Contrary to what Atrah says, cadaver bone can be rendered free from infection by using a combination of serological examination at donation and terminal sterilisation. This allows cancellous implants of weightbearing quality to be prepared from young cadaver donors. In other countries this technique is also used for femoral heads found to be contaminated with bacteria. In addition, the bone can be cut to the required shapes and sizes and washed free of marrow and fat, which obviates immune responses and improves incorporation.² The bone may be freeze dried to simplify storage (that is, shelf storage at room temperature) and transportation. After packaging, sterilisation may be achieved with either ethylene oxide gas or irradiation. This technique has been used in the Yorkshire Regional Tissue Bank for 27 years with excellent clinical results, and the service is available to other units if required.

To ensure that common principles are applied to the banking of all tissue grafts and implants within Britain it has been proposed that a British Association of Tissue Banks should be established, details of which are available from the address below.

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1 Atrah HI. Bone banks. *BMJ* 1992;304:68. (11 January.)
2 Aspenberg P, Thorén K. Lipid extraction enhances bank bone incorporation. *Acta Orthop Scand* 1990;61:546-8.

Randomised clinical trials in general practice

SIR,—Like G Tognoni and colleagues¹ and Viv Peto and Angela Coulter² we have experience of clinical studies in general practice that fall short of expectations regarding recruitment.

In a postmarketing surveillance study (of treatment of reflux oesophagitis) 457 general practitioners said that they were prepared to recruit at least three patients. After one year some doctors had been successful in recruiting but many had not recruited any patients. Recruitment increased sharply after we took two actions: we sent a personal letter relating actual to planned numbers of patients, and we subsequently visited each general practitioner to discuss possible issues regarding recruitment. This resulted in just over 1100 patients. We acknowledge that the yield may have been less if changes to clinical practice had been required. Still, 88 doctors failed to recruit patients despite our—and their—efforts.

We are convinced that it is essential that every trialist is visited regularly. At every visit the clinical record forms should be checked and compliance with the protocol discussed. The doctors should also be encouraged to continue recruitment (a simple flow chart summarising the criteria for eligibility and actions necessary at recruitment may help). We have found that this attention is a strong incentive in itself, probably as powerful as financial compensation.

Many of the studies for which general practitioners' cooperation is sought do not meet the essential criteria of a medically interesting question (the most powerful built in incentive), a sound but simple methodology, and an easy to use case record form. We do not see any incentive that could compensate for participation in such a study. Many doctors who do cooperate will be discouraged from doing so again, especially if additionally the study is criticised by colleagues or peers.

We agree with both Tognoni and colleagues and Peto and Coulter that financial incentives risk being counterproductive and may even induce scientific fraud, as recently highlighted in the lay press and the *BMJ*.^{3,4} Fees are meant to compensate for costs and to be a reasonable payment for

invested time. Every award beyond that should be strongly discouraged.

Even if a trial fulfils all the criteria we often find that general practitioners have little training in methodology in general. It is difficult for these general practitioners to understand the relevance of (in their view) small deviations from the protocol. We would welcome better education, both in universities and after qualification, and are considering supporting postgraduate education on this subject.

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2 Peto V, Coulter A. Randomised clinical trials in clinical practice. *BMJ* 1991;303:1549-50. (14 December.)
3 Doctor struck off register for drug test misconduct. *Scotsman* 1991 Dec 11.
4 Dillner L. GMC gets tough with fraudulent doctors. *BMJ* 1991;303:1493. (14 December.)

Cost effectiveness of magnetic resonance imaging

SIR,—Anthony Stevens¹ identifies our study on the cost effectiveness of magnetic resonance imaging in the neurosciences² as one that establishes a more rational basis on which decisions about the purchase and use of magnetic resonance imagers can now be made. We accept his point that the cost per patient imaged will be sensitive to throughput, but the situation is more complex than he suggests.³ Firstly, a clear distinction needs to be made between patients and examinations; several examinations may be needed per patient, depending on case mix. Furthermore, our high level of measured benefit relates to the mix of cases scanned in a specialty NHS centre such as that at Coventry; benefit levels cannot be applied pro rata if case mix changes.

Stevens's model predicts a throughput of 3840 patients for a 12 hour day. In reality, Coventry, which does operate a 12 hour day, averaged 3082 examinations last year (but only 2480 patients). A cautionary note also needs to be sounded over the much higher throughput (5760) that Stevens predicts for high field systems. Throughputs for mid-field and high field scanners in specialty units seem to be similar, although improved throughput has been reported with high field machines after recent upgrading of software.⁴ We do not think that even the most sophisticated magnetic resonance imaging unit would be able to examine four sites on one patient with changes of surface coil in 30 minutes as Stevens predicts. Units report similar "patient time in room" for different types of equipment, with only 11% of scans being completed in 30 minutes or less.⁵ Finally, Stevens makes no allowance for other factors such as non-attendance of patients (10% in Coventry), non-completion of the scan (due to non-compliance or movement by the patient), equipment downtime, preventive maintenance, and research and development work (eight hours a week in Coventry).³

Nevertheless, Coventry has recently shown (as part of the waiting list initiative) that high throughputs can be achieved under certain conditions. A mobile scanner (0.5 T) was hired and 225 patients examined in 10 days (equivalent to 5400 patients a year). These patients, however, were hand picked with the expectation that imaging would be straightforward (they required examinations at single sites); non-attendance was low (5%) and downtime only 1.5 hours. The impact of magnetic resonance imaging on management in this select group of patients is unclear.

Finally, we question certain costs used in Stevens's model. Firstly, service and cryogen costs (£65 000-85 000) seem low; the costs in Coventry are £96 600 (£65 000 for maintenance alone). Secondly, staffing costs are incorrectly modelled as a linear function of operating hours; in fact, workload is partially patient related (processing requests, consultation, producing reports, etc) and, too, an increase to 12 hours a day means higher out of hours staffing costs. Finally, although Stevens minimises cost by excluding upgrading of the system (and also contrast agents), we believe that any well managed service should budget for both of these.

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1 Stevens A. Cost effectiveness of magnetic resonance imaging. *BMJ* 1992;304:183-4. (18 January.)
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Wasted drugs in HIV infection and AIDS

SIR,—Sharon Steel and Rob George discuss the potential wastage of expensive drugs used to treat HIV infection.¹ In Riverside East drugs for patients with HIV infection are estimated to account for over 60% of the total drug budget. To assess whether stockpiling of drugs occurs we conducted a survey of outpatients attending the genitourinary medicine clinic at Westminster Hospital.

We asked 30 consecutive patients who were positive for HIV and taking zidovudine to complete a short questionnaire; 20 questionnaires were returned. Patients were required to count the number of tablets remaining in their possession (not including the most recent prescription). The table shows the number of weeks' supply of each drug patients had in reserve. Seven of the 20 patients had at least three weeks' supply of zidovudine stockpiled.

Number of weeks' supply of various drugs retained by 20 patients with HIV infection

	No of weeks in reserve					
	≤1	1-2	2-3	3-4	4-5	>5
Zidovudine (n=20)	9	4		4	1	2
Co-trimoxazole (n=7)	4	2			1	
Dapsone (n=2)	1			1		
Fansidar (n=2)	1			1		
Acyclovir (n=5)	3		2			
Gluconazole (n=1)	1					
Ketoconazole (n=1)	1					

We studied patients taking zidovudine because this drug accounts for over half of the outpatient drug costs for HIV positive patients. If we extrapolate our findings to our total population of patients (600 taking zidovudine with a mean two weeks' supply in reserve) over £50 000 worth of this drug may lie unused in patients' homes (and £100 000 worth of all drugs, if zidovudine is used as a marker for these other drugs).

Multiple causes of stockpiling are likely. The nature of HIV infection often necessitates frequent

visits to clinics, when prescribing may take place. Prescriptions may also be obtained from different clinics and after inpatient stays. If this prescribing is made without reference to existing supplies stockpiling can occur. Sometimes patients intentionally stockpile drugs to allow flexibility in their attendance at clinics. In this study self reported compliance was high, suggesting that poor compliance is not an important factor in stockpiling.

As well as the potential for wastage, stockpiled drugs are a potential danger to children and there are increasing problems in disposing of unused drugs in an environmentally acceptable manner.

To reduce stockpiling we recommend that, when prescribing, doctors should ask specifically about the drug supplies remaining and should tailor the prescription accordingly. Serious consideration could also be given to recycling blister packed medicines. These measures would still allow flexibility to meet a particular patient's needs.

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1 Steel S, George R. Wasted drugs in HIV infection and AIDS. *BMJ* 1992;304:123. (11 January.)

Audit in general practice

SIR,—John Derry and colleagues observed that in Oxfordshire "surprising numbers of practices [were] not undertaking audits," but they did not identify factors associated with conducting audit.¹

We conducted a postal survey of audit in Hampshire's 223 general practices during July and August 1991; we examined what data were being collected and whether practice characteristics determined the likelihood of participating in audit. We modified the questionnaire previously used by a group in Leeds.²

We received replies from 201 practices (90% response rate), of which 198 were suitable for analysis. Only 87 practices thought that medical audit was an effective way of improving quality of care, with 15 answering "no," 34 answering "don't know," and 62 giving no reply. Data were being collected in 19% of the 198 practices, but only 158 thought that they used the information collected.

One hundred and eighty five practices had an age-sex register, 165 a computer, 93 dedicated disease registers, 116 disease management policies, and 89 prescribing policies. Doctors' meetings within practices were held at least monthly in 126 of the 172 practices that were not single handed, and meetings of the whole team were held in 106; 54 practices participated in meetings with other practices.

Only 79 practices mentioned any continuing audit activity, which mainly concerned chronic conditions, targets and claims, patient oriented audit, prescribing, and test results. These practices were compared with the remainder in terms of geographical area, practice position (inner city, urban, semirural, rural), list size (more or fewer than 7600 patients or four partners), and degree of organisation and development (having a practice manager and practice nurse and teaching trainees or undergraduates). Significantly more rural than inner city practices ($\chi^2=11.28$, $p=0.01$), more large than small practices ($\chi^2=5.83$, $p=0.015$), and more developed practices ($\chi^2=8.3$, $p<0.01$) were performing audit.

Eighty four practices suggested subjects that they would be interested in auditing in the future, including chronic conditions, health promotion clinics, prescribing, patient satisfaction, finances, and maternity care. One hundred and twenty nine

practices foresaw difficulties, including lack of time, lack of agreement among partners, and incomplete records. Eighty eight practices suggested how the medical audit advisory group could help. Seventy four wanted advice about how and what to audit, including having audit packages and being told of similar practices to contact; 33 wanted help with locums or extra clerical time, and 22 wanted help with data handling.

The county's needs are not homogeneous. Not only do audit activities vary in different areas but also smaller, less well resourced, inner city practices seem to be disadvantaged in conducting audits. Budgets of medical audit advisory groups might be focused on such practices.

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1 Derry J, Lawrence M, Griew K, Anderson J, Humphreys J, Pandher KS. Auditing audits: the method of Oxfordshire Medical Audit Advisory Group. *BMJ* 1991;303:1247-9. (16 November.)

2 Webb SJ, Dowell AC, Heywood P. Survey of general practice audit in Leeds. *BMJ* 1991;302:390-2.

Off the rails

SIR,—In his letter Anthony G Freeman draws attention to the role of inheritance, age, and toxic substances in producing deficiency in red-green colour perception and the implication it has for drivers of both rail and road vehicles.

I wish to reassure readers that the British Rail Occupational Health Service has a long established procedure for testing the colour perception of all staff undertaking tasks related to safety, including train drivers. Train drivers are screened not only at the selection stage but also at five yearly intervals throughout their driving career.

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1 Freeman AG. Off the rails. *BMJ* 1991;303:1480. (7 December.)

Goya's living skeleton

SIR,—Richard H R Park and Maureen P Park suggest that Claude Ambroise Seurat, the "living skeleton," may have suffered from bilateral Sprengel's shoulder and the Klippel-Feil syndrome.¹ The clinical features that they describe and the illustration by Cruickshank in their article, however, strongly support the diagnosis of myositis ossificans progressiva. The onset in late childhood and the bars of bone in the trunk and arising from the scapulae are characteristic.² It would be interesting to know if contemporary descriptions of Seurat make any reference to shortness of the great toes.

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2 Wynne-Davies R, Fairbank TJ. *Fairbank's atlas of general affections of the skeleton*. 2nd ed. Edinburgh: Churchill Livingstone, 1976:160.

Cigarette advertising in European women's magazines

SIR,—Amanda Amos and Yvonne Bostock's paper on cigarette advertising and coverage of smoking and health in European women's magazines

is a reminder of the untenable stance adopted by magazines that promote health awareness on the front cover and cigarette smoking on the reverse.¹

Last year I wrote to the editors and health correspondents of eight of the United Kingdom's most popular women's magazines, questioning the validity of their policies on cigarette advertising. They proposed four main arguments to support their promotion of tobacco: that to smoke is a conscious decision, rationally taken; that because smoking is a legal activity, promoting it must be legal; that banning cigarette promotion is a restriction of liberty; and that cigarette advertising achieves only brand reinforcement. Reasons of financial expediency did not feature prominently in the replies elicited, probably because I had declared my intention to display the editors' replies in my waiting room.

William Waldegrave, writing on the health of Europe, trumpets the successful negotiation of the new European treaty at Maastricht.² He looks forward to "a new period in cooperation between the 12 member states... in health matters" and warmly welcomes coordination of health policies "to prevent disease, particularly the major health scourges, including drug dependence." Which drug is the secretary of state referring to if not tobacco? When he looks forward to "an effective framework for cooperating in public health between member states, supported by the European Commission," what is he thinking of if not Britain's support for the commission's directive banning tobacco advertising?

When a European ban has been achieved a worldwide ban on tobacco promotion must be sought under the aegis of the World Health Organisation.

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1 Amos A, Bostock Y. Policy on cigarette advertising and coverage of smoking and health in European women's magazines. *BMJ* 1992;304:99-101. (11 January.)

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Aboriginal skeletons in the closet

SIR,—Tony Delamonte's editorial on the morality of keeping the bones of Australian Aboriginals, which were often obtained by force or fraud, as curios rather than granting them burial rites in accord with the customs of their peoples reminds us of our ethical responsibilities.¹

I wonder whether he, and the rest of the medical profession, intends to limit these reservations to Australian Aboriginals. Many *BMJ* readers will have seen the skeleton of Charles O'Brien, known as "the Irish Giant," preserved in the Royal College of Surgeons. The final year of O'Brien's short life (1761-83) was clouded by the fear that he would be denied Christian burial and "anatomised" because of his physical anomaly—precisely the fate that Hunter ensured for him by bribing the undertakers.

After 209 years, has the Royal College of Surgeons reached a sufficient level of civilization to return this gentle giant's bones to his homeland so that he may receive the religious burial he wanted?

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1 Delamonte T. Aboriginal skeletons in the closet. *BMJ* 1991;303:1564. (21-28 December.)