



## Briefing: October 2020

### Neurosurgery

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#### Introduction

NHS England's Specialised Commissioning team lead a national programme aimed at improving specialised adult neuroscience services in England. The work programme seeks to support emerging regional teams, as well as integrated care systems in the NHS, through establishing 'what good looks like' for specialised neuroscience services for a local population. It works closely with colleagues from other programmes, such as the [Getting It Right First Time \(GIRFT\) programme](#) and [NHS RightCare](#), to capture both provider and clinical insights and support local improvements.

There are two main workstreams to the programme: adult neurosurgery and specialised neurology services for adults.

#### Adult neurosurgery

Adult neurosurgery is a specialised service, which means it is funded nationally through specialised commissioning. Over the past year, the national programme has worked with clinicians and patient groups to develop a view of 'what good looks like' for brain tumour, sub-arachnoid haemorrhage and pituitary surgery pathways, with the assumption that the principles from these three pathways are reflective of other elective, emergency and low

volume pathways, respectively. Through these pathways, the programme aimed to identify the emerging model that would address issues of flow and access.

### **Specialised neurology services for adults**

Much of the care that adults living with neurological conditions access is locally funded by CCGs (clinical commissioning groups) rather than specialised commissioning, so one of the aims of this work is to develop a clearer definition of specialised neurology, and improve access to specialised and specialist elements of care when required, delivering the right care at the right place and at the right time. For neurology, we have initially explored three care pathways: multiple sclerosis, epilepsy and neuro auto-immune disease, with a view that learning from these three conditions will help build a future model for specialised and specialist care that applies to most other neurology conditions.

We were asked by NHS England to bring together emerging thinking from NHS staff about how the delivery and commissioning models for specialist services could develop.

This short report looks at neurosurgery, and is based on a review of documents developed by NHS England, analysis of data and recent reports, and the outputs of a workshop with a large cross-section of people involved in the area that itself had built on extensive work on pathway development. Three key pathways developed nationally were also tested and discussed in detail at the workshop.

### **Key messages**

This report predates the Covid-19 pandemic, but its findings and recommendations still apply. The growing waiting list for planned neurosurgery was already an issue and capacity constraints will mean that it will be difficult to prevent this from worsening in the immediate future.

The key messages of the report are:

- Costs, activity and demand are growing, and this will continue.
- There are opportunities to improve efficiency through improved use of theatres, enhanced care to supplement critical care and in particular through improving flow. The GIRFT programme addresses many of these, but flow improvements require an increase in rehabilitation capacity and this is commissioned locally, which means there may be misalignment between specialised and CCG commissioning.

- There is a need for a more networked model of provision with standardised pathways (three of which were developed and broadly agreed as part of this process). In developing these, there is a need to reduced the number of units undertaking low volume procedures. Mechanisms should be put in place to facilitate transfers and to offer training opportunities for surgeons who wish to develop an expertise in these rare operations.
- Investment in systems to improve e-referral, information and image exchange and the provision of advice and support across systems is required.
- ICS/CCGs need to work with NSCs and NHSE to develop a more integrated approach to the commissioning of rehabilitation that reduces bottlenecks and handover problems. Additional rehabilitation capacity and mental health support will need to be commissioned locally to support the pathways – some elements of this could be bundled with the payments made to providers. Experiments with payment models that explore these approaches should be considered.
- Formal arrangements for repatriation should be negotiated within each NSC footprint – where practical consideration should be given to piggybacking on existing trauma networks to support improved flow.
- As ICSs develop, mechanisms should be put in place to involve them in commissioning processes, so they grow this capability over time. National standards for key elements of pathways will continue to be important and necessary to support any future change in commissioning arrangements.

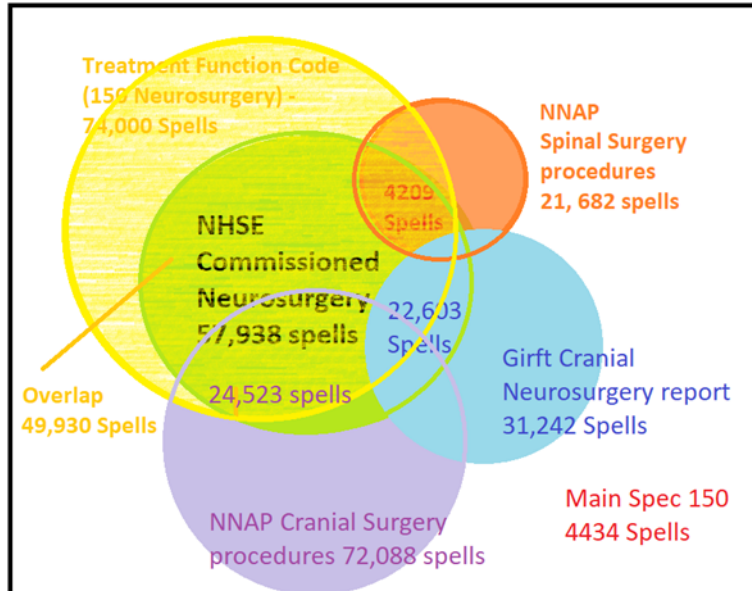
## Service profile

Adult neurosurgery is provided in 24 centres across England, which provide between 2,500 and 16,000 episodes a year. The units have catchment populations ranging from one million to over four million. The annual spend on these services, as part of specialised commissioning, was £660 million in 2018/19.

In 2017/18, there were 134,024 spells where the main specialty or functional code was neurosurgery. Of these, 57,938 were commissioned by NHSE as part of the specialised commissioning programme.

This produces some anomalies. For example, a minor procedure, such as for carpal tunnel syndrome performed by a neurosurgeon, will attract an enhanced rate, while a procedure classified as neurosurgical performed by an interventional radiologist will not, unless the patient is under the management of a neurosurgeon. This is because the payment model is associated with the neurosurgeon rather than with the type of procedure.

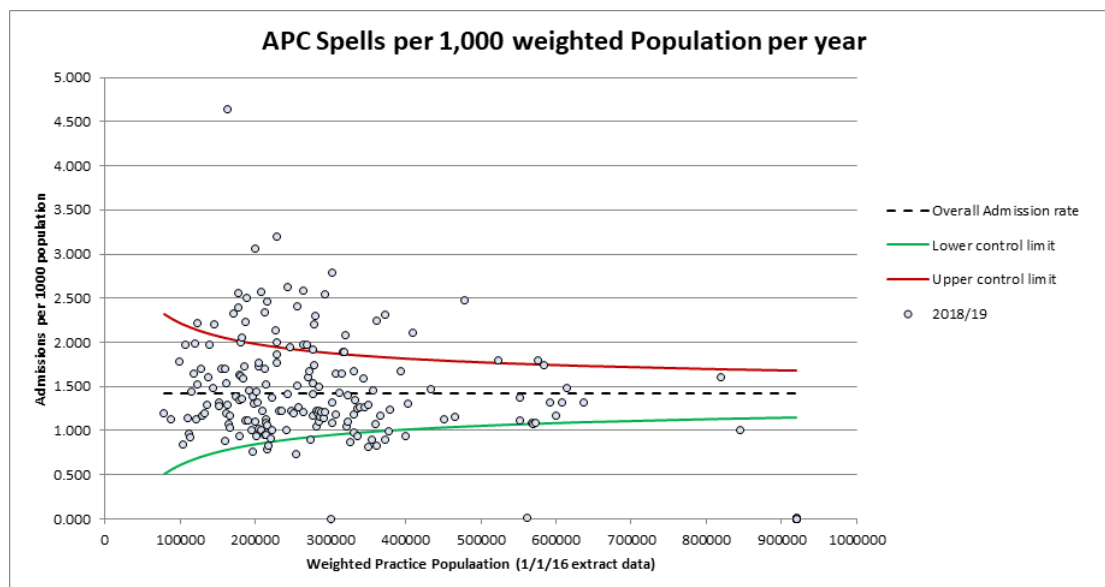
## What is Neurosurgical Activity?



2017/18 - 134,024 Spells

TFC 150 or Main Spec 150 or NCBPS08S or GIRFT Neurosurgery Code or NNAP Cranial Code

There is some variation in utilisation between CCG areas, but this appears to be less than in many other areas of activity, and there is little evidence that there is an issue of poor access for most CCGs. The high outliers do not show any pattern, and the extreme outlier may be an anomaly.

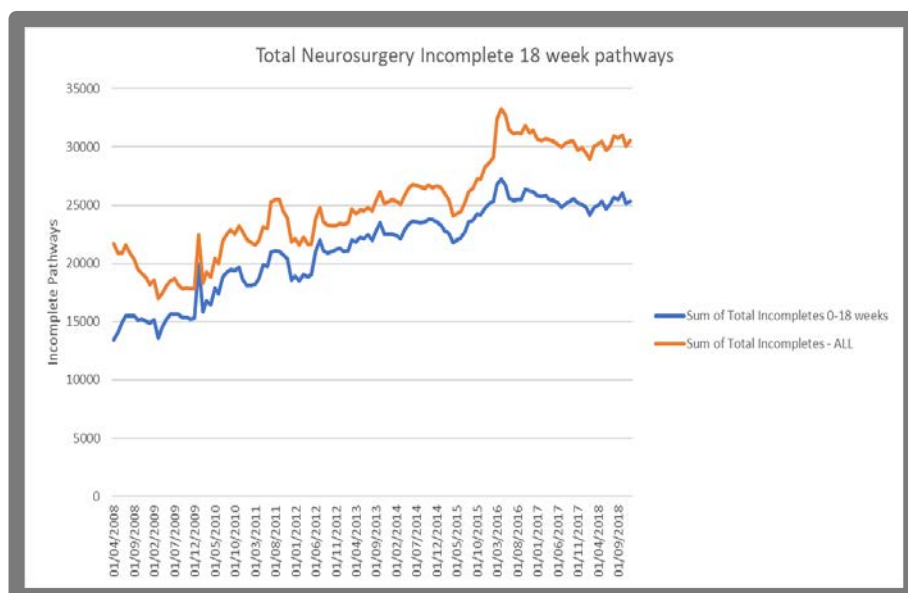


## Challenges and opportunities

There are a number of challenges in neurosurgery that need to be addressed. There is concern that some of these are manifesting in a growing level of medical negligence liabilities, and more general concerns about lost opportunities to improve services for patients as well as support to services in local acute hospitals.

## Waiting times

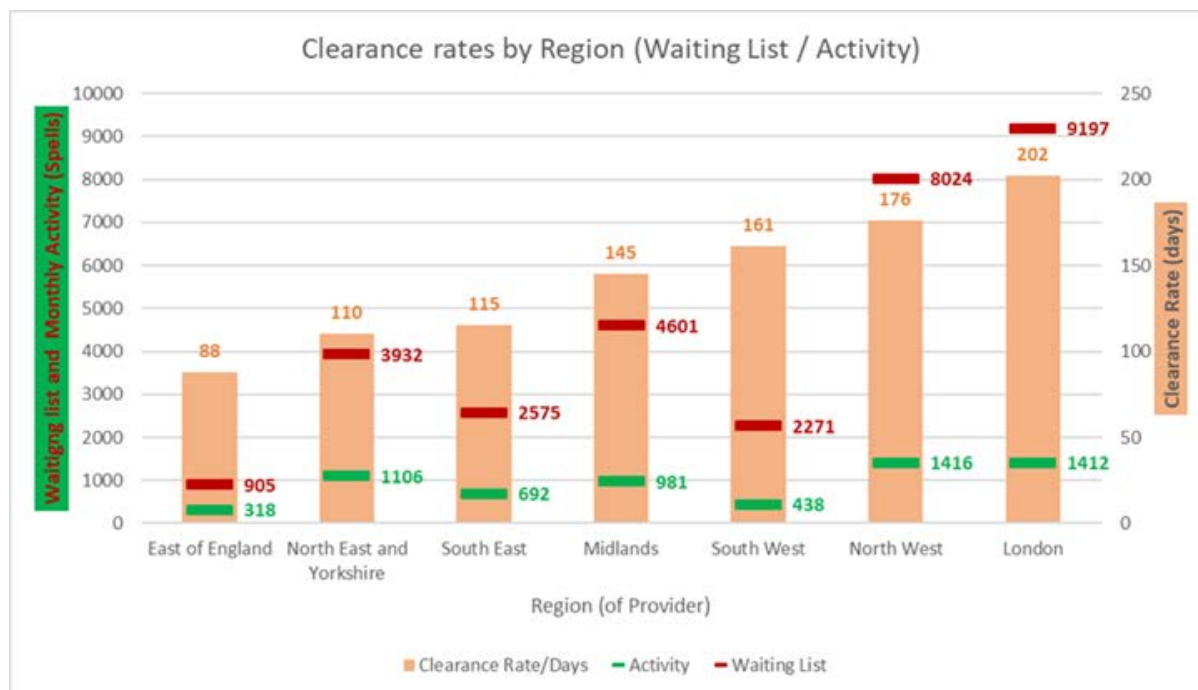
While waiting in the form of incomplete pathways has levelled recently (see below), there are a number of reasons to be concerned about current and future waiting times.



Capacity constraints mean that, without action, the waiting list is likely to grow quickly and could be unsustainable within two to three years unless action is taken now. Activity has been growing less rapidly than demand.

The maximum activity carried out in any month over the last three years was 5,472 procedures (October 18). On current growth, providers will need to undertake 6,129 procedures in any month to stop predicted growth in waiting lists, which could rise from 30,000 to 90,000 over the next five years without action now.

There is significant variation in the scale of the waiting list problem between regions. The diagram below shows the number of days required to clear the waiting list, along with the current activity and waiting list levels.



### Growing costs and activity

Activity has been growing and demand is also likely to increase over the next few years. This reflects changes in the population over time, including increasing incidence of conditions now amenable to a neurosurgical intervention.

Of as much concern is that costs are growing more quickly than can be explained by increasing demand or activity and general price inflation. For example:

	Activity increase	Tariff
Brain tumour	2%	6.6%
SAH	0%	4.3%
Pituitary	2.4%	6.9%

NHSE spend has increased at a faster rate than activity for a number of reasons. The switch from HRG4 to HRG4+ enabled treatment breakdown on a more granular level, and

with it, a wider spread of tariff payments, increasing spend in some areas. Additionally, tariff received a 1% uplift between 2017/18 and 2018/19.

Cost pressures are likely to continue driven by several factors:

- Increased use of complex imaging
- New treatment technologies that improve outcomes but do not reduce costs. These may also increase survival and so add to costs due to the additional cost of follow up
- The cumulative impact of problems with flow
- Increased complexity of patients treated with more co-morbidities
- Impact of more elderly and frail patients being treated, with an associated increased length of stay and higher chance of complications requiring treatment
- Growing litigation costs – these may also have an indirect impact through more defensive practice or directly on costs. A 2015 study found that neurosurgical litigation in NHS hospitals had significantly increased over the previous decade, predominantly due to spinal claims. Neurosurgical claims have a very high likelihood of success, and even for unsuccessful claims, associated legal fees are considerable. Overall, delay to diagnosis accounted for the predominant share of claims volume and damages.<sup>1</sup>

### **Opportunities for efficiency and improved flow**

Analysis from NHSE, GIRFT and other sources shows there are very significant opportunities for improvements in efficiency. The availability of theatre and critical care capacity is an issue in some providers and, as noted above, presents an obstacle to offering choice of an alternative provider for patients with a long wait at 26 weeks. Dealing with this may require increased weekend working, actions to unblock flow issues and in some cases use of the independent sector.

The most pressing issues are related to flow problems that also have serious implications for patients and the outcomes of care. A snapshot bed audit at one site showed 39% of patients were in the wrong setting, awaiting either repatriation or rehabilitation. Feedback from the workshop suggests that this figure is representative, and that the problems were complex. They include capacity constraints at DGHs, insufficient rehabilitation capacity locally, a shortage of specialist rehabilitation facilities and home care, and a number of other organisational issues that exacerbate this problem – including the lack of a strong set of relationships between staff in DGHs and neurosurgery centres.

Most post-treatment rehabilitation is commissioned by CCGs rather than at a national level, so that funding for more specialist types of rehabilitation has to be negotiated with individual CCGs that often have issues around funding and internal decision processes that can cause delay.

Rehabilitation providers can refuse patients and it is not always clear what their acceptance criteria are or how they are applied. The result of this is a long tail of length of stay, which has adverse implications for patients and flow and means that patients can be denied access to care. Flow problems at the discharge part of the process can still impact on critical care capacity if there is not capacity to step patients down when they are ready.

### **Cancellations**

There are high rates of cancellation – including on the day of surgery – with six trusts reporting that 10% of elective admissions were cancelled after admission.<sup>ii</sup> Patients may experience more than one cancellation or delay and have extended periods of fasting. Cancellations were strongly associated with the lack of dedicated emergency theatre availability, and the GIRFT programme recommends that this should be introduced.

Access to critical care is also a key factor in cancellations and is related to the shortage of critical care capacity, especially for centres that share units with other parts of the hospital. There are very significant differences in the use of critical care following subarachnoid haemorrhage (SAH), brain tumour and particularly pituitary surgery, which has a very distinct split between trusts that use it most of the time and the majority that make very limited use of it. Data presented at the workshop suggests there does not seem to be a significant difference in perioperative outcomes as a result of this. Different models of enhanced care after surgery seem to provide a range of safe but more flexible and efficient options for the care of these patients, and would reduce the impact of critical care shortages.

### **Low volume procedures**

There are a number of low volume procedures being undertaken across the 24 units, and there is concern that means it is not possible to make the best use of the expertise available, and could be holding back the development of expertise due to the small numbers available to each surgeon. Of most concern is that this is likely to increase the level of risk of sub-optimal outcomes.



## **Information flows**

Information flows between providers have improved, but obstacles still exist in the form of compatibility issues between PACS systems and the absence of e-referral systems within and between networks.

## **The NHS Long Term Plan**

The NHS Long Term Plan does not consider these specialties directly, but does have a number of important implications for them.

Firstly, the development of larger integrated care systems covering large populations offers the opportunity to support more effective methods of provision across providers, or, where they are required, the development of networks. It also could lead to more effective local commissioning of some specialist services than has been possible for the much smaller CCGs.

The second implication is that an improved focus on population health and the ambition to reduce variation in care could help deal with some of the issues about disjointed pathways and the results of the lack of rehabilitation on patient outcomes and flow.

The third opportunity comes from the development of digital systems that will help to support digital/virtual outpatients and consultations, e-referral and improve image transfer and some of the other obstacles to cross-system working that currently exist.

## **Developing the model**

There is an opportunity to make more of the relatively small network of highly trained professionals in neurosurgery across England to improve services, reduce variation, exploit areas of excellence and make the best use of scarce expertise. From this, it should be possible to create a model that can make the most of the power of a national system and regional networks, and realise the benefits of a well-functioning community of practice that links these together. Participants in the workshop identified a number of principles that should underpin the model. The key ones are:

- The model puts the best interests of patients at the forefront
- Equity of access for patients
- Clinical excellence and care in the right setting

- Standardised approaches to support trusted assessment, i.e. to ensure that assessment does not need to be repeated as clinicians are trained to take a standardised approach, use agreed terminology, and will accept decisions made by other clinicians on this basis
- Well organised, collaborative networks that concentrate expertise
- Flow across the system – especially to rehabilitation
- Avoid the bureaucracy that can accompany networks.

The main components of this model are:

### **Service configuration**

The current referral networks are to some extent a product of history, but there is no obvious advantage to changing these at present. Inpatient and other specialist neurosurgery will continue to take place in regional centres, but with close collaboration across a wide network of providers needed to ensure that patient pathways operate smoothly, eliminating the delays and issues with information transfer that are too often a feature of the current system. This may require some investment to improve the exchange of images, but also to develop an e-referral system to link the network together.

### **Pathways**

Effective networks will need well-defined pathways that are shared across the network that specify the roles of different participants, the information that needs to be shared and the standards that need to be met. Work has already been developed at national level to define the main components of pathways for SAH, brain tumours, pituitary tumours, epilepsy and low volume procedures.

There is a strong case for standardising the approach to post-operative critical care and the use of more enhanced care models, and where possible the protection of critical care capacity to support neurosurgery. Improving flow downstream will assist with this.

The development of common standards has implications for the treatment of patients referred from within tertiary centres, to ensure there is equality of access across the network. (I.e. it should be no harder or easier to access neurosurgery if the patient is already an inpatient in a neurosurgery centre than if they are in a DGH.)

Workshop participants and other stakeholders suggested that additional rehabilitation capacity will be required, particularly that commissioned by CCGs, to deal with issues of flow. The rehabilitation components need to be explicitly recognised in the pathways for neurosurgery and commissioned accordingly.

Patients should have access to psychosocial support services through their local health services post-discharge, to assist with re-integration into employment and education where appropriate.

### **Low volume procedures**

For very low volume procedures, decisions will need to be taken within networks (and in some cases between them) about how to concentrate very low volume activities. For paediatric epilepsy and craniofacial surgery, there are four centres providing care, coordination with other providers and giving expert advice to services within the children's neuroscience network and leadership for research, audit and training.

In other cases of low volume surgery, the emphasis will need to be on focusing expertise among as few surgeons as is practical and consistent with ensuring the service is resilient. Examples here include:

- Awake surgery for brain tumour resection
- Endoscopic surgery in patients with brain tumours
- Pineal tumour resection
- Intra-ventricular tumour resection
- Microsurgical aneurysm repair
- Epilepsy surgery
- Pituitary surgery
- Skull-base surgery
- Intramedullary spinal cord tumours.

In units where low volume procedures are not performed or only done in very small numbers, a network-wide agreement should be in place to support the service.

The focusing of complex, low volume types of work and developing the capability to deal with very serious emergencies may mean that on occasions it will be necessary to move staff rather than the patient. The standardisation of equipment between sites in a network will help with this, as well as having advantages for trainees moving between units.

While a larger centre will usually be the focus for low volume activity, this may not necessarily be the solution in all cases if there are pockets of expertise elsewhere across the system. Staff who have expertise in low volume areas, or who would like to develop, will need to be offered opportunities to work across sites within the network, or local services may need support from a larger centre to sustain a high-quality low volume service.

Overall systems and process for coordination, providing advice and ensuring that the patient gets to the right expert will need to be in place – this requires collaboration and some changes in approach to recognise when it is better to refer a patient.

### **Advice and support**

The availability of sub-specialty advice and input to multidisciplinary teams (MDTs) will be an important part of this model as there is more focus and more concentration of low volume procedures. For neurovascular services, a 24-hour rota within the network will be needed to provide advice and support, and to deal with those patients where either a micro-surgical or endovascular approach is required to deal with an aneurysm.

The model will move to methods of offering specialist consultation using local clinics and where appropriate moving away from face-to-face consultation. Better initial triage and routing of patients to the right specialist will also help provide a better patient experience as well as a more efficient use of resources. One-stop clinics have an important role in some cases. For example, the network should be able to offer a one-stop multidisciplinary neuro-oncology clinic, including:

- Defined, separate MDT neuro-oncology clinic within neurocentres
- At least one per week per centre with surgery, oncology and CNS presence
- Access to pre-assessment clinics on day of appointment
- Access to MRI on the same day.

### **Care across the system**

The creation of flow into and out of the neurosurgical system, and the sharing of expertise across centres, will require a more collaborative model of operation. This does not need to be as formal and structured as networks in cancer, for example. There are two areas of focus:

- Between neurosurgical units for the management of rare, low volume and ultra-low volume diagnoses, and/or procedures where the issue is ensuring the rapid provision of advice, the seamless handover of the patient and sharing knowledge.
- Between the centres and the DGH and rehabilitation providers to address issues of rapid transfers of emergencies, issues about flow, multidisciplinary care for patients with cancers, long-term problems and rehabilitation needs.

In both cases, however, there are similar sets of tasks:

- Standardising processes and pathways – it will be important that there is a well-defined pathway into palliative care, rehabilitation, mental health and other supporting services across the footprint served by the neurosurgical centre. This means there will also need to be shared clinical governance and audit.
- Developing systems for rapid and easy information exchange, especially images.
- Mechanisms for unblocking flow and holding providers to account for this. This includes the development repatriation policy that sets out the obligations of the members of the network to each other, such as to take urgent patients without quibbles and to accept patients back for rehabilitation without delay. Some trauma networks have coordinators whose role is to facilitate transfers. These are backed up by protocols for transfers within and between trauma networks, so that a patient requiring aftercare who lives outside the network's area can still be rapidly returned home or to a local provider.

These functions seem to require less of the complex machinery than more formal networks where there are higher volumes but some mechanisms for coordination, for oversight of the model and resolving issues when they arise would be of value. Without creating a large bureaucracy, there will need to be a set of processes to oversee this system and a formal agreement between the participants in it. The arrangements developed to support Operational Delivery Networks can form a good foundation to be used as a model. One option would be to make neurosurgical systems part of an existing network arrangement that shares the same footprint and issues, such as trauma or spinal.

Between neurosurgical centres there are additional tasks:

- Identifying opportunities for specialists to work across sites
- Deciding on the location of low volume services and systems for collaboration to ensure succession planning to train the next generation of surgeons able to perform these cases.

These approaches will also require:

- Metrics that capture issues of flow, pathway compliance, assurance that the patients reached the correct specialist rapidly, performance of low volume care and clinical outcomes.
- Access to mechanisms for patient engagement – experience from cancer networks suggests that data on patient experience and direct mechanisms for patient engagement are both important in shaping services.
- Mechanisms to allow staff to work across the network, such as passport arrangements.
- Data-sharing agreements between providers.

## **Commissioning**

### **Responsibility for commissioning**

The development of regional directorates and ICSs mean that there are now options to consider about the level at which specialised commissioning for neurosurgery is best situated, and how it should develop. The volumes involved in most neurosurgery are relatively low and the networks of care are large and span proposed ICS boundaries.

With the exception of the interface with local hospital emergency departments and rehabilitation services, neurosurgery has a relatively low level of contact with services commissioned at CCG/ICS level. This means that outside of those service areas, the opportunities for more local commissioning to improve services for the local population by closer integration and inclusion in the wider population are small.

Current legislation means that NHS England will retain overall accountability for the commissioning of neurosurgery but can delegate elements of the commissioning function. Whatever model is adopted, the specialist knowledge required to commission neurosurgery means there are advantages for some functions to be done once nationally. These areas include:

- The specification of key standards
- The development of approaches to quality improvement and the dissemination of good practice
- The design of payment models
- Working on some of the difficult issues of definition mentioned above

- The approach to be taken to the management of low volume procedures, including potentially taking action to commission these through a more limited number of centres, and the specification of minimum volumes and specifications for this.

As ICSs develop, they may wish to become more involved, and mechanisms will need to be developed to ensure they are represented and have a voice in commissioning. This will allow capacity building that will mean, over time, that decisions about the optimal level for commissioning can be reviewed.

### **Payment models**

For some types of patient, it might be appropriate for payment for the entire pathway to be bundled with the payment to the specialist provider to give more control over the provision of rehabilitation. There will still be a need for CCG-commissioned services, however, and so this is only a partial solution that may have its own difficulties. There is no alternative to the leadership of the network engaging with local commissioners and providers to improve these interfaces.

The current approach of funding based on a complex set of definitions is not ideal and there are anomalies. How significant these are, and how much of a priority it is to sort them out, is not clear not least because the net effect on commissioners may not be very significant.

### **Looking to the future**

One of the particular challenges of specialist services is that they tend to experience cost growth at a faster rate than other areas. This is often exacerbated by the emergence of new technologies that are used in addition to (rather than instead of) current ones, or by innovations that allow patients to be treated who might previously have been ineligible for treatment or unlikely to benefit. As can be seen above, costs are growing faster than activity.

We asked delegates at our event to think about how developments in their discipline or the wider system would impact on their practice. Examples include:

- Immunotherapy for glioma (although evidence is not yet available)
- 5 ALA for surgery
- Robotic assisted surgery

- Increased use of intra-operation molecular diagnostics, intraoperative neurophysiology or MRI
- Multi-modality imaging including DTI, tractography, cerebral perfusion, fMRI
- Expansion of remote consultation, IT and video to support MDT working
- Self-unblocking shunts
- AI assisted diagnosis
- Blood tests to diagnose brain tumours.

Some of these innovations do have the capacity to improve efficiency and the use of resources. Others may allow treatments to be extended to patients who currently would not benefit from neurosurgery and so could add to costs. Scanning the horizon for these developments, and ensuring the resources and staff expertise to make the most of them, would be a useful step.

## **Summary of recommendations**

A number of clear conclusions emerged from the workforce and the additional analysis presented above.

- There was broad support for the model proposed and for the principles that underpin it, including an increase in collaboration between NSCs, and with NSCs and the wider system.
- There was support for the three pathways that were presented, and for the concept that these should continue to be developed nationally.
- The approach to the use of post-operative critical care should be reviewed, while best practice from units making more use of enhanced care should be considered.
- The difficulties in offering choice for delayed patients at 26 weeks may require increased weekend working, actions to unblock flow issues, and in some cases use of the independent sector.
- Commissioners and NSCs should collectively act to reduce the number of centres performing complex low volume procedures. Mechanisms should be put in place to facilitate transfers and to offer training opportunities for surgeons who wish to develop an expertise in particular operations.
- Investment in systems to improve e-referral, information and image exchange and the provision of advice and support across systems is required.
- Additional rehabilitation capacity and mental health support will need to be commissioned locally to support the pathways – some elements of this could be



bundled with the payments made to providers. Experiments with payment models that explore these approaches should be considered.

- ICSs/CCGs need to work with NSCs and NHSE to develop a more integrated approach to the commissioning of rehabilitation that reduces bottlenecks and handover problems.
- Formal arrangements for repatriation should be negotiated within each NSC footprint – where practical consideration should be given to piggybacking on existing trauma networks to support improved flow.
- As ICSs develop, mechanisms should be put in place to involve them in commissioning processes, so they grow this capability over time.
- It would be worth considering developing more formal approaches to horizon-scanning for new technologies, drugs or approaches – particularly those with implications for costs, training or the need to review pathways.



## References

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<sup>i</sup> Louise Steele, Soumya Mukherjee, Ashley Stratton-Powell, Ian Anderson & Jake Timothy (2015) Extent of medicolegal burden in neurosurgery – An analysis of the National Health Service Litigation Authority Database, *British Journal of Neurosurgery*, 29:5, 622-629, DOI: 10.3109/02688697.2015.1054362

<sup>ii</sup> Data from GIRFT

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