population of 2 101 252 (1991 census data, Basque Institute of Statistics) with about 80 000 children aged less than 5 in 1993-4. During 1993-4 *H influenzae* type b was isolated from cerebrospinal fluid and blood from 42 children aged less than 5 with invasive disease, 29 of whom had meningitis. The annual incidence of bacteriologically confirmed invasive type b infections was 53, 59, and 26 per 100 000 children aged <1, <3, and <5 years respectively. If there is any bias in our figures it is likely to be due to underdetection, as several small hospital centres do not have appropriate facilities for culturing bacteria.

Of the 42 cases, 29 were recorded by the two main paediatric hospitals in the area. These hospitals saw 88 other cases of invasive disease in children aged less than 5 from 1986 to 1992; 49 of the children had meningitis. The proportion of the strains of *H influenzae* type b isolated from these children in Gipuzkoa and Bizkaia that produced β -lactamase was 59% and 53% respectively. More than a third of these strains, which are resistant to ampicillin, were also resistant to chloramphenicol.

The incidence in the Basque region is similar to the incidences estimated for most western European countries before the introduction of conjugate vaccines.^{1,5} The high proportion of strains of *H influenzae* type b that are resistant to antibiotics emphasises the need for the *H influenzae* type b conjugate vaccine to be given to Spanish infants, even when a regional variation in incidence within Spain is allowed for.

EMILIO PEREZ-TRALLERO
Head

JOSE L DIAZ DE TUESTA
Research fellow

Microbiology Service,
Hospital NS Aranzazu,
San Sebastian, Gipuzkoa,
Spain

CARMEN GUTIERREZ
Attending physician, paediatric infectious diseases unit
LOURDES GAZTELORRUTIA
Section chief, microbiology service

Hospital de Cruces,
Bilbao, Bizkaia,
Spain

- 1 Reinert P, Liwarski A, Dabernat H, Guyot C, Boucher J, Carrere C. Epidemiology of Haemophilus influenza type b disease in France. *Vaccine* 1993;11:S38-42.
- 2 Brewster D. The epidemiology of Haemophilus influenzae invasive disease in Scotland prior to immunisation. *Health Bull* 1993;51:385-93.
- 3 Desgrandchamps D, Schmid R, Zimmermann HP, Imahorn P, Kabus K, Schubiger G. Auswirkung der konjugierten PRP-Impfstoffe auf die Inzidenz invasiver Erkrankungen durch Haemophilus influenzae Typ b im Kindesalter. *Schweiz Med Wochenschr* 1994;124:575-82.
- 4 Howard AJ, Dunkin KT, Musser JM, Palmer SR. Epidemiology of Haemophilus influenzae type b invasive disease in Wales. *BMJ* 1991;303:441-5.
- 5 Severien C, Lehnert TH. Epidemiology of invasive Haemophilus influenzae disease in a German city. *Klin Padiatr* 1994;206:108-11.

Orthopaedic and trauma surgery

Best method of anterior cruciate ligament reconstruction is debated

EDITOR,—Christopher J K Bulstrode's article on recent advances in orthopaedic and trauma surgery suggests that long term research into the treatment of injuries to the anterior cruciate is not being undertaken.¹ Many of these injuries improve with conservative treatment, with only 21-43% of patients (18-36 out of 84) in one study ultimately requiring reconstruction.² Reconstruction is now widely accepted to be the best treatment in patients in whom conservative treatment has failed. There is much debate, however, about the best method of reconstruction. Synthetic materials have fallen out of favour with some surgeons following the failure of carbon fibre and Dacron grafts. Polyester now seems to be the preferred material for synthetic grafts, good results having been reported in 80%

(20/25) of patients at five years of follow up.³ Autografts of patella tendon are becoming increasingly popular, with good results having been reported in 92% (68/74) of patients at six years, although loss of extension was present in 23% (17/74) of patients.⁴ One prospective randomised trial comparing polyester and patella tendon grafts in 60 patients has reported results at two years.⁵ No difference in symptom scores or functional scores was found. The group given polyester grafts, however, showed greater laxity on Lachman's test, and a greater proportion of this group had a positive result of a pivot shift test; the group given patella tendon grafts had an increased incidence of extension lag. A similar long term randomised controlled trial is being undertaken at Royal Preston Hospital.

The debate over the best method of reconstruction in patients in whom conservative treatment has failed is likely to continue. It has not been helped by the plethora of procedures available and the wide variety of methods used to evaluate patients. These problems are being addressed and trials are under way, but the long term results of these will not be available for many years.

D S JOHNSON
Research registrar

R B SMITH
Consultant orthopaedic surgeon

Department of Orthopaedic Surgery,
Royal Preston Hospital,
Preston PR2 4HT

- 1 Bulstrode CJK. Recent advances: orthopaedic and trauma surgery. *BMJ* 1995;310:917-9. (8 April.)
- 2 Noyes FR, Matthews DS, Moor PA, Grood ES. The symptomatic anterior cruciate deficient knee. *J Bone Joint Surg [Am]* 1983;65:163-74.
- 3 McLoughlin SJ, Smith RB. The Leeds-Keio prosthesis in chronic anterior cruciate deficiency. *Clin Orthop* 1992;283:215-22.
- 4 Rackemann S, Robinson A, Dandy DJ. Reconstruction of the anterior cruciate ligament with an intra-articular patellar tendon graft and an extra-articular tenodesis. *J Bone Joint Surg [Br]* 1991;73:368-73.
- 5 Engström B, Wredmark T, Westblad P. Patellar tendon or Leeds-Keio graft in the surgical treatment of anterior cruciate ligament ruptures. *Clin Orthop* 1993;295:190-7.

Review by Thromboembolic Risk Factors Consensus Group was misquoted

EDITOR,—Christopher J K Bulstrode suggests that "the risk of death from pulmonary embolus after total hip replacement has been overestimated and anticoagulants should not be used routinely."¹ He misquotes the review by the Thromboembolic Risk Factors Consensus Group, which did not "try to persuade surgeons that all patients undergoing major surgery should receive prophylactic anticoagulation"; it recommended that patients at moderate or high risk of venous thromboembolism should receive specific antithrombotic prophylaxis of proved efficacy (either antithrombotic drugs or mechanical prophylaxis).² Neither did the review argue that "the complications of anticoagulation are both rare and of no significance"; it specifically noted the increased risk of bleeding with prophylactic anticoagulants as well as the concern of some orthopaedic surgeons that bleeding due to prophylaxis with anticoagulants may occasionally result in deep joint infection and failure of the implant.²

Bulstrode quotes Collins *et al*'s meta-analysis of randomised trials of prophylactic heparin as support for the notion that death rates are low in unprotected patients undergoing total hip replacement operations.³ In fact, in the trials in elective orthopaedic surgery, prophylaxis with heparin not only reduced the frequency of deep vein thrombosis by about 50% (17.2% v 36.2% in patients not receiving heparin) but also effectively prevented fatal pulmonary embolism (0% v 1.6%), in keeping with the results in all types of surgery.³ Heparin increased the risk of bleeding in elective orthopaedic surgery (3.0% v 1.8%).

The two other studies of mortality after total hip replacement that Bulstrode quotes merit addition to the literature but do not replace it. The overall literature suggests that, in the absence of specific antithrombotic prophylaxis, the risk of fatal pulmonary embolism after elective hip replacement is about 1% and that this risk is substantially reduced by prophylactic heparin. In crude terms, prophylactic heparin will prevent one fatal pulmonary embolism per 100 patients as well as preventing deep vein thrombosis in another 20 patients. These preventive effects should be compared with the risk of one extra episode of wound bleeding per 100 patients. Orthopaedic surgeons who wish to avoid the risk of wound bleeding can achieve similar efficacy in preventing deep vein thrombosis by giving mechanical prophylaxis, but the efficacy of this in preventing fatal pulmonary embolism has yet to be shown in randomised trials.

The continuing importance of preventing venous thromboembolism in hip surgery is emphasised by the audit report by Todd *et al* of the management of hip fracture in East Anglian hospitals.⁴ They observe that use of prophylactic antithrombotic drugs reduced the risk of fatal pulmonary embolism from 4% to zero. The efficacy of anticoagulant prophylaxis in virtually abolishing pulmonary embolism in this group of patients was shown 36 years ago in a randomised trial by Seviitt and Gallagher⁵ but has had to be "rediscovered" in an audit study. Todd *et al* reinforce the recommendations of the Thromboembolic Risk Factors Consensus Group that prophylaxis against thromboembolism is indicated in patients having hip surgery, as in other high risk groups in hospital, and that it should be ensured by the development and implementation of written policies.

GORDON D O LOWE
Professor of medicine

Glasgow Royal Infirmary,
Glasgow G31 2ER

- 1 Bulstrode CJK. Recent advances: orthopaedic and trauma surgery. *BMJ* 1995;310:917-9. (8 April.)
- 2 Thromboembolic Risk Factors (THRIFT) Consensus Group. Risk of and prophylaxis for venous thromboembolism in hospital patients. *BMJ* 1992;305:567-73.
- 3 Collins R, Scrimgeour A, Yusuf S, Peto R. Reduction in fatal pulmonary embolism and venous thrombosis by perioperative administration of subcutaneous heparin. *N Engl J Med* 1988;318:1162-73.
- 4 Todd CJ, Freeman CJ, Camilleri-Ferrante C, Palmer CR, Hyder A, Laxton CE, *et al*. Differences in mortality after fracture of hip: the East Anglian audit. *BMJ* 1995;310:904-8.
- 5 Seviitt S, Gallagher NG. Prevention of venous thrombosis and pulmonary embolism in injured patients. A trial of anticoagulant prophylaxis with phenindione in middle-aged and elderly patients with fractured necks of femur. *Lancet* 1959;ii:981-9.

Anaesthetists in training do not want new deal

EDITOR,—In December 1993 all 25 anaesthetic registrars and senior house officers at Glasgow Royal Infirmary answered a questionnaire after working shifts compatible with the new deal for three months. The trainee department was fully staffed. Only two respondents wished to continue working such shifts, which were consequently rejected.

In November 1994 a similar questionnaire was sent to the 1725 members of the group of anaesthetists in training of the Association of Anaesthetists of Great Britain and Ireland. Altogether 758 (44%) responded. Only 73 were working partial or full shifts alone or in combination with an on call rota; 305 were working a rota that exceeded the limits on the length of shifts or on average hours; 346 routinely exceeded their contracted hours; and 339 had slept 0-4 hours, while only 40 had slept over eight hours, during their last night on call. Of 191 trainees whose

Aspect of life	Better	Worse	Multinomial confidence interval for difference in proportions
Teaching opportunities	50 (6.6)	503 (66.4)	-0.64 to -0.55*
Research opportunities	137 (18.1)	295 (38.9)	-0.25 to -0.16*
Study time for examinations	339 (44.7)	173 (22.8)	0.16 to 0.27*
Fatigue while on call	472 (62.7)	96 (12.7)	0.44 to 0.54*
Social and family life	198 (26.1)	397 (52.4)	-0.32 to -0.30*
Overall quality of life	220 (29.0)	309 (40.8)	-0.16 to 0.05*

*P<0.05.

departments had implemented shifts compatible with the new deal, 32 indicated that these had been rejected, mostly because of resistance by trainees (28 replies). Four hundred and fifty six respondents gave reasons for the non-implementation or rejection of the shifts, the two main reasons being "not enough trainees" (214) and "change resisted by trainees" (166).

Overall, 473 respondents did not think that the introduction of shifts compatible with the new deal would improve their training in anaesthesia. The table shows members' opinions on what effect the shifts would have on various aspects of their lives. Only 121 preferred to continue with or convert to a shift compatible with the new deal, while 451 wanted to base average hours on intensity of the workload as defined by the new deal but to allow the maximum length of the shift to be decided locally by trainees.

Significantly, only six of the 25 trainees at Glasgow Royal Infirmary thought that fatigue on call had improved and three thought that study opportunities had increased while they were working shifts compatible with the new deal.

These surveys suggest that, in anaesthesia, the clear withdrawal of restrictions on the maximum length of a shift from the new deal's guidelines would favour the uptake of flexible shiftwork without exacerbating fatigue on call. Shortages of staff may continue to impede the reduction of contracted and actual hours to the level commensurate with the intensity of the workload (64 hours a week) but should not prevent trainee anaesthetists from being contracted for the appropriate class (2) of additional duty hours. A report on the survey of the group of anaesthetists in training has been sent to the bodies responsible for negotiating and implementing the new deal. There is no reason to assume that these findings are exclusive to anaesthesia.

PETER MACKENZIE
Honorary secretary

Group of Anaesthetists in Training Committee,
Association of Anaesthetists of Great Britain and Ireland,
London WC1B 3RA

1 NHS Management Executive. *Junior doctors. The new deal.* London: NHSME, 1991.

Anaesthetics training in the United States

EDITOR,—In response to the report of the chief medical officer's working group,¹ the Royal College of Anaesthetists published plans for a new structured training programme for the specialty.² It will take six years to train as an anaesthetist. I am caught up in both the old and the new systems. I spent two years as a senior house officer and three as a registrar. I am currently employed for 18 months in the United States, in a teaching and research post. On my return I will have to complete a further two years as a senior registrar (the new term will be specialist-registrar). My anaesthetics training will have lasted more than eight years.

This contrasts greatly with anaesthetics training in the United States, where the training programme lasts three years, but "residents" (trainees) may then opt to do a further six month "fellowship" in a specialty. Three years after start-

ing in the specialty they are considered to be fully trained and may begin practice as an "attending" (consultant). The discrepancy between our programmes means that most of the residents I am now supervising will be consultants before I am.

Training in the United States takes half the time that even the new structured training programme in the United Kingdom will take. The amount and quality of formal teaching are similar to those in the United Kingdom, but the supervision at work is vastly superior: trainees are supervised throughout their three year training. One attending is in charge of two residents for the day. Patients are seen preoperatively by both the resident and the attending. The attending rotates from one theatre to another, is always present at induction of anaesthesia, and is usually present at emergence from anaesthesia. Whenever necessary the resident will call the attending to assist (if he or she is not already present). This system provides a safe environment for trainees to practise their skills, as well as many opportunities for teaching and discussion. The level of supervision is the same throughout the nights and weekends and whether the case is an arthroscopy or open heart surgery. Confidence in the quality of the training is reflected in the fact that on completion of their residency it is not obligatory (although it is desirable) for residents to pass their "board" exams before they can practise independently.

This system results in confident and competent anaesthetists. This indicates that the quality of the learning experience rather than the length of the apprenticeship is the more important factor. British trainees know that the length of training has more to do with providing a service than with gaining new skills, and this fact has been openly acknowledged.³ If the quality of the teaching and supervision is to be improved the numbers of staff will have to be increased so that the same level of service can be provided. This cannot be a cost neutral process. Indeed, the length of training will ultimately be determined by the amount of money that the government makes available.

GEOFFREY N MORRIS
Assistant professor in anaesthesiology

University of Virginia,
Charlottesville,
USA

1 Department of Health. *Hospital doctors: training for the future. The report of the working group on specialist medical training.* London: DoH, 1993.

2 Royal College of Anaesthetists. *Specialist training in anaesthesia, supervision and assessment.* London: RCA, 1994.

3 Norman J. Learning to teach anaesthesia. *Royal College of Anaesthetists Newsletter* 1995 Mar:1.

Doctors are promoting expansion in non-consultant career grades

EDITOR,—With the implementation of the Calman report and the restriction of junior doctors' working hours to 52 a week (plus four hours of educational time), the existing pattern of hospital staffing in the United Kingdom is clearly unsustainable without a large increase in the number of hospital doctors. All agree that increasing the

number of junior doctors is out of the question (even though over 700 additional senior house officers have been appointed in the past year despite apparently tight controls). *Achieving A Balance* envisaged that with the reduction in the availability of junior doctors the work would be carried out by increased numbers of consultants together with a small number of non-consultants (staff grade doctors and associate specialists), who for personal reasons were unable to progress to consultant status.¹

I now perceive an alliance between trusts, many consultants already in post, and some junior doctors (who hope to become consultants of the old style) promoting an unfettered expansion in these non-consultant career grades to do the medical work in hospitals, mainly at unsocial hours, that until now has been done by junior doctors. Those in the profession who are supporting this move are allowing the government, through the trusts, to staff hospitals with cheap labour; they will force many specialist trainees to accept posts in these grades with lower remuneration than if the profession insisted that such work must be carried out by doctors whose remuneration was equivalent to that for the current consultant grade, with an appropriate and realistic premium for work at unsocial hours.

To date most of the doctors appointed to the associate specialist grade and the staff grade have been aware of their personal difficulties in attaining full specialist training. If, however, we were to move to a scenario in which large numbers of non-consultant doctors with poor pay and conditions had been frustrated in their realistic hopes of achieving at least the pay of the consultant grade, the United Kingdom might well be faced with large numbers of demoralised hospital doctors, some in middle age, who would be unlikely to be the most enthusiastic deliverers of efficient specialist care in our hospitals in the middle of the night, when illness can be at its most critical.

M J GOODMAN
Consultant physician

Bury General Hospital,
Bury,
Lancashire BL9 6PG

1 United Kingdom Health Departments. *Hospital medical staffing: achieving a balance. Plan for action.* London: HMSO, 1987.

The changing role of hospital consultants

EDITOR,—We agree with John Bailey that traditional working arrangements must be changed and that consultants should seize the initiative.¹ He suggests that a hierarchical management structure, as found in Sweden and other countries, should be adopted. In contrast, we believe that consultants should support the creation of management teams within a horizontal structure.² Each team can develop expertise in a particular specialty and should provide flexibility for each member's skills to be applied for the benefit of the patients. The team consists of an appropriate skill mix of at least one consultant, clinical nurse specialists, assistant physicians, trainees, and secretarial staff. Continuity of care is provided by the multidisciplinary approach within the team and by staff who are introduced to the patient at the initial consultation and whom the patient sees consistently.

Within an institution each team acts as both a consumer and a supplier of services through its interactions with other teams. We believe that line managers should be facilitators rather than have subordinates. They can help to coordinate teams to provide cross cover and to mediate the allocation of resources within budgetary constraints. Facilitators could be elected by teams from their own members on a rotational basis to allow closer