

Neurosurgery

Neurosurgeons diagnose, assess and perform surgery to treat disorders of the nervous system. They operate on the central nervous system (brain and spinal cord) and the peripheral nervous system which can involve any area of the body.

This page provides useful information on the nature of the work, the common procedures/interventions, sub-specialties and other roles that may interest you.



Nature of the work

Neurosurgeons may work with patients of all ages from premature babies to elderly people. Some conditions are immediately life-threatening although chronic debilitating conditions are also treated.

Neurosurgery is a very challenging surgical specialty where techniques and technologies are constantly developing. Minimally-invasive procedures using surgical microscopes and endoscopes are increasingly used which achieve comparable or better results than open surgery. The benefits to the patient include less pain, faster recover time and minimal scarring.

Here are some examples of the main types of conditions that neurosurgeons treat:

- tumours of the brain, spine and skull
- trauma to the head and spinal cord
- degenerative spinal conditions and prolapsed discs
- cerebral (brain) aneurysms [1] and strokes
- epilepsy
- infections
- movement disorders such as Parkinson's disease
- certain psychiatric disorders
- congenital conditions such as spina bifida
- conditions that affect cerebro-spinal fluid flow such as hydrocephalus
- pituitary tumours and neuroendocrine disorders

Outpatients work is very interesting and is often about helping patients come to terms with changes in their life after brain or spinal injury?. Helen Fernandes, Consultant Neurosurgeon, Addenbrooke's Hospital, Cambridge.

Read Helen's story [2]

Common procedures/interventions

- craniotomy ? surgical microscopes are used to help the surgeon make narrow openings that minimise damage to other brain tissue for the removal of tumours
- neuroendoscopy ? using specialised endoscopes with high resolution video cameras to treat deep-seated tumours in the brain and skull base. The tumour can be removed with a minimally invasive approach
- stereotactic radiosurgery ? this is a form of non-invasive treatment for tumours that focuses radiation on a part of the brain

Neurosurgeons also use highly advanced imaging procedures, for example to look at the function of the brain around a tumour. This helps the surgeon to examine the tumour's boundaries and to see if it is actively dividing. Neurosurgeons work very closely with radiologists [3] and use a range of diagnostic tools including CT and MRI scans and other techniques such as brain angiography.

Sub-specialties

The main sub-specialties of neurosurgery are:

- paediatric neurosurgery ? includes facial anomalies, congenital spine defects and tumours
- neuro-oncology ? the management of brain and spinal tumours
- functional neurosurgery ? the management of a range of conditions including epilepsy, movement disorders and cerebral palsy
- neurovascular surgery ? including complex aneurysms and abnormal or narrowed blood vessels
- traumatology ? to treat head injury
- skull-base surgery ? disorders of the skull-base and skull-base tumours
- spinal surgery ? often for elderly patients

Want to learn more?

Find out more about:

- the working life [4] of someone in neurosurgery
- the entry requirements [5] and training and development [6]
- two first-hand accounts of life:
 - as a consultant neurosurgeon [2]
 - as a specialist registrar in neurosurgery [7]
- Pay and conditions

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This section provides useful information about the pay for junior doctors (doctors in training), SAS doctors (specialty doctors and associate specialists) and consultants.

Find out more about the current pay scales for doctors [8], and there's more information on the BMA website [9].

NHS Employers [10] provides useful advice and guidance on all NHS pay, contracts terms and conditions.

Medical staff working in private sector hospitals, the armed services or abroad will be paid on different scales.

There are opportunities within private practice for neurosurgeons.

- Where the role can lead

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Read about consultant and non-consultant roles in neurosurgery, flexible working and about wider opportunities.

Consultant roles

You can apply for consultant roles six months prior to achieving your Certificate of Completion of Training [11] (CCT [12]). You will receive your CCT [12] at the end of your neurosurgery training.

Managerial opportunities for consultants include:

- clinical lead - lead NHS consultant for the team
- clinical director - lead NHS consultant for the department
- medical director - lead NHS consultant for the Trust

Most NHS consultants will be involved with clinical and educational supervision of junior doctors.

Here are some examples of education and training opportunities:

- director of medical education - the NHS consultant appointed to the hospital board who is responsible for the postgraduate medical training in a hospital. They work with the postgraduate dean to make sure training meets GMC [13] standards.

- training programme director - the NHS consultant overseeing the education of the local cohort of trainee doctors eg foundation training [14] programme director. This role will be working within the Local Education and Training Board [15] (LETB)/deanery
- associate dean - the NHS consultant responsible for management of the entirety of a training programme. This role will be also be working within the LETB/deanery

SAS doctor roles

SAS surgeons (Staff, Associate Specialists and Specialty Doctors) work as career grade specialty doctors who are not in training or in consultant posts. You will need at least four postgraduate years training (two of those being in a relevant specialty) before you can apply for SAS roles.

The role of an SAS surgeon can vary greatly. Depending on your experience you might work on complex surgery or relatively minor diagnostic and outpatients work. SAS doctors will frequently participate in routine and elective [16] surgery rather than emergency work. They may also train other staff.

Some surgeons are attracted to the SAS role as the hours are more regular than those of the consultant, and you're paid for on-call work and overtime beyond 7am-7pm.

Further information on the SAS doctor roles. [17]

Other non-training grade roles

These roles include:

- trust grade
- clinical fellows

Academic pathways

If you have trained on an academic neurosurgery pathway or are interested in research there are opportunities in academic medicine.

For those with a particular interest in research, you may wish to consider an academic career in neurosurgery. Whilst not essential, some doctors start their career with an Academic Foundation post. This enables them to develop skills in research and teaching alongside the basic competences in the foundation curriculum.

Entry into an academic career would usually start with an Academic Clinical Fellowship (ACF) and may progress to a Clinical Lectureship (CL). Alternatively some trainees that begin with an ACF post then continue as an ST trainee on the clinical programme post-ST4.

Applications for entry into Academic Clinical Fellow posts are coordinated by the National Institute for Health

Further information can be found? on Research Trainees Coordinating Centre (NIHRTCC) website. [18]

There are also numerous opportunities for trainees to undertake research outside of the ACF/CL route, as part of planned time out of their training programme. Find out more about academic medicine.

The Clinical Research Network (CRN) actively encourages all doctors to take part in clinical research.

Other opportunities

Neurosurgery is a highly competitive specialty. To be successful at consultant level you will need to be the first named author on multiple research papers. A higher degree such as a PhD is also helpful, but not always essential.

There are good opportunities to build an academic career. This can include teaching and research activities such as writing papers, presenting work at conferences and collaboration with national and international colleagues.

Neurosurgeons also teach postgraduate medical students and supervise junior doctors. They also undertake audit and committee work. With experience there are excellent opportunities to become involved in management and to actively participate in professional organisations.

- **Job market and vacancies**

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This section provides useful information about the availability of jobs, how to find vacancies and sources of further information.

Job market information

There were 301 consultant neurosurgeons and 368 medical registrars in England ([19]NHS Digital, 2016 [20]). [19] Neurosurgery is a small surgical specialty, comprising around 3% of the surgery workforce.

In 2016, the competition ratio for ST1 Neurosurgery was 6.50, and for ST3 Neurosurgery it was 3.67 (NHS specialty training 2016). [21]

About 6.5% of neurosurgeons are women.

For information regarding Scotland, Wales and Northern Ireland please click on the links below.

NHS Scotland workforce information [22]

NHS Wales workforce information [23]

NHS Northern Ireland workforce information [24]

Where to look for vacancies

The Yorkshire and Humber Deanery coordinates national recruitment for neurosurgery training. This training programme is open to those who may want to train flexibly on a less than full-time basis (LTFT). You can request and apply for this after you have been offered the job. Restrictions apply.

Registration and application for core surgery and specialist training is online via Oriel [25].

Further details person specifications and application deadlines are also available on the Oriel site [25].

Applications for neurosurgery training in Northern Ireland are handled by the Northern Ireland Dental and Medical Training Agency [26].

- **Further information**

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Organisations

British Medical Association [27]

British Neurosurgical Trainees? Association [28]

General Medical Council [29]

Joint Committee on Intercollegiate Examinations [30]

Neurology and Neurosurgery Interest Group (NANSIG) [31]

Royal College of Physicians and Surgeons of Glasgow [32]

Royal College of Surgeons [33]

Royal College of Surgeons of Edinburgh [34]

Society of British Neurological Surgeons [35]

Real-life stories

Helen Fernandez, consultant neurosurgeon (The Foundation Programme) [36]

Other roles that may interest you

- Oral and maxillofacial surgery [37]
- Neurology [38]
- Endocrinology and diabetes [39]
- Otorhinolaryngology (ear, nose and throat surgery, ENT) [40]

Source URL: <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/surgery/neurosurgery>

Links

[1] <https://www.healthcareers.nhs.uk/glossary#Aneurysms>

[2] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery/real-life-story-miss-helen-fernandes>

[3] <https://www.healthcareers.nhs.uk/explore-roles/clinical-radiology>

[4] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery/working-life>

[5] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery/entry-requirements-skills-and-interests>

[6] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery/training-and-development>

[7] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery/real-life-story-dr-damiano-barone>

[8] <https://www.healthcareers.nhs.uk/about-us/careers-medicine/pay-doctors>

[9] <http://bma.org.uk/practical-support-at-work/pay-fees-allowances/pay-scales>

[10] <http://www.nhsemployers.org/your-workforce/pay-and-reward>

[11] https://www.healthcareers.nhs.uk/glossary#Certificate_of_completion_of_training

[12] <https://www.healthcareers.nhs.uk/glossary#CCT>

[13] <http://www.gmc-uk.org>

[14] https://www.healthcareers.nhs.uk/glossary#Foundation_training

- [15] <https://www.healthcareers.nhs.uk/explore-roles/surgery/neurosurgery>
- [16] <https://www.healthcareers.nhs.uk/glossary#Elective>
- [17] <https://www.healthcareers.nhs.uk/i-am/currently-working-health/information-doctors/sas-doctors>
- [18] <https://www.nihr.ac.uk/about-us/how-we-are-managed/managing-centres/about-the-trainees-coordinating-centre.htm>
- [19] [http://www.hscic.gov.uk/searchcatalogue?productid=19760&topics=1%2fWorkforce%2fStaff+numbers&";](http://www.hscic.gov.uk/searchcatalogue?productid=19760&topics=1%2fWorkforce%2fStaff+numbers&)
- [20] <http://content.digital.nhs.uk/searchcatalogue?productid=23451&topics=2%2fWorkforce%2fStaff+numbers%2f>
- [21] <https://specialtytraining.hee.nhs.uk/Competition-Ratios>
- [22] <http://www.isdscotland.org/isd/5345.html>
- [23] <http://wales.gov.uk/topics/statistics/headlines/?lang=en>
- [24] <https://www.health-ni.gov.uk/articles/staff-numbers>
- [25] <https://www.oriel.nhs.uk/Web/>
- [26] <http://www.nimdta.gov.uk/>
- [27] <http://www.bma.org.uk>
- [28] <http://e1v1m1.co.uk/>
- [29] <http://www.gmc-uk.org/>
- [30] <http://www.jcie.org.uk>
- [31] <http://www.nansig.co.uk/>
- [32] <http://www.rcpsg.ac.uk>
- [33] <http://www.rcseng.ac.uk/>
- [34] <http://www.rcsed.ac.uk>
- [35] <http://www.sbns.org.uk/>
- [36] <http://www.foundationprogramme.nhs.uk/pages/home/your-career-path/neurosurgery>
- [37] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/surgery/oral-and-maxillofacial-surgery>
- [38] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/neurology>
- [39] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/endocrinology-and-diabetes>
- [40] <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/surgery/otorhinolaryngology-ear-nose-and-throat-surgery-ent>