

EDITORIAL

Factors likely to affect the location and provision of future neurosurgical services in the UK

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Introduction

Neurosurgery currently faces a period of considerable turbulence and of widespread changes in the way we will be required to organize and deliver our work in the future. This paper is an attempt to identify some of the factors driving these changes and to identify the ways in which they might affect the delivery of neurosurgical care. It also suggests some ways in which we might be able to adapt to these pressures for change. It is hoped that the paper may prove helpful both in generating debate within our specialty on how best to organize and deliver safe and effective neurosurgical care for the populations we serve and to inform commissioners of healthcare.

In most human affairs it is never possible to identify all the variables that may be acting to produce change, but the following are some of the variables likely to be of importance to Neurosurgery in the next few years:

- Patient and family expectations.
- Medical staffing: junior doctors' hours; European Working Time directive; medical manpower strategies.
- Training requirements.
- Governance, litigation and subspecialization.
- Organizational: nurse recruitment; workload targets; finance.

Patient expectations

Patients in the NHS now have increased expectations of what the Health Service should deliver. These expectations have been encouraged not only by this government's proper emphasis on quality of service, but also on access and waiting times. These new

expectations may reasonably be summarized as:

- High quality services should be delivered as locally as possible.
- Patients should have reasonable expectations of immediate admission for emergency care, admission within about 2 weeks for urgent conditions and within a 'reasonable' (6 weeks?) time for routine conditions.
- Patients should have access to subspecialty expertise whenever required.
- Patients should have access to specialist expertise and expensive equipment regardless of its location.
- Patients increasingly expect explicit and monitored standards for the delivery of their care.

While, as clinicians, we would agree with and support all the above as reasonable and, indeed, desirable, many of these expectations are currently difficult to meet. In particular, it is likely that the 'access' requirements (i.e. immediate admission for emergency care, admission within 2 weeks for urgent care and within a 'reasonable' time for routine) will be particularly difficult to deliver within the constraints that we currently face. The government has allowed these to become a priority area of 'zero tolerance' for Trust managements, but in most neurosurgical units the necessary staffing and infrastructure investments are not in place. In particular, most units have significant shortfalls in bed capacity, theatre capacity and access to intensive care and high dependency facilities.

The Society of British Neurological Surgeons, in conjunction with representatives of the Regional Specialist Commissioning groups, has spent the last 18 months developing a set of clinical standards that we believe sets out these reasonable expectations. It has been our intention that this document may be

used as a checklist to identify those areas where individual departments are unable to reach the necessary standards. While, in some instances, the achievement of the standards may simply be a matter of organizational change, in other cases the achievement of the standards may require additional investment. We believe that the explicit duty placed upon chief executives for responsibility for quality and the government's current emphasis on access and waiting times presents Neurosurgery with an opportunity to achieve the necessary investment. However, investment will only be made if it delivers the government's access targets and a quality of service at the level set out in the standards document.¹

Medical staffing, junior doctors' hours and European Working Time directive

For Senior House Officers (SHOs) and preregistration House Officers, compliance with the 'New Deal' for junior doctors' hours became a contractual obligation on 1 January 2002. For specialist registrars compliance becomes a contractual obligation on 1 August 2004. This requirement limits the working hours of all training grades of staff to 56 h per week with a maximum of 48 h in 2009. In addition, each trainee requires a minimum of 11 h rest in every 24 h and time spent resident on call must be considered 'work' for the purposes of hours' calculations, even if no actual work is performed during this period. This requirement (which has been tested in the European Courts) means that the delivery of the necessary 24-h cover can only be accomplished by some type of shift working. Whereas previously a rota could be provided by five trainees, now a minimum of six or seven will be required (Medical Staffing Officer, Addenbrookes Hospital, personal communication). With this rota, only one or two juniors will be present during working hours. This presents considerable problems, particularly for smaller neurosurgical units. Regardless of the actual rota arrangements adopted, it is certain that the contribution to the service workload by the trainees will be substantially reduced.

For consultants, compliance with the European Working Time Directive (EWTd) became an obligation for Trusts in October 1998.² In England, the EWTd has been enacted as part of 'Health and Safety' legislation. This imposes on Trusts a positive duty to ensure compliance with the relevant legislation. Failure of compliance could result in a criminal prosecution by the Health and Safety Executive. Although most Acute Hospital Trusts have hitherto ignored the EWTd, the BMA has recently begun a campaign of reporting to the Health and Safety Executive those Trusts it views as non-compliant. For the moment, consultants are allowed to 'derogate' from the directive, but this freedom is time-limited and, unless the Government applies

for an extension, will in due course expire. The European Working Time directive is complex in its effects, particularly with regard to the application of the 'compensatory rest' requirements. As yet, there has been no agreement between the government and the BMA on what entitles an individual to 'compensatory rest'. In addition, it is probable that the application of the directive to the work of consultants will, at some time, be legally tested, particularly with regard to the validity of the 'derogation' aspects of the directive. The details of its possible effects on manpower requirements in neurosurgery are eloquently set out in the recent paper by Donald Shaw.³ For consultants, the minimum numbers required to provide an individual consultant present and available at all times is likely to be increased by 33%.

Medical manpower strategies and training requirements

In August 2002, Sir Liam Donaldson published a consultation paper 'Unfinished business: proposals for reform of the Senior House Officer Grade'.⁴ In this document, a new framework is proposed for improvement of the training of SHOs. The document clearly sets out the current shortcomings of the SHO grade and proposes a new system of training, which will be 'programme-based' and consist of a 2-year 'Foundation programme' incorporating the preregistration year followed by a second programme of 'broad-based time-capped basic specialist training'. It is further proposed that postgraduate Deans should, in future, be responsible for the arrangements for appointment to all programmes and for the overall management of the programme-based training. The document also proposes that there be eight specialist programmes, including medicine, paediatrics, pathology, etc. One of these would, it is proposed, be 'Surgery in General'.

While such a change to a more explicit training system for SHOs is to be welcomed, and will undoubtedly enhance the SHOs training and job satisfaction, there is no doubt that for the postgraduate Deans, who will appoint to the programmes, and the training programme directors, who will supervise the training, the educational content of the various SHO posts will be paramount. Given that, in neurosurgery, our current SHOs carry a very heavy service load, gaps in the provisions of service by our SHOs may become a very real consequence of these welcome improvements. Furthermore, it may well be considered by the postgraduate Deans that a period of service as an SHO in Neurosurgery may have only a limited appeal as training for 'Surgery in General'. Since most neurosurgical units do not have preregistration House Officers, it may well be that for this level of service the majority of units will be entirely reliant on 'non-training' grades of staff. It is essential that

Clinical Neurosciences in general and Neurosurgery in particular emphasize their pivotal role in the management of many common conditions. SHO rotations between Neurosurgery, Neurology and neuro-intensive care are highly valued by the current SHOs.

Likewise it appears that tight national controls on Specialist Registrar training grade numbers will remain for the foreseeable future. Although the manpower planning strategies promulgated by the Society under 'Safe Neurosurgery 2000' have helped to persuade the deaneries to provide an increase in Neurosurgery national training numbers, this increase has been largely as a consequence of conversion from visiting training numbers, and there has been little or no increase in the intermediate grade manpower required to run the service. This conversion of posts has done a disservice to our traditional policy of assisting in the specialist training of overseas doctors. It seems likely that if a similar system is adopted for our SHOs (or, as has also been suggested, they are incorporated into a single training grade) the various manpower constraints at junior and intermediate level will remain or get tighter.

Some Trusts have been successful in recruiting to unrecognized Trust Doctor posts, but these are of variable quality and are often difficult to recruit. A secondary consequence of this growth in the numbers of Trust Doctors has been that locums with the necessary experience are now almost unobtainable. It is reasonable to assume that the majority of the Trust Doctor posts have been filled with young doctors who would otherwise have wished to obtain training for a consultant career, but have been effectively 'disenfranchised' from the training system by the current restrictions in numbers. It is hard to envisage a more demotivating experience for a young doctor. The government appears to believe that the emerging shortfall in medical staffing can be filled by recruitment from abroad. Although doctors trained in the EU countries can now work anywhere within Europe, the practical difficulties of language, housing, schooling, etc., are likely to prove formidable obstacles and it is doubtful if such a source will be particularly productive. Recruitment from outside the EU is likely to be minimal if we no longer have training positions available for overseas doctors.

Training Requirements

The 'Calman' system of training and the chief medical officers' proposals for the SHO grade are both 'time-limited' systems. Since the 'New Deal' also reduces the trainee's hours of work, the amount of exposure our trainees have to clinical cases and to practical procedures will necessarily reduce. Whether true or not, it is widely perceived that the current

generation of trainees are already less experienced than those who trained prior to the imposition of the restrictions in hours. Furthermore, formal training is difficult to deliver with shift systems. Because of the effects on training of the restrictions in junior doctor's hours both the Royal College Specialist Advisory Committees and the postgraduate Deans are becoming increasingly explicit in their training requirements. It is not difficult to foresee increased pressure to withdraw 'training recognition' from units that are not compliant with both hours and with increasingly rigorous training requirements, thus compounding the difficulties that units will have with their service provision. Various opinion surveys of junior doctors make it clear that our juniors, when they are with us, feel overworked and under-valued, and regularly claim that they find it difficult to assist in theatres or take advantage of other training opportunities in the way that has been the norm in the past (Eastern Regional Postgraduate Deanery, personal communication). It is certain that those who reach CCST and the Specialist Register under the current system, although they may still be well 'trained', having attended the necessary courses and training modules, and having passed the necessary examinations, will also be substantially less experienced than the previous generation of consultants.

Because of the perceived difficulties with training, the Royal Colleges of Surgeons have now asked the specialist SACs to consider and comment upon the training requirements in the various specialties including the following options:

- Provision of explicit training sessions for trainees (training lists, training outpatient clinics, etc.).
- Separation of training from service.
- Concentration of training programmes in larger units or the amalgamation of training units.

If such proposals were to be agreed it might then be possible to devise a training programme that would provide the necessary minimum of teaching and training for entry onto the specialist register. However, if the hours spent gaining the necessary experience are reduced then newly-appointed consultants will, nevertheless, be relatively inexperienced. It appears that the two groups of staff currently most vulnerable to litigation, and to disciplinary proceedings are trainees and the newly-appointed consultants. It seems likely that the further reduction in experience, which the new system will bring will exacerbate this trend unless we are able to devise a means of allowing the newly appointed consultants to gain the necessary experience, while protecting them from these hazards.

Subspecialization

The Chief Medical Officer's Document also proposes that the time taken to reach CCST certifica-

tion is reduced and that 'generalist' consultants with lesser experience are appointed. It seems unlikely that such a system would be acceptable in a complex specialty such as Neurosurgery. Under the current 'Calman' system of training the final year of the training programme is usually spent in developing a subspecialty interest (neurovascular surgery, skull base surgery, paediatric neurosurgery, etc.). It seems likely that as the technical complexities of the specialty increase this trend to subspecialization will increase. Likewise the increasing incidence of complaints and litigation in the NHS seems likely to reinforce that trend. Those procedures that are performed only rarely will soon be 'not worth the risk' of undertaking. For example, it is now becoming difficult to find an 'adult' anaesthetist willing to anaesthetize or intubate a child even in an emergency. Although there is little direct evidence for the link between volume and outcome in Neurosurgery, such a link has now become 'common knowledge' amongst regulators and the educated public. This link between volume and outcome looks likely to be further reinforced by the external regulatory environment of National ('surgeon-specific') League Tables, CHI, NCEPOD, etc. Similarly, the effects of Trusts' internal regulatory requirements, such as risk management, appraisal, individual performance review and revalidation seem likely to further reinforce the trend to ever narrower specialization. In such circumstances, the 'rational' policy for smaller units and for individual surgeons to adopt is to transfer rare, complex or high-risk cases to units and colleagues who can command sufficient volume and expertise in their management to protect themselves from adverse criticisms. For those units with sufficiently large volumes of such highly specialized or high risk cases, it will be necessary to provide sufficient subspecialty expertise to comply with the requirements of the working time directive and yet provide full emergency access to this area of service. This presents particular difficulties in the organization of both on-call and of subspecialty rotas.

The combination of the medical manpower constraints and of such rational, but 'risk avoiding' behaviour may well be that many units will find themselves unable or unwilling to provide at all times a full range of services. Planned or unplanned closures of parts of the services that they offer are increasingly likely. Even in larger units, unless the subspecialty areas are adequately staffed, it seems unavoidable that gaps in the service provision will appear or consultants will find themselves on general call for emergencies and also 'on call' for their particular area of specialist expertise. For those subspecialty areas with a high probability of emergency out of hours work, a minimum of four subspecialists would theoretically be required to provide a reasonable rota in that subspecialty.

Financial arrangements

Until now, Regional Specialist Commissioning Groups had the responsibility for commissioning neurosurgical services. However, any financial investment required the unanimous agreement of all the health authority representatives on the commissioning groups. In general, this resulted in unresponsive and insensitive commissioning arrangements. As a consequence, many Neurosurgical units now find themselves significantly under-resourced, yet, nevertheless, expected to deliver increasingly onerous workload targets. The Government's recent management and organizational changes ('Shifting the Balance of Power') are likely to make the future commissioning of neurosurgical services more explicit in the requirement to meet patient's expectations (particularly with regard to access and standards of service). Unfortunately, since the funding has been transferred to Primary Care Trusts (PCTs), there is some risk of the financial and commissioning arrangements for Neurosurgery becoming even more fragmented and unresponsive than previously. Although it seems likely that some reconfiguration of the regional commissioning arrangements will occur, it is unlikely that these will conform exactly to the referral patterns that exist in most Neurosurgical units.

In order to achieve some uniformity of standards, resourcing and staffing of specialist services, the development of National Service Frameworks has become crucial, the pioneering model being the National Service Framework for Cancer Services. Although there are currently no plans for a National Service Framework for Neurosurgery, the Department of Health has recently proposed a National Service Framework for Long-Term Disability in which neurological disorders will predominate. The SBNS has been developing close links with the Neurological Alliance (an umbrella organization which co-ordinates the neurological patient charities and societies) in attempting to increase the profile of Neurosurgery. While it is obvious to Neurosurgeons that, if one wishes to minimize long-term neurological disability, then investment in Neurosurgery is both wise and cost-effective, it remains to be seen how effective we shall be in ensuring that Neurosurgery's needs are included in this new National Service Framework Document.

Although the needs of Neurosurgery may or may not be specifically considered in the forthcoming NSF; nevertheless, the joint work already undertaken by the SBNS and representatives from the Regional Specialist Commissioners in developing its Standards Document may prove a helpful alternative in persuading some of the more reluctant commissioners of the need for further investment to address some of the more serious deficiencies in current Neurosurgery service provision. Notwithstanding

this, the devolution of most financial resources to a very local level and the fragile arrangements for specialist commissioning presents particular dangers for a regionally organized and delivered service like Neurosurgery. Modern neurosurgical investigations and treatments are frequently technologically complex, often expensive to provide (e.g. gamma knife, PET, deep brain implants) and may involve quite small numbers of patients. This makes the development of an 'evidence base' for their efficacy difficult and prolonged. Consequently, it will be difficult to persuade a host of small agencies (PCTs) with serious budget pressures to make the necessary investments in services for which there is often little clear evidence of efficacy and which are often provided at locations remote from their local sphere of interest. If neurosurgeons are to persuade our paymasters to make the necessary investments it will be necessary for us to provide them with reliable and national outcome measures about the success and continuing cost-effectiveness of our procedures and treatments. Although the assumptions in the paper by John Pickard on 'Cost Effectiveness in Neurosurgery'⁵ no doubt still hold, it would be timely if this subject were now revisited.

Organizational arrangements, nursing and other issues

There are currently severe national shortages of appropriately trained nurses and allied professionals, particularly for theatre staff and for ITUs, and of neuroradiographers. In addition, nurses and other professionals are increasingly seeking professional autonomy. As has previously been mentioned, junior doctors are scarce and, when present, overworked during working hours. 'Trust Doctors' when available are not infrequently under-trained, inexperienced and demoralized. The locum pool has diminished and 'Staff Grades' are scarce and not infrequently unsuitably trained. These widespread staffing constraints have resulted in most neurosurgical units experiencing unplanned bed closures, particularly of intensive care and high dependency beds, and there are frequent restrictions on theatre lists or neuroradiology lists. The additional imposition by commissioners of workload 'waiting list', 'access' and 'waiting time' targets has further added to the pressures felt by the remaining overworked staff. This, in turn, may lead to further staff resignations, increasing sickness absence and further recruitment difficulties. These pressures, together with the increasing difficulties in medical staffing and the increasing demand, on governance grounds, for subspecialization is likely to further limit the ability of many of the existing neurosurgical units to deliver the full range of services required. In general, those units that are large enough to sustain a viable pool of trained staff to buffer recruitment difficulties, and

unplanned staff shortages are more likely to absorb these pressures and difficulties without unacceptable, unplanned restrictions of capacity. 'Safe Neurosurgery'⁶ states that the minimum catchment population needed to sustain a viable neurosurgical unit is of the order of 1,000,000–1,500,000. However, taking into account all the above pressures, this is now likely to have risen to around 2,000,000–2,500,000 and the minimum number of consultants needed is now nine. There will also need to be a minimum of six to eight intermediate trainees (SpR or equivalent) to provide an 'intermediate' grade of cover at all times. Likewise a minimum of eight or nine SHO or equivalent grades will be needed to ensure one is available at all times. For smaller units the combined pressures of the European Working Time directive, the junior doctors hours legislation, the staffing pressures and the 'centripetal' tendencies implicit in subspecialization present considerable challenges. While the logical solution might be to close the smaller units and develop a smaller number of very large units, this is almost certain to prove politically unacceptable in some parts of the UK.

A few suggestions

Although, with the exception of London, neurosurgical units in the UK are relatively dispersed, it would be possible for them to achieve a minimum viable size by combining catchment populations and staff with adjacent units, and in effect 'fusing' their staff to become 'one unit in two centres'. This approach has been adopted by other specialties, particularly oncology and is usually described as a 'managed clinical network'. In the cancer networks, the smaller units undertake the management of the more common cancers referring the more complex or those requiring special equipment to larger cancer 'centres' within the network. It is reasonable to accept that running a unified service spread across a number of geographical locations presents its own difficulties and disadvantages. Nevertheless, the adoption of such an approach may provide Neurosurgery with the means to resolve the various incompatibilities between the 'centripetal' pressures that we are all facing, and the political realities of patient and political expectations.

The possibilities offered and the difficulties faced by 'managed clinical networks' are eloquently set out in two papers by Nigel Edwards.^{7,8} As this paper points out, there are currently no clear arrangements for the construction, regulation and funding of such clinical networks. It would appear reasonable to consider this to be a role for the new Strategic Health Authorities, but for Neurosurgery these entities and the unit's catchment population do not necessarily coincide. However, an agreement to facilitate the development of such arrangements may be a reasonable first step.

Managed clinical networks in neurosurgery

In the development of the concept of a workable model of a managed clinical network for Neurosurgery, the following considerations would apply:

Prevalence and incidence of neurosurgical conditions

Many neurosurgical conditions are relatively rare and a few very rare. Although as has already been mentioned the relationship between numbers and outcome is, at best, 'non-proven' in Neurosurgery, most neurosurgeons accept a probable relationship between volume and outcome for certain conditions, for example, the rare syndromic craniofacial anomalies. Likewise, driven by the same considerations, most of the larger units now offer a degree of subspecialization, particularly for the management of conditions such as arteriovenous anomalies, pituitary tumours, movement disorders and some skull base lesions. Conversely, it is generally accepted that the management of the common neurosurgical emergencies such as head injuries, acute spinal cord compression, intracranial haemorrhage and blocked shunts should be regarded as within the necessary expertise of all neurosurgical consultants. Thus, all neurosurgeons who are on-call for neurosurgical emergencies will be required to achieve and maintain expertise in emergency management of these conditions regardless of their particular subspecialty interest. Likewise all neurosurgeons should be encouraged to refer to colleagues those rarer non-emergency conditions that are not within their sphere of expertise. In a neurosurgical 'managed clinical network', it should be possible for a neurosurgeon with a particular subspecialty interest or expertise, but who is appointed to a smaller unit without sufficient cases to support that expertise, to contribute that expertise within the larger centre within the network. Conversely, the 'smaller' unit in such a network, by developing an area of subspecialty expertise, might reduce the pressure and facilities on the 'larger' unit in the network.

Clinical 'stage' of the disorder

It is recognized that most acute neurosurgical emergencies require expeditious treatment and that long journeys to large units risk an undesirable outcome. It is also the case that the service we offer for some non-emergency conditions, particularly for the degenerative spinal diseases, is often compromised by the pressures of the emergency work. If such routine conditions could be effectively investigated and treated in locations not subject to the demands of emergency work, then we would be able to provide a better quality of service and would be more likely to deliver the government's 'waiting list' and 'waiting time' targets. Thus, a managed clinical

network might offer a redistribution of the workload across both centres. With regard to the management of head injuries, it is already accepted that it is numerically and logistically impossible for all patients who have had a head injury to be seen by a neurosurgeon and admitted to a neurosurgical unit. It is therefore usual for neurosurgical units to provide the necessary training, support and advice for those clinicians who look after the head injured in the District General Hospitals. These arrangements can be considered an already existing example of a managed clinical network. The growth of the specialty of Accident and Emergency Medicine and wide availability of CT, image linkage, telemedicine facilities and 'outreach' clinics has sustained and enhanced the functioning of this 'managed clinical network approach' to the head injured. Such arrangements have allowed us to triage those cases requiring specialist expertise and there is no reason why such arrangements could not also be applied to the management of other neurosurgical conditions within a Neurosurgery network. Conversely, it is also recognized that when 'super-specialized expertise' is necessary, wider referral and joint patient management with colleagues working in 'national' centres already occurs (e.g. the named craniosynostosis centres, the Sheffield Radiosurgery Centre). If such a pattern already exists, its application to a wider range of neurosurgical conditions should not present too many obstacles. The pioneering work undertaken in the North West of England to develop the 'Northwest Clinical Neurosciences Partnership' for the management of subarachnoid haemorrhage may prove to be an important example[1].

Staffing considerations

A 'managed' clinical network distributed across two or more centres should be capable of providing in the aggregate sufficient medical manpower to maintain access across the network for the emergency and urgent conditions. The exact distribution of the on-call arrangements would be likely to require detailed negotiation, but it is perhaps noteworthy that in metropolitan Paris (which apparently has five neurosurgical units), there is only one unit on-call for emergency neurosurgical care on any one day of the week. For more dispersed networks, the workability of any emergency transfer arrangements might need particular consideration. It is also probable that, although one part of a neurosurgical network might not accept emergency admissions every day; nevertheless, there would need to be an on-call rota for internal emergencies. However, in these circumstances the 'disturbance' rate would be likely to be low and the provision of an intermediate tier of cover would probably not then be necessary.

With regard to the working arrangements for junior doctors, it seems likely that explicit 'training opportunities' will need to be set aside to fulfil the

training requirements. Again, it seems likely that these can be more reliably provided and would cause less disruption to service if spread across the aggregated resources of a large clinical network. Within a network it should be possible both to provide an 'academic half-day' and exposure to the various areas of subspecialty expertise necessary for the completion of training. If these arrangements can be made effective it seems possible to provide trainees with the necessary formal education and training experience within the network during the tenure of their SpR appointment. However, it is certain that in a 'time-limited' training system, where the hours of trainees are reduced, even if they can be effectively trained, they will be less experienced on their appointment to a consultant post. This lack of clinical experience will represent a 'risk' for the newly accredited consultant and for their patients. In order to minimize this risk to them and to their patients while they acquire the necessary experience, it might be helpful to consider an informal 'mentoring' system for newly appointed consultants.

What seems certain, particularly if the proposals for the SHO grade go ahead, is that the service contribution of our trainees will be substantially reduced. This is likely to be most noticeable in the smaller units that do not have sufficient workload to justify a large cohort of trainees. Even in the larger units, it now seems likely that not all consultants will have available the services of an intermediate grade trainee at all times during the working week. In those circumstances, it is sensible to consider alternative types of staffing arrangements. Those neurosurgical departments in the USA, which do not have their own training programmes normally make substantial use of nurse practitioners, physicians' and surgeons' assistants ('physicians' assistants' perform ward-based tasks normally undertaken by nurses or junior doctors; 'surgeons' assistants' perform theatre-based tasks normally performed by nurses or junior doctors). Many neurosurgical units already employ nurse practitioners and physicians' assistants to great effect, and in those units where surgeons' assistants are available their contribution has been described 'invaluable'. It has been suggested that the introduction of such posts may dilute the training and experience of our juniors and increase the nursing shortages by 'cannibalizing' the ward-based nursing staff. However, it appears that in those units where this pattern of service has been established, nurse recruitment, and the service to patients is improved and the trainees have more time for the tasks, which only doctors can do and for attending theatres. What seems certain is that in smaller units this approach is probably the most practical way of providing a reasonable standard of service and continuity of care. Similarly, the preoperative assessment and postoperative review may be offered as close to the

patient's home as possible, whilst organizing the surgery itself more centrally. Such reconfiguration will create a managed clinical network.

Financial considerations

As has been indicated many neurosurgical treatments are expensive and are provided for uncommon conditions. It is likely that commissioners faced with intense financial pressures and local priorities that are unlikely to include Neurosurgery, will be resistant to making the necessary investments in Neurosurgery. In financial terms, we will certainly be required to provide for our investors a 'dividend', but it is useful to identify the 'currency' in which that dividend needs to be paid. For Neurosurgery, if we are requesting investment in our services, the investment must be able to deliver for commissioners compliance with the government's (and, hence, the commissioners) priorities of 'access', waiting times and targets. If Trust chief executives, Strategic Health Authorities, and our monitoring and regulatory masters are to support our case for further investment, that investment must resolve the majority of the problems of staffing, training and service configuration that have been set out in this paper.

I believe that by looking imaginatively at how we configure our services and use our staff, we have the possibility to resolve some of these problems, and of providing improved services to patients, improved training opportunities for our juniors and a better quality of life for ourselves.

Note

- [1] The North West Clinical Neurosciences Partnership, Director Dr I. R. Williams, St Helens Primary Care Trust, Cowley Hill lane, St Helens WA10 2AP, UK.

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