments and carry out tests and procedures that are beyond their knowledge and competence.

It is high time that senior members of this profession stood out against the impossible professional conditions and the absence of proper supervision and help available to sorely tried junior hospital doctors. It would not be surprising if their dedication evaporated. There are too few doctors and too much is expected of them.

The profession must take its full share of responsibility for allowing such a state of affairs to have developed and should take steps to rectify it.

J R HERON

North Staffordshire Royal Infirmary,
Stoke on Trent ST4 7LN

1 Dyer C. Manslaughter convictions for making mistakes. *BMJ* 1991;**303**:1218. (16 November.)

SIR,—Clare Dyer's editorial on two doctors found guilty of manslaughter raised some important issues.[1] At no time—at medical school or since—have I been taught the practical principles of administering cytotoxic drugs. As a medical student I sat through numerous lectures about pharmacodynamics, pharmacokinetics, and prescribing but never about administering drugs. While we were house staff many of us were expected to give cytotoxic chemotherapy as part of everyday duties without any supervision from senior staff—we were expected to "get on with it," as it was a "junior" duty.

As a former nurse I was examined in the administration of all drugs. The importance of checking drugs with two people and of checking the dose, the correct mixing solution, the mode of administration, side effects, and expiry dates was emphasised. This became second nature, and during my medical career I have been thankful for that training.

From my own observation I suspect that few doctors check drugs for intravenous or intrathecal administration with another professional before administration. Perhaps this is because the emphasis in our medical education is on learning lists of drugs rather than on the practical aspects of giving drugs. This principle must become part of our standard medical training before more of us are found guilty of manslaughter.

SALLY ANN HAYWARD

Northwick Park Hospital,
Harrow,
Middlesex HA1 3UJ

1 Dyer C. Manslaughter convictions for making mistakes. *BMJ* 1991;**303**:1218. (16 November.)

SIR,—The problem highlighted by the recent conviction of two doctors for manslaughter is not one of equipment[1,2]; it is a problem of training and supervision, and its solutions must go to the heart of the way in which medical practice is organised in the NHS. Paul Crawshaw suggests modifications to hardware as a response to the problems of inadvertent intrathecal injections.[3] This solution, apart from the major logistical problems it would pose, would do juniors and patients a major disservice in once again providing a sticking plaster to treat a major wound.

The problems of this case are those of inappropriate delegation, inability to decline a delegated task, inadequate training in the detail of procedures, and poor awareness of risks. All are perpetuated by a system that promotes learning by experience alone, discourages refusal of duties by institutionalised job insecurity, and maintains that "it would not be appropriate for consultants to have routinely to undertake work which is easily within the competence of other doctors."[4] The solutions are set out in a recent study by the Standing Committee on Postgraduate Medical Education; they lie in increased job security and a commitment to proper training by hospitals, which will not be forthcoming until the investment stops disappearing every six months.[5] The recommendations of this report should be adopted by the NHS and the profession forthwith.

Given the overwhelming importance of this issue for junior doctors, I am astonished to have seen no reaction from the leaders of the Junior Doctors' Committee. The timing, with the convictions coinciding with the publication of the standing committee's study[5] and forthcoming changes in postgraduate medical education, would seem to offer hope that some good may arise from the ashes of these two unfortunate careers. I await some sign of leadership.

GRAHAM HENDERSON

London E14 3DE

1 Dyer C. Doctors convicted of manslaughter. *BMJ* 1991;**303**:1157. (9 November.)
2 Dyer C. Manslaughter convictions for making mistakes. *BMJ* 1991;**303**:1218. (16 November.)
3 Crawshaw P. Doctors convicted of manslaughter. *BMJ* 1991;**303**:1400. (30 November.)
4 NHS Management Executive: *Junior doctors—the new deal: guidance from the Central Consultants and Specialists Committee.* London: Department of Health, 1991.
5 Standing Committee on Postgraduate Medical Education. *Improving the experience: good practice in senior house officer training.* London: SCOPME, 1991.

Health of the nation: obesity

SIR,—Jane Wardle may be correct in believing that the measures I suggested to control obesity would be ineffective and that it would be better to "promote healthy patterns of eating and activity throughout society and across all weights,"[1] but she does not explain how this idea is to be achieved. Her reasons for rejecting my plan are not compelling. It is true that most obese people know that they are obese, but many do not know the health hazards of obesity or the best way to avoid them.[2] With surprising logic, she is against trying to prevent obesity in children "until the efficacy of treatment is improved," whereas many people might think that the case for prevention is all the stronger if treatment is ineffective. It is true that not all obese people aged 36 were obese children, which is why we must not rely purely on prevention in primary schools to abolish the problem of obesity. In the study she cites, however, weight status at age 11 years was as good a predictor of obesity at age 36 as was weight status at age 20.[3]

I wrote in the article that Wardle criticises: "This strategy also needs the backing of those in primary health care, who could easily sabotage the scheme by hostility or even indifference."[4] Wardle's letter provides a good example of the hostility and destructive criticism that, for obscure reasons, seem to be caused by plans to do something about obesity in the United Kingdom. I agree with her that recommendations for reducing the prevalence of obesity must not be accepted uncritically, but I believe that the time has come to put a best guess into action as a pilot study and see what happens rather than forever putting off a decision to do anything.

JOHN GARROW

St Bartholomew's Hospital,
London EC1A 7BE

1 Wardle J. Health of the nation. *BMJ* 1991;**303**:1333. (23 November.)
2 Health Education Authority. *Weight loss and maintenance.* London: Health Education Authority, 1991.
3 Braddon FE, Rodgers B, Wadsworth ME, Davies JM. Onset of obesity in a 36 year birth cohort study. *BMJ* 1986;**293**:299-301.
4 Garrow JS. Importance of obesity. *BMJ* 1991;**303**:704-6. (21 September.)

Doctors and the Children Act

SIR,—In her editorial Jane Tuke discusses what the Children Act 1989 will mean for doctors. I would point out that the "Gillick principle" may be embodied in the act, but many doctors seem still to be reluctant to apply it to medical treatment.[1]

The act states that "due consideration" must be given to a child's views, but there is much doubt among academic lawyers over what weight will be attached to these, especially when they conflict with the views of interested adults; it would be possible to go through the motion of ascertaining the child's views only to ignore them on account of supposed immaturity or because they are outweighed by other factors.[2]

Tuke does not mention that this statutory scheme may afford less protection to the child, especially regarding medical treatment, than the common law wardship jurisdiction, which is no longer available to children in care. In particular, wardship afforded very rapid decisions in urgent cases. A judge was available, by telephone, 24 hours a day.

Recently a decision was reached about a 12 year old pregnant girl 13 days after diagnosis, within