

## **Neurosurgery Curriculum Purpose Statement**

### **1.1 The curriculum scope of practice, service, patient and population needs**

The purpose of the curriculum for Neurosurgery is to produce, at certification, competent doctors, able to deliver excellent outcomes for patients as consultant surgeons in the UK. The curriculum will provide consultant surgeons with the generic professional and specialty-specific capabilities needed to manage patients presenting with the full range of acute neurosurgical conditions up to and including the operation. Consultant surgeons will also be able to manage the full range of acute and elective conditions in the generality of their chosen special interests, including the operations. Phase 2 and 3 trainees will be entrusted to undertake the role of the general neurosurgery registrar during training and will be qualified at certification to apply for consultant posts in Neurosurgery in the United Kingdom or Republic of Ireland.

Patient safety and competent practice are both essential and the curriculum has been designed so that the learning experience itself should not affect patient safety. Patient safety is the first priority of training demonstrated through safety-critical content, expected levels of performance, critical progression points, required breadth of experience and levels of trainer supervision needed for safe and professional practice. Upon satisfactory completion of a training programme, we expect trainees to be able to work safely and competently in the defined area of practice and to be able to manage or mitigate relevant risks effectively. A feature of the curriculum is that it promotes and encourages excellence through the setting of high-level outcomes, appropriate supervision levels, tailored assessment and feedback, allowing trainees to progress at their own rate.

### **1.2 Shape of training review**

The Shape of Training (SoT) review<sup>2</sup> provides an opportunity to reform postgraduate training to produce a workforce fit for the needs of patients, producing a doctor who is more patient focused, more general and has more flexibility in career structure. The Neurosurgery curriculum meets the main recommendations of SoT as shown below.

1. Takes account of and describes how the proposal will better support the needs of patients and service providers:

The curriculum has been developed in consultation with stakeholders, including trainees, trainers, employers, lay representatives, the specialty association, the SAC and other groups, ensuring the development of a curriculum that is fair, flexible, non-discriminatory, fit for purpose today with the capacity to evolve in future iterations in response to the changing needs of patients.

The curriculum will produce Neurosurgeons with;

- i. Generic competence to participate in an unselected take

Patients presenting to an on-call neurosurgical service often require immediate management including surgery. Employers require all Neurosurgeons to be able to contribute to the on call take. The curriculum therefore supports this (see 1.2.2 below).

- ii. Broad abilities to deal with the majority of common elective cases

The majority of elective Neurosurgery is unspecialised. For example 70% of the Neurosurgery elective workload is spinal, comprising for the most part, patients with spinal degenerative disease. Employers and the public require as many neurosurgeons as possible to undertake surgery for spinal degenerative disease and for the other common and straightforward neurosurgical conditions. The incidence of degenerative spinal disease has increased massively and is expected to continue increasing. The overwhelming majority of patients on neurosurgical waiting lists are patients with degenerative spinal disease.

- iii. Flexibility to adapt to changing service requirements

Neurosurgical practice covers a broad spectrum of disease, much of which is quite rare and it is also a rapidly evolving specialty. A consequence of these facts is that the techniques used and referral patterns change rapidly so surgeons have to remain flexible with transferable skills and a willingness to change how they practice. For example aneurysm clipping that was a very significant part of neurosurgical practice has diminished massively with the advent of radiological coiling while oncology surgery, spinal surgery and functional surgery have all expanded. Further growth in spinal surgery and stroke clot retrieval are areas Neurosurgeons will be expected to develop.

- iv. Subspecialist skills in one or more of the key specialised areas

Some elective areas of Neurosurgery are highly complex and rare. There is an increasing body of literature showing that these cases should be concentrated in the hands of only a few practitioners. There has been

supra-regional consolidation in some areas of practice including for example paediatric epilepsy, craniofacial and the management of Neurofibromatosis. However, even at the regional level surgeons have special interests in the key areas of vascular, skull base, oncology, hydrocephalus, spinal, paediatric or functional neurosurgery. The curriculum, therefore allows flexibility for a Neurosurgeon to develop special interest skills that can be applied to an elective area of practice but to continue to have the broad generic skills required for the neurosurgical on call and general elective neurosurgical work.

2. Ensures that the proposed curriculum to CCT equips doctors with the generic skills to participate in the acute unselected take and to provide continuity of care thereafter:

Approximately 70% of Neurosurgical work is emergency work. A significant proportion of this work needs immediate management including surgery so an on-call neurosurgical consultant has to be competent to deal with the entire spectrum of neurosurgical cases. The curriculum is designed therefore, to provide surgeons with the skills to undertake all aspects of acute neurosurgical care including the management of acute spinal and acute cranial conditions in adults and in children. This would apply for example to cranial and spinal trauma, haemorrhage, hydrocephalus and some tumours. Ongoing post-surgical continuity of care is an essential part of this activity and is standard practice in Neurosurgery.

Separate Paediatric Neurosurgery on call rotas have been established in nearly all UK and Ireland Neuroscience centres that manage paediatric neurosurgery patients and there is also a growing trend in some of the larger centres to separate spinal and adult cranial on call rotas. However, in this curriculum, we believe that maintaining generic skills is important as it produces surgeons who are more patient focused, more general and have more flexibility in career structure.

Trainees are expected to manage all aspects of an unselected Neurosurgery take under the supervision of Neurosurgery consultants. The curriculum is designed to reflect and support this activity.

At the critical progression point at the end of phase 1 (see 1.4.1 below), the curriculum requires that a trainee is assessed and has achieved supervision level III in the following two Capabilities in Practice: 2) Manages the unselected emergency take 3) Manages ward rounds and the ongoing care of inpatients. By the completion of phase 3, supervision level IV must have been achieved in both these areas. (see 1.3.3 below)

3. Where appropriate describes how the proposal would better support the delivery of care in the community:

The nature of Neurosurgery makes it a specialty of tertiary centres. Inpatient, surgical care and therefore some training opportunities (e.g. elective spine surgery) may occur in "hub and spoke" hospitals, including private hospitals. A hub and spoke model may also be used when geographically feasible for example, when running clinics in peripheral centres and thus reduces the need for unnecessary patient travel. The use of videoconferencing can facilitate this model of care in the MDT setting.

On call neurosurgeons provide advice to hospital clinicians in other centres and general practitioners to facilitate the management of patients with non-surgical Neurosurgical conditions in the District General Hospitals or community.

4. Describes how the proposal will support a more flexible approach to training:

During phase 1 it is essential that trainees have exposure to the other Neuroscience specialties and emergency medicine. To facilitate this, Neurosurgery pioneered run-through training where >90% of our trainees enter the training programme at the ST1 level. Flexibility is however maintained enabling trainees from other specialties, who have achieved phase 1 capabilities to enter phase 2 training directly. The Neuroscience specialties that phase 1 trainees are required to learn are Neurosurgery, Neuroradiology, Neurology and Neuro-intensive care. These specialties do not normally form part of core surgical training programmes and consequently Neurosurgery phase 1 training needs to be provided through a separate training pathway. Never the less it is recognised that Neurosurgery is primarily a surgical specialty so the MRCS examination is required and the common surgical core will be adopted as part of the Phase 1 Neurosurgery curriculum. Experience in Emergency Medicine or a related surgical specialty is also recognised. We anticipate that Phase 1 trainees will attain experience in 4 to 6 relevant areas of practice (Neurosurgery, Neurology, Neurointensive care, Neuroradiology, Emergency Medicine, another surgical speciality.) This ensures that trainees are broadly educated in surgical and neuroscience principles which promotes the creation of generalists who are patient focused and have flexible career options.

The curriculum describes clinical Capabilities in Practice (CiPs) shared with other specialties in surgery supporting flexibility for trainees to move between the specialties in line with the recommendations set out in the GMC's report to the four UK governments<sup>3</sup>. The CiPs include the Generic Professional Capabilities (GPCs) common to all medical specialties, facilitating transferability of learning outcomes across other related specialties and disciplines. It will, therefore, be possible for trainees to transfer generic knowledge, clinical and surgical skills to another surgical specialty without restarting at CT1/ST1 level provided phase 1 competencies have been achieved. As an example, prior learning of history-taking, physical examination, health promotion, medical record keeping and technical skills in one specialty may allow accelerated learning in the clinical areas of another specialty

with identical requirements for communication skills, team-working and empathy, compassion and respect for patients. Consequently, trainees will acquire generic skills in the CiPs which can be transferred to other surgical specialties, or to other non-surgical specialties. Trainees who choose a different career route may be able to have a shorter than usual training pathway in their new training programme, in recognition of learning already gained. We encourage bespoke training for trainees entering the speciality in the early years of training to avoid repetition of previously learnt skills and enablement of new learning in clinical areas not studied in other training programmes. Trainees who have undertaken Neurosurgery phase 1 training will acquire these generic competencies and skills that are highly relevant to other surgical specialties but also to radiology, anaesthetics, neurology and general practice.

This flexible approach with acquisition of transferable capabilities will allow training in Neurosurgery to adapt to current and future patient and workforce needs as well as to changes in surgery with the advent of new treatments and technologies. For example, at a senior level, recent developments in interventional neuroradiology (stroke clot retrieval) and spinal surgery (complex instrumented fixations) have provided new opportunities for career flexibility. These two examples are given here to demonstrate how career flexibility is maximised by keeping the Neurosurgery curriculum as broad as possible.

The curriculum has been developed in consultation with stakeholders, including trainees, trainers, employers, lay representatives and other groups, ensuring the development of a curriculum that is fair, flexible, non-discriminatory, fit for purpose today with the capacity to evolve in future iterations in response to the changing needs of patients.

5. Describes the role that credentialing will play in delivering the specialist and sub-specialist components of the curriculum:

Post-certification credentialing will be considered for highly specialised areas of work to meet service and patient needs, these areas are detailed in 1.4.4. (Please see Reference Section for GMC definition of 'Credentialing')

### **1.3 The high-level outcomes of Neurosurgery**

The curriculum is outcomes-based, specifying the high-level generic, shared and specialty-specific capabilities that must be demonstrated to complete training. There is a greater focus on the generic professional capabilities common to all doctors.

#### **1.3.1 Capabilities in Practice**

The high-level outcomes of the curriculum are expressed as Capabilities in Practice (CiPs). These CiPs are common to all surgical specialties and describe the professional tasks or work within the scope of Neurosurgery.

These are:

- 1) Manages an out-patient clinic
- 2) Manages the unselected emergency take
- 3) Manages ward rounds and the ongoing care of inpatients
- 4) Manages an operating list
- 5) Manages a multi-disciplinary meeting

By the completion of training and certification, the trainee must demonstrate that they are capable of unsupervised practice in all CiPs.

### 1.3.2 Generic Professional Capabilities

Embedded within each CiP are the full range Generic Professional Capabilities (GPCs) which describe the professional responsibilities of all doctors in keeping with Good Medical Practice.

These attributes are common, minimum and generic standards expected of all medical practitioners achieving certification or its equivalent. The GPCs have equal weight in the training and assessment of clinical capabilities and responsibilities in the training programme. The nine domains of the GPC framework are:

1. Professional knowledge
2. Professional skills
3. Professional values and behaviours
4. Health promotion and illness prevention
5. Leadership and team-working
6. Patient safety and quality improvement
7. Safeguarding vulnerable groups
8. Education and training
9. Research and scholarship

### 1.3.3 Supervision levels

The assessment of CiPs draws on the holistic judgement of Clinical Supervisors by ascribing the supervision level required by the trainee to undertake each CiP to the standard of certification. The level of supervision will change in line with the trainee's progression, consistent with safe and effective care for the patient. Typically, there should be a gradual reduction in the level of supervision required and an increase in the complexity of cases managed until the level of competence for independent practice is acquired. The supervision levels are:

<b>Level I</b>	Able to observe only
<b>Level II</b>	Able to act with direct supervision:  a) supervisor present throughout b) supervisor present for part
<b>Level III</b>	Able to act with indirect supervision
<b>Level IV</b>	Able and trusted to act at the level expected of a day one consultant
<b>Level V</b>	Able and trusted to act at a level beyond that expected of a day one consultant

Phase 1 of training will be completed when the appropriate level of competency (as defined in 1.4 below) has been achieved in each CiP, and a trainee will be eligible for certification when level IV has been achieved. Level V indicates excellence.

### 1.3.4 Descriptors

Each CiP contains key descriptors associated with the clinical activity or task and all the GPC descriptors. The descriptors are intended to help trainees and trainers recognise the level of knowledge, skills and professional behaviours which must be demonstrated for independent practice. All descriptors will be taken in to account when carrying out assessment and they will be used by Clinical Supervisors to highlight where trainees achieve excellence at a faster rate and when targeted training is necessary in the manner of an exception report. They, therefore, provide the basis for specific, constructive

feedback to the trainee. The CiPs will also provide trainees with a self-assessment, providing an opportunity to show insight and actively engage in the feedback discussion.

#### **1.4. Progression through training**

Trainees will enter Neurosurgery training via a national selection process at either the ST1 or ST3 level. Trainees will learn in a variety of settings using a range of methods, including workplace-based experiential learning in a variety of environments, formal postgraduate teaching, simulation based education and through self-directed learning.

Neurosurgery training is outcome-based rather than time-based. However, it will normally be completed in an indicative time of 8 years for those entering run through training at ST1 (2 years phase 1, 5 years phase 2 and 1 year phase 3) or 6 years for trainees entering at ST3 (5 years in phase 2 and 1 year in phase 3).

There will be options for those trainees who demonstrate exceptionally rapid development and acquisition of capabilities to complete training more rapidly than the current indicative time of 8 years. There may also be a small number of trainees who develop more slowly and will require an extension of training in line with the Reference Guide for Postgraduate Specialty Training in the UK (the Gold Guide<sup>4</sup>).

Trainees who choose less than full time training (LTFT) will have their indicative training time extended pro-rata in accordance with the Gold Guide. LTFT trainees will perform both elective and out of hours duties pro rata throughout the time of LTFT.

The programme will be divided into 3 phases

- Phase 1 will take an indicative time of 2 years to complete for run through trainees, during which trainees will gain many of the GPCs and the knowledge, clinical and technical skills in Neurosurgery, as defined in the CiPs and syllabus. At the end of Phase 1 there is a critical progression point for Phase 2 entry, assessed at the Annual Review of Competence Progression (ARCP), where trainees will demonstrate competencies in knowledge, clinical skills and professional behaviours commensurate with the CiPs and defined syllabus. MRCS will be achieved by this point in the training programme.
- Phase 2 will take an indicative time of 5 years to complete during which trainees will train in the full breadth of Neurosurgical practice. At the end of this period they will sit the Intercollegiate Board Exam in Neurosurgery. To apply for a first sitting of the Joint Committee Intercollegiate Exam in Neurosurgery a trainee will have demonstrated the knowledge, clinical and professional skills of a day one consultant in Neurosurgery as defined by the syllabus. It is anticipated that most trainees will reach this level by 4 years after entering Phase 2 of the curriculum.
- Phase 3 will take an indicative 1 year to complete and allow a trainee to develop technically, especially with regards to the essential transferable microsurgical skills required of a day one consultant in Neurosurgery and to focus on one (or two



complementary) special interest areas of practice. Phase 3 training in approved fellowship schemes in external centres is encouraged subject to deanery approval. Completion of phase 3 occurs at the final ARCP with the award of an outcome 6. In this outcomes-based curriculum, some trainees may reach the end of Phase 3 in less than the indicative time. On completion of Phase 3 trainees will be eligible for certification and for recommendation to enter the specialist register. Trainees who do not meet the requirements of Phase 2 within 7 years may require an extension of training time in accordance with the Gold Guide.

#### 1.4.1 Critical Progression points

Indicative levels of supervision are indicated for the end of phase 1, phase 2 and phase 3 (see table below). Critical progression points are at the end of phase 1 and the end of phase 3. By CCT trainees are required to reach level IV in both the shared and specialty-specific Capabilities in Practice.

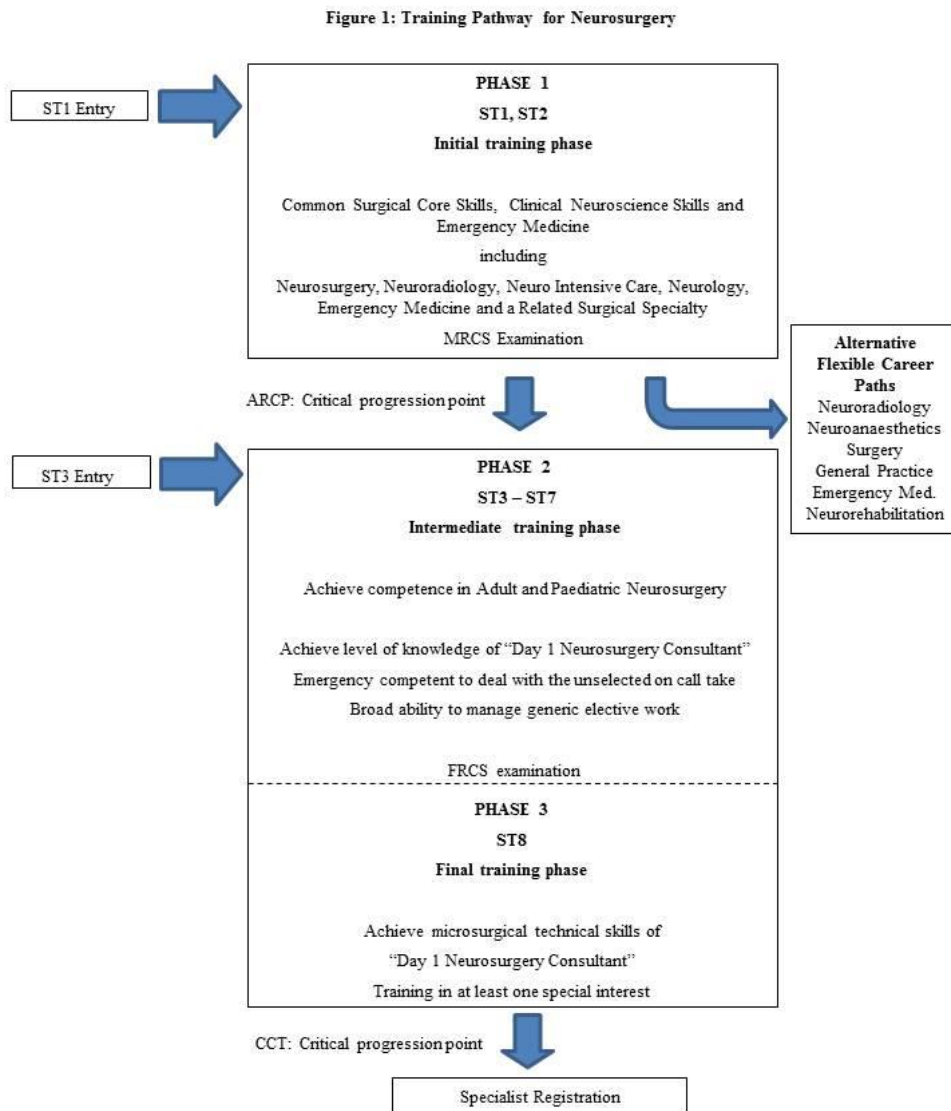
Excellence will be recognised by:

- a) achievement of Level V in any of the Capabilities in Practice
- b) exceeding the supervision level expected for the end of Phase 1
- c) achievement of a supervision level at an earlier stage than would normally be expected
- d) recognition of particularly good performance in any of the descriptors within a Capability in Practice

<b>Capability in practice (shared)</b>	<b>Supervision Level (end of phase 1)</b>	<b>Supervision level (end of phase 2)</b>	<b>Supervision level (end of phase 3)</b>
1. Manages an out-patient clinic	Level II	Level II	Level IV
2. Manages the unselected emergency take	Level II	Level III	Level IV
3. Manages ward rounds and the ongoing care of inpatients	Level II	Level III	Level IV
4. Manages an operating list	Level I	Level II	Level IV
5. Manages a multi-disciplinary meeting	Level I	Level II	Level IV

## 1.4.2 Training Pathway

The training pathway for Neurosurgery is shown in Figure 1



## 1.4.3 Spinal Training Interface Group (STIG)

During phase 3 some trainees in Orthopaedics and Neurosurgery will undertake interface training in complex spinal surgery through the Spinal TIG pathway.

#### 1.4.4 Proposed place of Credentialing following training

Credentialing is defined as a process which provides formal accreditation of competencies (which include knowledge, skills and performance) in a defined area of practice, at a level that provides confidence that the individual is fit to practice in that area (GMC).<sup>5</sup>

Credentialing will be particularly relevant for surgeons who work in niche areas of medical practice that are not covered by existing standards for training and in new and emerging areas of medical practice.

The SAC is enthusiastic about working with the GMC to introduce a process of credentialing to enhance medical regulation and patient protection by:

- providing a framework of standards and accreditation in areas where regulation is limited or absent
- providing patients and employers with information about doctors' particular capabilities and current areas of competence
- providing better recognition of doctors' capabilities to support:
  - improvements in workforce flexibility and professional mobility
  - the new architecture for postgraduate medical education
- providing recognition of the capabilities of neurosurgeons to assure the public, service providers and employers that they have met and are maintaining UK standards in their field
- developing detailed frameworks, standards, assessment processes and proposals for quality assurance

Areas within the specialty which could be considered suitable for credentialing:

- Neurointervention (Acute Stroke)
- Stereotactic Radiosurgery
- Elective complex paediatric surgery
- Complex spinal surgery including deformity correction
- Complex peripheral nerve surgery including tumours

#### References

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