

D03/S/a

**NHS STANDARD CONTRACT  
FOR NEUROSURGERY (ADULT)**

**SCHEDULE 2 – THE SERVICES – A. SERVICE SPECIFICATIONS**

<b>Service Specification No.</b>	D03/S/a
<b>Service</b>	Neurosurgery (Adult)
<b>Commissioner Lead</b>	
<b>Provider Lead</b>	
<b>Period</b>	12 months
<b>Date of Review</b>	

**1. Population Needs**

**1.1 National/local context and evidence base**

**National Context**

Neurosurgery concerns the operative and non-operative management of patients with disorders of the central and peripheral nervous systems. The specialty developed initially through the treatment of cranial trauma and intracranial mass lesions. Subsequent advances in microsurgical techniques, non-invasive imaging, neuro-anaesthesia, intensive care, image-guided surgery, and the introduction of sophisticated radio-oncological and interventional treatments have substantially enhanced and widened the scope of effective neurosurgical treatments.

England is served by a network of 25 neurosurgical units covering populations of between 1.0 and 3.5 million. These neurosurgical units are an integral part of regional clinical neuroscience centres and the majority form an essential component of their local major trauma centre. Most centres offer a comprehensive range of adult services. Rare and complex disorders may be managed at a supra-regional level by units with specialist expertise.

Neurosurgical activity has been increasing steadily at annual growth rates of 2-5%. In-patient hospital spells are reaching 1400/million population in larger units and operative caseload is typically 1000 cases/million population.

Although paediatric neurosurgery is commissioned separately from adult neurosurgery, there exist important clinical, training and infrastructure links between the two neurosurgical services. Almost all neurosurgical consultants are involved in the delivery of emergency services and must therefore be competent to manage a wide range of adult conditions and to provide basic emergency paediatric care.

### **Local Context**

Clinical, professional and operational relationships have been built up over many years between the regional neurosurgical units and their referring District General Hospitals and other Specialist Hospitals. These relationships underpin high quality, effective clinical pathways for many acute neurosurgical conditions. Emergency and urgent activity accounts for approximately 50% of the caseload of a neurosurgical unit.

Specialist elective care is provided by neurosurgeons with special interest training, working in multi-disciplinary teams with colleagues in the clinical neurosciences, neuro-oncology, endocrinology and surgical disciplines including otolaryngology, maxillofacial, plastic and orthopaedic surgery.

Over the last 20 years, neurosurgical units have taken an increasing role in the delivery of spinal services, both traditionally as a complex and emergency tertiary service and in some regions as the major provider of elective secondary care spinal services, such that spinal surgery accounts for up to 50% of the in-patient activity of some units.

### **Evidence Base**

A substantial body of National Institute for Health and Clinical Excellence (NICE) guidance relates to neurosurgery ([www.nice.org.uk](http://www.nice.org.uk)):

- Technology Appraisal (TA) 23: Brain cancer (temozolomide)
- TA121: Glioma (newly diagnosed and high grade) – carmustine implants and temozolomide
- Medical Technologies Guidance (MTG) 10: Pipeline embolisation device for the treatment of complex intracranial aneurysms
- Clinical Guidelines 56: Head Injury
- CG75: Metastatic spinal cord compression
- CG137: Epilepsy
- Cancer Service Guidelines: Brain/Central Nervous System (CNS) Brain tumours
- Interventional Procedures Guidance 12: Percutaneous vertebroplasty
- IPG19: Deep brain stimulation for Parkinson's disease
- IPG32: Endoscopic transsphenoidal pituitary adenoma resection
- IPG65: Subthalamotomy for Parkinson's disease
- IPG68: Lumbar subcutaneous shunt
- IPG80: Selective peripheral denervation of cervical dystonia
- IPG84: Supraorbital minicraniotomy for intracranial aneurysm

- IPG85: Stereotactic radiosurgery for trigeminal neuralgia using the gamma knife
- IPG105: Coil embolisation of unruptured intracranial aneurysms
- IPG106: Coil embolisation of ruptured intracranial aneurysms
- IPG108: Auditory brainstem implants
- IPG146: Direct C1 lateral mass screw for cervical spine stabilisation
- IPG166: Balloon kyphoplasty for vertebral compression fractures
- IPG188: Deep brain stimulation for tremor and dystonia (excluding Parkinson's disease)
- IPG223: Therapeutic percutaneous image-guide aspiration of spinal cysts
- IPG263: Lumbar infusion test for the investigation of normal pressure hydrocephalus
- IPG278: Functional electrical stimulation for drop foot of central neurological origin
- IPG285: Ultrasound guided regional nerve block
- IPG290: Photodynamic therapy for brain tumours
- IPG319: Percutaneous intradiscal electrothermal therapy for low back pain
- IPG348: Extracranial to intracranial bypass for intracranial atherosclerosis
- IPG370: Percutaneous closure of patent foramen ovale for recurrent migraine
- IPG381: Deep brain stimulation for intractable trigeminal autonomic cephalalgias
- IPG416: Deep brain stimulation for refractory epilepsy
- IPG420: Percutaneous venoplasty for chronic cerebrospinal venous insufficiency for multiple sclerosis

## 2. Scope

### 2.1 Aims and objectives of service

The aims of neurosurgical services are to:

- reduce the morbidity and mortality of neurosurgical conditions;
- to minimise pain and disability;
- to optimise functional recovery and
- improve the quality of life of neurosurgical patients.

To achieve this aim, neurosurgical patients should receive the highest levels of patient-centred, multi-disciplinary care in the most appropriate environment.

### Service Objectives

This service specification and commissioning guidance should ensure that the following minimum standards and core objectives are met:

### Resources

All necessary resources will be available to allow for the assessment, admission, investigation, treatment, on-going care and rehabilitation of neurosurgical patients

to agreed national standards and within timescales appropriate to the patient's clinical need.

Access to emergency treatment for the neurosurgical unit's catchment population will be available at all times.

Neurosurgical services will be consultant-led and when appropriate consultant-provided by consultants with the requisite general and specialist training.

The minimum requirement for full 24 hour consultant led service is 1 Whole Time Equivalent (WTE) neurosurgeon per 200,000 population. Small units serving populations of 1.0 to 1.2 million should have a minimum of six consultant neurosurgeons.

A minimum of 30 neurosurgical Level 1 and 2 beds are required per million population to ensure timely and equitable access to inpatient care and to maintain a safe service.

Neurosurgical units must be staffed by nursing and allied healthcare professional with specific training in the clinical neurosciences and neurosurgery.

All units require a minimum of two fully resourced dedicated operating theatres and immediate access to an emergency (National Confidential Enquiry into Patient Outcome and Death (NCEPOD) theatre. Those units serving a population of more than 2.0 million require a minimum of four theatres.

### **Service Delivery**

Multi-professional teams will work together, across disciplines and locations, to achieve the optimal decision making, treatment and clinical outcomes.

Care will be provided in accordance with agreed national guidelines.

Delivery and development of each aspect of the neurosurgical service will be co-ordinated by named personnel to ensure that standards are met.

Services will be designed and developed around the needs of the individual patients

### **Neuro-oncology Services**

Neuro-oncology services should be delivered in accordance with NICE

Improving Outcomes Guidance and will be subject to peer review.

The neurosurgical service should be fully supported by, amongst others, neuro-oncologists, neuroradiologists, neuropathologists and clinical nurse specialists in the care of neuro-oncology patients.

### **Neuroradiology**

All neurosurgical units must have 24 hours access to a specialist neuroradiological opinion.

All neurosurgical units must have access to:

- 24 hour computed tomography (CT) scanning, CT angiography and Magnetic resonance imaging (MRI) scanning.
- 24 hour MRI scanning under General Anaesthetic for selected patients.
- Elective functional MRI scanning
- Intra-operative CT and MRI image-guidance
- Fixed frame stereotaxy
- Intra-operative MRI, or ultrasound imaging

All neurosurgical units providing a neurovascular service must have a multi-disciplinary neurovascular team including vascular neurosurgeons and interventional neuroradiologists. The service must have access to high quality, bi-planar digital subtraction angiography

### **Neurophysiology**

All neurosurgical units must have access to a comprehensive neurophysiology service including cerebral function, cranial nerve and spinal cord monitoring, 24 hour video Electroencephalography (EEG), nerve conduction, and Electromyography (EMG) studies.

### **Neurocritical Care**

Neurosurgical units must be provided with a minimum of 4 Level 3 neurosurgical intensive care beds per million population served. These beds must be staffed by consultant intensivists and Intensive Care Unit (ICU) nurses with specific training and expertise in the care of critically-ill neurosurgical patients.

### **Communication**

There will be effective communication between all those responsible for the patient's care, the patient and where appropriate their family and other carers.

Patients will be provided with a full range of condition-specific information in appropriate formats.

Neurosurgical units must have immediate and direct web-based access to critical diagnostic imaging in all referring units.

A consultant neurosurgeon will be available in every unit 24 hours a day for advice. The consultant will be provided with remote virtual private networks (VPN) access to all necessary imaging.

### **Continuing Care and Rehabilitation**

Robust mechanisms for the repatriation of patients to their local secondary and

primary care setting must be agreed as part of a regional framework to achieve the efficient and responsive working of the neurosurgical unit.

Neurosurgical patients should have timely access to a full range of inpatient and outpatient specialist neurorehabilitation services.

### **Quality Improvement**

Every Neurosurgical Unit will have a nominated lead for clinical governance, audit and quality improvement.

Neurosurgical units will be provided with the necessary administrative and informatics support to take part in all local and national audits and quality improvement initiatives.

The performance of units, including measures of effectiveness of care, compliance with guidelines and prevention of avoidable morbidity and mortality will be audited, benchmarked against national norms and the results used to promote service development and improvements.

### **Education and Training**

There will be a programme of continuing education for all personnel within the neurosurgical unit to achieve a full understanding of, and compliance with local protocols, patient care pathways and national guidelines, to ensure competence and to maintain a uniformly high standard of care.

There will be a parallel programme of education in relevant aspects of neurosurgical care for primary care and emergency services that will support effective referral pathways.

Training programmes will deliver the necessary level of competence to all medical, nursing and allied health professional staff in training grades.

The service will engage in neurosurgical research and development.

## **2.2 Service description/care pathway**

All consultant spells attributed to consultants within Specialty Code 150 are considered specialised and form part of this service description with the exceptions listed in section 2.4. Children are not covered by this service specification.

The major areas of specialist adult neurosurgical activity are:

- Neuro-oncology
- Neurovascular Surgery
- Skull Base Surgery
- Spinal Surgery

- Traumatology
- Hydrocephalus
- Central Nervous System Infections
- Functional Neurosurgery including pain and epilepsy services

## Care Pathway

### Elective Care

The basic neurosurgical elective care pathway is described below. Specific care pathways, for example in the management of complex epilepsy, may involve a series of additional pre-defined stages.

- Patients are referred by general practitioners, secondary care consultants and other neuroscience centres for specialist and supra-regional services.
- A preliminary diagnosis is refined by specialist neuro-imaging, neurophysiological assessment and laboratory investigations.
- A management plan is determined by the appropriate multi-disciplinary team and out-patient consultation and counselling is undertaken by the appropriate member/s of the multi-disciplinary team (MDT). For some patients a period of conservative management with clinical and radiological monitoring is indicated.
- Patients due to undergo elective surgery have a pre-admission medical and anaesthetic assessment. Additional investigations, for example volume acquisition MRI scans for intra-operative image guidance, are obtained.
- Surgery is undertaken in a dedicated neurosurgical environment with the appropriate technical support and instrumentation. Patients are often managed post-operatively in a neuro-intensive care or high dependency unit. Non-complex spinal surgery patients can be managed Level 1 beds. Day case surgery should not require critical care.
- Early out-patient follow-up addresses the immediate impact and outcome of surgery. Subsequent out-patient care is determined by the patient's condition and progress. Many patients will require long term follow-up in specialist multi-disciplinary clinics.

### Emergency Care

The majority of neurosurgical patients requiring emergency care present with cranio-spinal trauma; intracranial haemorrhage; raised intracranial pressure, hydrocephalus and compression of the cranio-spinal axis; and sepsis.

They are typically admitted directly to Emergency Departments by the ambulance services. Following resuscitation and initial assessment, many of these patients will require immediate transfer to the neurosurgical unit for further investigation, urgent surgery and subsequent neuro-intensive care.

The prompt and safe transfer of ventilated and monitored patients by medical and nursing staff with appropriate expertise is an essential part of the emergency care pathway and must be fully resourced to avoid unnecessary

mortality and morbidity.

Emergency patients are by the nature of their conditions more likely to require longer periods of intensive care and hospitalisation and more complex aftercare and rehabilitation. Timely transfer to facilities closer to home is an essential part of their re- integration into the community.

## **2.3 Population covered**

The service outlined in this specification is for patients ordinarily resident in England\*; or otherwise the commissioning responsibility of the NHS in England (as defined in “Who Pays? Establishing the Responsible Commissioner” and other Department of Health guidance relating to patients entitled to NHS care or exempt from charges)

\* Note: for the purposes of commissioning health services, this EXCLUDES patients who, whilst resident in England, are registered with a GP Practice in Wales, but INCLUDES patients resident in Wales who are registered with a General Practitioner (GP) practice in England

The service applies to all adults receiving treatment for conditions of the central and peripheral nervous systems as outlined within this specification.

## **2.4 Any acceptance and exclusion criteria**

### **Acceptance Criteria**

- Neurosurgical Units will provide a full range of elective and emergency services to meet the immediate needs of their catchment populations.
- Units will adopt relevant nationally-agreed guidelines for the acceptance of patients. Acceptance protocols based on clinical and radiological criteria may be agreed locally.
- Referrals will be accepted from primary, secondary and tertiary care, according to the national and local protocols.
- The protocols will be set out in a Directory of Services that will highlight the Unit's specialised services and will include details of how to refer to a specific service.
- Units may provide additional specialist services. Patients with Parkinson's disease, dystonia or tremor can be considered for Deep Brain Stimulation (DBS) using the criteria established by the NHS England.
- Other criteria developed by the NHS England are relevant for Occipital Nerve Stimulators for severe intractable headache and Flow Diverters for un-ruptured intracranial aneurysms.
- Units that do not provide for recognised specialist services, such as DBS, will advise on tertiary referrals to other units.

### **Exclusion Criteria**

Children are not covered by this specification. The following services for adults are excluded from this specification:

- discharges or transfers with a diagnosis of head injury and a hospital stay under 48 hours;
- peripheral nerve surgery for carpal tunnel syndrome, ulnar nerve entrapment, radial nerve entrapment, tarsal tunnel syndrome or common peroneal nerve entrapment.

## 2.5 Interdependencies with other services

The following services must be available to support the management of neurosurgical patients:

**Co-located services** – to be provided on the same site:

- neurology
- neuro-anaesthetics
- neuro-critical care
- neuropathology
- neuroradiology
- neurophysiology

**Interdependent services** – required during the spell of care, but not necessarily co-located with neurosurgery:

- oncology
- pain management
- otolaryngology
- maxillofacial surgery
- endocrinology
- plastic surgery
- orthopaedic surgery

**Related services** – possibly required during stages of the patient's care:

- neurorehabilitation
- palliative care
- spinal cord injury
- dietetics
- GP led pain management services
- physiotherapy

Several other service specifications are relevant to the Adult Neurosurgery specification:

### Paediatric Neuroscience

Adult Neurosurgery is closely associated with Paediatric Neuroscience, particularly

in the transitional care of adolescents and young adults and in the shared multi-disciplinary care of children with complex pathologies requiring the expertise of clinicians throughout the range of adult and paediatric clinical neurosciences services.

### **Complex Disability and Brain Injury & Complex Rehabilitation**

Neurological rehabilitation is an essential aspect of the management of many neurosurgical patients, particularly following cranio-spinal trauma.

### **Oncology and Stereotactic Radiosurgery**

Neuro-oncology is a major component of Adult Neurosurgery involving close collaboration between neurosurgeons, oncologists and radiation physicists to deliver radiotherapy, chemotherapy and Stereotactic Radiosurgery.

### **Spinal Services**

Neurosurgical units make a substantial contribution to the provision of spinal services, often working closely with orthopaedic surgeons in regional centres. Changes in service provision nationally have resulted in Neurosurgical Units undertaking increasing amounts of secondary spinal care in addition to specialist tertiary care.

### **Pain Management**

Specific Pain Management services are closely linked to Adult Neurosurgery.

## **3. Applicable Service Standards**

### **3.1 Applicable national standards e.g. NICE, Royal College**

A comprehensive set of standards for neurosurgery was published in 2002 by the Society of British Neurosurgeons and the Regional Specialised Services Commissioning Group. The standards enable commissioners to assess service delivery and promote consistency between centres.

'Standards for Patients requiring Neurosurgical Care': accessed at <http://www.sbns.org.uk/index.php/policies-and-publications/>

The document contains 68 general standards of which 11 are considered core.

### **Core Standards**

The following standards must be met before a contract is placed

1	Each patient's perceptions, expectations, and needs will be addressed to maximise the benefit from neurosurgical care.
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2	Patients will be cared for in an appropriate environment and account taken of their special needs, which will vary according to their clinical condition.
3	The neurosurgical needs of the population will be met by adequately resourced Neurosurgical Units and Multidisciplinary Neuroscience Centres.
4	A specialist multidisciplinary team will be constantly available to meet the needs of the population served.
5	Sufficient staff and facilities will exist for patients to gain admission and to remain in a neurosurgery unit for as long as clinically necessary.
6	Sufficient staff and facilities will exist for both emergency and routine theatre care.
7	The neuro-critical care service will be designed and developed around the needs of the patient as an individual.
8	Adequate neuro-critical care resources will be available to allow assessment, admission, investigation and treatment to agreed standards at times appropriate to the patient's need.
9	There will be an audit process assessing outcome, to include effectiveness of care, compliance with guidelines and avoidable distress, disability and death.
10	Sufficient staff and facilities will be available for post-acute neurosurgery episodes of care.
11	Patients will receive specialist neurosurgical follow-up for as long as necessary.

Interim for Adoption from 01/10/13

#### 4. Key Service Outcomes

##### Key Generic Outcome Measures

- Compliance with national access and time to treatment targets
- 30 day post-operative mortality
- Un-planned return to theatre
- Un-planned re-admission to the unit
- Elective care discharge to other than pre-operative domicile
- Surgical site infections
- Contribution to and compliance with national audits and guidelines including:
  - NICE Guidelines
  - NICE Improving Outcomes Guidance (IOG)
  - Trauma Audit and Research Network (TARN)
  - NCEPOD recommendation
  - NCEPOD Subarachnoid Haemorrhage Study – reporting 2013
  - UK Shunt Registry
  - Spinal Outcome Registries e.g. Spine Tango or the British Association of Spine Surgeons Registry
  - Subspecialty national audits e.g. British Skull Base Society National Acoustic Neuroma Audit

Other key neurosurgical measures are shown in the table below:

No.	DOMAIN	MEASURE	MEASUREMENT CRITERIA
1	Preventing people from dying prematurely	Percentage of emergency sub-arachnoid haemorrhage patients who had surgery or coiling with two days.	Average time difference (in days) between the emergency referral for treatment and the first operation date for all patients admitted with sub-arachnoid haemorrhage.
1	Preventing people from dying prematurely	TARN – Major Trauma Centre (MTC)	
2	Enhancing quality of life for people with long term conditions	indicators SPINE TANGO Measures	

No.	DOMAIN	MEASURE	MEASUREMENT CRITERIA
3	Helping people to recover from episodes of ill health or following injury	Patients with degenerative disc disease: percentage of patients with a new neurological deficit following a neurosurgery procedure, during the 6 month time period. Neurological deficit after surgery may imply a less than optimal technique.	<p><b>Denominator Description</b> Total number of patients undergoing a neurosurgery procedure, during the 6 month time period (see the related "Denominator Inclusions/Exclusions" field)</p> <p><b>Numerator Description</b> Total number of patients with a new neurological deficit following a neurosurgery procedure, during the 6 month time period. (Intracranial and spinal operations should be included as neurosurgery procedures.) <a href="http://www.qualitymeasures.ahrq.gov/content.aspx?id=33491#top">http://www.qualitymeasures.ahrq.gov/content.aspx?id=33491#top</a></p>
3	Helping people to recover from episodes of ill health or following injury	Measure of inappropriate discharge to wards by Consultants	% of Critical Care Patients readmitted from wards (not including death) as a % of admitted
4	Ensuring that people have a positive experience of care	Complaints National Outpatient Survey National Inpatient Survey Internal Questionnaires	<p>Checking to see if we can get feedback on doctors questions from surveys split by neurology and surgery – if not consider requesting a change to survey.</p> <p>Current questions on doctors include:-</p> <ul style="list-style-type: none"> <li>• Patients getting answers they could understand from the doctor, when they asked important questions</li> <li>• Patients having confidence and trust in the doctors treating them</li> <li>• Acknowledging patients and for doctors not talking in front of them, as if they weren't there</li> <li>• Patients noticing that doctors washed or cleaned their hands between touching patients</li> <li>• Involving family or friends or someone else close to them having enough opportunity to talk to a doctor if they wanted to.</li> </ul> <p>- Or about operation/procedure:</p> <ul style="list-style-type: none"> <li>• Patients being given an explanation that they could understand about the risks and benefits</li> </ul>

4	<p>..Continued/  Ensuring that people have a positive experience of care</p>	<p>..Continued/  Complaints National Outpatient Survey National Inpatient Survey Internal Questionnaires</p>	<ul style="list-style-type: none"> <li>•Explanation of operation before the operation or procedure, being given an explanation of what would happen</li> <li>•Having questions answered before the operation or procedure, in a way they could understand</li> <li>•Expectations after the operation - being told how they could expect to feel after the operation or procedure</li> <li>•Receiving an explanation they could understand from the anaesthetist or another member of staff about how they would be put to sleep or their pain controlled</li> <li>•After the operation being told how the operation or procedure had gone in a way they could understand</li> </ul>
5	<p>Treating and caring for people in a safe environment and protecting them from avoidable harm</p>	<p>Percentage of patients having a neurosurgical infection in hospital, excluding superficial wound infections, requiring nothing more than a single short course of antibiotics, during the 6 month time period.</p>	<p><b>Denominator Description</b> Total number of patients having a neurosurgical procedure performed, during the 6 month time period (see the related "Denominator Inclusions / Exclusions" field)</p> <p><b>Numerator Description</b> Total number of patients having a neurosurgical infection in hospital, excluding superficial wound infections, requiring nothing more than a single short course of antibiotics, during the 6 month time period (*Only intracranial and spinal operations should be included as neurosurgery procedures) <a href="http://www.qualitymeasures.ahrq.gov/popups/printView.aspx?id=33489">http://www.qualitymeasures.ahrq.gov/popups/printView.aspx?id=33489</a></p>
5	<p>Treating and caring for people in a safe environment &amp; protecting them from avoidable harm</p>	<p>Shunt failure</p>	<p>The number of shunt revisions within 30 days of insertion</p>
		<p>Shunt infection</p>	<p>The number of insertions resulting in infection. SHUNT Registry</p>