of the recommendations made by members of the Vascular Surgical Society^{1,3} and of the findings in the Scottish report.²

In general, this situation shows the need for well informed independent advice to purchasers. Clinical directors and vascular surgeons in trusts will inevitably provide advice that accords with the level of service available. Purchasers have to take advice either from experts outside the locality or from specialists in public health medicine who have knowledge of the relevant clinical and service issues and can assess the situation dispassionately.

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- 1 Michaels JA, Galland RB, Morris PJ. Organisation of vascular surgical services: evolution or revolution? [With commentary by R Greenhalgh.] *BMJ* 1994;309:387-8. (6 August.)
- 2 Working Group of the National Medical Advisory Committee. *Vascular surgery services*. Edinburgh: HMSO, 1993.
- 3 Wolfe JHN, Harris PL, Ruckley CV. Trust hospitals and vascular services. *BMJ* 1994;309:414. (6 August.)

Develop specialised units

EDITOR,—I agree with J A Michaels and colleagues that specialised vascular units should be developed.¹ In Kent, which has a population of over 1.5 million, six acute units provide both elective and emergency surgical care for patients with aortic aneurysms (International Classification of Diseases code 441). From 1988 to 1993 inclusive, 887 major operations (of which 390 were emergencies) were undertaken by 33 consultants. In addition, seven operations were attributed to two consultants who could not be identified.

The table compares the number of operative deaths in hospital between consultants who did 20 or more elective and emergency operations during the six years and those who did fewer than 20.

Hospital mortality among patients operated on for aortic aneurysm in acute hospitals in Kent during 1988-93 according to number of operations performed by surgeon

No of operations done by surgeon	No of operations	No (%) of deaths	No (%) of survivors
< 20 (n=19)	127	61 (48)	66 (52)
≥ 20 (n=14)	760	166 (22)	594 (78)

χ^2 test: $P < 0.01$.

Hospital mortality for the 19 surgeons who operated on fewer than 20 patients was significantly worse than that for the 14 surgeons who performed an average of 54 operations each. Seven surgeons, each of whom did fewer than 20 operations within the study period, undertook only emergencies; these operations were associated with a 62% hospital mortality, compared with 45% for the emergency operations done by the other consultants.

I sympathise with John H N Wolfe and colleagues' frustration over the fact that the creation of separate trusts is undermining any sensible rationalisation of services.² However, purchasers also have difficulties, which the profession has to recognise. To produce support for change purchasers must be able to translate external empirical evidence to the local situation. This produces two problems. Firstly, there are usually insufficient data to produce significant findings on volume and quality. Secondly, the public, and therefore politicians, have difficulty in believing that transfer of patients with a ruptured major artery over some distance confers a greater chance of survival.

An alternative strategy would be for the Royal College of Surgeons to seek the NHS Executive's agreement that purchasers would be supported in proposals that concentrated work so that a team of

at least three vascular surgeons could be justified. Then the politicians would be left only with the option of challenging the choice of the provider unit rather than whether the rationalisation should happen at all.

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- 1 Michaels JA, Galland RB, Morris PJ. Organisation of vascular surgical services: evolution or revolution? *BMJ* 1994;309:387-8. (6 August.)
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German junior doctors in Britain

Training in Germany is unstructured

EDITOR,—Hans-Jürgen Bartz and Winfried Kahlke point out that German doctors look for alternatives to work in Germany.¹ As a German doctor working in Britain, I agree that the time spent as an "Arzt im Praktikum" is poorly paid, with doctors receiving only one third of the usual salary. They receive no structured training and are often expected to work with minimal supervision at an early stage, carrying out duties unacceptable for British house officers—for example, reporting electroencephalograms from their first day in neurology. The whole of this period can be spent in a single specialty and counts towards specialisation; it therefore does not provide any opportunity for gaining general experience or training outside that specialty.

Bartz and Kahlke do not, however, point out the main reason why German doctors may opt to work in Britain, which is the fear of unemployment. There is a severe shortage of Arzt im Praktikum posts, and despite the posts' shortcomings many German graduates spend long periods hoping to gain employment. Eventually some of them become frustrated and turn to Britain.

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- 1 Bartz H-J, Kahlke W. German junior doctors in Britain. *BMJ* 1994;309:199. (16 July.)

Are enthusiastic and knowledgeable

EDITOR,—Hans-Jürgen Bartz and Winfried Kahlke have highlighted many of the benefits to German doctors who come to work in Britain.¹ German doctors have filled hundreds of vacant house jobs in district hospitals in Britain; the NHS could not easily run without them.

The shortage of preregistration jobs in Germany prompted the Marburgerbund (the German equivalent of the British Medical Association) to seek employment for its members. The Marburgerbund now promotes courses for German doctors coming to Britain. When teaching on these courses I have been impressed by the doctors' knowledge and enthusiasm; they are keen to experience the greater exposure to patients that they will get in British jobs.

German preregistration doctors are good. It is their subsequent training as an "Arzt im Praktikum" that is often poor—"unstructured," according to Bartz and Kahlke.¹ For instance, there is no requirement to do both medicine and surgery. It is hardly surprising that German doctors prefer to do their training in British house jobs. Some German doctors gain full registration with the General Medical Council on the basis of German posts as an Arzt in Praktikum in only one

narrow specialty, such as neurology, or even wholly in laboratory work in pathology. They cannot safely be offered posts as senior house officers in Britain unless they do a ward based post as a junior house officer first. This delays their career by six months, but they then make excellent senior house officers.

The most serious staff shortage in the NHS is of preregistration house officers. Many doctors are dissuaded from coming to Britain by high fees charged by the General Medical Council. The provisional registration fee for Germans is £400, nearly three times the full registration fee for those who have completed their period as an Arzt in Praktikum. Most other Europeans, who have no preregistration training at all, get immediate full registration for the lower fee. This discrimination against Germans is hard to justify on administrative grounds. To add insult to injury, the General Medical Council now charges another £70 to German house officers who extend their registration by one day at the beginning of August to cover new colleagues attending an induction day.

The international exchange of medical skill should be positively encouraged. The excellent British preregistration training could be used as a model for other countries. In the meantime, we should not put artificial barriers in the way of well trained and much needed doctors wanting to do preregistration jobs in Britain.

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- 1 Bartz H-J, Kahlke W. German junior doctors in Britain. *BMJ* 1994;309:199. (16 July.)

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Tunnel travelling

EDITOR,—In his interesting editorial on the health risks associated with travelling through a tunnel David W Proops states, "Rapid changes in ambient pressure occur when entering a tunnel at speed, or when two trains pass each other in a tunnel. This increase in pressure deflects the intact tympanic membrane medially."¹ The tympanic membrane is actually deflected laterally, not medially.

A moving train (like any other moving object) catches air with it, and a passing train (or the tunnel wall) makes this air move backwards. This air flow causes a negative pressure, which is proportional to the square of the air velocity, according to Bernoulli's principle. As a consequence, air escapes from the cabin and the cabin pressure decreases, making the tympanic membrane move outwards—that is, laterally. The opposite happens when the trains have passed each other. If the passing train or the tunnel is long enough there will be time for this relative positive pressure in the middle ear to normalise, but adaptation to the sudden increase in outside pressure after the trains have passed may be more difficult because of the tendency of the eustachian tube to lock.² This means that most ear troubles are presumably faced at the end, not at the beginning, of travel through a tunnel.

A similar situation exists during flights, when babies whose eustachian tube does not function properly cry most during landing, not during take off.

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