A Comparison of the ACGME (United States) and GMC (United Kingdom) Training Programs and Board Certification Requirements

I. Introduction

The Accreditation Council for Graduate Medical Education (ACGME) is an independent, not-for-profit, physician-led organization that sets and monitors the professional educational standards essential in preparing physicians to deliver safe, high-quality medical care to all Americans. A Neurological Surgery Review committee exists within the ACGME who is responsible for the oversight of neurosurgical training within the United States. This committee is comprised of both neurosurgeons and lay members. Graduates from neurosurgical programs in the United States may choose to obtain board certification through the American Board of Neurological Surgeons to demonstrate one's expertise in neurosurgery and or subspecialty.

The General Medical Council (GMC) of the United Kingdom is responsible for the licensure and medical education across the United Kingdom. Similar to the ACGME and its Neurological Surgery Review committee, the GMC utilizes Specialty Advisory Committees (SACs), which exists for neurosurgery, serves a similar purpose, and maintains a similar membership composition as its peers in the United States. Upon completion of training, Graduates of United Kingdom trained programs are required to seek board certification through the GMC to practice within the United Kingdom. Individuals who successfully achieve board certification receive the notation of Fellow, Royal College Surgeons.

II. Training Rotations

Trainees of ACGME accredited Neurosurgery training programs are required to meet the following rotational requirements during their residency, which allows graduates to pursue board certification through the ABNS. The requirements for Board Eligibility may be found in Appendix A. Throughout their training, trainees are designated PGY + numerical value to signify standing in the program. For example, a first-year trainee would be noted as PGY1.

- Eighty-four months of neurosurgical residency training
    - Fifty-four months of core clinical neurosurgery that includes:
        - Twelve months as chief resident during the last two years
        - Three months of basic neuroscience in the first 18 months of training
        - Three months of critical care relevant to neurosurgery taken in the first 18 months of training
        - Minimum six months of structured education in general patient care
        - Thirty months of electives in areas such as neuropathology, neuroradiology, or research.
    - Twenty-one months must be spent at one program

Each year, United States trainees have an annual evaluation of their performance with their Program Director which includes an anonymous 360 appraisal comprised of faculty, fellow residents, nurses, and allied health professionals.

Trainees of GMC accredited Neurosurgery training programs are required to meet the following rotational requirements during their residency, which allows graduates to pursue board certification through the GMC. Information on the United Kingdom Training program may be found in Appendix B. Known as Foundation Training and prior to starting specialty training, all trainees in the United Kingdom are required to complete one year of general medicine and one year of general surgery rotations, a difference to their counterparts in the United States. Once they begin their specialty training, trainees are designated ST + numerical value to signify standing in the program. For example, a first year trained would be noted as ST1.

- Eighty-four months of neurosurgical residency training
    - Twelve months as chief resident (ST7)
    - Three months of basis neuroscience (ST1)
    - Three month of critical care relevant to neurosurgery (ST1-ST3)
    - Minimum six months of structured education in general patient care
        - Two years as foundation training prior to residency
    - Thirty months of electives in areas such as neuropathology, neuroradiology, or research. (ST2 – ST6)

Similar to United States trainees who receive an annual review with the Program, United Kingdom Trainees receive an annual assessment at the end of each training year, which includes case presentation of forty cases along with a 360 appraisal from twelve colleagues that includes faculty, fellow residents, nurses, administrators, and allied health providers. Successful completion of the year of training is awarded with a certificate to denote the completion of the Annual review of competency progression.

III. Case Requirements

In order for a United States trained resident to be eligible to pursue board certification with the ABNS, they must meet the following case requirements depicted in the table below. At a minimum, a total of 800 cases must be performed through the various indexed case categories, with at least 400 as the lead and 40 pediatric patients. The published ACGME case requirements for graduates in 2021 and present may be found in Appendix C.

In order for a United Kingdom trained resident to be eligible to pursue board certification with the GMC, they must meet the following case requirements. At a minimum, a total of 1,200 cases must be performed throughout the various index categories with 70 of the cases comprising pediatric patients.

Similar to the ACGME, indexed case categories for United Kingdom trainees change overtime and unfortunately attempts to secure these values were unsuccessful. Two data points are not tracked by the GMC, which are critical care components and lumbar drains. Critical care

components for the United Kingdom trainee are captured in the Foundational Training. The GMC candidate profile below demonstrates the case logs achieved by a graduate of an accredited United Kingdom training program who is currently completing a US fellowship.

	ACGME		GMC Candidate Profile	
	Lead	Senior + Lead	Lead	Senior + Lead
Cranial: Tumor General	30	60	68	113
Cranial: Tumor Sellar/Parasellar	10	20	11	27
Cranial: Trauma/Other	30	60	30	290
Cranial: Vascular Open		10	169	248
Cranial: Vascular Endovascular		10	35	51
Total Cranial Vascular	30	60		729
Cranial: CSF Diversion/ETV/Other	10	20	303	364
Cranial/Extracranial: Pain	5	10	11	18
Cranial/Extracranial: Functional Disorder	5	10	5	9
Epilepsy	5	10	4	8
Total Cranial	150	300		399
Spinal: Anterior Cervical	15	30	44	93
Spinal: Posterior Cervical	15	30	17	41
Spinal: Thoracic/Lumbar/Sacral/Instrumentation/Fusion	15	30	7	15
Spinal: Lumbar Laminectomy/Laminotomy	15	10	55	103
Spinal: Stimulation/Lesion/Pump/Other	5	10	8	8
Total Spinal		300		260
Peripheral Nerve	5	10	7	11
Radiosurgery	5	10	0	0
Peripheral Device Management	10	20	12	19
Critical Care				
Airway Management	10		35	
Angiography	20			
Arterial Line Placement	10		20	
CVP Line Placement	10		30	
EVD/Transdural Monitor Placement	30		50	
Lumbar/Other Puncture/Drain Placement	10		200	
Percutaneous Tap of CSF Reservoir	10		30	
Total Critical Care	100			
Pediatric: Cranial Tumor		5	7	7
Pediatric: Cranial Trauma/Other	5	10	18	21
Pediatric: CSF Diversion/ETV/Other	5	10	60	79
Pediatric: Spinal		5		14
Total Pediatric	20	40	85	121
Total All Defined Case Categories	400	800	1,109	1,509

Appendix A – ABNS Criteria for Board Eligibility

For Candidates Who Began Training On Or After July 1, 2019

All post-graduate training described must be acquired as a resident in a neurological surgery training program or programs accredited by the Accreditation Council for Graduate Medical Education (ACGME). It must be under the ultimate direction and control of the resident's neurosurgery program director.

*Click here for the details on the *Individual Case Minimum Requirement*

Eighty-four months of neurosurgical residency training in ACGME accredited programs under the direction of a neurosurgical program director. This must consist of:
Fifty-four months of core clinical neurosurgery, including:

- Twelve months as chief resident during the last two years of training (PGY-6 or 7)
- Three months of basic neuroscience (e.g., neurology, neuro-otology, neuroradiology or neuropathology) taken in the first 18 months of training
- Three months of critical care relevant to neurosurgery patients taken in the first 18 months of training
- A minimum of six months of structured education in general patient care (e.g., trauma, general surgery, neurosurgery, orthopedic surgery, otolaryngology or plastic surgery).
- Twenty-one months must be spent in one program
- Thirty months of electives in areas such as neuropathology, neuroradiology, research, additional neurosurgery or possibly in areas of special interest such as complex spine surgery, endovascular or pediatric neurosurgery or clinical and non-clinical neurosciences.
- Six to 12 months in an outside rotation in an ACGME accredited program may be counted towards the core 54 months of

neurosurgery training. The program director must request credit from the ABNS prior to the rotation.

- Credit towards the 30 months of elective time may be requested by a program director for prior educational experiences, such as a PhD degree in a relevant subject, clinical rotations other than fellowships obtained at non-ACGME accredited programs, and neurosurgical training completed outside of the U.S., particularly if the resident is certified in that country. Written requests submitted by the program director to the ABNS must contain a complete description of the experience and justification of the request.
- The board will evaluate ACGME case log data as a measure of the breadth of resident experience at the completion of residency training.

Appendix B – GMC Approved Curriculum for Neurosurgery

The Intercollegiate Surgical Curriculum

Educating the surgeons of the future

Neurosurgery

From 2010
(Updated 2013 and 2015)

ISCP INTERCOLLEGIATE SURGICAL CURRICULUM PROGRAMME

Approved 3 July 2013, for implementation in August 2013

Contents page

This document is the Neurosurgery curriculum, approved by the GMC in July 2010. It was subsequently updated in 2013 to incorporate simulation, and again in 2015 to include changes to the Core modules and amended text to reflect the adoption of the ISCP by the Royal College of Surgeons in Ireland.

Introduction

The intercollegiate surgical curriculum provides the approved UK framework for surgical training from completion of the foundation years through to consultant level. In the Republic of Ireland it applies from the completion of Core Surgical Training through to consultant level. It achieves this through a syllabus that lays down the standards of specialty-based knowledge, clinical judgement, technical and operative skills and professional skills and behaviour, which must be acquired at each stage in order to progress. The curriculum is web based and is accessed through www.iscp.ac.uk.

The website contains the most up to date version of the curriculum for each of the ten surgical specialties, namely: Cardiothoracic Surgery; General Surgery; Neurosurgery; Oral and Maxillofacial Surgery (OMFS); Otolaryngology (ENT); Paediatric Surgery; Plastic Surgery; Trauma and Orthopaedic Surgery (T&O); Urology and Vascular Surgery. They all share many aspects of the early years of surgical training, but naturally diverge further as training in each discipline becomes more advanced. Each syllabus will emphasise the commonalities and elucidate in detail the discrete requirements for training in the different specialties.

Doctors who will become surgical trainees

After graduating from medical school doctors move onto a mandatory two-year foundation programme in clinical practice (in the UK) or a one year Internship (in the Republic of Ireland). During their final year of medical school students are encouraged to identify the area of medicine they wish to pursue into specialty training. During the Foundation programme or Internship, recently qualified doctors are under close supervision whilst gaining a wide range of clinical experience and attaining a range of defined competences. Entry into surgery is by open competition and requires applicants to understand, and provide evidence for their suitability to become members of the surgical profession.

Selection into a surgical discipline

The responsibility for setting the curriculum standards for surgery rests with the Royal Colleges of Surgeons which operate through the Joint Committee on Surgical Training (JCST) and its ten Specialty Advisory Committees (SACs) and Core Surgical Training Committee (CSTC). In the UK, each SAC has developed the person specifications for selection into its specialty and the person specification for entry to ST1/CT1 in any discipline. Postgraduate Medical Deaneries and/or Local Education and Training Boards (LETBs) and their Schools of Surgery are responsible for running training programmes, which are approved by the UK's General Medical Council (GMC), and for aiding the SACs in the recruitment and selection to all levels of pre-Certification training. In the Republic of Ireland, these roles are undertaken by the Royal College of Surgeons in Ireland (RCSI) and by Ireland's Medical Council of Ireland (MCoI).

The critical selection points for surgical training are at initial entry either directly into specialty training in the chosen discipline (ST1) or into a generic training period referred to as core training (CT1). Those who enter core training are then selected into the discipline of their choice after two core years and join the specialty programme at a key competency point (ST3) after which transfer from one discipline to another would be relatively unusual. Selection at both core and higher surgical training takes place via a national selection process overseen by the Deaneries/LETBs and JCST and, in the Republic of Ireland, by the RCSI.

Those who are selected into training programmes will then have to achieve agreed milestones in terms of College examinations and the Annual Review of Competence Progression (ARCP) requirements.

Guidance about the UK recruitment process, application dates and deadlines and links to national person specifications by specialty are available from the Specialty Training website here. The RCSI provides this information for Ireland.

Educational Principles of the Curriculum

The provision of excellent care for the surgical patient, delivered safely, is at the heart of the curriculum.

The aims of the curriculum are to ensure the highest standards of surgical practice in the UK and the Republic of Ireland by delivering high quality surgical training and to provide a programme of training from the completion of the foundation years through to the completion of specialty surgical training, culminating in the award of a CCT/CESR-CP[1]/CCST. The curriculum was founded on the following key principles which support the achievement of these aims:

- A common format and similar framework across all the specialties within surgery.
- Systematic progression from the end of the foundation years through to completion of surgical specialty training.
- Curriculum standards that are underpinned by robust assessment processes, both of which conform to the standards specified by the GMC/RCSI.
- Regulation of progression through training by the achievement of outcomes that are specified within the specialty curricula. These outcomes are competence-based rather than time-based.
- Delivery of the curriculum by surgeons who are appropriately qualified to deliver surgical training.
- Formulation and delivery of surgical care by surgeons working in a multidisciplinary environment.
- Collaboration with those charged with delivering health services and training at all levels.

The curriculum is broad based and blueprinted to the GMC's Good Medical Practice and RCS England's (on behalf of all four Royal Colleges in the UK and the Republic of Ireland) Good Surgical Practice frameworks to ensure that surgeons completing the training programme are more than just technical experts.

Equality and diversity are integral to the rationale of the curriculum and underpin the professional behaviour and leadership skills syllabus. The ISCP encourages a diverse surgical workforce and therefore encourages policies and practices that:

- ensure that every individual is treated with dignity and respect irrespective of their age, disability, race, religion, sex, sexual orientation or marital status, or whether they have undergone gender reassignment or are pregnant.
- promote equal opportunities and diversity in training and the development of a workplace environment in which colleagues, patients and their carers are treated fairly and are free from harassment and discrimination.

It is expected that these values will be realised through each individual hospital trust's equality and diversity management policies and procedures. This principle also underlies the Professional Behaviour and Leadership syllabus.

Who Should Use the Curriculum?

The ISCP comprises the curricula for the ten surgical specialties which are GMC-approved in the UK and MCoI-approved in the Republic of Ireland. It reflects the most up to date requirements for trainees who are working towards a UK Certificate of Completion of Training (CCT), a UK Certificate of Eligibility for Specialist Registration via the Combined Programme (CESR-CP) or, in the Republic of Ireland, a Certificate of Completion of Specialist Training (CCST). Where an older version of the curriculum is superseded, trainees will be expected to transfer to the most recent version in the interests of patient safety and educational quality.

The GMC's position statement on moving to the most up to date curriculum is here.

The curriculum is appropriate for trainees preparing to practice as consultant surgeons in the UK and the Republic of Ireland. It guides and supports training for a UK Certificate of Completion of Training (CCT), a UK Certificate of Eligibility for Specialist Registration via the Combined Programme (CESR-CP) or, in the Republic of Ireland, Certificate of Completion of Specialist Training (CCST) in a surgical specialty. The curriculum enables trainees to develop as generalists within their chosen surgical specialty, to be able to deliver an on-call emergency service and to deliver more specialised services to a defined level.

A CCT/CESR-CP/CCST can only be awarded to trainees who have completed a fully- or part-approved specialty training programme. Doctors applying for a full Certificate of Eligibility for Specialist Registration (CESR) will be required to demonstrate that they meet the standards required for a CCT/CESR-CP/CCST as set out in the most up to date curriculum at the time of application.

Components of the Curriculum

The surgical curriculum has been designed around four broad areas, which are common to all the surgical specialties:

- **Syllabus** - what trainees are expected to know, and be able to do, in the various stages of their training
- **Teaching and learning** - how the content is communicated and developed, including the methods by which trainees are supervised
- **Assessment and feedback** - how the attainment of outcomes are measured/judged with formative feedback to support learning
- **Training systems and resources** - how the educational programme is organised, recorded and quality assured

In order to promote high quality and safe care of surgical patients, the curriculum specifies the parameters of knowledge, clinical skills, technical skills, professional behaviour and leadership skills that are considered necessary to ensure patient safety throughout the training process and specifically at the end of training. The curriculum therefore provides the framework for surgeons to develop their skills and judgement and a commitment to lifelong learning in line with the service they provide.

Length of training

A similar framework of stages and levels is used by all the specialties. Trainees progress through the curriculum by demonstrating competence to the required standard for the stage of training. Within this framework each specialty has defined its structure and indicative length of training. Each individual specialty syllabus provides details of how the curriculum is shaped to the stages of training.

In general terms, by the end of training, surgeons have to demonstrate:

- Theoretical and practical knowledge related to surgery in general and to their specialty practice;
- Technical and operative skills;
- Clinical skills and judgement;
- Generic professional and leadership skills;
- An understanding of the values that underpin the profession of surgery and the responsibilities that come with being a member of the profession;
- The special attributes needed to be a surgeon;
- A commitment to their on-going personal and professional development and practice using reflective practice and other educational processes;
- An understanding and respect for the multi-professional nature of healthcare and their role in it; and
- An understanding of the responsibilities of being an employee in the UK and/or Republic of Ireland health systems and/or a private practitioner.

In the final stage of training, when the trainee has attained the knowledge and skills required for the essential aspects of the curriculum in their chosen specialty, there will be the opportunity to extend his/her skills and competences in one or two specific fields. The final stage of the syllabus covers the major areas of specialised practice. The syllabuses are intended to allow the future CCT/CESR-CP/CCST holder to develop a particular area of clinical interest and expertise prior to appointment to a consultant post. Some will require further post-certification training in order to achieve the competences necessary for some of the rarer complex procedures. In some specialties, interface posts provide this training in complex areas pre-certification.

Acting up as a consultant (AUC)

'Acting up' under supervision provides final year trainees with experience to help them make the transition from trainee to consultant. A period of acting up offers trainees an opportunity to get a feel for the consultant role while still being under a level of supervision.

The post must be defined as acting up for an absent consultant, and cannot be used to fill a new locum consultant post or to fill service needs.

The trainee acting up will be carrying out a consultant's tasks but with the understanding that they will have a named supervisor at the hosting hospital and that the designated supervisor will always be available for support, including out of hours or during on-call work.

Specialty Advisory Committee (SAC) support is required and must be sought prospectively through an application to the JCST. Further GMC prospective approval is not required unless the acting up post is outside the home Deanery/LETB. If accepted the AUC will be able to count towards the award of a CCT/CESR-CP/CSD. Trainees will need to follow the JCST guidance which can be found on the JCST website.

Educational Framework

The educational framework is built on three key foundations that are interlinked:

- Stages in the development of competent practice
- Standards in the areas of specialty-based knowledge, clinical judgement, technical and operative skills, and professional behaviour and leadership
- Framework for Appraisal, Feedback and Assessment

Stages of training

The modular surgical curriculum framework has been designed to define stages in the development of competent surgical practice, with each stage underpinned by explicit outcome standards. This provides a means of charting progress through the various stages of surgical training in the domains of specialty-based knowledge, clinical and technical skills and professional behaviour and leadership (including judgement).

Each surgical specialty has adapted this approach to reflect their training pathway. Therefore, although the educational concept is the same for all specialties the composition of the stages will differ.

UK Only

The core (or initial stage for run-through training) reflects the early years of surgical training and the need for surgeons to gain competence in a range of knowledge and skills many of which will not be specialty-specific. A syllabus, which is common to all the surgical specialties (the common component of the syllabus, which is founded in the applied surgical sciences) has been written for this stage. This is supplemented by the topics from the appropriate surgical specialty syllabus as defined in each training programme (the specialty-specific component of the syllabus).

UK and Republic of Ireland

During the intermediate and final stages the scope of specialty practice increases with the expansion in case mix and case load and this is accompanied by the need for greater depth of knowledge and increasing skills and judgement. The content is therefore based on progression, increasing in both depth and complexity through to the completion of training.

Standards of training

Surgeons need to be able to perform in differing conditions and circumstances, respond to the unpredictable, and make decisions under pressure, frequently in the absence of all the desirable data. They use professional judgement, insight and leadership in everyday practice, working within multi-professional teams. Their conduct is guided by professional values and standards against which they are judged. These values and standards are laid down in the General Medical Council's Good Medical Practice in the UK and the Republic of Ireland Medical Council's Guide to Professional Conduct and Ethics.

The Professional Behaviour and Leadership Skills syllabus is mapped to the Leadership framework as laid out by the Academy of Medical Royal Colleges and derived from Good Medical Practice. The Professional Behaviour and Leadership skills section of the syllabus is common to all surgical specialties and is based on Good Medical Practice.

The syllabus lays down the standards of specialty-based knowledge, clinical judgement, technical and operative skills and professional skills and behaviour that must be acquired at each stage in order to progress. The syllabus comprises the following components:

- A specialty overview which describes the following:
    - Details of the specialty as it practised in the UK and the Republic of Ireland
    - The scope of practice within the specialty
    - The key topics that a trainee will cover by the end of training
    - An overview of how, in general terms, training is shaped
- Key topics that all trainees will cover by certification and will be able to manage independently, including complications. These are also referred to as essential topics.
- Index procedures that refer to some of the more commonly performed clinical interventions and operations in the specialty. They represent evidence of technical competence across the whole range of specialty procedures in supervised settings, ensuring that the required elements of specialty practice are acquired and adequately assessed. Direct Observations of Procedural Skills (DOPS) and Procedure-based Assessments (PBAs) assess trainees carrying out index procedures (whole procedures or specific sections) to evidence learning.
- The stages of training, which comprise a number of topics to be completed during a notional period of training. Within each stage there is the syllabus content which contains the specialty topics that must be covered. Each of these topics includes one or more learning objectives and the level of performance / competence to be achieved at completion in the domains of:
    - Specialty-based knowledge
    - Clinical skills and judgement
    - Technical and operative skills

Standards for depth of knowledge during early years surgical training (UK only)

In the early years of training, the appropriate depth and level of knowledge required can be found in exemplar texts tabulated below. We expect trainees to gain knowledge from these texts in the context of surgical practice defined in the core surgical component of the curriculum above.

The curriculum requires a professional approach from surgical trainees who will be expected to have a deep understanding of the subjects, to the minimum standard laid out below. It is expected that trainees will read beyond the texts below and will be able to make critical use, where appropriate of original literature and peer scrutinised review articles in the related scientific and clinical literature such that they can aspire to an excellent standard in surgical practice.

The texts are not recommended as the sole source within their subject matter and there are alternative textbooks and web information that may better suit an individual's learning style. Over time it will be important for associated curriculum management systems to provide an expanded and critically reviewed list of supporting educational material.

Topic	Possible textbooks or other educational sources
Anatomy	Last's Anatomy: Regional and Applied (MRCS Study Guides) by R.J. Last and Chummy Sinnatamby Netter's Atlas of Human Anatomy 4th Edition Saunders-Elsevier ISBN-13-978-1-4160-3385-1
Physiology	Ganong's Review of Medical Physiology, 23rd Edition (Lange Basic Science)
Pathology	Robbins Basic Pathology by Vinay Kumar MBBS MD FRCPath,

	Abul K. Abbas MBBS, Nelson Fausto MD, and Richard Mitchell MD PhD
Pharmacology	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Microbiology	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Radiology	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Grainger & Allison's Diagnostic Radiology, 5th Edition. Andy Adam (Editor), Adrian Dixon (Editor), Ronald Grainger (Editor), David Allison (Editor) Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Common surgical conditions	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Surgical skills	Basic surgical skills course and curriculum
Peri-operative care including critical care	ATLS® course CCrISP course Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)

Surgical care of children	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor) Jones Clinical Paediatric Surgery Diagnosis and Management Editors JM Hutson, M O'Brien, AA Woodward, SW Beasley 6th Edition 2008 Melbourne Blackwell Paediatric Surgery: Essentials of Paediatric urology by D Thomas, A Rickwood, P Duffy
Care of the dying	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)
Organ transplantation	Principles and Practice of Surgery by O. James Garden MB ChB MD FRCS(Glasgow) FRCS(Edinburgh) FRCP (Edinburgh) FRACS(Hon) FRCSC(Hon) Professor, Andrew W. Bradbury BSc MBChB MD MBA FRCSEd Professor, John L. R. Forsythe MD FRCS(Ed) FRCS, and Rowan W Parks Bailey and Love's Short Practice of Surgery 25th Edition by Norman S. Williams (Editor), Christopher J.K. Bulstrode (Editor), P. Ronan O'Connell (Editor)

In addition to these standard texts, sample MRCS MCQ examination questions are also available at www.intercollegiatemrcs.org.uk, which will demonstrate the level of knowledge required to be able to successfully pass the MRCS examination.

Standards for depth of knowledge during intermediate and final years surgical training

In the intermediate and final stages of surgical training the following methodology is used to define the relevant depth of knowledge required of the surgical trainee. Each topic within a stage has a competence level ascribed to it for knowledge ranging from 1 to 4 which indicates the depth of knowledge required:

1. knows of
2. knows basic concepts
3. knows generally
4. knows specifically and broadly

Standards for clinical and technical skills

The practical application of knowledge is evidenced through clinical and technical skills. Each topic within a stage has a competence level ascribed to it in the areas of clinical and technical skills ranging from 1 to 4:

1. Has observed

Exit descriptor; at this level the trainee:

- Has adequate knowledge of the steps through direct observation.
- Demonstrates that he/she can handle instruments relevant to the procedure appropriately and safely.
- Can perform some parts of the procedure with reasonable fluency.

2. Can do with assistance

Exit descriptor; at this level the trainee:

- Knows all the steps - and the reasons that lie behind the methodology.
- Can carry out a straightforward procedure fluently from start to finish.
- Knows and demonstrates when to call for assistance/advice from the supervisor (knows personal limitations).

3. Can do whole but may need assistance

Exit descriptor; at this level the trainee:

- Can adapt to well- known variations in the procedure encountered, without direct input from the trainer.
- Recognises and makes a correct assessment of common problems that are encountered.
- Is able to deal with most of the common problems.
- Knows and demonstrates when he/she needs help.
- Requires advice rather than help that requires the trainer to scrub.

4. Competent to do without assistance, including complications

Exit descriptor, at this level the trainee:

- With regard to the common clinical situations in the specialty, can deal with straightforward and difficult cases to a satisfactory level and without the requirement for external input.
- Is at the level at which one would expect a UK consultant surgeon to function.
- Is capable of supervising trainees.

The explicit standards form the basis for:

- Specifying the syllabus content;
- Organising workplace (on-the-job) training in terms of appropriate case mix and case load;
- Providing the basis for identifying relevant teaching and learning opportunities that are needed to support trainees' development at each particular stage of progress; and
- Informing competence-based assessment to provide evidence of what trainees know and can do.

Standards for the professional skills and leadership syllabus

The methodology used to define the standards for this component of the syllabus is through a series of descriptors that indicate the sorts of activities that trainees should be able to successfully undertake at two specific time points, namely the end of “early years” training (i.e. entry into ST3, or ST4 in Neurosurgery) and the end of surgical training (i.e. certification).

The Framework for Appraisal, Feedback and Assessment

The curriculum is consistent with the four domains of Good Medical Practice:

- Knowledge, skills and performance
- Safety and quality
- Communication, partnership and team-working
- Maintaining trust

The knowledge, skills and performance aspects are primarily found within the specialty-specific syllabus. All domains are reflected within the professional behaviour and leadership syllabus, which also reflect the Academy’s common competence and leadership competence frameworks.

The purpose and structure of the training programme

The curriculum is competence-based. It focuses on the trainee’s ability to demonstrate the knowledge, skills and professional behaviours that they have acquired in their training (specified in the syllabus) through observable behaviours. Since it is competence-based, it is not time-defined and accordingly it allows these competences to be acquired in different time frames according to variables such as the structure of the programme and the ability of the trainee. Any time points used are therefore merely indicative.

There are certain milestones or competence points which allow trainees to benchmark their progress:

- Entry to surgical training - CT1 (or ST1 for those specialties or localities with run-through programmes)
- Entry to entirely specialised training - ST3*
- Exit at certification

*** A critical competence point is ST3 at which point, in practice, trainees will make a clear commitment to one of the ten SAC-defined disciplines of surgery.**

UK Only

Within the early years of training (defined as the period prior to entry into ST3), much of the content is common across all the surgical specialties. During this period, trainees will acquire the competences that are common to all surgical trainees (defined as common competences) together with a limited range of competences that are relevant to their chosen surgical specialty (defined as specialty-specific competences).

- Those who have made a definitive choice of their desired surgical specialty, and who have been able to enter a “run-through” training programme, will be able to focus upon achieving the common competences and the specialty-specific competences for their chosen specialty.

- Those who have not yet made a definitive choice of their desired surgical specialty will obtain a range of extra competences in a variety of surgical specialties, while at the same time sampling those specialties, before focussing on the chosen specialty prior to entry into ST3.

For those not in run-through programmes, within the early years, training is not committed to a specific surgical specialty and trainees can enter any of the relevant specialties at ST3 level provided they a) meet their educational milestones in the common surgical component of the curriculum and b) satisfy all the specialty requirements for entry in the specialty of their choice. The different training schemes offered by the Postgraduate Deaneries and Local Education and Training Boards (LETBs) meet different educational needs and permit trainees to make earlier or later final career choices based on ability and preference.

It is essential that trainees achieve both common and specialty-specific competence to be eligible to compete at the ST3 specialty entry competence level. In the early years (initial stage), the common core component reflects the level of competence that all surgeons must demonstrate, while specialty-specific competence reflects the early competences relevant to an individual specialty.

From August 2013, the MRCS examination became a formal exit requirement from Core Surgical Training. It is also a mandatory requirement to enter higher specialty training in any discipline, irrespective of candidates reaching all other educational requirements. Otolaryngology trainees are required to pass the MRCS(ENT) examination or the MRCS and the DO-HNS examination.

UK and Republic of Ireland

Following entry into higher specialty training (which for those who have undergone training in core programmes will follow on from a second selection process), the trainee will typically undergo a period of training in the broad specialty and at the higher levels begin to develop an area of special interest, to allow some degree of specialisation in his or her subsequent career.

Early Years Surgical Training – UK Only

The purposes of early years (i.e. the initial stage) training are:-

1. To provide a broad based initial training in surgery with attainment of knowledge, skills and professional behaviours relevant to the practice of surgery in any specialist surgical discipline. This is defined within the common component of the syllabus (which is also the syllabus of the MRCS).
2. In addition it will provide early specialty training such that trainees can demonstrate that they have the knowledge, skills and professional behaviours to enter higher specialty training in a surgical specialty. The specialty element in the early years is not tested in the MRCS but through workplace-based assessments (WBAs) in the first instance.

Additionally trainees will be continuously assessed on the contents of the common component and their specialty specific slots through WBAs and structured reports from Assigned Educational Supervisors (AES) which in turn contribute to the Annual Review of Competence Progression (ARCP); this includes the level of competence expected of all doctors including surgeons to meet their obligations under Good Medical Practice (GMP) in order to remain licensed to practise.

Trainees who gain entry to higher specialty training despite some remediable and identified gaps in their specialty specific curriculum competences must ensure that these are dealt with expeditiously during ST3. All these gaps must be addressed by the time of a ST3 ARCP as part of their overall permission to progress to ST4. They must be specifically addressed through local

learning agreements with educational supervisors. Trainees with identified gaps must be accountable to the Training Programme Directors (TPDs) whom in turn must address this as part of their report to the ARCP process.

Intermediate and Final Years Specialty Training – UK and Republic of Ireland

The purposes of the intermediate and final years training are:

1. To provide higher specialty training in the specialty with attainment of knowledge, skills and professional behaviours relevant to the practice in the specialty. This is defined within the specialty-specific component of the early years syllabus and the intermediate and final stages of the syllabus (and is also the syllabus of the FRCS).
2. To develop competence to manage patients presenting either acutely or electively with a range of symptoms and conditions as specified in the syllabus (and the syllabus of the FRCS).
3. To develop competence to manage an additional range of elective and emergency conditions by virtue of appropriate training and assessment opportunities obtained during training as specified by special interest or sub-specialty components of the final stage syllabus. This is tested either by the FRCS and/or by WBAs.
4. To acquire professional competences as specified in the syllabus and in the General Medical Council's Guide to Professional Conduct and Ethics.

The Training Pathway

From the trainee's perspective, he or she will be able to undertake surgical training via differing routes depending on which training scheme they choose or are selected for.

1. Run-through training (UK only)

For those trainees who are certain of their specialty choice, and who choose to enter "run-through" training, competitive entry into ST1 will be possible in their chosen specialty to certification, where this is offered by the specialty. As well as specialty-specific competences, those on this route will still need to attain the level of competence common to all surgeons before entering ST3 (ST4 in Neurosurgery) and this will be assessed through the MRCS, WBAs and the ARCP. This route is currently available in Neurosurgery (and in some Deaneries/LETBs Cardiothoracic Surgery, Oral and Maxillofacial Surgery and Trauma and Orthopaedic Surgery).

2. Uncoupled training

This route is currently available in General Surgery, Cardiothoracic Surgery, Oral and Maxillofacial Surgery, Otolaryngology, Paediatric Surgery, Plastic Surgery, Trauma and Orthopaedic Surgery, Urology and Vascular Surgery.

For those trainees who are either uncertain of their chosen specialty, who are unable to gain entry to run-through training, or who choose a specialty that does not offer the run-through route, a period of "Core" surgical training will be necessary. This period of training is designated CT1 and CT2 in the UK. During this period trainees will attain the common surgical knowledge and skills and generic professional behaviours, while sampling a number of surgical specialties. In addition to attaining common competences, trainees will need to complete their speciality specific competences to be eligible to enter ST3 in their chosen specialty. They will then seek to enter specialty training at the ST3 level by competitive entry. Open competition will test trainees against SAC defined competences for ST3 entry.

This model has a number of possible variants. Core training might sample several specialties, without any particular specialty focus. In such cases some specialty top up training may be needed later on in order to reach specialty entry at ST3 level. Another variant would organise core training along a theme that supports progression to a specific specialty. In these situations many trainees may pass straight from CT2 to ST3 in their chosen discipline if selected. In practice, core surgical training will run over an indicative timescale of 2 years (CT1-2).

3. Academic training

In the UK some early years' trainees may wish to pursue an academic surgical career and will devote a significant proportion of their time to additional academic pursuits including research and teaching. For the majority this will lead (later in specialised training) to a period of time in dedicated research, resulting in the award of a higher degree in a scientific area related to their chosen specialty. For others who wish to revert to full time clinical training, this will also be possible, providing that the relevant clinical competences are achieved.

General information on UK academic pathways can be found using the following link: http://specialtytraining.hee.nhs.uk/news/the-gold-guide/

The JCST is keen to support academic careers within surgery and has ensured that the surgical curriculum is flexible enough to accommodate an academic pathway. The curriculum specifies that each individual trainee's training is planned and recorded through the learning agreement.

In England, Academic Clinical Fellows (ACFs) are generally expected to achieve the same level of clinical competence as other surgical trainees within the same timeframe. In order to progress through training pathways the ACF, in addition to demonstrating competence in clinical aspects, will generally be required to have obtained a funded Research Training Fellowship in order to undertake a PhD or MD, which they will complete during an out of programme period. Some trainees during their period of full-time research may want to carry out some clinics or on call, if they and their academic supervisor feel that it is in their best interests. On successful completion of a PhD or MD the ACF will either return to their clinical programme, apply for an Academic Clinical Lecturer (ACL) or Clinician Scientist post.

Arrangements for academic training differ in detail in the devolved nations of the UK and in the Republic of Ireland. For Wales, further information can be obtained from http://www.walesdeanery.org/index.php/en/wcat.html. For Scotland, information can be obtained at http://www.nes.scot.nhs.uk/, and for Northern Ireland at http://www.nimdta.gov.uk/.

In the Republic of Ireland trainees with an interest in academic surgery may choose to spend time out of training in a dedicated research post.

Academic trainees will need to complete all the essential elements of their specialty syllabus satisfactorily in order to be awarded a CCT, CESR-CP or CCST. It is acknowledged that Clinical Academics may take somewhat longer in training to achieve competence at CCT/CESR-CP level than trainees taking a clinical pathway; however they will be supported fully and treated as individuals with their personal progress being matched to their learning agreement.

Moving from one discipline of surgery to another

In the early years it is possible that a trainee who has started to develop a portfolio consistent with a particular specialist discipline might wish to move to another. One of the strengths of the flexible early years programme is that it will be possible, depending on the local circumstances, to make such changes with an identification of suitable educational competences that may be transferred. This is strictly conditional on a trainee achieving the educational milestones so far

agreed for them. Moving from one discipline to another because of the need to remediate in the original discipline would not normally be permitted. All common requirements, for example, possession of the MRCS, would be transferable. Those leaving ENT however could not use the DO-HNS examination as equivalent to the MRCS examination and those wishing to enter ENT (and already having the MRCS) would be required to sit the Part 2 DO-HNS examination.

In order to be eligible to move from one discipline to another the following conditions therefore apply:

1. Achieve a satisfactory outcome in ARCPs up to that point including all relevant WBAs.
2. Fulfil the minimum period in the new specialty of choice in order to progress to ST3 in that discipline (ST4 in Neurosurgery).
3. Obtain the new position through open competition in the annual selection round.
4. Pass the MRCS, MRCS(ENT) (or DO-HNS in addition to the MRCS) examination

The process in practice would be subject to local negotiations between the Postgraduate Dean or appointed nominee in the Republic of Ireland, designated training supervisors and the trainee making the request. If the decision to change theme in core programmes occurs early the effective increase in training time may be minimal. If the decision occurs later or during run-through, more time spent in the early years is almost inevitable. The progression to ST3 is in essence competence rather than time dependent. Those spending longer having made a change may be subject to limitations on any subsequent period required for remediation, although this ultimately would be a Deanery/LETB decision.

Completion of training

Successful completion of the programme in the UK will result in a Certificate of Completion of Training (CCT) or a Certificate of Eligibility for Specialist Registration via the Combined Programme (CESR-CP) and, in Ireland, a Certificate of Completion of Specialist Training (CCST), and placement on the Specialist Register of the GMC or the Medical Council of Ireland (MCoI). This will indicate that the surgeon has reached the curriculum standards of competence to practice as a consultant surgeon in the UK or the Republic of Ireland. These requirements are set by the SACs and the Royal Colleges of Surgeons, are approved by the GMC in the UK or MCol in Ireland, and translate into the ability to manage a significant proportion of the elective work within the specialty and to undertake the primary management of emergencies. It is anticipated that where additional, well-recognised specialist skills are required by the service, these will be gained by the completion of additional modules before the completion of training and the award of the specialty certificate.

Doctors who wish to join the GMC's Specialist Register and have not followed a full or part of a training programme approved by the GMC in the UK leading to a CCT/CESR-CP but who may have gained the same level of skills and knowledge as CCT/CESR-CP holders can apply for a Certificate of Eligibility for Specialist Registration (CESR).

Once on the Specialist Register, all surgeons will be expected to maintain their professional development in line with Good Medical Practice for the purpose of revalidation in the UK, and in accordance with the Professional Competence Scheme (PCS) in the Republic of Ireland.

The Syllabus

Each syllabus details the learning content and outcomes to be achieved at each stage of training.

Which syllabus should I choose?

If you are a trainee in a generic or themed core programme **(CT1-2):** Click on the ***Core Surgical Training syllabus***

If you are a trainee in the early years of a run-through programme **(ST1-2):** Click on the relevant ***specialty syllabus*** and then on the ***Initial Stage*** of training. Run-through programmes include:

- Cardiothoracic Surgery (in some deaneries)
- Neurosurgery

If you are a trainee in Higher Surgical Training **(ST3 or above):** Click on the relevant ***specialty syllabus*** and then on the stage of training

Which version?

The syllabuses are from time to time updated in line with changes in the practice or structure of training. They indicate the date of GMC approval and all trainees should use the most up to date version. When an older version of the curriculum is superseded, trainees will be expected to transfer to the most recent version in the interests of patient safety and educational quality. All but the latest version of the curriculum will be decommissioned by 1st January 2016. Trainees will be able to view documents that map new versions to previous ones.

Related downloads

- Quick Guide to the early years syllabus [PDF:190Kb]
- GMC position statement - Moving to the Current Curriculum November 2012

The Syllabus

Overview and objectives of the Neurosurgery curriculum

Neurosurgery encompasses the diagnosis, assessment and surgical management of disorders of the nervous system. The specialty developed in the first half of the twentieth century 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 changed and widened the scope of neurosurgical practice. The British Neurosurgical Training Programme reflects developments taking place in the clinical neurosciences and the requirements of service delivery.

Neurosurgical Services

Neurosurgical services in the United Kingdom are provided from regional neuroscience centres serving populations of between 1 and 3.5 million. Most regional centres offer a comprehensive range of adult services. Rare and complex disorders are managed at a supra-regional level in units with specialist expertise.

Consultant Neurosurgical Practice

Newly appointed NHS consultants must be competent to manage unselected emergency and urgent admissions to a regional neurosurgical unit. They will be capable of taking full responsibility for the continuing care of patients in a neurosurgical unit. In particular they will be proficient in all aspects of the clinical and emergency operative management of patients presenting with the essential neurosurgical conditions.

They will have acquired the skills, knowledge and professional attributes to participate in the provision of specialist elective services with appropriate support and mentoring. They will have demonstrated the potential to lead a clinical team and to undertake increasingly advanced practice with post-CCT professional development in one or more of the special interest areas of neurosurgery. The major areas of special interest practice in neurosurgery are:

- Paediatric Neurosurgery
- Neuro-oncology
- Functional Neurosurgery
- Neurovascular Surgery
- Skull Base Surgery
- Spinal Surgery
- Traumatology

British Neurosurgical Training Programme

The Neurosurgical Training Programme reflects developments taking place in the basic and applied clinical neurosciences and the requirements of service delivery. It contains eight indicative years (ST1-ST8) in three stages. The first year of the initial stage establishes a foundation of core knowledge in the clinical neurosciences - core neuroscience training. The intermediate stage provides two years in full-time general neurosurgical training (ST4 & 5). The final three-year stage (ST 6, 7 & 8) incorporates a year of special interest training.

The emphasis will change, as trainees progress through the programme, from acquiring core neuroscience knowledge and competencies in ST 1 to developing technical operative skills and surgical judgement in the final stage. Transition from the initial to intermediate neurosurgical training will depend on trainees acquiring the necessary clinical and operative competences, receiving satisfactory in-training assessments and passing an examination of essential knowledge in the basic and applied neurosciences, surgical science and clinical neurosurgery. The MRCS will be adapted to meet these requirements.

The transition from intermediate to final neurosurgical training will take place when trainees have achieved the appropriate clinical and operative competencies. They will be competent to manage a wide range of emergency neurosurgical presentations and will have demonstrated the ability to acquire microsurgical skills. Trainees whose clinical or professional skills are unsatisfactory will be referred for targeted training and will not start final training.

The acquisition of operative skills and experience will accelerate in the final phase of training. Units will concentrate advanced training in the hands of their senior trainees who will spend more of their time in the operating theatre with proportionately less commitment to ward management and general outpatient clinics.

The specialist interest year may be taken flexibly during final training. However, trainees will not start specialist interest training until their programme director is satisfied with their general neurosurgical training and their acquisition of microsurgical and advanced operative skill.

Academic Neurosurgical Training

The neurosurgical curriculum will accommodate a range of academic training pathways. The core neuroscience knowledge embodied in ST1 will provide an essential foundation for an academic career. ST 2 & 3 provide opportunities for specific training in areas relevant to a trainee's emerging academic interests e.g. patho-physiology applied to neuro-intensive care. The intermediate training stage will consolidate a trainee's clinical and operative competencies.

Full-time academic research or training fellowships to thesis level may be undertaken between the initial, intermediate and final training stages or flexibly within the final stage. The specialist interest year will usually form part of advanced training in the trainee's academic field of interest. Academic trainees will be expected to meet all of the essential competencies defined in the curriculum before award of a CCT in Neurosurgery.

Neurosurgical Services

Neurosurgical services in the United Kingdom are provided from regional neuroscience centres serving populations of between 1 and 3.5 million. Most regional centres offer a comprehensive range of adult services. Rare and complex disorders are managed at a supra-regional level in units with specialist expertise.

The Neurosurgical Workforce Plan envisages a UK-wide workforce of 325-350 WTE consultants by 2015 to meet the projected demands for service delivery and training. Neurosurgery has always been both a consultant-led and consultant-provided service. Fewer than 5% of trained neurosurgeons work in the SAS grades.

Emergency and urgent work accounts for more than 50% of neurosurgical caseload. 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.

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

Schedule of Essential Neurosurgical Conditions

- Cranial trauma
- Spontaneous intracranial haemorrhage
- Hydrocephalus
- Intracranial tumours
- CNS infections
- Spinal trauma
- Benign intradural tumours
- Malignant spinal cord compression
- Degenerative spinal disorders
- Emergency paediatric care

Schedule of Essential Operative Competences is displayed in Key Topics

Special Interests

Paediatric Neurosurgery

Paediatric neurosurgery accounts for 10-15% of neurosurgical activity. Paediatric neurosurgical units are located in larger centres to ensure appropriate levels of activity and expertise. The discipline involves the management of developmental disorders of the neuroaxis including craniofacial anomalies and spinal dysraphism; all forms of hydrocephalus; intrinsic tumours of the brain and spine and a wide range of rarer pathologies. Paediatric neurosurgeons often contribute to the management of related disorders such as hydrocephalus, spinal dysraphism and epilepsy presenting in young adults.

Neuro-oncology

The management of malignant intrinsic tumours of the nervous system remains a major challenge. Gradual progress has followed the refinement of surgical techniques using radiological and functional guidance; improvements in adjuvant chemotherapy and radiotherapy; greater understanding of the molecular biology of CNS tumours and better organisation of oncology services. Further advances are likely to be based on advances in basic oncological science and the sophisticated delivery of intra-lesional therapies.

Functional Neurosurgery

Functional neurosurgery involves the surgical management of a wide range of neurological problems including intractable pain, epilepsy, spasticity and movement disorders. Traditional ablative surgery is being replaced by deep brain and spinal cord stimulation. Research into neuromodulation using gene therapy, biological vectors and pharmacological agents offers the prospect of effective treatment for neurodegenerative diseases and disabling psychiatric conditions.

Neurovascular Surgery

The advent of advanced endovascular techniques in the early 1990s has fundamentally changed the practice of neurovascular surgery. Most simple intracranial aneurysms are now managed by endovascular coiling such that aneurysm surgery is no longer part of general neurosurgical practice. Neurovascular surgeons work closely with their interventional colleagues dealing with complex aneurysms, vascular malformations and occlusive cerebrovascular disease.

Skull-base Surgery

Technical advances in microsurgery, surgical approaches and reconstructions have been incorporated into the routine practice of surgeons dealing with disorders of the skull-base including common tumours such as meningiomas, acoustic neuromas and pituitary adenomas. Skull-base surgery is often undertaken jointly with neuro-otological, plastic and maxillo-facial surgeons. Adjuvant treatments with sophisticated radiosurgery and fractionated stereotactic radiotherapy have improved clinical outcomes for patients with skull-base tumours

Spinal Surgery

Spinal surgery is now the largest subspecialty in neurosurgery and accounts for more than 50% of the operative workload of some departments. Many departments offer a comprehensive service for primary and secondary spinal malignancy, spinal trauma, spinal pain and degenerative

spinal disorders. A small number of neurosurgeons in the UK are exclusively spinal surgeons. The demand for spinal surgery grows steadily, particularly in the elderly population.

Traumatology

Head injury remains a major cause of death and disability in children and young adults. Recent research confirms that prompt neurosurgical intervention and neurointensive care lead to substantially better outcomes. British neurosurgeons with a special interest in head injury have made important contributions to head injury research and management.

Key Topics

To be eligible for the award of a CCT in Neurosurgery or to be considered for a Certificate of Eligibility for Specialist Registration trainees and applicants will be competent in all aspects of the clinical management of patients presenting with the essential neurosurgical conditions.

Trainees and applicants must be competent to undertake the full range of emergency and urgent operative procedures specified in the final training stage of the schedule of essential operative competencies. They must demonstrate sufficient operative experience to be able to undertake these procedures without supervision and to manage operative difficulties and complications (Competence level 4).

Essential Neurosurgical Conditions

- Cranial trauma
- Spontaneous intracranial haemorrhage
- Hydrocephalus
- Intracranial tumours
- CNS infections
- Spinal trauma
- Benign intradural tumours
- Malignant spinal cord compression
- Degenerative spinal disorders
- Emergency paediatric care

Schedule of Essential Operative Competences

Core Overview

The purpose of the initial stage (early years) is to allow the trainee to develop the basic and fundamental surgical skills common to all surgical specialties, together with a broad foundation of theoretical knowledge; clinical experience, skills and competences in:

- Basic and applied clinical neurosciences
- Basic neurosurgical care
- Neuro-intensive care
- Emergency (A&E) medicine

Initial Neurosurgical Training ST2 & 3

During ST2 & 3 trainees will concentrate on acquiring core surgical skills and knowledge, together with specific competencies in the non-operative and operative management of the core neurosurgical conditions.

The outcome of early years training is to achieve the initial stage competences including:

- Competence in the management of patients presenting with a range of symptoms and elective and emergency conditions as specified in the core syllabus for surgery.
- Competence in the management of patients presenting with an additional range of elective and emergency conditions, as specified by the Neurourgery specialty component of the early years syllabus.
- Professional competences as specified in the syllabus and derived from Good Medical Practice documents of the General Medical Council of the UK

On completion of initial neurosurgical training, trainees will be competent in all aspects of the assessment and initial clinical management of the major disorders of the nervous system specified in the core neuroscience syllabus.

They will be competent in the resuscitation, assessment, operative preparation and post-operative care of patients presenting with core neurosurgical conditions. They will be competent to undertake a range of basic procedures without direct supervision.

Core Neuroscience Training: ST1

The first year of the training programme will concentrate on core neuroscience training. During this year trainees will consolidate their knowledge and understanding of the applied neurosciences underpinning clinical practice.

See Core Neuroscience Knowledge

Management of Common Neurological Disorders

Trainees will be able to resuscitate when necessary; assess through a full neurological history and examination; establish a differential diagnosis; initiate and interpret investigations for patients presenting with a wide range of common neurological disorders. (See panel)

Clinical Placements and Teaching in ST1

Clinical placements for ST1 neurosurgical trainees will include:

- One six-month full-time attachment in neurosurgery and one six-month attachment in an acute neurology service incorporating experience in clinical neurophysiology and neuro-rehabilitation or
- Four month attachments in neurosurgery, neurology and neuro-intensive care providing the same clinical experience as above.

Teaching for ST1 neurosurgical training will include:

- Regular exposure to neuroradiology and neuropathology through multi-disciplinary team meetings and case discussions.
- A core neuroscience teaching programme incorporating the core neuroscience subjects with an emphasis on the assessment and management of the common neurological presentations.

Clinical Placements in ST2 & 3

The timing of clinical placements in ST2 & 3 is flexible and at the discretion of the programme director. The following principles apply:

- All trainees will undertake at least one full-time, six month placement in neurosurgery in ST2 & 3
- By the end of ST3 all trainees will have undertaken a minimum of twelve months' full-time training in basic neurosurgery
- Trainees will undertake one or more placements in complementary surgical disciplines up to a maximum of twelve months
- By the end of ST3 trainees will have obtained four months experience in an emergency department (A & E) receiving multiply-injured patients, head-injury patients of all severities and patients presenting with acute neurological disorders
- By the end of ST3 all trainees will have had direct involvement in the care of patients receiving neuro-intensive care. This may be obtained as part of an ST1 programme or through placements in ST 2 & 3

Click on Workplace Based Assessments to view the assessment forms including DOPS and PBAs

By the end of early years training, trainees, including those following an academic pathway, will have acquired to the defined level:

- Generic skills to allow team working, and management of neurosurgery patients
- perform as a member of the team caring for surgical patients
- receive patients as emergencies and review patients in clinics and initiate management and diagnostic processes based on a reasonable differential diagnosis
- manage the perioperative care of their patients and recognise common complications and either be able to deal with them or know to whom to refer
- be safe and useful assistant in the operating room
- perform some simple procedures under minimal supervision and perform more complex procedures under direct supervision

In addition they will have attained the knowledge, skills and behaviour as defined in the following (common) modules of the syllabus:

Module 1: Basic Science Knowledge relevant to surgical practice (These can all be contextualised within the list of presenting symptoms and conditions outlined in module 2)

- Anatomy
- Physiology
- Pharmacology - in particular safe prescribing
- Pathological principles underlying system specific pathology
- Microbiology
- Diagnostic and interventional radiology

Module 2: Common surgical conditions

- To assess and initiate investigation and management of common surgical conditions which may confront any patient whilst under the care of surgeons, irrespective of their speciality.
- To have sufficient understanding of these conditions so as to know what and to whom to refer in a way that an insightful discussion may take place with colleagues whom will be involved in the definitive management of these conditions.
- This defines the scope and depth of the topics in the generality of clinical surgery required of any surgeon irrespective of their ST3 defined speciality

Module 3 Basic surgical skills

- To prepare oneself for surgery
- To safely administer appropriate local anaesthetic agents
- To handle surgical instruments safely
- To handle tissues safely
- To incise and close superficial tissues accurately
- To tie secure knots
- To safely use surgical diathermy
- To achieve haemostasis of superficial vessels.
- To use a suitable surgical drain appropriately.
- To assist helpfully, even when the operation is not familiar.
- To understand the principles of anastomosis
- To understand the principles of endoscopy

Module 4: The principles of assessment and management of the surgical patient

- To assess the surgical patient
- To elicit a history that is relevant, concise, accurate and appropriate to the patient's problem
- To produce timely, complete and legible clinical records.
- To assess the patient adequately prior to operation and manage any pre-operative problems appropriately.
- To propose and initiate surgical or non-surgical management as appropriate.
- To take informed consent for straightforward cases.

Module 5: Peri-operative care of the surgical patient

- To manage patient care in the peri-operative period.
- To assess and manage preoperative risk.
- To take part in the conduct of safe surgery in the operating theatre environment.
- To assess and manage bleeding including the use of blood products.
- To care for the patient in the post-operative period including the assessment of common complications.
- To assess, plan and manage post-operative fluid balance
- To assess and plan perioperative nutritional management.

Module 6: Assessment and early treatment of the patient with trauma

- To safely assess the multiply injured patient.
- To safely assess and initiate management of patients with

- traumatic skin and soft tissue injury
- chest trauma
- a head injury
- a spinal cord injury
- abdominal and urogenital trauma
- vascular trauma
- a single or multiple fractures or dislocations
- burns

Module 7: Surgical care of the paediatric patient

- To assess and manage children with surgical problems, understanding the similarities and differences from adult surgical patients.
- To understand common issues of child protection and to take action as appropriate.

Module 8: Management of the dying patient

- To manage the dying patient appropriately.
- To understand consent and ethical issues in patients certified DNAR (do not attempt resuscitation)
- To manage the dying patient in consultation with the palliative care team.

Module 9: Organ and tissue transplantation

- To understand the principles of organ and tissue transplantation.
- To assess brain stem death and understand its relevance to continued life support and organ donation.

Module 10: Helath promotion

- To promote good health.

CORE SURGICAL TRAINING MODULES

Module 1	**Basic sciences**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	• To acquire and demonstrate underpinning basic science knowledge appropriate for the practice of surgery, including:- • Applied anatomy: Knowledge of anatomy appropriate for surgery • Physiology: Knowledge of physiology relevant to surgical practice • Pharmacology: Knowledge of pharmacology relevant to surgical practice centred around safe prescribing of common drugs • Pathology: Knowledge of pathological principles underlying system specific pathology • Microbiology: Knowledge of microbiology relevant to surgical practice Imaging: • Knowledge of the principles, strengths and weaknesses of various diagnostic and interventional imaging methods	Course completion certificate MRCS	
Knowledge	Applied anatomy: • Development and embryology • Gross and microscopic anatomy of the organs and other structures • Surface anatomy • Imaging anatomy This will include anatomy of thorax, abdomen, pelvis, perineum, limbs, spine, head and neck as appropriate for surgical operations that the trainee will be involved with during core training (see Module 2). Physiology: General physiological principles including: • Homeostasis • Thermoregulation • Metabolic pathways and abnormalities • Blood loss and hypovolaemic shock • Sepsis and septic shock		Strongly recommended: Life support Critical care Desirable Anatomy Team-Based Human Factors

	• Fluid balance and fluid replacement therapy • Acid base balance • Bleeding and coagulation • Nutrition This will include the physiology of specific organ systems relevant to surgical care including the cardiovascular, respiratory, gastrointestinal, urinary, endocrine and neurological systems. Pharmacology: • The pharmacology and safe prescribing of drugs used in the treatment of surgical diseases including analgesics, antibiotics, cardiovascular drugs, antiepileptic, anticoagulants, respiratory drugs, renal drugs, drugs used for the management of endocrine disorders (including diabetes) and local anaesthetics. • The principles of general anaesthesia • The principles of drugs used in the treatment of common malignancies • Can describe the effects and potential for harm of alcohol and other drugs including common presentations, wide range of acute and long term presentations (e.g. trauma, depression, hypertension etc.), the range of interventions, treatments and prognoses for use of alcohol and other drugs. Pathology: General pathological principles including: • Inflammation • Wound healing • Cellular injury • Tissue death including necrosis and apoptosis • Vascular disorders • Disorders of growth, differentiation and morphogenesis • Surgical immunology • Surgical haematology • Surgical biochemistry • Pathology of neoplasia • Classification of tumours • Tumour development and growth including metastasis • Principles of staging and grading of		

	cancers • Principles of cancer therapy including surgery, radiotherapy, chemotherapy, immunotherapy and hormone therapy • Principles of cancer registration • Principles of cancer screening • The pathology of specific organ systems relevant to surgical care including cardiovascular pathology, respiratory pathology, gastrointestinal pathology, genitourinary disease, breast, exocrine and endocrine pathology, central and peripheral, neurological systems, skin, lymphoreticular and musculoskeletal systems Microbiology: • Surgically important micro organisms including blood borne viruses • Soft tissue infections including cellulitis, abscesses, necrotising fasciitis, gangrene • Sources of infection • Sepsis and septic shock • Asepsis and antisepsis • Principles of disinfection and sterilisation • Antibiotics including prophylaxis and resistance • Principles of high risk patient management • Hospital acquired infections Imaging: • Principles of diagnostic and interventional imaging including x-rays, ultrasound, CT, MRI. PET, radiounucleotide scanning		

Module 2	**Common Surgical Conditions**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	This section assumes that trainees have general medical competences consistent with a doctor leaving Foundation in the UK. It also assumes an ongoing commitment to keeping these skills and knowledge up to date as laid out in GMP. It is predicated on the value that surgeons are doctors who	Certificate of successful completion of course MRCS	

	carry our surgery and require competence. To demonstrate understanding of the relevant basic scientific principles for each of these surgical conditions and to be able to provide the relevant clinical care as defined in modules assessment and management as defined in Modules 1 and 4.			
Topics	Presenting symptoms or syndromes • Abdominal pain • Abdominal swelling • Change in bowel habit • Gastrointestinal haemorrhage • Rectal bleeding • Dysphagia • Dyspepsia • Jaundice	To include the following conditions • Appendicitis • Gastrointestinal malignancy • Inflammatory bowel disease • Diverticular disease • Intestinal obstruction • Adhesions • Abdominal hernias • Peritonitis • Intestinal perforation • Benign oesophageal disease • Peptic ulcer disease • Benign and malignant hepatic, gall bladder and pancreatic disease		Strongly recommended: Basic surgical skills Basic laparoscopic skills Fracture treatment Desirable Imaging interpretation Desirable (Cardiothoracic Surgery / Plastic Surgery): • Anastomosis • Angiography • Vascular ultrasound • Surgical approaches to fractures

		• Haemorrhoids and perianal disease • Abdominal wall stomata		
	Breast disease • Breast lumps and nipple discharge • Acute Breast pain	To include the following conditions • Benign and malignant breast lumps • Mastitis and breast abscess		
	Peripheral vascular disease Presenting symptoms or syndrome • Chronic and acute limb ischaemia • Aneurismal disease • Transient ischaemic attacks • Varicose veins • Leg ulceration	To include the following conditions • Atherosclerotic arterial disease • Embolic and thrombotic arterial disease • Venous insufficiency • Diabetic ulceration		
	Cardiovascular and pulmonary disease	To include the following conditions • Coronary heart disease • Bronchial carcinoma • Obstructive airways disease • Space occupyin		

		g lesions of the chest		
	Genitourinary disease Presenting symptoms or syndrome • Loin pain • Haematuria • Lower urinary tract symptoms • Urinary retention • Renal failure • Scrotal swellings • Testicular pain	To include the following conditions • Genitourinary malignancy • Urinary calculus disease • Urinary tract infection • Benign prostatic hyperplasia • Obstructive uropathy		
	Trauma and orthopaedics Presenting symptoms or syndrome • Traumatic limb and joint pain and deformity • Chronic limb and joint pain and deformity • Back pain	To include the following conditions • Simple fractures and joint dislocations • Fractures around the hip and ankle • Basic principles of Degenerative joint disease • Basic principles of inflammatory joint disease including bone and joint infection		

		• Compartment syndrome • Spinal nerve root entrapment and spinal cord compression • Metastatic bone cancer • Common peripheral neuropathies and nerve injuries		
	Disease of the Skin, Head and Neck Presenting symptoms or syndrome • Lumps in the neck • Epistaxis • Upper airway obstructions	To include the following conditions • Benign and malignant skin lesions • Benign and malignant lesions of the mouth and tongue		
	Neurology and Neurosurgery Presenting symptoms or syndrome • Headache • Facial pain • Coma	To include the following conditions • Space occupying lesions from bleeding and tumour		
	Endocrine Presenting symptoms or syndrome • Lumps in the	To include the following conditions • Thyroid		

	neck • Acute endocrine crises	and parathyroid disease • Adrenal gland disease • Diabetes		

Module 3	**Basic surgical skills**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	• Preparation of the surgeon for surgery • Safe administration of appropriate local anaesthetic agents • Acquisition of basic surgical skills in instrument and tissue handling. • Understanding of the formation and healing of surgical wounds • Incise superficial tissues accurately with suitable instruments. • Close superficial tissues accurately. • Tie secure knots. • Safely use surgical diathermy • Achieve haemostasis of superficial vessels. • Use suitable methods of retraction. • Knowledge of when to use a drain and which to choose. • Handle tissues gently with appropriate instruments. • Assist helpfully, even when the operation is not familiar. • Understand the principles of anastomosis • Understand the principles of endoscopy	WBA- PBA, CBD, DOPS	

Knowledge	Principles of safe surgery • Preparation of the surgeon for surgery • Principles of hand washing, scrubbing and gowning • Immunisation protocols for surgeons and patients Administration of local anaesthesia • Choice of anaesthetic agent • Safe practise Surgical wounds • Classification of surgical wounds • Principles of wound management • Pathophysiology of wound healing • Scars and contractures • Incision of skin and subcutaneous tissue: o Langer's lines o Choice of instrument o Safe practice • Closure of skin and subcutaneous tissue: o Options for closure o Suture and needle choice • Safe practice • Knot tying o Range and choice of material for suture and ligation o Safe application of knots for surgical sutures and ligatures • Haemostasis: o Surgical techniques o Principles of diathermy • Tissue handling and retraction: o Choice of instruments • Biopsy techniques including fine needle aspiration cytology • Use of drains: o Indications o Types o Management/removal • Principles of anastomosis • Principles of surgical endoscopy		Strongly recommended: Basic surgical skills Tissue handling/suturing Strongly recommended (Paediatric Surgery): • Basic suturing and wound management Desirable (Cardiothoracic Surgery / Plastic Surgery): • Anastomosis • Endoscopy
Clinical Skills	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning • Administration of local anaesthesia • Accurate and safe administration of local anaesthetic agent 4 Preparation of a patient for surgery		

	• Creation of a sterile field • Antisepsis • Draping		
Technical Skills and Procedures	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning 4 Administration of local anaesthesia • Accurate and safe administration of local anaesthetic agent 4 Incision of skin and subcutaneous tissue: • Ability to use scalpel, diathermy and scissors 4 Closure of skin and subcutaneous tissue: • Accurate and tension free apposition of wound edges 4 Knot tying: • Single handed • Double handed • Instrument • Superficial • Deep 3 Haemostasis: • Control of bleeding vessel (superficial) • Diathermy • Suture ligation • Tie ligation • Clip application • Transfixion suture 4 Tissue retraction: • Tissue forceps • Placement of wound retractors 3 Use of drains: • Insertion • Fixation • Removal 3 Tissue handling: • Appropriate application of instruments and respect for tissues • Biopsy techniques 4 Skill as assistant: • Anticipation of needs of surgeon when assisting		

Module 4	**The assessment and management of the surgical patient**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	To demonstrate the relevant knowledge, skills and attitudes in assessing the patient and manage the patient, and propose surgical or non-surgical management.	Examinations- MRCS	
Knowledge	The knowledge relevant to this section will be variable from patient to patient and is covered within the rest of the syllabus – see common surgical conditions in particular (Module 2). As a trainee develops an interest in a particular speciality then the principles of history taking and examination may be increasingly applied in that context.		Strongly recommended: Life Support Critical Care ATLS / APLS Desirable: Team working Human Factors
Clinical Skills	4 Surgical history and examination (elective and emergency) 3 Construct a differential diagnosis 3 Plan investigations 3 Clinical decision making 3 Team working and planning 3 Case work up and evaluation; risk management 3 Active participation in clinical audit events 3 Appropriate prescribing 3 Taking consent for intermediate level intervention; emergency and elective 3 Written clinical communication skills 3 Interactive clinical communication skills: patients 3 Interactive clinical communication skills: colleagues		

Module 5	**Peri-operative care**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	To assess and manage preoperative risk To manage patient care in the peri-operative period To conduct safe surgery in the operating theatre environment To assess and manage bleeding including the use of blood products To care for the patient in the post-operative period including the assessment of common complications To assess, plan and manage post-operative fluid balance To assess and plan perioperative nutritional management To prevent, recognise and manage delirium in the surgical patient within the appropriate legal framework in place across the UK (see **footnote**). **Footnote** The relevant legislation includes: • Mental Capacity Act (2005) • Mental Health Act (1983 and 2007) • Adults with Incapacity (Scotland) Act (2000) • Mental Health (Care and Treatment) (Scotland) Act (2003) • Adult Support and Protection (Scotland) Act (2007)	WBA Course test completion certificate	
Knowledge	Pre-operative assessment and management: • Cardiorespiratory physiology • Diabetes mellitus and other relevant endocrine disorders • Fluid balance and homeostasis • Renal failure • Pathophysiology of sepsis – prevention and prophylaxis • Thromboprophylaxis		Strongly recommended: Basic surgical skills Life Support Critical Care Strongly recommended (Paediatric Surgery): • Safe surgery Desirable

	• Laboratory testing and imaging • Risk factors for surgery and scoring systems • Pre-medication and other preoperative prescribing • Principles of day surgery Intraoperative care: • Safety in theatre including patient positioning and avoidance of nerve injuries • Sharps safety • Diathermy, laser use • Infection risks • Radiation use and risks • Tourniquet use including indications, effects and complications • Principles of local, regional and general anaesthesia • Principles of invasive and non-invasive monitoring • Prevention of venous thrombosis • Surgery in hepatitis and HIV carriers • Fluid balance and homeostasis Post-operative care: • Post-operative monitoring • Cardiorespiratory physiology • Fluid balance and homeostasis • Diabetes mellitus and other relevant endocrine disorders • Renal failure • Pathophysiology of blood loss • Pathophysiology of sepsis including SIRS and shock • Multi-organ dysfunction syndrome • Post-operative complications in general • Methods of postoperative analgesia To assess and plan nutritional management • Post-operative nutrition		Human Factors Team-working

	• Effects of malnutrition, both excess and depletion • Metabolic response to injury • Methods of screening and assessment of nutritional status • Methods of enteral and parenteral nutrition Haemostasis and Blood Products: • Mechanism of haemostasis including the clotting cascade • Pathology of impaired haemostasis e.g. haemophilia, liver disease, massive haemorrhage • Components of blood • Alternatives to use of blood products • Principles of administration of blood products • Patient safety with respect to blood products Coagulation, deep vein thrombosis and embolism: • Clotting mechanism (Virchow Triad) • Effect of surgery and trauma on coagulation • Tests for thrombophilia and other disorders of coagulation • Methods of investigation for suspected thromboembolic disease • Principles of treatment of venous thrombosis and pulmonary embolism including anticoagulation • Role of V/Q scanning, CTpulmonary angiography, D-dimer and thrombolysis • Place of pulmonary embolectomy • Prophylaxis of thromboembolism: • Risk classification and management of DVT • Knowledge of methods of prevention of DVT, mechanical and pharmacological		

	Antibiotics: • Common pathogens in surgical patients • Antibiotic sensitivities • Antibiotic side-effects • Principles of prophylaxis and treatment Metabolic and endocrine disorders in relation perioperative management • Pathophysiology of thyroid hormone excess and deficiency and associated risks from surgery • Causes and effects of hypercalcaemia and hypocalcaemia • Complications of corticosteroid therapy • Causes and consequences of Steroid insufficiency • Complications of diabetes mellitus • Causes and effects of hyponatraemia • Causes and effects of hyperkalaemia and hypokalaemia Delirium • Epidemiology and prognosis of delirium • Causes and clinical features of delirium • The impact of delirium on patient, family and carers		
Clinical Skills	3 Pre-operative assessment and management: • History and examination of a patient from a medical and surgical standpoint • Interpretation of pre-operative investigations • Management of co morbidity • Resuscitation • Appropriate preoperative prescribing including premedication 3 Intra-operative care: • Safe conduct of		

	intraoperative care • Correct patient positioning • Avoidance of nerve injuries • Management of sharps injuries • Prevention of diathermy injury • Prevention of venous thrombosis 3 Post-operative care: • Writing of operation records • Assessment and monitoring of patient's condition • Post-operative analgesia • Fluid and electrolyte management • Detection of impending organ failure • Initial management of organ failure • Principles and indications for Dialysis • Recognition, prevention and treatment of post-operative complications 3 Haemostasis and Blood Products: • Recognition of conditions likely to lead to the diathesis • Recognition of abnormal bleeding during surgery • Appropriate use of blood products • Management of the complications of blood product transfusion 3 Coagulation, deep vein thrombosis and embolism • Recognition of patients at risk • Awareness and diagnosis of pulmonary embolism and DVT • Role of duplex scanning, venography and d-dimer measurement • Initiate and monitor treatment of venous thrombosis and pulmonary embolism • Initiation of prophylaxis		

	3 Antibiotics: • Appropriate prescription of antibiotics 3 Assess and plan preoperative nutritional management • Arrange access to suitable artificial nutritional support, preferably via a nutrition team including Dietary supplements, Enteral nutrition and Parenteral nutrition 3 Metabolic and endocrine disorders • History and examination in patients with endocrine and electrolyte disorders • Investigation and management of thyrotoxicosis and hypothyroidism • Investigation and management of hypercalcaemia and hypocalcaemia • Peri-operative management of patients on steroid therapy • Peri-operative management of diabetic patients • Investigation and management of hyponatraemia • Investigation and management of hyperkalaemia and hypokalaemia Delirium 3 Assessment of cognitive impairment seeking to differentiate dementia from delirium, with the knowledge that delirium is common in people with dementia 3 Management of patients with delirium including addressing triggers and using non-pharmacological and pharmacological methods where appropriate 3 Explanation of delirium to patients and advocates		

Technical Skills and Procedures	2 Central venous line insertion 4 Urethral catheterisation		Strongly recommended (Paediatric Surgery) Desirable

Module 6	**Assessment and management of patients with trauma (including the multiply injured patient)**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	Assess and initiate management of patients with chest trauma • who have sustained a head injury • who have sustained a spinal cord injury • who have sustained abdominal and urogenital trauma • who have sustained vascular trauma • who have sustained a single or multiple fractures or dislocations • who have sustained traumatic skin and soft tissue injury • who have sustained burns • Safely assess the multiply injured patient. • Contextualise any combination of the above • Be able to prioritise management in such situation as defined by ATLS, APLS etc It is expected that trainees will be able to show evidence of competence in the management of trauma (ATLS / APLS	WBA Course test and certificate	

	certificate or equivalent).		
Knowledge	General • Scoring systems for assessment of the injured patient • Major incident triage • Differences In children Shock • Pathogenesis of shock • Shock and cardiovascular physiology • Metabolic response to injury • Adult respiratory distress syndrome • Indications for using uncross matched blood Wounds and soft tissue injuries • Gunshot and blast injuries • Stab wounds • Human and animal bites • Nature and mechanism of soft tissue injury • Principles of management of soft tissue injuries • Principles of management of traumatic wounds • Compartment syndrome Burns • Classification of burns • Principle of management of burns Fractures • Classification of fractures • Pathophysiology of		Strongly recommended: Life Support Critical Care Wound management ATLS / APLS Desirable: Team-working Human Factors Trauma management

	fractures • Principles of management of fractures • Complications of fractures • Joint injuries Organ specific trauma • Pathophysiology of thoracic trauma • Pneumothorax • Head injuries including traumatic intracranial haemorrhage and brain injury • Spinal cord injury • Peripheral nerve injuries • Blunt and penetrating abdominal trauma • Including spleen • Vascular injury including iatrogenic injuries and intravascular drug abuse • Crush injury • Principles of management of skin loss including use of skin grafts and skin flaps		
Clinical Skills	General 4 History and examination 3 Investigation 3 Referral to appropriate surgical subspecialties 4 Resuscitation and early management of patient who has sustained thoracic, head, spinal, abdominal or limb injury according to ATLS and APLS guidelines 4 Resuscitation and early management of the multiply injured patient 3 Specific problems • Management of the unconscious patient • Initial management		

	of skin loss • Initial management of burns • Prevention and early management of the compartment syndrome		
Technical Skills and Procedures	2 Central venous line insertion 3 Chest drain insertion 2 Diagnostic peritoneal lavage 4 Urethral catheterisation 2 Suprapubic catheterisation		Desirable

Module 7	**Surgical care of the Paediatric patient**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	To assess and manage children with surgical problems, understanding the similarities and differences from adult surgical patients To understand the issues of child protection and to take action as appropriate	WBA MRCS	
Knowledge	• Physiological and metabolic response to injury and surgery • Fluid and electrolyte balance • Thermoregulation Safe prescribing in children • Principles of vascular access in children • Working knowledge of trust and Local Safeguarding Children Boards (LSCBs) and Child Protection Procedures • Basic understanding of child protection law • Understanding of Children's rights • Working knowledge of types and categories of child maltreatment, presentations, signs and other features (primarily physical, emotional, sexual, neglect, professional) • Understanding of one		Strongly recommended: Critical Care Child protection Desirable Team-working

	personal role, responsibilities and appropriate referral patterns in child protection • Understanding of the challenges of working in partnership with children and families • Recognise the possibility of abuse or maltreatment • Recognise limitations of own knowledge and experience and seek appropriate expert advice • Urgently consult immediate senior in surgery to enable referral to paediatricians • Keep appropriate written documentation relating to child protection matters • Communicate effectively with those involved with child protection, including children and their families		
Clinical Skills	3 History and examination of the neonatal surgical patient 3 History and examination of paediatric surgical patient 3 Assessment of respiratory and cardiovascular status 3 Undertake consent for surgical procedures (appropriate to the level of training) in paediatric patients		

Module 8	**Management of the dying patient**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	Ability to manage the dying patient appropriately. To understand consent and ethical issues in patients certified DNAR (do not attempt resuscitation) Palliative Care: Good management of the dying patient in consultation with the palliative care team.	MRCS	
Knowledge	Palliative Care: • Care of the terminally ill • Appropriate use of analgesia, antiemetics and laxatives Principles of organ donation: • Circumstances in which consideration of organ donation is appropriate • Principles of brain death Understanding the role of the coroner and the certification of death		Desirable Team-working Human Factors
Clinical Skills	3 Palliative Care: • Symptom control in the terminally ill patient 3 Principles of organ donation: • Assessment of brain stem death • Certification of death		Strongly recommended (Paediatric Surgery: • Ethical issues • Palliative care • Communication

Module 9	**Organ and Tissue transplantation**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Objective	To understand the principles of organ and tissue transplantation	MRCS	
Knowledge	• Principles of transplant immunology including tissue typing, acute, hyperactute and chronic rejection		

	• Principles of immunosuppression • Tissue donation and procurement • Indications for whole organ transplantation		

Module 10	Health Promotion
General Aspects	
Objective	This syllabus module aims to enable all surgical trainees to develop the competencies necessary to support patients in caring for themselves, to empower them to improve and maintain their own health.
Knowledge	• Damaging health and social issues such as excessive alcohol consumption, obesity, smoking and illicit drugs and the harmful effects they have on health • The connection between mental health and physical health • The importance of health education for promoting self-care for patients
Clinical Skills	3 Modification of explanations to match the intellectual, social and cultural background of individual patients 3 Patient centred care 4 Identification and utilisation of opportunities to promote health
Reference to other relevant syllabus items	• Nutrition (Module 5, Perioperative Care) • Drugs and alcohol (Module 1, Pharmacology) • Screening (Module 1, Pathology) • Child protection (Module 7, Surgical Care of the Paediatric Patient)
Obesity	
Objective	• Recognise the health risks posed by obesity including an increased incidence of coronary heart disease, type 2 diabetes, hypertension, stroke, and some major cancers. • Assess and explain the higher risks for obese individuals undergoing surgery.
Knowledge	• Classification of excess body mass • Social, psychological and environmental factors that underpin obesity • Physiological and metabolic effects of obesity on the surgical patient • Available treatments for obesity including diet, exercise, medication

	and surgery
Clinical Skills	4 The ability to treat patients who are obese in a supportive and sensitive manner 3 Management of cardiovascular, respiratory and metabolic complications in patients with obesity undergoing surgery 2 Provide advice and guidance about weight loss to overweight and obese patients within the context of a multidisciplinary team
Dementia	
Objective	• Adapt surgical treatment in order to deliver high quality and person-centred care for patients with dementia • Apply the appropriate legal framework to the treatment of patients with cognitive impairment
Knowledge	• Clinical features of dementia and the distinction between it and delirium • The impact of dementia on patient, family and carers • Principles and key provisions of the relevant legislation regarding the safeguarding of vulnerable adults across the UK (see **footnote**).
Clinical Skills	3 Recognises cognitive impairment and appropriately refers 2 Management of surgical patients in the context of their dementia 4 A range of techniques and strategies to communicate effectively with people with dementia and their carers/families 4 Assessment of capacity, involvement of advocates and documentation of consent and best interests in accordance with current legislation in place across the nations of the UK (see **footnote**). **Footnote** The relevant legislation includes: • Mental Capacity Act (2005) • Mental Health Act (1983 and 2007) • Adults with Incapacity (Scotland) Act (2000) • Mental Health (Care and Treatment) (Scotland) Act (2003) • Adult Support and Protection (Scotland) Act (2007).
Exercise and physical fitness	
Objective	• Promote the use of exercise in the prevention and management of long term chronic conditions such as coronary heart disease, diabetes, hypertension, obesity, cancer, osteoporosis, peripheral vascular disease and depression and the promotion of health and well being

Knowledge	• Physical inactivity as an independent risk factor for ill health and obesity • Relationship between physical exercise programmes and healthy eating and smoking cessation programmes • Government behaviour change programmes such as 'Let's Get Moving' and 'Shift into Sports'
Clinical Skills	4 Utilisation of all patient interactions as opportunities for health and fitness promotion 4 Modification of advice on physical exercise to the specific requirements of individual patients

Requirement to meet the ST3 in Neurosurgery

At present (6/09), neurosurgery continues with run through training that is specialty specific. Most trainees will be entering ST3 from neurosurgery programs, although it is hoped that in time, some Core trainees will be attracted into the specialty from attachments in CT2. However, those that do so will need to address the issue of competencies outside of surgery (qv).

In order to meet the job specifications of an ST3 trainee, an early years trainee must take a clear role in the Neurosurgery team, managing clinic and ward based patients under supervision, including the management of acute Neurosurgical admissions. They will need to be able to take

part in an outpatient clinic and in some centres see patients themselves with the consultant available for advice.

Therefore in early years training, IN ADDITION to the generic competencies for all surgeons, it is necessary to address the specifics of a developing interest in Neurosurgery during these years. This means spending 6-12 months in neurosurgery in a service which gives trainees access to the appropriate learning opportunities. They will also have to have completed either a 6 months module in clinical neurology, or four months of neurology and four in an allied clinical neuroscience such as neuro-intensive care. Also by the time a trainee enters ST3 they need to be familiar with the operating room environment both with respect to elective and emergency cases.

Trainees must attend MDT and other Departmental meetings and ward rounds, prepare elective operating lists (both inpatient, day-case), and will be expected to have performed some surgery under appropriate supervision. They must manage all patients in a neurosurgery ward environment, preoperatively and post operatively. This includes recognising and initiating the management of common complications and emergencies, over and above those already laid out in the generic component of the curriculum, particularly module 2.

The range of conditions a trainee needs to manage are laid out below and in the depth demonstrated in a text book such as Clinical Neurosurgery (Lindsay), Schmidek and Sweet or Youmans

Cranial trauma: including the resuscitation, assessment, investigation and continuing care of head-injured patients; the prevention and detection of secondary intracranial and systemic insults; insertion of an intracranial pressure monitor; burr-hole drainage of a chronic subdural haematoma;

Spinal Trauma: the resuscitation and assessment, investigation and care of patients suffering spine injuries. The initial external stabilisation of the spine including placement of skull traction. Spontaneous intracranial haemorrhage: including the resuscitation, assessment and investigation of patients suffering a subarachnoid haemorrhage; the management of post-haemorrhagic hydrocephalus; the detection and management of delayed cerebral ischaemia; the management of systemic complications; diagnostic lumbar puncture

Hydrocephalus: in particular the management of hydrocephalus complicating intracranial haemorrhage, head injury and intracranial space-occupying lesions; insertion and tapping of CSF reservoirs; insertion and maintenance of lumbar and external ventricular drains

Intracranial tumours: including the assessment and peri-operative management of patients with intracranial tumours; the detection and management of post-operative cerebral swelling, intracranial haematomas and intracranial sepsis; the management of post-operative seizures; the management of post-operative metabolic and endocrine disorders

Acute spinal disorders: including the assessment and peri-operative management of patients presenting with spinal cord, cauda equina and spinal root compression: the management of spinal shock; the ward management of patients with spinal instability; the detection and initial management of postoperative complications including compressing haematomas, CSF fistula and spinal sepsis

Topic	**Early Years Neurosurgery**
Objective	*Provide experience in the early care of patients with common neurosurgical problems:* • *The common emergency problems are brain and spine trauma,*

	spontaneous intracranial haemorrhage inc. Sub arachnoid haemorrhage and hypertensive intracerebral haematomas, Acute hydrocephalus Management of acute raised intracranial pressure from brain tumours. Epilepsy. Acute spinal cord and nerve root compression and cauda equina syndrome. • *The common elective problems include assessment and management of various brain tumours, the investigation and management thereof. The management and investigation of patients with epilepsy, stroke and movement disorders. The management investigation and assessment of patients with spinal degenerative disease including spinal stenosis and disc protrusions. Spinal tumours of all types.* *Provide some operative experience of aspects of all of these.*
Knowledge	Basic science relevant to the management of patients with the common elective and emergency brain and spine problems, (including anatomy, physiology, pharmacology, pathology and radiology) Principles of management of patients including children presenting with the common elective and emergency brain and spine problems Detailed initial management of patients presenting the common neurosurgical problems including onward referral
Clinical Skills	Assessment, investigation and initial management of patients presenting with common elective and emergency neurosurgical conditions
Technical Skills and Procedures	Insertion of ICP bolt Burr hole drainage of CSDH Basic craniotomy flap position and procedures Tapping of CSF reservoirs and shunts Lumbar puncture Part of placement of ventriculo peritoneal shunts Placement of EVD's Positioning and safety of patients for spine procedures (lumbar) Some part of simple spinal decompressive procedures

Assessment

The speciality elements of the early years will all be assessed primarily in the workplace and then scrutinised in the Annual Review of Competency Progression. All these documents would be included in a portfolio which would contribute as evidence in subsequent applications to enter ST3. The specific job specifications for entry into ST3 are shown in appendix XX. Completion of the MRCS is mandatory during the same period

Specific evidence includes

Assessment type	Subject
DOPS a selection of types and numbers of each type according to learning agreements	Burr hole for CSDH Therapeutic/diagnostic LP Insert Lumbar drain External vent drain Insert CVP line Placement of skull traction - 2 Placement of image guidance fiducials and set up -2/3 Placement of craniotomy -2/3
Case Based Discussion	One per attachment
CEX	Clinical assessment of patients with common neurosurgical conditions
PBAs	Craniotomy for trauma
Training Supervisors report	Evidenced by the above WPBAs
ARCP for each specified training interval	As per local Deanery specifications
MRCS	Generic syllabus

Initial Stage Topics – Neurosurgery specific modules of the syllabus

TOPIC	Embryology and maldevelopment	Areas in which simulation should be used to develop relevant skills
Category	Core Neuroscience knowledge ST1	
Sub-category:	Applied neuroanatomy	
Objective	*To understand basic neuroembryology and its relevance to clinical practice*	
Knowledge	4 Embryogenesis of the brain and spinal cord 4 Embryogenesis of supporting structures - skull and vertebral column 4 Common anatomical variations and developmental abnormalities	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	Anatomy of the skull	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Applied neuroanatomy	
Objective	*To understand the anatomy of the skull*	
Knowledge	4 Structure, blood supply, innervation, surface and three-dimensional relationships of the: - scalp - skull - meninges - orbit - cranial fossae - cranial foraminae - cranial nerves	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	Anatomy of the brain	
Category	Core Neuroscience knowledge ST1	

Sub-category:	Applied neuroanatomy	
Objective	*To understand the structural anatomy of the brain*	
Knowledge	4 Cortical topography 4 Projection and association tracts 4 Organisation of the basal ganglia 4 Structure, organisation and connections of the cerebellum, pons and brainstem 4 Cranial nerves and their relationships 4 Visual and auditory pathways 4 Ventricular system and choroid plexus 4 Subarachnoid space and cisterns 4 Circle of Willis and principle regional and segmental blood supply 4 Venous drainage and dural sinuses	Strongly recommended
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Anatomy of the spine**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Applied neuroanatomy	
Objective	*To understand the anatomy of the spine*	
Knowledge	4 Structure, blood supply, innervation, surface and three-dimensional relationships of the: - vertebral column - spinal cord: ascending and descending tracts - spinal nerve roots - cauda equina	Strongly recommended
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Anatomy of the autonomic and peripheral nervous system**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Applied neuroanatomy	
Objective	*To understand the anatomy of the autonomic and peripheral nervous system*	
Knowledge	4 Sympathetic and parasympathetic pathways 4 Visceral and pelvic innervation: control of sphincter function 4 Brachial plexus 4 Lumbosacral plexus	

	4 Course, distribution and innervation of the major peripheral nerves	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Functional neurophysiology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neurophysiology	
Objective	*To understand the functional organisation and integration of the central nervous system*	
Knowledge	4 Structure and function of neurones and glial cells 4 Synaptic function, action potentials and axonal conduction 4 Higher cerebral functions 4 Sleep and coma 4 Memory and disorders of the limbic system 4 Control of motor function: ascending and descending pathways, basal ganglia and cerebellar function 4 The special senses 4 Functions of the autonomic nervous system 4 Hypothalamic-pituitary function	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Principles of clinical neurophysiology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neurophysiology	
Objective	*To understand the basic principles of clinical neurophysiology*	
Knowledge	4 Principles of electroencephalography 4 Principles of somatosensory, motor and brainstem evoked potential monitoring 4 Peripheral neuropathies and entrapment neuropathies including: - structure and function of peripheral nerves - use of nerve conduction studies 4 Disorders of the neuromuscular junction including: - structure and function of smooth and striated muscle - use of electromyographic studies	
Clinical Skills	3 Interpretation of the results of EEG, EMG and NC studies	
Technical Skills and	None specified	

Procedures		

TOPIC	**Pathophysiology of intracranial disorders**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Pathophysiology of intracranial disorders	
Objective	*To understand the pathophysiology of intracranial disorders*	
Knowledge	4 Cerebral blood flow and metabolism 4 Cerebral autoregulation and vasospasm 4 Blood brain barrier and cerebral odema 4 Intracranial pressure dynamics 4 Cerebral ischaemia and neuroprotection 4 CSF hydrodynamics - production and absorption	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Principles of neuropharmacology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neuropharmacology	
Objective	*To understand the principles of neuropharmacology*	
Knowledge	4 Receptor and ion channel function 4 Neuropeptides and neurotransmitters 4 Principles of pharmacological neuroprotection 4 The pharmacology of anaesthetic agents, muscle relaxants, barbiturates, anticonvulsants and corticosteroids including: - mechanisms of action - pharmacodynamics - interactions	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Principles of neuropathology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neuropathology and Neuro-oncology	
Objective	*To understand the neuropathology of infection, inflammation, ischaemia, neoplasia and trauma affecting the nervous system*	
Knowledge	4 Acute and chronic inflammatory processes in the CNS including demyelination	

	4 Bacterial, fungal and parasitic meningitis, encephalitis and abscess formation 4 Viral encephalitis 4 Slow viruses, CJD and vCJD 4 HIV associated infections, tumours and leucoencehalopathies 4 Cytopathology of neurones and glial in response to ischaemia, hypoxia and trauma 4 Diffuse axonal injury 4 Macroscopic brain and spinal cord injury including effects of brain shift, herniation and raised ICP 4 Classification, epidemiology and pathology of CNS tumours 4 Tumour biology, cell kinetics, tumour markers, immunocytochemistry	
Clinical Skills	N/A	
Technical Skills and Procedures	None specified	

TOPIC	**Principles of neuroradiology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neuroradiology	
Objective	*To understand the principles of neuroradiological imaging of the structure and function of the nervous system*	
Knowledge	4 Interpretation of plain radiographs of the skull and spine 4 Principles of computerised tomography of the brain, skull and spine 4 Interpretation of CT scans with particular reference to acute spinal disorders, cranial trauma, hydrocephalus, intracranial tumours and spontaneous intracranial haemorrhage 4 Principles of basic magnetic resonance imaging 4 Interpretation of MRI scans with particular reference to acute spinal disorders, cranial trauma, hydrocephalus and intracranial tumours 3 Principles of advance magnetic resonance imaging including fMRI, DWI and spectroscopy 3 Interpretation of angiographic images: CTA, MRA and DSA	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Principles of neuropsychology**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neuropsychology	
Objective	*To understand the principles of neuropsychological assessment,*	

	application of the Mental Health Act	
Knowledge	3 The principles of neuropsychological assessment 3 Common neuropsychological problems associated with head injury, subarachnoid haemorrhage, hydrocephalus, structural lesions of the frontal and temporal lobes and disorders of the limbic system	
Clinical Skills	3 Ability to undertake bed-side assessment of cognition and memory	
Technical Skills and Procedures	None	

TOPIC	**Principles of neurological rehabilitation**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Neurological Rehabilitation	
Objective	*To understand the principles of neurological rehabilitation*	
Knowledge	3 The principles of neurological rehabilitation including strategies to optimise the recovery of cognition, communication, continence, selective movement, gait, self-care, psychological stability, social adjustment and employment	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Medical ethics**	
Category	Core Neuroscience knowledge ST1	
Sub-category:	Medical ethics	
Objective	*To understand the ethical issues that commonly arise in the management of patients with neurological disorders*	
Knowledge	4 Criteria for the diagnosis of brainstem death 3 Diagnosis and management of persistent vegetative states 3 Prognosis in chronic progressive neurological disorders 3 Professional and statutory framework governing living directives and end-of-life decisions	Desirable Ethics
Clinical Skills	3 Ability to empathise with and support patients and carers	Desirable Ethics
Technical Skills and Procedures	None specified	

TOPIC	**Principles of neurogenetics**	

Category	Core Neuroscience knowledge ST1	
Sub-category:	Neurogenetics	
Objective	*To understand the principles of neurogenetic studies and their relevance to clinical practice*	
Knowledge	3 Inherited neurological disorders 3 Genetic control of neural connectivity 3 Inborn errors of metabolism 3 Molecular genetics of CNS tumours	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	

TOPIC	**Impaired consciousness and non-traumatic coma**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with impaired consciousness and non-traumatic coma*	
Knowledge	4 The aetiology, pathophysiology and differential diagnosis of altered consciousness and coma due to: - meningitis - encephalitis - intracranial haemorrhage - acutely raised ICP - hydrocephalus - hypoxaemia and ischaemia - cardiogenic shock - hypoglycaemia - epilepsy - metabolic encephalopathies - drugs and toxins	
Clinical Skills	4 Neurological assessment and initial resuscitation of patients in coma or with impaired consciousness 4 Indications for intubation and ventilation 4 Treatment of seizures 4 Establishing a neurological differential diagnosis 4 Planning and interpreting scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	4 Maintenance of airway 3 Endotracheal intubation 3 Central venous cannulation 4 Lumbar puncture	Strongly recommended

TOPIC	**Headache - acute and chronic**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with acute and chronic headache*	
Knowledge	4 The aetiology and differential diagnosis of acute and chronic headache including headache associated with: - benign headache syndromes - migraine, cluster headache and related syndromes - space occupying lesions - meningitic disorders - intracranial haemorrhage - trigemminal neuralgia - atypical craniofacial pain syndrome Indications for investigation including scanning, lumbar puncture and angiography	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	4 Lumbar puncture	Strongly recommended

TOPIC	**Weakness and paralysis**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with weakness and paralysis*	
Knowledge	4 Common causes of ocular, cranial nerve, limb, trunk and respiratory muscle weakness	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Dizziness, unsteadiness and falls**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with dizziness, unsteadiness and falls*	
Knowledge	4 Common causes of cerebellar, vestibular, extrapyrammidal and autonomic dysfunction	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Pain and sensory loss**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with pain and sensory loss*	
Knowledge	4 Common causes of musculoskeletal, neurogenic and neuropathic pain and sensory loss	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Hearing disorder**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with hearing loss*	
Knowledge	4 Common causes of conductive and sensorineural hearing loss 3 Principles of audiological assessment	
Clinical	4 Neurological history taking	Strongly

Skills	4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans 3 Interpretation of pure tone audiograms and auditory evoked potentials 4 Presentation and summary of cases	recommended
Technical Skills and Procedures	None specified	

TOPIC	**Visual disorder**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with visual disorders*	
Knowledge	4 Patterns of visual loss in relation to common bulbar, retrobulbar, sellar, parasellar and optic pathway disorders 4 Analysis of diplopia and nystagmus in relation to common cranial nerve and brainstem disorders	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Use of computerised visual field assessment 4 Detailed fundoscopy 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	
Technical Skills and Procedures	None specified	

TOPIC	**Language and speech disturbance**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with disturbances of language and speech*	
Knowledge	4 Classification, causes and presentations of dysphasias, speech dyspraxia and dyslexia 4 Classification, causes and presentations of dysarthria 2 Role of speech and language therapists in assessment and treatment	
Clinical Skills	4 Neurological history taking 4 Neurological examination with assessment of dysphasia and dysarthria	

	4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	
Technical Skills and Procedures	N/A	

TOPIC	**Swallowing disorders**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with swallowing disorders*	
Knowledge	4 Neurological causes of dysphagia 2 Indications for laryngoscopy, videofluoroscopy, nasogastric and percutaneous gastric feeding	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	
Technical Skills and Procedures	None specified	

TOPIC	**Disorders of the Sphincteric and sexual function**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with sphincteric disorders*	
Knowledge	4 Common causes of sphincteric and sexual dysfunction 2 Interpretation of urodynamic studies	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Movement disorder**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with movement disorders*	
Knowledge	4 Parkinson's disease 4 Iatrogenic movement disorders 2 Dystonic syndromes 2 Choreiform syndromes	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Memory and cognitive disorders**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with disorders of memory and cognition*	
Knowledge	4 Disorders of memory and cognition associated with head injury, subarachnoid haemorrhage, hydrocephalus, structural lesions of the frontal and temporal lobes and disorders of the limbic system	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Behavioural disorders**	
Category	Management of Common Neurological Conditions ST1	
Sub-category:	None	
Objective	*To understand the aetiology, differential diagnosis, investigation and initial management of patients presenting with behavioural*	

	disorders	
Knowledge	4 The common acute and chronic presentations of organic and psychiatric behavioural disorders relating to alcohol and drug abuse, encephalitis, organic dementia, and psychosis	
Clinical Skills	4 Neurological history taking 4 Neurological examination 4 Establishing a neurological differential diagnosis 4 Planning investigation 4 Interpretation of scans and other investigations 4 Presentation and summary of cases	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**General management of the head injured patient**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in the general management of head-injured patients*	
Knowledge	4 Pathophysiology of head injury and of multiple trauma including an understanding of: - Cerebral perfusion and oxygenation - Raised intracranial pressure - Impaired intracranial compliance - Intracranial herniation 4 Medical management of acutely raised intracranial pressure 4 Indications for operation intervention including the use of pressure monitoring 4 Principles, diagnosis and confirmation of brain death 4 Principles of intensive care of head injured patients 4 Principles of spinal stabilisation and radiological assessment in head injured patients 3 Natural history of recovery from head injury including neurological, cognitive and behavioural disability and post-traumatic epilepsy 2 Role of neurological rehabilitation	
Clinical Skills	4 Clinical assessment of the multiply-injured patient. 4 Neurological assessment of the head-injured patient including: - Assessment and categorisation of impaired consciousness - Recognition and interpretation of focal neurological deficits 4 Prioritisation of clinical risk 3 Interpretation of CT scans and plain radiology	Strongly recommended Desirable
Technical Skills and Procedures	No procedures specified	

TOPIC	**Insertion of ICP monitor**	
Category	Basic Clinical Neurosurgery ST2 & ST3	

Sub-category:	Cranial Trauma	
Objective	*To achieve competence in the insertion of subdural and intraparenchymal ICP monitors*	
Knowledge	4 Indications for ICP monitoring 4 Applied anatomy of the skull vault 4 Calibration, zeroing and interpretation of ICP traces 4 Potential complications of the procedure	
Clinical Skills	Non specified	
Technical Skills and Procedures	4 Insertion of frontal subdural and intraparenchymal ICP monitors using a standard frontal burr hole and/or twist drill craniostomy.	Strongly recommended

TOPIC	**Burr hole evacuation of chronic subdural haematoma**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in burr hole evacuation of chronic subdural haematomas*	
Knowledge	4 Pathophysiology of chronic subdural haematomas 4 Applied anatomy of the skull vault and subdural space 4 Indications for surgery 4 Surgical options 4 Complications of surgery 4 Management of anti-platelet and anti-coagulant medication	
Clinical Skills	4 Neurological assessment of patients with a CSDH 3 Interpretation of CT scans 4 Obtaining informed consent 4 Post-operative assessment and management	Strongly recommended
Technical Skills and Procedures	3 Performance of single and multiple frontal and parietal burrhole evacuation of CSDHs	Strongly recommended

TOPIC	**Management of soft tissue trauma**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in the management of cranial soft tissue trauma*	
Knowledge	4 Anatomy and blood supply of the scalp 4 Indications for primary and secondary closure of wounds 4 Indications for antibiotic prophylaxis	
Clinical Skills	4 Assessment of tissue perfusion and viability	
Technical Skills and	4 Wound exploration under local and general anaesthesia 3 Wound debridement	Strongly recommended

Procedures	4 Arrest of scalp haemorrhage 4 Layered closure of the scalp without tension 3 Suturing technique 4 Wound drainage and head bandaging	

TOPIC	**General management of subarachnoid haemorrhage**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Spontaneous Intracranial haemorrage	
Objective	*To achieve competence in the general management of subarachnoid haemorrhage (SAH)*	
Knowledge	4 Aetiology of SAH 4 Pathophysiology of SAH 4 WFNS grading of SAH 4 Principles of resuscitation and timing of interventions. 4 Indications for CT scanning, diagnostic lumbar puncture, CT angiography and digital subtraction angiography. 4 Principles of management of post-haemorrhagic hydrocephalus 4 Indications for endovascular and surgical intervention	
Clinical Skills	3 Interpretation of CT scans including assessment of intracranial blood load, haematomas and hydrocephalus 3 Basic interpretation of cerebral angiography	Strongly recommended
Technical Skills and Procedures	4 Lumbar puncture	Strongly recommended

TOPIC	**Diagnostic lumbar puncture**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Spontaneous Intracranial haemorrage	
Objective	*To understand the indications for diagnostic lumbar puncture* *To undertake an atraumatic lumbar puncture*	
Knowledge	4 Indications for diagnostic lumbar puncture 4 Interpretation of basic microscopy and biochemistry 3 Principles of spectrophotometry	
Clinical Skills	None specified	
Technical Skills and Procedures	4 Lumbar puncture	Strongly recommended

TOPIC	**Management of delayed secondary ischaemia**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-	Spontaneous Intracranial haemorrage	

category:		
Objective	*To recognise and manage delayed cerebral ischaemia following subarachnoid haemorrhage*	
Knowledge	4 Pathophysiology of delayed cerebral ischaemia including the impact of secondary insults 4 Principles governing the augmentation of cerebral blood flow	
Clinical Skills	4 Assessment of a deteriorating patient 4 Recognition and management of secondary insults 4 Interpretation of CT scans 3 Management of hypervolaemic hypertension	Strongly recommended
Technical Skills and Procedures	3 Insertion of central venous catheter 3 Insertion of lumbar drain 3 Insertion of external ventricular drain	Strongly recommended

TOPIC	**Management of post-haemorrhagic hydrocephalus**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Spontaneous Intracranial haemorrage	
Objective	*To achieve competence in the management of post-haemorrhagic hydrocephalus*	
Knowledge	4 Pathophysiology of hydrocephalus 4 Indications for external ventricular drainage and lumbar subarachnoid drainage 4 Applied anatomy of the skull vault, subdural space and ventricular system 4 Complications of surgery	
Clinical Skills	4 Assessment of the unconscious and deteriorating SAH patient 3 Interpretation of CT scans	Strongly recommended
Technical Skills and Procedures	4 Insertion of lumbar drain 3 Insertion of external ventricular drain	Strongly recommended

TOPIC	**Adult hydrocephalus**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Hydrocephalus	
Objective	*The management of hydrocephalus complicating intracranial haemorrhage, head injury and intracranial space occupying lesions; insertion and taping of CSF reservoirs; insertion and maintenance of lumbar and ventricular drains*	
Knowledge	3 The pathophysiology of CSF circulation 3 Applied surgical anatomy of the ventricular system 3 Indications for external ventricular drainage, ventriculoperitoneal shunting, lumbar CSF drainage and shunting, ventriculo-cisternostomy 3 Complications of surgery	
Clinical	None	

Skills		
Technical Skills and Procedures	3 Insertion of ventricular drain/access device 2 Insertion of VP shunt 1 Revision of VP shunt	Strongly recommended

TOPIC	**Assessment and peri-operative management of patients with space-occupying intracranial tumours**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in the assessment and peri-operative management of patients with intracranial tumours*	
Knowledge	3 The neuropathology of primary and secondary intracranial tumours including: - classification - epidemiology - natural history 4 Clinical presentations of intracranial tumours 4 Indications for neuroimaging 4 Management of raised intracranial pressure 3 Principles of operative management 4 Detection and management of post-operative complications	
Clinical Skills	4 Neurological history taking and examination 4 Basic interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Image-guided biopsy of intracranial tumour**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Intracranial tumours	
Objective	*To undertake image-guided biopsy of an intracranial tumour under supervision*	
Knowledge	4 Indications for biopsy of intracranial tumours 4 Risks of biopsy 4 Principles of image-guided surgery	
Clinical Skills	3 Interpretation of CT and MRI scans and selection of biopsy targets	Strongly recommended
Technical Skills and Procedures	3 Image-guided frameless and/or frame-based stereotactic biopsy including: - Setting up a computer workstation and importing and interrogating image data - Positioning the patient and applying a cranial fixator - Obtaining and confirming accurate patient registration - Positioning and performing a suitable burr hole - Passage of biopsy probe and biopsy - Preparation of smear histology (when available)	Strongly recommended

TOPIC	**Acute Spinal Disorders**	
Category	Basic Clinical Neurosurgery ST2 & ST3	
Sub-category:	Acute Spinal Disorders	
Objective	*To achieve competence in the peri-operative management of patients presenting with acute spinal disorders*	
Knowledge	4 The assessment and peri-operative management of patients presenting with spinal cord, cauda equina and spinal root compression 4 The management of spinal shock 4 The ward management of patients with spinal instability 4 The detection and initial management of post-operative complications including compressing haematomas, CSF fistula and spinal sepsis	
Clinical Skills	None	
Technical Skills and Procedures	None	

Intermediate Stage Overview

Intermediate Training Stage ST4 – ST5

During the intermediate stage trainees will consolidate the theoretical knowledge and clinical skills gained during the initial training stage. They will develop their surgical judgement, decision making and operative competencies in the following conditions:

- Cranial trauma: including the general management of the head injured patient; surgical management of cranial trauma; neuro-intensive care of the head-injured patient; the role of post-traumatic neurological rehabilitation
- Intracranial haemorrhage: including the operative management of space-occupying spontaneous intracerebral haematomas; surgical aspects of the multi-disciplinary management of aneurysmal subarachnoid haemorrhage SAH
- Hydrocephalus: including the assessment and operative management of adult patients with communicating and non communicating hydrocephalus; the assessment of children with hydrocephalus; emergency external ventricular drainage in children with acute hydrocephalus
- Neuro-oncology: including the multi-disciplinary management of patients with intracranial neoplasia; image-guided surgery applied to the management of patients with intracranial tumours; the operative management of supra-tentorial intrinsic tumours; the operative management of convexity meningiomas
- CNS sepsis: including the general management of CNS infections e.g. ventriculitis, cerebral abscess, subdural empyema and spinal epidural abscess; the operative management of cerebral abscess by burr hole aspiration
- Spinal trauma: all aspects of the non-operative management of spinal injury patients
- Spinal oncology: including the general management of patients with malignant spinal cord compression and basic surgical management of patients with malignant spinal cord compression
- Degenerative spinal disorders: including the surgical management of lumbar compressive radiculopathies by lumbar microdiscectomy and associated microsurgical decompressions; the surgical management of compressive cervical myeloradiculopathies

By the end of the intermediate stage trainees will have acquired the necessary clinical and operative skills with sufficient experience to manage without direct supervision a range of adult emergency conditions together with selected, life saving emergency intervention in children. They will be competent to undertake all the common surgical approaches and to perform selected microsurgical procedures included in the Operative Competency Schedule.

Click on Workplace Based Assessments to view the assessment forms including DOPS and PBAs

Entry into ST3

Entry into ST3 will usually involve a competitive selection process. The current person specifications for entry into ST3 in Neurosurgery are shown on the Modernising Medical Careers website. The essential components are completion of the common component of the core surgical training programme (as evidenced by successful ARCP, WPBA and completion of the MRCS examination) and completion of the Neurosurgery specific components of the early years training as evidenced by a successful ARCP and completion of the appropriate WPBA.

2009 Person Specification

Application to enter Specialty Training at ST3: Neurosurgery

Essential		**When Evaluated[1]**
Qualifications	• MBBS or equivalent medical qualification • Successful completion of MRCS or equivalent at time of application	Application form
Eligibility	• Eligible for full registration with the GMC at time of appointment	Application form
	• Evidence of achievement of Foundation competences by time of appointment in line with GMC standards/ Good Medical Practice including: o *Good clinical care* o *Maintaining good medical practice* o *Good relationships and communication with patients* o *Good working relationships with colleagues* o *Good teaching and training* o *Professional behaviour and probity* o *Delivery of good acute clinical care*	Application form Interview / Selection centre[2]
	• Evidence of achievement of **CT/ST1 competences** in neurosurgery at time of appointment & projected completion of **CT/ST2 competences** in neurosurgery by August 2009	Application form Interview / Selection centre
	• Eligibility to work in the UK	Application form
Fitness To Practise	Is up to date and fit to practise safely	Application form References
Language Skills	All applicants to have demonstrable skills in written and spoken English adequate to enable effective communication about medical topics with patients and colleagues demonstrated by one of the following: o *a) that applicants have undertaken undergraduate medical training in English; or* o *b) have the following scores in the academic International English Language Testing System (IELTS) – Overall 7, Speaking 7, Listening 6, Reading 6, Writing 6* • If applicants believe they have adequate communication skills but do not fit into one of these examples they must provide supporting evidence	Application form Interview / Selection centre

[1] when evaluated' is indicative, but may be carried out at any time throughout the selection process

[2] A selection centre is a process not a place. It involves a number of selection activities that may be delivered within the Unit of Application.

Health	Meets professional health requirements (in line with GMC standards/Good Medical Practice)	Application form Pre-employment health screening
Career Progression	• *Ability to provide a complete employment history* • Evidence that career progression is consistent with personal circumstances • Evidence that present achievement and performance is commensurate with totality of period of training • *At least **24 months' experience**[3] in neurosurgical-related training at ST/SHO level (not including Foundation modules) by August 2009*	Application form Interview / Selection centre
Application Completion	***ALL** sections of application form completed **FULLY** according to written guidelines*	Application form

SELECTION CRITERIA			
Essential	**Desirable**	**When Evaluated**	
Career Progression	**As Above**	• Foundation competences to have been achieved in posts completed not more than five years before August 2009	
Clinical Skills	**Technical Knowledge & Clinical Expertise:** • Capacity to apply sound clinical knowledge & judgement & prioritise clinical need • Demonstrates appropriate technical and clinical competence and evidence of the development of diagnostic skills and clinical judgement • Validated logbook documentation of surgical exposure to date	**Personal Attributes:** • Shows aptitude for practical skills, e.g. hand-eye co-ordination, dexterity, visuo-spatial awareness • Attendance at relevant courses, e.g. ATLS, Basic Surgical Skills or equivalent, CCrISP	Application form Interview / Selection centre References

[3] Any time periods specified in this person specification refer to full time equivalent

Academic / Research Skills	**Research Skills:** • Demonstrates understanding of the basic principles of audit, clinical risk management & evidence-based practice • Understanding of basic research principles, methodology & ethics, with a potential to contribute to research **Audit:** Evidence of active participation in audit **Teaching:** • Evidence of contributing to teaching & learning of others	• Evidence of relevant academic & research achievements, e.g. degrees, prizes, awards, distinctions, publications, presentations, other achievements • Evidence of participation in risk management and/or clinical/laboratory research	Application form Interview / Selection centre Application form Interview / Selection centre

Personal Skills	**Judgement Under Pressure:** • Capacity to operate effectively under pressure & remain objective In highly emotive/pressurised situations • Awareness of own limitations & when to ask for help **Communication Skills:** • Capacity to communicate effectively & sensitively with others • Able to discuss treatment options with patients in a way they can understand **Problem Solving:** • Capacity to think beyond the obvious, with analytical and flexible mind • Capacity to bring a range of approaches to problem solving **Situation Awareness:** • Capacity to monitor and anticipate situations that may change rapidly **Decision Making:** • Demonstrates effective judgement and decision-making skills **Leadership & Team Involvement:** • Capacity to work effectively in a Multi-Disciplinary Team • Demonstrate leadership when appropriate. • Capacity to establish good working relations with others **Organisation & Planning:** • Capacity to manage time and prioritise workload, balance urgent & important demands, follow instructions • Understands importance & impact of information systems	Application form Interview / Selection centre References
Probity	**Professional Integrity:** • Takes responsibility for own actions • Demonstrates respect for the rights of all • Demonstrates awareness of ethical principles, safety, confidentiality & consent • Awareness of importance of being the patients' Advocate, clinical governance & responsibilities of an NHS Employee	Application form Interview / Selection centre References

Commitment To Specialty	**Learning & Development:** • Shows realistic insight into neurosurgery and the personal demands of a commitment to surgery • Demonstrates knowledge of the neurosurgical training programme & commitment to own development • Shows critical & enquiring approach to knowledge acquisition, commitment to self-directed learning and a reflective/analytical approach to practice	**Extracurricular activities:** • Achievements relevant to neurosurgery, including elective or other experience • Attendance at, or participation in, national and international meetings relevant to neurosurgery	Application form Interview / Selection centre References

Intermediate Stage Topics

TOPIC	General management of the head injured patient	Areas in which simulation should be used to develop relevant skills
Category	Cranial Surgery	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in all aspects of the general management of head-injured patients*	
Knowledge	4 Pathophysiology of head injury and of multiple trauma 4 Prevention of secondary insults 4 Indications for operative intervention 4 Medical management of acutely raised intracranial pressure	
Clinical Skills	4 Clinical assessment of the head-injured and multiply-injured patient 4 Prioritisation of clinical risk 4 Interpretation of CT scans and plain radiology 4 Interpretation of multi-modality cerebral monitoring 4 Ability to assess and advise on the transfer of head-injured patient using image-transfer and telemedicine	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	Surgical management of cranial trauma	
Category	Cranial Surgery	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in the operative management of head-injured patients*	
Knowledge	4 Pathophysiology of raised intracranial pressure and space occupying haematomas 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Indications for surgery and appropriate surgical approaches	
Clinical Skills	4 Assessment of the head-injured patient 4 Interpretation of trauma CT scans	Strongly recommended

Technical Skills and Procedures	3 Craniotomy for supratentorial traumatic haematoma, in particular: 3 Planning and siting of craniotomies for evacuation of extradural and subdural haematomas 3 Handling the "tight" brain 3 Achieving haemostasis in the coagulopathic patient 3 Achieving haemostasis from the skull base and venous sinuses 3 Elevation of compound depressed skull fracture with dural repair 3 Delayed cranioplasty of skull vault	Strongly recommended

TOPIC	**Neuro-intensive care of the head-injured patient**	
Category	Cranial Surgery	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in the neurointensive care of head-injured patients*	
Knowledge	4 Pathophysiology of head injury 4 The management of raised intracranial pressure, impaired intracranial compliance, and cerebral ischaemia 4 Prevention and management of secondary insults	
Clinical Skills	4 Assessment of the unconscious patient 4 Use and interpretation of multimodality monitoring 4 Interpretation of CT scans 4 Ability to advise on management of secondary complications and further surgical intervention	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Neurological rehabilitation**	
Category	Cranial Surgery	
Sub-category:	Cranial Trauma	
Objective	*To understand the role of post-traumatic neurological rehabilitation*	
Knowledge	4 The natural history of recovery from head injury 4 Understanding of neurological, cognitive and behavioural disabilities following mild and severe head injury 4 Risks of post-traumatic epilepsy and its management	
Clinical Skills	4 Ability to contribute to the multi-disciplinary assessment of head injured patients 4 Ability to advise family and carers regarding prognosis, professional and lay support	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Primary intracerebral haematomas**	
Category	Cranial Surgery	
Sub-category:	Intracranial Haemorrhage	
Objective	*To achieve competence in the operative management of space-occupying spontaneous intracerebral haematomas*	

Knowledge	4 Aetiology of supra and infratentorial intracerebral haemorrhage 4 Pathophysiology of spontaneous intracerebral haemorrhage 4 Indications for surgical evacuation 4 Management strategies to reduce the risk of intra-operative re-bleeding in presence of suspected aneurysm or AVM including partial haematoma evacuation, pre or post-operative embolisation and definitive surgical treatment	
Clinical Skills	4 Assessment of patients with intracerebral haematomas and raised intracranial pressure 4 Interpretation of CT and MRI scans and identification of probable aetiology 4 Indications for pre-operative CT angiography, MRA and digital subtraction angiography	Strongly recommended
Technical Skills and Procedures	3 Craniotomy for supratentorial haematoma including: 3 Planning and siting of craniotomies 3 Use of ventricular drainage 3 Intracerebral haemostasis in the coagulopathic patient	Strongly recommended

TOPIC	**Aneurysmal subarachnoid haemorrhage**	
Category	Cranial Surgery	
Sub-category:	Intracranial Haemorrhage	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of aneurysmal subarachnoid haemorrhage SAH*	
Knowledge	4 Pathophysiology of SAH 4 Prevention and management of delayed cerebral ischaemia, cerebral vasospasm and hydrocephalus 4 Relative indications for endovascular and surgical interventions	
Clinical Skills	4 Clinical assessment of patients with aneurysmal SAH 4 Non operative management of patients undergoing endovascular coiling 4 Management of delayed cerebral ischaemia	Strongly recommended
Technical Skills and Procedures	4 External ventricular drainage 4 Lumbar subarachnoid drainage 3 Ventriculoperitoneal shunting	Strongly recommended

TOPIC	**Adult hydrocephalus**	
Category	Cranial Surgery	
Sub-category:	Hydrocephalus	
Objective	*To achieve competence the assessment and operative management of adult patients with communicating and non communicating hydrocephalus.*	
Knowledge	4 The pathophysiology of CSF circulation 4 Applied surgical anatomy of the ventricular system 4 Indications for external ventricular drainage, ventriculoperitoneal shunting, lumbar CSF drainage and shunting, ventriculo-cisternostomy 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with hydrocephalus, including interpretation of CT and MRI scans and identification of shunt malfunction	Strongly recommended

Technical Skills and Procedures	4 Lumbar subarachnoid drainage 4 External ventricular drainage 3 Primary ventriculoperitoneal shunt 2 Revision of ventriculoperitoneal shunt 2 Lumbo-peritoneal shunt	Strongly recommended

TOPIC	**Paediatric hydrocephalus**	
Category	Cranial Surgery	
Sub-category:	Hydrocephalus	
Objective	*To achieve competence in the assessment of children with hydrocephalus. To undertake emergency external ventricular drainage in children with acute hydrocephalus*	
Knowledge	4 The pathophysiology of CSF circulation 4 Applied surgical anatomy of the ventricular system 4 Indications for external ventricular drainage	
Clinical Skills	4 Assessment of the ill child with hydrocephalus, impaired consciousness and sepsis 4 Differential diagnosis of shunt malfunction 4 Interpretation of CT scans in shunted children	Strongly recommended
Technical Skills and Procedures	4 Taping and draining from an Ommaya reservoir 4 Taping a shunt 2 External ventricular drainage	Strongly recommended

TOPIC	**General principles of neuro-oncology**	
Category	Cranial Surgery	
Sub-category:	Neuro-oncology	
Objective	*To achieve competence in the multi-disciplinary management of patients with intracranial neoplasia*	
Knowledge	4 Classification, natural history and pathology of benign and malignant intracranial neoplasia 4 Pathophysiology of raised intracranial pressure associated with space occupying tumours 4 Diagnostic imaging of intracranial tumours including the interpretation of CT and MRI scans and the role of MRS 4 Principles of fractionated radiotherapy, stereotactic radiotherapy and radiosurgery 4 Role of adjuvant chemotherapy 4 Principles of clinical trials and their application to neuro-oncology 4 Principles of palliative care	
Clinical Skills	4 Clinical assessment of patients with raised intracranial pressure and space occupying lesions 4 Ability to contribute to the multi-disciplinary management of patients with intracranial neoplasia 4 Empathetic communication with patients and families	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Principles of image-guided surgery**	
Category	Cranial Surgery	
Sub-category:	Neuro-oncology	
Objective	*To achieve competence in image-guided surgery applied to the management of patients with intracranial tumours*	
Knowledge	4 An understanding of the principles and practice of frameless image-guided surgery and the principles of frame-based stereotactic surgery	
Clinical Skills	4 Interpretation of CT and MRI scans	
Technical Skills and Procedures	3 Image-guided biopsy of supratentorial intrinsic tumour 4 Ability to import, check and interrogate image data sets on a standard work station 4 Setting up an image-guidance system and obtaining satisfactory intra-operative registration 4 Planning and siting burr holes and craniotomy flaps using image-guidance 4 Identification of an intra-cranial tumour and its margins using image-guidance	Strongly recommended

TOPIC	**Supra-tentorial intrinsic tumours**	
Category	Cranial Surgery	
Sub-category:	Neuro-oncology	
Objective	*To achieve competence in the operative management of supra-tentorial intrinsic tumours*	
Knowledge	4 Indications for surgery 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with supratentorial intrinsic tumours	Strongly recommended
Technical Skills and Procedures	3 Craniotomy for superficial, lobar supratentorial intrinsic tumour In particular: 3 safe patient positioning 3 planning and siting of craniotomy with and without image-guidance 3 intra-operative management of raised ICP 3 appropriate exposure of the tumour, using operating microscope as necessary 3 safe use of fixed retractors 3 precise use of suction, electo-coagulation and ultrasonic aspiration 3 intracranial haemostasis	Strongly recommended

TOPIC	**Convexity meningioma**	
Category	Cranial Surgery	
Sub-category:	Neuro-oncology	
Objective	*To achieve competence in the operative management of a convexity menginiomas*	

Knowledge	4 Indications for surgery 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with convexity meningiomas	Strongly recommended
Technical Skills and Procedures	Resection of a convexity meningioma, in particular: 3 safe patient positioning 3 planning and siting of craniotomy with and without image-guidance 3 intra-operative management of raised ICP 3 appropriate exposure of the tumour 3 precise use of suction, electo-coagulation and ultrasonic aspiration 3 use of internal tumour decompression 3 dissection in the subarachnoid plane using the operating microscope as necessary 3 intracranial haemostasis 3 use of duraplasty and cranioplasty	Strongly recommended

TOPIC	**General microbiological principles**	
Category	Cranial Surgery	
Sub-category:	CNS Sepsis	
Objective	*To achieve competence in the general management of CNS infections including ventriculitis, cerebral abscess, subdural empyema and spinal epidural abscess*	
Knowledge	4 The pathophysiology of intracranial and spinal sepsis 4 Principles of anti-microbial chemotherapy 4 Indications for operative intervention	
Clinical Skills	4 Clinical assessment of patients with CNS infections 4 Interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	None specified	

TOPIC	**Management of intracerebral abscess**	
Category	Cranial Surgery	
Sub-category:	CNS Sepsis	
Objective	*To achieve competence in the operative management of cerebral abscess using burr hole aspiration*	
Knowledge	4 Indications for surgery 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment and pre-operative preparation of patients with a cerebral abscess	Strongly recommended
Technical Skills and Procedures	4 Burr hole aspiration of a cerebral abscess with and without image-guidance	Strongly recommended

TOPIC	**Management of the spinal injury patient**	

Category	Spinal Surgery	
Sub-category:	Spinal Trauma	
Objective	*To achieve competence in all aspects of the non-operative management of spinal injury patients.*	
Knowledge	4 Pathophysiology of spinal cord injury 4 Classification of spinal fracture dislocations 4 Biomechanics of spinal instability 4 Indications for halo traction and external stabilisation 4 Indications for and principles of open reduction and stabilisation	
Clinical Skills	4 Clinical assessment of the spinal injury patient 4 Management of spinal shock 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with spinal injury units	Strongly recommended
Technical Skills and Procedures	4 Use of external mobilisation including cervical collars and spinal boards 3 Application of halo traction 2 Application of a halo-body jacket	Strongly recommended

TOPIC	**Malignant spinal cord compression**	
Category	Spinal Surgery	
Sub-category:	Spinal Oncology	
Objective	*To achieve competence in the general management of patients with malignant spinal cord compression.*	
Knowledge	4 The pathophysiology of spinal cord compression 4 The classification, aetiology and natural history of vertebral metastases 4 Spinal instability associated with vertebral malignancy 4 Indications for surgical intervention 4 Role of primary radiotherapy and adjuvant radiotherapy or chemotherapy	
Clinical Skills	4 Clinical assessment of patients with malignant spinal cord compression 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with medical oncologists and radiotherapist	Strongly recommended
Technical Skills and Procedures	N/A	

TOPIC	**Surgical management of thoraco-lumbar metastases**	
Category	Spinal Surgery	
Sub-category:	Spinal Oncology	
Objective	*To achieve competence in the basic surgical management of patients with malignant spinal cord compression*	
Knowledge	4 Indications for surgery 4 The principles of operative spinal decompression and stabilisation of patients with spinal cord metastases. 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with malignant spinal cord compression	Strongly recommended
Technical	3 Extradural spinal biopsy and decompression by laminectomy in selected	Strongly

Skills and Procedures	patients without segmental instability 2 Instrumented posterior spinal stabilisation	recommended

TOPIC	**Lumbar radiculopathies**	
Category	Spinal Surgery	
Sub-category:	Degenerative Spinal Disorders	
Objective	*To achieve competence in the surgical management of lumbar compressive radiculopathies by lumbar microdiscectomies and associated microsurgical decompressions.*	
Knowledge	4 Indications for operative management of lumbar radiculopathies 4 Applied surgical anatomy of the lumbar spine with particular reference to degenerative neural compression and morphological variations in vertebral anatomy 4 Selection of minimally-invasive approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with lumbar radiculopathies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms	Strongly recommended
Technical Skills and Procedures	3 Primary lumbar microdiscectomy 3 Primary posterior decompression (laminotomy, hemilaminectomy etc): including - Identification of spinal level by pre and intra-operative fluoroscopy - Achieving safe access to the spinal canal by micro-surgical fenestration - Achieving full decompression of the spinal canal, lateral recess and foramen by appropriate bone and soft tissue resection - Protection and safe retraction of neural tissues	Strongly recommended

TOPIC	**Compressive cervical myeloradiculopathies**	
Category	Spinal Surgery	
Sub-category:	Degenerative Spinal Disorders	
Objective	*To achieve competence in the surgical management of compressive cervical myeloradiculopathies*	
Knowledge	4 Indications for operative management of cervical myeloradiculopathies 4 Applied surgical anatomy of the cervical spinal column with particular reference to the relationships between the bony elements, spinal cord, nerve roots and vertebral arteries 4 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with cervical myeloradiculopathies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms	Strongly recommended
Technical Skills and Procedures	3 Single level anterior cervical discectomy with and without fusion In particular: 3 Standard anterolateral approach to the cervical spine 3 Use of fluoroscopy or plain radiographs to confirm spinal level 3 Radical and subtotal excision of the cervical disc, PLL, central and unco-vertebral osteophytes 3 Protection and full decompression of the spinal cord and spinal nerve	Strongly recommended

	roots 3 Interbody fusion using autologous bone with or without interbody cages	

Final Stage Overview

Final Stage ST6 – ST7

The final stage syllabus is not intended to be a comprehensive training guide. Due to the nature of neurosurgical practice there will be conditions and procedures that are not individually specified in the syllabus and that will form part of a trainee's experience. This clinical and operative experience will be taken into account when assessing the overall quality of advanced training.

However, by the time that trainees apply for special interest training or to take the FRCS (Neurosurgery) they must be competent in all aspects of the clinical management of patients presenting with the following essential conditions:

- Cranial trauma
- Spontaneous intracranial haemorrhage
- Hydrocephalus
- Intracranial tumours
- CNS infections
- Spinal trauma
- Benign intradural tumours
- Malignant spinal cord compression
- Degenerative spinal disorders
- Emergency paediatric care

They must be competent to undertake the full range of operative procedures specified in the final training stage of the essential operative competency schedule (Table 1) without supervision and have sufficient operative experience to be able to manage operative difficulties and complications (Competence level 4).

Paediatric training

Before completing their training all trainees will undertake a six month placement in a paediatric neurosurgery service under the direct supervision of paediatric neurosurgeons with a full-time or major commitment to paediatric surgery. The service must provide a comprehensive range of paediatric neurosurgical care (with the exception of supra-regional services) and have a minimum annual operative workload of 250 cases. On completion of general paediatric training trainees will be competent to assess and undertake the emergency neurosurgical management of the critically-ill child with raised intracranial pressure.

Special Interest Training ST8

To ensure the quality of emergency and continuing care of neurosurgical patients with appropriate liaison and cross referral all trainees are expected to have a basic understanding of the specialist areas of neurosurgical practice. During final stage training all trainees will undertake selected specialist operative procedures under direct supervision to consolidate their advanced operative skills.

Trainees in special interest training will develop a comprehensive and in-depth knowledge of their field. The special interest training year is allocated to ST8 in the stage overview for convenience. However this year may be undertaken at any time in the final stage at the doscretion of the programme director. By the end of special interest training they will be competent to undertake selected operative procedures relating to the common presentations in their specialist field without direct supervision. They will be competent to undertake other procedures in their field under the mentorship of a senior colleague. The specialist interest summaries indicate the breath and depth of training required in a specialist interest fellowship

Table1. Schedule of Essential Operative Competencies

This table summarises the level of operative competence which should be attained at each stage of training using the four point scale: 1 – has observed; 2 – can do with assistance; 3 – can do whole but may need assistance; 4 – competent to do whole without assistance and manage complications.

	Initial	Intermediate	Final
• **Surgical Approaches**			
• Burr hole	3	4	4
• Craniotomy – convexity	2	3	4
• Craniotomy – pterional	1	3	4
• Craniotomy – midline supratentorial	1	3	4
• Craniotomy – midline posterior fossa	2	3	4
• Transsphenoidal approach	1	2	4
• Lateral posterior fossa	1	2	4
• Lumbar fenestration	2	4	4
• Laminectomy	2	3	4
• **General Procedures**			
• Insertion of lumbar drain	3	4	4
• Tapping/draining of CSF reservoir	3	4	4
• Application of skull traction	2	4	4
• Image Guidance/Stereotaxy set up	2	4	4
• **Management of cranial trauma**			
• Insertion of Intracranial (ICP) monitor	3	4	4
• Burr hole evacuation of CSDH	3	4	4
• Elevation of depressed skull fracture	2	4	4
• Craniotomy for traumatic haematoma (ICH)	2	3	4
• **Management of spontaneous intracranial haemorrhage**			
• Craniotomy for spontaneous intracerebral haematoma (ICH supratentorial)	1	3	4
• Craniotomy for spontaneous intracerebellar haematoma (ICH infratentorial)	1	3	4
• **Management of hydrocephalus**			
• Insertion of ventricular drain/access device	3	4	4
• Insertion of VP shunt	2	3	4
• Revision of VP shunt	1	2	4
• **Management of intracranial tumours**			
• Supratentorial tumour biopsy	2	3	4
• Craniotomy for supratentorial intrinsic tumour/metastasis	1	3	4
• Craniotomy for posterior fossa intrinsic tumour/metastasis	1	2	4
• Craniotomy for convexity meningioma	1	3	4
• **Management of intradural spinal tumours**			
• Excision of intradural extramedullary tumour	1	2	4
• **Management of degenerative spinal disorders**			
• Lumbar microdiscectomy	1	3	4
• Anterior cervical discectomy	1	3	4
• **Emergency paediatric care**	1	2	4

• Insertion of EVD • Evacuation of intracranial haematoma (ICH)	1	2	4

Click on Workplace Based Assessments to view the assessment forms including DOPS and PBAs

Final Stage Topics

TOPIC	Management of head injured patients	Areas in which simulation should be used to develop relevant skills
Category	Cranial Surgery	
Sub-category:	Cranial Trauma	
Objective	*To achieve competence in all aspects of the advanced operative management of head-injured patients*	
Knowledge	4 Pathophysiology of raised intracranial pressure and space occupying haematomas 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Indications for surgery and appropriate surgical approaches 4 Indications for open and endoscopic closure of traumatic CSF fistulae 4 Complications of surgery and their management	Desirable:
Clinical Skills	4 Competence in all aspects of peri-operative management of head-injured patients 4 Ability to diagnose and confirm brain death	Strongly recommended
Technical Skills and Procedures	4 Craniotomy for supra and infratentorial extradural, subdural and intracerebral haematomas 4 Lobectomy for haemorrhagic contusion 4 Vault cranioplasty using in-situ or preformed prostheses 3 Decompressive bifrontal craniotomy with extensive durotomy 3 Subfrontal extradural or subdural repair of anterior fossa fractures 3 Combined craniofacial repair of fronto-orbito-maxillary injuries (fellowship)	Strongly recommended

TOPIC	Aneurysmal Subarachnoid haemorrhage	
Category	Cranial Surgery	
Sub-category:	Spontaneous Intracranial haemorrage	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of aneurysmal subarachnoid haemorrhage SAH*	
Knowledge	4 Pathophysiology of SAH 4 Prevention and management of delayed cerebral ischaemia, cerebral vasospasm and hydrocephalus 4 Relative indications for endovascular and surgical interventions	
Clinical Skills	4 Clinical assessment of patients with aneurysmal SAH 4 Non operative management of patients undergoing endovascular coiling 4 Management of delayed cerebral ischaemia	Strongly recommended
Technical Skills and	4 External ventricular drainage 4 Lumbar subarachnoid drainage	Strongly recommended

Procedures	4 Ventriculoperitoneal shunting 4 Revision of ventriculoperitoneal shunt 4 Craniotomy for intracerebral haematoma	

TOPIC	**Adult hydrocephalus**	
Category	Cranial Surgery	
Sub-category:	Hydrocephalus	
Objective	*To achieve competence in all aspects of the management of adult patients with hydrocephalus*	
Knowledge	4 The pathophysiology of CSF circulation 4 Applied surgical anatomy of the ventricular system 4 Indications for external ventricular drainage, shunting, lumbar CSF drainage and shunting, ventriculo-cisternostomy 4 Surgical complications and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with hydrocephalus 4 Interpretation of pressure studies and CSF infusion studies 4 Interpretation of CT and MRI scans and identification of shunt malfunction	Strongly recommended
Technical Skills and Procedures	Competence in all aspects of primary and revisional shunt surgery including: 4 Use of 3-D image-guidance or ultrasound for difficult ventricular cannulation 4 Intra-operative testing of shunt function 4 Selection of appropriate shunts 4 Management of peri-operative ventricular haemorrhage 4 Lumbo-peritoneal shunt 2 Third ventriculo-cisternostomy	Strongly recommended

TOPIC	**Anterior and middle fossa skull base tumours**	
Category	Cranial Surgery	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in the surgical management of patients with anterior and middle fossa tumours*	
Knowledge	4 Indications for selected approaches in relation to pathology and surgical goals 4 Applied microsurgical anatomy of the anterior and middle cranial fossae 4 Principles of intra-operative management of patients undergoing resection of anterior and middle fossa tumours including olfactory groove, planum sphenoidale, parasellar and sphenoid wing and falcine meningiomas 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with anterior and middle fossa tumours 4 Interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	4 Standard pterional and subfrontal approaches including: - Pterional resection and basal drilling - Subfrontal approach to the optic nerve, chiasm and internal carotid arteries - Sylvian fissure splitting and exposure of the MCA bifurcation - CSF drainage by chiasmatic cisternal suction, intra-operative ventricular puncture and lamina terminalis fenestration	Strongly recommended

	4 Bi-Frontal/Frontal and panietal parafalcine approaches 4 Microsurgical resection of superficial skull base meningioma 2 Anterior interhemispheric, fronto-orbital, zygomatic and temporo-zygomatic approaches	

TOPIC	**Transphenoidal surgery**	
Category	Cranial Surgery	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in transphenoidal approaches to the pituitary fossa and resection of pituitary adenomas*	
Knowledge	4 Pathophysiology of the hypothalamic-pituitary axis 3 Indications for surgery 3 Selection of surgical approaches: sublabial, transnasal and endoscopic 3 Applied surgical anatomy of the skull base 4 Principles of peri-operative care 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with pituitary, sellar and parasellar tumours 4 Interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	3 Microsurgical transphenoidal approach 2 Transphenoidal resection of non-functioning macroadenoma	Strongly recommended

TOPIC	**Movement disorders**	
Category	Cranial Surgery	
Sub-category:	Functional neurosurgery	
Objective	*To understand the management of patients with movement disorders*	
Knowledge	3 The aetiology and pathophysiology of movement disorders 2 Indications for medical, minimally-invasive and surgical management 4 Complications of surgery and their management	
Clinical Skills	3 Surgical aspects of the multi-disciplinary assessment of patients with movement disorders	Desirable
Technical Skills and Procedures	N/A	

TOPIC	**Midline tumours**	
Category	Cranial Surgery	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in the management of patients with midline sellar, parasellar, pineal and third ventricular tumours*	
Knowledge	4 Indications for surgery 4 Applied surgical anatomy of midline structures 4 Selection of surgical approaches including principles of endoscopic biopsy and/or resection 4 Principles of intra-operative management of patients undergoing resection of midline sellar, para-sellar, pineal and third ventricular tumours including colloid cysts	

	4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with midline tumours tumours 4 Interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	3 Transfrontal, transcortical approach to the lateral and third ventricle 2 Microsurgical resection of lateral intraventricular tumour 2 Transfrontal endoscopic biopsy	Strongly recommended

TOPIC	**Malignant posterior fossa tumours**	
Category	Cranial Surgery	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in the surgical management of superficial, hemispheric and midline intrinsic posterior fossa tumours and metastases*	
Knowledge	4 Indications for surgery 4 Selection of surgical approaches 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with posterior fossa malignant tumours 4 Interpretation of CT and MRI scans	Strongly recommended
Technical Skills and Procedures	4 Competence in midline, paramedian and retrosigmoid posterior fossa craniotomies including: - safe patient positioning in the prone and semi-prone positions - exposure of the lateral and sigmoid sinuses - exposure and decompression of the foramen magnum - use of cisternal CSF drainage - safe use of fixed retractors - exposure and resection of superficial, lateral and mid-line intrinsic cerebellar tumours and metastases	Strongly recommended

TOPIC	**Cerebellopontine angle tumours**	
Category	Cranial Surgery	
Sub-category:	Intracranial tumours	
Objective	*To achieve competence in the management of patients with cerebellopontine angle tumours*	
Knowledge	4 Relative indications for surgery, radiosurgery and conservative management 4 Principles of intra-operative management of patients undergoing resection of CP angle tumours including vestibular schwannomas and menignomas 3 Principles and application of cranial nerve and brainstem monitoring 4 Applied microsurgical anatomy of the CP angle, brainstem and lower cranial nerves 3 Relative indications for retrosigmoid, middle fossa, and translabyrinthine approaches with respect to hearing preservation, tumour size and position	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with CP angle tumours 4 Interpretation of CT and MR scans	Strongly recommended
Technical Skills and Procedures	4 Retrosigmoid approach 3 Subarachnoid dissection and exposure of the tumour and lower cranial nerves	Strongly recommended

	2 Subtotal microsurgical resection of acoustic neuroma	

TOPIC	**Intracerebral abscess and subdural empyema**	
Category	Cranial Surgery	
Sub-category:	CNS Infection	
Objective	*To achieve competence in the management of patients with CNS infections including ventriculitis, cerebral abscess and subdural empyema*	
Knowledge	4 The aetiology and pathophysiology of intracranial sepsis 4 Indications for burr hole drainage, ventricular drainage and craniotomy in the management of intracranial sepsis 4 Indications for combined otorhinological procedures 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Surgical complications	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with intracranial sepsis 4 Interpretation of CT and MRI scans 3 Management of anti-microbial therapy	Strongly recommended
Technical Skills and Procedures	4 Burr hole drainage of intracerebral abscess 4 Ventricular drainage 4 Craniotomy for subdural empyema, including frontal and parietal parafalcine approaches 4 Craniotomy and resection of frontal, temporal and cerebellar abscess 3 Anterior and middle fossa extradural and subdural duroplasty	Strongly recommended

TOPIC	**Intracranial aneurysms**	
Category	Cranial Surgery	
Sub-category:	Neurovascular surgery	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of ruptured and unruptured intracranial aneurysms*	
Knowledge	4 Aetiology, epidemiology and natural history of unruptured and ruptured intracranial aneurysms 4 Pathophysiology and general management of subarachnoid haemorrhage 3 Angiographic and microsurgical anatomy of the cerebral circulation 3 Indications for surgical management of intracranial aneurysms by clipping, trapping, microsurgical reconstruction and microvascular bypass 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with ruptured and unruptured aneurysms 4 Interpretation of CT, MR and catheter angiography	Strongly recommended
Technical Skills and Procedures	4 Standard pterional and subfrontal approaches 2 Clipping of anterior circulation aneurysm	Strongly recommended

TOPIC	**Intracranial vascular malformations**	
Category	Cranial Surgery	
Sub-category:	Neurovascular surgery	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary*	

	management of intracranial vascular malformations	
Knowledge	4 Pathogenesis, aetiology, epidemiology and natural history of intracranial vascular malformations including AVMs, A-V fistula, cavernomas and venous malformations 4 Pathophysiology and general management of intracranial haemorrhage 3 Angiographic and microsurgical anatomy of the cerebral circulation 3 Indications for embolisation and radiosurgery 3 Indications for surgical management of malformations 4 Complications of surgery and their management, including hyperperfusion syndromes	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with vascular malformations 4 Interpretation of CT, MR and catheter angiography	Strongly recommended
Technical Skills and Procedures	3 Image-guided craniotomy and exposure of supratentorial AVM 2 Microsurgical resection of superficial gyral or sulcal AVM	Strongly recommended

TOPIC	**Occlusive cerebrovascular disease**	
Category	Cranial Surgery	
Sub-category:	Neurovascular surgery	
Objective	*To achieve competence in the clinical management of occlusive cerebrovascular disease*	
Knowledge	3 The epidemiology, natural history and pathophysiology of extra- and intracranial atherosclerotic occlusive disease 3 The epidemiology, natural history and pathophysiology of non-atherosclerotic occlusive diseases 3 Optimal medical management of occlusive and thrombo-embolic cerebrovascular disease 3 Imaging of the acutely ischaemic brain using CT and MRI 3 Principles of non-invasive and invasive imaging of the extra and intracranial vasculature using CT, MRI and catheter angiography 2 Principles of regional cerebral blood flow and metabolism measurement and imaging using CT and MRI perfusion techniques; SPECT and PET scanning 2 Indications for carotid endarterectomy 2 Indications for endovascular intervention including intra-arterial thrombolysis; carotid angioplasty and stenting; intracranial angioplasty 2 Principles of cerebral revascularisation by indirect synangiosis, low-flow EC-IC anastomosis and high flow EC-IC bypass grafting	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients undergoing surgery for occlusive cerebrovascular disease with ruptured and unruptured aneurysms 3 Interpretation of CT, MR and catheter angiography	Strongly recommended
Technical Skills and Procedures	None	

TOPIC	**Chronic pain**	
Category	Cranial Surgery	
Sub-category:	Functional neurosurgery	
Objective	*To understand the management of patients with chronic pain syndromes*	
Knowledge	3 The aetiology and pathophysiology of chronic pain syndromes	

	3 Indications for medical, minimally-invasive and surgical management 3 Complications of surgery and their management	
Clinical Skills	3 Surgical aspects of the multi-disciplinary assessment of chronic pain patients 4 Pre-operative counselling and preparation	Strongly recommended
Technical Skills and Procedures	None	

TOPIC	**Trigeminal neuralgia**	
Category	Cranial Surgery	
Sub-category:	Functional neurosurgery	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of patients with trigeminal neuralgia*	
Knowledge	4 Aetiology, epidemiology and natural history of trigeminal neuralgia 4 Differential diagnosis and management of related cranio-facial pain syndromes 4 Medical management of cranio-facial pain 4 Surface anatomy of the trigemminal nerve and microsurgical anatomy of the CP angle 4 Indications for surgical management of trigeminal neuralgia by peripheral neurectomy, percutaneous rhizotomy, radiofrequency rhizotomy, microvascular decompression 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with trigeminal neuralgia 4 Interpretation of posterior fossa CT and MRI scans	Strongly recommended
Technical Skills and Procedures	3 Retrosigmoid microsurgical approach to the CP angle and trigeminal nerve 2 Trigeminal microvascular decompression 2 Percutaneous trigeminal rhizotomy	Strongly recommended

TOPIC	**Epilepsy**	
Category	Cranial Surgery	
Sub-category:	Functional neurosurgery	
Objective	*To understand the management of patients with idiopathic and lesional epilepsy)*	
Knowledge	4 The aetiology and pathophysiology of idiopathic and lesional epilepsy 3 Indications for medical and surgical management	
Clinical Skills	4 Surgical aspects of the multi-disciplinary assessment of epilepsy patients 4 Interpretation of CT, MRI and SPECT scans 4 Pre-operative counselling and preparation	Strongly recommended
Technical Skills and Procedures	3 Image-guided resection of cortical lesions 3 Vagal nerve stimulation	Strongly recommended

TOPIC	**Cervical spine fracture-subluxation**	
Category	Spinal Surgery	
Sub-	Spinal Trauma	

category:		
Objective	*To achieve competence in the general management of fracture-subluxations of the cervical spine*	
Knowledge	4 Pathophysiology of spinal cord injury 4 Classification of cervical spinal fracture dislocations 4 Biomechanics of spinal instability 4 Indications for halo traction and external stabilisation 4 Indications for and principles of open reduction and stabilisation	Desirable: Cervical spine
Clinical Skills	4 Clinical assessment of the spinal injury patient 4 Management of spinal shock 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with spinal injury units 4 Counselling and pre-operative preparation of spinal injury patients	Strongly recommended:
Technical Skills and Procedures	4 Application of cranial-cervical traction	Strongly recommended

TOPIC	**Thoraco-lumbar fractures**	
Category	Spinal Surgery	
Sub-category:	Spinal Trauma	
Objective	*To achieve competence in the general management of thoracolumbar fractures*	
Knowledge	4 Pathophysiology of spinal cord injury 4 Classification of thoracolumbar fracture dislocations 4 Biomechanics of spinal instability 4 Indications for open reduction and stabilisation	Desirable:
Clinical Skills	4 Clinical assessment of the spinal injury patient 4 Management of spinal shock 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with spinal injury units 4 Counselling and pre-operative preparation of spinal injury patients	Strongly recommended
Technical Skills and Procedures	2 Posterior reduction of thoracolumbar fractures by pedicle screw instrumentation and ligamentotaxis	Strongly recommended

TOPIC	**Intradural extramedullary tumours**	
Category	Spinal Surgery	
Sub-category:	Benign Intradural Tumours	
Objective	*To achieve competence in the management of patients with intradural extramedullary tumours including scwannomas, neurofibromas and meningiomas*	
Knowledge	4 Classification, natural history and basic molecular biology of intradural spinal tumours 4 Pathophysiology of spinal cord compression 4 Indications for surgery 4 Selection of surgical approaches 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery and their management	
Clinical Skills	4 Assessment, counselling and pre-operative preparation of patients with intradural spinal tumours	Strongly recommended

	4 Interpretation of spinal MRI scans	
Technical Skills and Procedures	4 Microsurgical excision of posterior and postero-lateral intradural extramedullary tumours 2 Microsurgical excision of anterior intradural extramedullary tumours	Strongly recommended

TOPIC	**Intramedullary spinal cord tumours**	
Category	Spinal Surgery	
Sub-category:	Benign Intradural Tumours	
Objective	*To achieve competence in the management of patients with intramedullary spinal cord tumours*	
Knowledge	4 Classification, natural history and pathology of intramedullary spinal cord tumours 4 Indications for biopsy, subtotal and radical excision 4 Role of adjuvant treatment 4 Applied surgical anatomy of spine and spinal cord 4 Selection of surgical approaches 4 Principles of intra-operative management of patients undergoing resection of intramedullary tumours 4 Complications of surgery and their management	
Clinical Skills	4 Assessment, counselling and pre-operative preparation of patients with intramedullary spinal cord tumours 4 Interpretation of spinal MRI scans	Strongly recommended
Technical Skills and Procedures	3 Microsurgical biopsy of intramedullary spinal cord tumour 2 Subtotal microsurgical resection of intramedullary tumour 4 Duroplasty	Strongly recommended

TOPIC	**Malignant spinal cord compression**	
Category	Spinal Surgery	
Sub-category:	Malignant Spinal Cord Compression	
Objective	*To achieve competence in the management of patients with malignant secondary spinal cord compression*	
Knowledge	4 The pathophysiology of spinal cord compression 4 The classification, aetiology and natural history of vertebral metastases 4 Spinal instability associated with vertebral malignancy 4 Indications for percutanous and open spinal biopsy 4 Role of primary radiotherapy and adjuvant radiotherapy or chemotherapy 4 Indications for spinal decompression with and without instrumented spinal stabilisation	
Clinical Skills	4 Clinical assessment of patients with malignant spinal cord compression 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with medical oncologists and radiotherapist 4 Counselling and pre-operative preparation of patients with malignant spinal cord compression	Strongly recommended
Technical Skills and Procedures	4 Decompressive thoracic and lumbar laminectomy with extradural tumour resection Posterior pedicle screw stabilisation 3 Anterior cervical corporectomy with anterior column re-construction and anterior cervical plating	Strongly recommended

TOPIC	**Lumbar radiculopathies**	

Category	Spinal Surgery	
Sub-category:	Degenerative Spinal Disorders	
Objective	*To achieve competence in the surgical management of lumbar compressive radiculopathies by lumbar microdiscectomies and associated microsurgical decompressions*	
Knowledge	4 Indications for operative management of lumbar radiculopathies 4 Applied surgical anatomy of the lumbar spine with particular reference to degenerative neural compression and morphological variations in vertebral anatomy 4 Selection of minimally-invasive approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with lumbar radiculopathies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms	Strongly recommended
Technical Skills and Procedures	4 Lumbar microdiscectomy 4 Microsurgical lateral recess decompression 4 Posterior decompression (laminotomy, hemilaminectomy etc) 4 Revisional lumbar microsurgical discectomy with and without decompression 4 Microsurgical lumbar discectomy for central disc protrusion with cauda equina compression	Strongly recommended

TOPIC	**Cervical myeloradiculopathy**	
Category	Spinal Surgery	
Sub-category:	Degenerative Spinal Disorders	
Objective	*To achieve competence in the management of cervical radiculopathy*	
Knowledge	4 Indications for operative management of cervical radiculopathies 4 Applied surgical anatomy of the cervical spinal column, spinal cord, nerve roots and vertebral arteries 4 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with cervical myeloradiculopathies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms	Strongly recommended
Technical Skills and Procedures	4 Single and multi-level anterior cervical discectomy with and without fusion 4 Anterior cervical plating 3 Posterior cervical microforaminotomy and microdiscectomy 4 Posterior cervical decompression (laminotomy, hemilaminectomy etc	Strongly recommended

TOPIC	**Rheumatoid disease**	
Category	Spinal Surgery	
Sub-category:	Craniocervical junction disorders	
Objective	*To understand the management of rheumatoid patients with atlanto-axial subluxation, cranial settling and related disorders*	
Knowledge	3 The pathology and natural history of rheumatoid spondylopathy 3 Indications for operative management of atlanto-axial subluxation, cranial	

	settling and related disorders 3 Applied surgical anatomy of the craniocervical junction 3 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with cervical myeloradiculopathies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms and 3D spinal reconstructions	Strongly recommended
Technical Skills and Procedures	2 Atlanto-axial wiring for reducible atlanto-axial subluxation	Strongly recommended

TOPIC	**Hindbrain herniation**	
Category	Spinal Surgery	
Sub-category:	Craniocervical junction disorders	
Objective	*To achieve competence in the management of craniocervical stenosis and hindbrain herniation*	
Knowledge	4 The pathogenesis and natural history of hindbrain herniation, cranicervical stenosis, syringomyelia and syringobulbia 4 Indications for foramen magnum decompression 4 Applied surgical anatomy of the craniocervical junction 4 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with hind brain anomalies 4 Interpretation of plain radiographs, CT scan, MRI scans and CT myelograms and 3D spinal reconstructions	Strongly recommended
Technical Skills and Procedures	3 Foramen magnum decompression	Strongly recommended

TOPIC	**Spinal epidural abscess**	
Category	Spinal Surgery	
Sub-category:	Spinal Infection	
Objective	*To achieve competence in the operative management of spinal epidural abscess*	
Knowledge	4 The aetiology and pathophysiology of spinal sepsis 4 Indications for drainage of spinal epidural abscess by laminectomy and multiple laminotomies 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Surgical complications and their management 4 Principles of peri-operative care	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with spinal sepsis 4 Interpretation of spinal CT and MRI scans 3 Management of anti-microbial therapy	Strongly recommended
Technical Skills and	4 Drainage of spinal epidural abscess by laminectomy and/or multiple laminotomies	Strongly recommended

Procedures		

TOPIC	**Vertebral osteomyelitis and discitis**	
Category	Spinal Surgery	
Sub-category:	Spinal Infection	
Objective	*To achieve competence in the operative management of vertebral osteomyelitis and discitis*	
Knowledge	4 The aetiology and pathophysiology of vertebral osteomyelitis and discitis, including pyogenic, tuberculous and atypical infections 4 Indications for percutaneous and open biopsy 4 Indications for spinal stabilisation 4 Principles of peri-operative care 4 Surgical complications and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with spinal sepsis 4 Interpretation of spinal CT and MRI scans 3 Management of anti-microbial therapy	Strongly recommended
Technical Skills and Procedures	2 Transpedicular and open vertebral and disc biopsy	Strongly recommended

TOPIC	**Carpal tunnel compression**	
Category	Peripheral Nerve Surgery	
Sub-category:	None	
Objective	*To achieve competence in carpal tunnel decompression*	
Knowledge	4 Presentation, differential diagnosis and management of carpal tunnel syndrome 4 Interpretation of nerve conduction studies 4 Indications for surgery 4 Applied surgical anatomy	
Clinical Skills	4 Assessment and counselling of patients with carpal tunnel syndrome	Strongly recommended
Technical Skills and Procedures	4 Carpal tunnel decompression	Strongly recommended

TOPIC	**Ulnar neuropathy**	
Category	Peripheral Nerve Surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of ulnar neuropathy*	
Knowledge	4 Presentation, differential diagnosis and management of ulnar neuropathies 4 Interpretation of nerve conduction studies 4 Indications for surgery 4 Applied surgical anatomy	
Clinical Skills	4 Assessment and counselling of patients with an ulnar neuropathy	Strongly recommended

Technical Skills and Procedures	4 Cubital ulnar nerve decompression with and without transposition	Strongly recommended

TOPIC	**Peripheral nerve sheath tumours**	
Category	Peripheral Nerve Surgery	
Sub-category:	None	
Objective	*To achieve competence in the resection of major and minor peripheral nerve tumours*	
Knowledge	4 Pathology of peripheral nerve sheath tumours 4 Indications for complete and subtotal resection of tumours 4 Applied surgical anatomy of the major peripheral nerves	
Clinical Skills	4 Assessment and counselling of patients with peripheral nerve sheath tumours	Strongly recommended
Technical Skills and Procedures	3 Microsurgical excision of peripheral nerve sheath tumour	Strongly recommended

TOPIC	**Paediatric head and spinal injury**	
Category	Paediatric Neurosurgery	
Sub-category:	None	
Objective	*To achieve competence the management of accidental and non-accidental paediatric head and spinal injuries.*	
Knowledge	4 Pathophysiology of raised intracranial pressure in children following head injury 4 Prevention and treatment of secondary insults relating to transfer and emergency surgery in head-injured children 4 Medical management and intensive care in paediatric head injury 4 Pathophysiology, legal and social aspects of non-accidental injury in children 4 Management of perinatal trauma, growing fractures and penetrating injuries in children 4 Indications for decompressive craniectomy in management of intractable increases in ICP 3 Rehabilitation after mild, moderate and severe head injuries 4 Diagnosis and certification of brain death in children 4 Classification, assessment, investigation and management of paediatric spinal injuries (including SCIWORA)	
Clinical Skills	4 Assessment and clinical management of children with head and spinal injuries	Strongly recommended
Technical Skills and Procedures	4 Insertion of ICP monitor 4 Insertion of ventriculostomy 4 Craniotomy for traumatic intracranial haematoma 3 Repair of depressed skull fracture	Strongly recommended

TOPIC	**Paediatric hydrocephalus**	
Category	Paediatric Neurosurgery	

Sub-category:	None	
Objective	*To achieve competence in the management of paediatric hydrocephalus*	
Knowledge	4 The pathophysiology of CSF circulation 4 Applied surgical anatomy of the ventricular system 4 Indications for external ventricular drainage, lumbar CSF drainage and shunting, ventriculo-cisternostomy 4 Indications for VP and VA shunting and 4 Principles of shunt function and selection 4 Surgical complications and their management	
Clinical Skills	4 Assessment of the ill child with hydrocephalus, impaired consciousness and sepsis 4 Differential diagnosis of shunt malfunction 4 Interpretation of CT scans in shunted children	Strongly recommended
Technical Skills and Procedures	4 Insertion, tapping and draining from a CSF reservoir 4 External ventricular drainage including externalisation of VP shunts 3 Ventriculo-peritoneal shunting	Strongly recommended

TOPIC	**Intracranial vascular disorders**	
Category	Paediatric Neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the emergency neurosurgical management of children presenting with intracranial vascular disorders*	
Knowledge	4 Epidemiology, natural history, pathophysiology and clinical features of subarachnoid haemorrhage, haemorrhagic stroke and ischaemia stroke in children secondary to intracranial aneurysms, arteriovenous malformations and fistulae, cavernomas, arterial dissection, moya-moya disease and venous sinus thrombosis 4 Surgical and endovascular strategies for the management of acute intracranial vascular disorders in children	
Clinical Skills	4 The assessment and clinical management of children presenting with spontaneous intracranial haemorrhage and acute cerebral ischaemia	Strongly recommended
Technical Skills and Procedures	4 Emergency operative management of spontaneous intracerebral haemorrhage	Strongly recommended

Special Interest Training Stage

Trainees in special interest training will develop a comprehensive and in-depth knowledge of their field. By the end of specialist interest training they will be competent to undertake selected operative procedures relating to the common presentations in their specialist field without direct supervision. They will be competent to undertake other procedures in their field under the mentorship of a senior colleague. The specialist interest summaries indicate the breath and depth of training required in a specialist interest fellowship.

Paediatric neurosurgery

On completion of a special interest fellowship in paediatric neurosurgery trainees will be competent in all aspects of the non-operative neurosurgical management of children presenting with disorders of the nervous system. They will have detailed knowledge of the statutory framework governing the care of children, paediatric neurointensive care, the principles of paediatric neurorehabilitation and of the management of non-accidental injury. They will be competent to undertake all aspects of the emergency neurosurgical operative care of children and to undertake a range of elective procedures in the following fields with appropriate supervision:

- Hydrocephalus: including the insertion and revision of ventriculo-peritoneal, ventriculo-atrial and lumbo-peritoneal shunts; endoscopic third ventriculostomy; image-guided placement of ventricular catheters; management of neonatal post-haemorrhagic hydrocephalus
- Paediatric neuro-oncology: including stereotactic and image-guided biopsy of paediatric tumours; endoscopic biopsy of third ventricular tumours; resection of supratentorial and infratentorial intrinsic tumours; approaches to suprasellar, third ventricular and pineal tumours; management of spinal cord tumours
- Paediatric head injury: including decompressive craniectomy; cranioplasty; management of growing fractures; craniofacial reconstruction; management of CSF fistulae
- Spinal dysraphism: including the management of neonatal spina bifida, meningoceles and encephaloceles; spinal cord tethering syndromes
- Congenital and acquired spinal deformity: including the management of syndromic spinal deformity and post-operative spinal deformity
- Craniofacial disorders: including the management of simple craniosynostosis, syndromic craniosynostosis, post-traumatic deformity

Neuro-oncology

All trainees will be competent to manage patients with high grade intrinsic tumours, metastases and convexity meningiomas. Trainees will a special interest in neuro-oncology will participate fully in the multidisciplinary management of neuro-oncology patients and will be familiar with current developments in molecular neuro-oncology, emerging surgical techniques and the ethical, regulatory and practical considerations governing clinical trials in neuro-oncology. They will develop additional expertise as follows:

- Advanced surgical techniques: including awake craniotomy; stereotactic craniotomy, intraoperative neurophysiological monitoring; advanced image guidance with integration of functional data; intraoperative imaging techniques; the use of intraoperative chemotherapy wafers; third ventriculostomy
- Low-grade intrinsic tumours: the management of low grade intrinsic tumours using advanced techniques; optimal resection of lobar low grade intrinsic tumours
- Tumours of the ventricular system and pineal: including surgical approaches to the third ventricle and pineal; transfrontal transventricular excision of intraventricular tumours and cysts; transcallosal transventricular excision of lesions of the third ventricle and foramen of Munro
- Brainstem tumours: including the management options for intrinsic brainstem tumours; stereotactic biopsy of accessible lesions
- Radiosurgery and stereotactic radiotherapy: including the principles of radiosurgery and stereotactic radiotherapy and the indications for their use as adjunctive and/or primary treatment modalities.

Functional neurosurgery

Trainees with a special interest in functional neurosurgery will develop additional expertise as follows:

- Surgical management of pain: including the implantation of spinal cord stimulators; the insertion of intrathecal drug delivery systems; knowledge of ablative surgical treatment for pain including DREZ lesioning, cordotomy and myelotomy and of neuromodulatory techniques including peripheral nerve, motor cortex and deep brain stimulation.
- Neurovascular compression syndromes: including microvascular decompression of the trigeminal nerve; microvascular decompression of the facial nerve; percutaneous trigeminal rhizotomy
- Spasticity: including an in-depth understanding of medical and surgical treatments for spasticity; implantation of intrathecal drug delivery systems; knowledge of other surgical treatments for spasticity including phenol blocks, neurectomies and rhizotomy.
- Epilepsy: including the multidisciplinary assessment and preparation of patients for epilepsy surgery; stereotactic placement of depth electrodes and placement of subdural electrode grids; temporal lobectomy; selective amygdalohippocampectomy; callosotomy; insertion of vagal nerve stimulators; hemispherectomy; multiple subpial transections
- Movement disorders: including the multidisciplinary assessment and selection of patients with movement disorders e.g. Parkinsons's disease and dystonia; selection, targeting and placement of deep brain stimulation electrodes; management of neuro-stimulators; radiofrequency lesioning

Neurovascular surgery

Special interest training will take place in units with extensive experience in the multi-disciplinary management of all common intracranial vascular disorders. These units should manage a minimum of 120 aneurysmal subarachnoid haemorrhages a year. Trainees with a special interest in neurovascular surgery will develop additional expertise in:

 Intracranial aneurysms: including surgical and endovascular strategies for the management of ruptured and unruptured intracranial aneurysms; surgical treatment of ruptured aneurysms of the anterior circulation; principles of microvascular reconstruction and bypass for complex aneurysms

 Intracranial vascular malformations: including surgical, endovascular and radiosurgical strategies for the management of arteriovenous malformations; surgical treatment of superficial cortical arteriovenous malformations, surgical and endovascular treatment of dural arteriovenous fistulae, image-guided resection of cavernomas

 Other vascular disorders: including the management of primary intracerebral haematomas; the management of venous occlusive disorders

 Acute and chronic cerebral ischaemia: including the medical, surgical and endovascular management of extracranial arterial occlusive disease

Skull-base surgery

Special interest training in skull base surgery will take place in units with extensive multi-disciplinary experience in the management of all common skull-base disorders. Trainees with a special interest in skull-base surgery will develop additional expertise as follows:

- Skull-base and craniofacial surgical access: including standard variations of fronto-basal, fronto-orbital, trans-zygomatic, infratemporal, transtemporal, far-lateral, transphenoidal and transmaxillary approaches
- Cranial base meningiomas: including resection of anterior fossa (olefactory groove and suprasellar) meningiomas; tentorial and petrous temporal meningiomas; petroclival meningiomas
- Pituitary and sellar tumours: including microsurgical and endoscopic transphenoidal resection of pituitary tumours; pterional, subfrontal, interhemispheric and transventricular approaches to suprasellar tumours
- Acoustic neuromas: including retrosigmoid, translabyrinthine and middle fossa resection of acoustic neuromas
- Other skull-base tumours: including the management of other cranial nerve schwannomas, glomus tumours and malignant primary and secondary tumours of the skull-base

- Management of cranio-facial trauma: including multi-disciplinary management of fronto-orbital disruption
- Repair of CSF fistulae: including the management of post-operative CSF fistulae; indications for endoscopic repair of basal CSF fistula; techniques for open repair and skull-base reconstruction

Spinal surgery

On completion of a special interest fellowship in spinal surgery trainees will be competent in all aspects of the emergency and urgent operative care of patients with spinal disorders. They will develop additional expertise as follows:

- Spinal trauma: including reduction and internal stabilisation of atlanto-axial, sub-axial and thoraco-lumbar fractures and dislocations
- Metastatic disease of the spine: including posterior decompression and stabilisation using pedicle screw, hook and sub-laminar wire constructs; corporectomy and instrumented reconstruction of the anterior column
- Primary tumours of the spine: including techniques for local ablation of benign lesions and en bloc resections of malignant tumours
- Intradural tumours: including the radical resection of intradural, extra-medullary tumours; biopsy and optimal resection of intramedullary tumours
- Syringomyelia and hind brain anomalies: including foramen magnum decompression, syringostomy, syringopleural shunting, detethering and duroplasty
- Advanced surgery of the ageing and degenerative spine: including the management of osteoporotic collapse, vertebroplasty, kyphoplasty; stabilisation of the osteoporotic spine; operative management degenerative spondylolisthesis and scoliosis
- The rheumatoid and ankylosed spine: including the management of atlanto-axial subluxation; cranial settling and odontoid migration; sub-axial degeneration; cervico-dorsal kyphosis
- Spinal deformity: including the multidisciplinary management of patients with spinal dysraphism, diastematomyelia etc

Click on Workplace Based Assessments to view the assessment forms including DOPS and PBAs

Special Interest Topics

TOPIC	Paediatric neuro-oncology	Areas in which simulation should be used to develop relevant skills
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of children with tumours of the brain and spinal cord*	
Knowledge	4 Epidemiology, natural history and pathology of tumours of the central nervous system in children including medulloblastoma, pilocytic astrocytoma, high grade gliomas, supratentorial PNET, pineal region tumours, brain stem tumours and intramedullary spinal cord tumours 4 Imaging of paediatric CNS tumours 4 Radiological and biochemical staging of tumours 4 Indications for surgery, radiotherapy, primary and adjuvant chemotherapy 4 Goals of surgery 4 Long-term effects of treatment on cognition, hypothalamic-pituitary function and quality of life 3 Availability of clinical (CCLG) trials 3 Management of delayed spinal deformity associated with treatment of	

	spinal cord tumours	
Clinical Skills	4 Assessment and clinical management of children with tumours of the central nervous system 4 Multidisciplinary approach to treating patients with paediatric brain tumours	Strongly recommended
Technical Skills and Procedures	4 Emergency operative management of a deteriorating child with an intracranial haemorrhage and/or hydrocephalus secondary to tumour 4 Use of CT, MRI, electromagnetic and ultrasound guided localisation of tumours of the brain and spine 4 Stereotactic, image-guided and endoscopic biopsy of intracranial tumours 4 Supratentorial craniotomy for hemispheric tumour 4 Approaches to the suprasellar region: pterional, orbitozygomatic and subfrontal 4 Approaches to the third ventricle: transcortical-transventricular, transcallosal 4 Approaches to the pineal region: endoscopic, supracerebellar, suboccipital transtentorial 4 Midline posterior fossa craniotomy for tumour 3 Retrosigmoid approach to tumour presenting in the CP angle 3 Laminoplasty approach to spine cord tumours.	Strongly recommended
Professional Skills	4 Consent issues in children 4 Recognition of importance of mentorship in dealing with unfamiliar or complicated exposures and procedures	Strongly recommended

TOPIC	**Paediatric head and spinal injury**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in all aspects of the management of accidental and non-accidental paediatric head and spinal injuries.*	
Knowledge	4 Pathophysiology of raised intracranial pressure in children following head injury 4 Prevention and treatment of secondary insults relating to transfer and emergency surgery in head-injured children 4 Medical management and intensive care in paediatric head injury 4 Pathophysiology, legal and social aspects of non-accidental injury in children 4 Management of perinatal trauma, growing fractures and penetrating injuries in children 4 Indications for decompressive craniectomy in management of intractable increases in ICP 3 Rehabilitation after mild, moderate and severe head injuries 4 Diagnosis and certification of brain death in children 4 Classification, assessment, investigation and management of paediatric spinal injuries (including SCIWORA)	
Clinical Skills	4 Assessment and clinical management of children with head and spinal injury	Strongly recommended
Technical Skills and Procedures	4 Insertion of ICP monitor 4 Insertion of ventriculostomy 4 Craniotomy for traumatic intracranial haematoma 4 Repair of depressed skull fracture	Strongly recommended

	3 Anterior skull base repair	
Professional Skills	Understanding of the legal issues surrounding non-accidental injury Understanding of multi-disciplinary approach to non- accidental injury	Strongly recommended

TOPIC	**Hydrocephalus**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in all aspects of the management (operative and non-operative) of paediatric patients with hydrocephalus.*	
Knowledge	4 Pathophysiology and investigation of abnormal CSF dynamics in hydrocephalus and BIH 4 Indications for third ventriculostomy and for shunt insertion Principles of shunt design and function 4 Antenatal diagnosis of hydrocephalus and its prognosis 4 Medical and ophthalmological treatment options for BIH.	
Clinical Skills	4 Assessment and clinical management of neonates and children presenting with hydrocephalus 4 Assessment and clinical management of neonates and children presenting with shunt malfunction including obstruction, over-drainage and slit ventricle syndrome 4 Interpretation of CT, MRI scans and ultrasound scans	Strongly recommended
Technical Skills and Procedures	4 Insertion of intracranial pressure monitor 4 Insertion of ventricular access device in neonates 4Insertion and revision of ventriculoperitoneal shunt/subduroperitoneal shunt 4 Insertion and revision of ventriculoatrial /ventriculopleural shunt 4 Insertion and revision of lumboperitoneal shunt 4 Endoscopic third ventriculostomy 4 Endoscopic fenestration of loculated ventricles 4 CT, MRI and ultrasound guided ventricular access 4 Management of arachnoid cysts by shunting, open or endoscopic fenestration	Strongly recommended
Professional Skills	4 Antenatal counselling 4 Consent in neonates and children	Strongly recommended

TOPIC	**Congenital spinal disorders**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in all aspects of the management (operative and non-operative) of children with congenital spinal disorders*	
Knowledge	4 Embryogenesis of craniospinal dysraphism 4 Pathophysiology of CSF circulation associated with hindbrain hernia, syringobulbia and syringomyelia 4 Epidemiogy, natural history and clinical features of congenital spinal disorders including dysraphism, tethered cord syndrome, diastematomyelia, Chiari malformations, Klippel-Feil syndrome, achondroplasia, Downs syndrome etc 4 Imaging of the neonatal and growing paediatric spine of children with	

	congenital disorders commonly 4 Antenatal diagnosis of dysraphism and its implications.	
Clinical Skills	4 Assessment and clinical management of children presenting with open or closed dysraphic spines and other congenital spinal abnormalities.	Strongly recommended
Technical Skills and Procedures	4 Closure of myelomeningocoele 4 Foramen magnum decompression for hind brain herniation 3 Syringostomy and shunting of syringomyelia Untethering of thickened filum 4 Excision of simple dermal sinus tract 3 Untethering and resection of bony spur in diastematomyelia 3 Untethering of lipomyelomeningocoele 2 Instrumented stabilization and fusion in the treatment of congenital spinal disorders	Strongly recommended
Professional Skills	4 Consent issues in children 4 Collaborative multidisciplinary approach, particularly with orthopaedic surgery	Strongly recommended

TOPIC	**Craniofacial disorders**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in all aspects of the management (operative and non-operative) of children with simple craniosynostosis and cranial deformity after trauma or tumour* *To understand the management of children with syndromic craniosynostosis and encephalocoeles*	
Knowledge	4 Advances in the genetic understanding of craniofacial conditions 4 Epidemiology, natural history and clinical features of simple and syndromic craniosynostosis including cosmetic, cognitive and ophthalmological complications 4 Imaging of simple and syndromic craniosynostosis 4 Indication for and timing of surgical interventions 4 Understanding of causes and management of positional plagiocephaly 4 Epidemiology, natural history, and clinical features of common skull vault conditions including eosinophilic granuloma, fibrous dysplasia etc	
Clinical Skills	4 Management of ophthalmic and airway emergencies in syndromic craniosynostosis 4 Neurosurgical contribution to the multi-disciplinary management of children with craniofacial abnormalities	Strongly recommended
Technical Skills and Procedures	4 Cranioplasty using autologous, titanium or acrylic implants 4 Surgical management of non-syndromic single suture synostosis (in the context of a multidisciplinary team)	Strongly recommended
Professional Skills	4 Consent issues children 4 Liaison with supraregional centres for designated cases.	Strongly recommended

TOPIC	**Paediatric epilepsy**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To understand the management of paediatric epilepsy and the assessment of children for epilepsy surgery*	

Knowledge	4 Classification, epidemiology, natural history and clinical features of epilepsy in childhood 4 Clinical, encephalographic, videotelemetric and radiological assessment of children entering a surgical program 4 Indications for, prognosis and complications of VNS, disconnection procedures and temporal lobe surgery	
Clinical Skills	4 Treatment of status epilepticus 4 Neurosurgical contribution to the multidisciplinary assessment and clinical management of children in preparation for and undergoing epilepsy surgery	Strongly recommended
Technical Skills and Procedures	4 Cortical lesionectomy 3 VNS insertion/revision 2 Invasive EEG recording by grid and depth electrode placement 2 Surgery for temoral lobe epilepsy 2 Non-temporal lobe resections 2 Disconnection procedures	Strongly recommended
Professional Skills	4 Consent in children	Strongly recommended

TOPIC	**Intracranial vascular disorders**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the neurosurgical aspects of the multi-disciplinary management of children presenting with intracranial vascular disorders*	
Knowledge	4 Epidemiology, natural history, pathophysiology and clinical features of subarachnoid haemorrhage, haemorrhagic stroke and ischaemia stroke in children secondary to intracranial aneurysms, arteriovenous malformations and fistulae, cavernomas, arterial dissection, moya-moya disease and venous sinus thrombosis 4 Surgical, endovascular and radiosurgical strategies for the management of intracranial vascular disorders in children	
Clinical Skills	4 The assessment and clinical management of children presenting with spontaneous intracranial haemorrhage, acute cerebral ischaemia and chronic cerebral ischaemia	Strongly recommended
Technical Skills and Procedures	4 Emergency operative management of spontaneous intracerebral haemorrhage 3 Resection of superficial vascular malformations and cavernomas	Strongly recommended
Professional Skills	4 Consent issues in children	Strongly recommended

TOPIC	**Spasticity and movement disorders**	
Category	Paediatric neurosurgery	
Sub-category:	None	
Objective	*To understand the principles of surgical management of spasticity and movement disorders in children*	
Knowledge	3 Clinical presentations of spasticity and other movement disorders in childhood	

	3 Multi-disciplinary assessment of children entering a surgical program 3 The indications for, prognosis and complications of intrathecal baclofen therapy, dorsal rhizotomy and deep brain stimulation in the management of spasticity and dystonia 2 Awareness of indications for CNS modulating procedures in the management of pain and convulsive disorders	
Clinical Skills	4 Neurosurgical aspects of the multi-disciplinary assessment and management of children with spasticity and movement disorders	Strongly recommended
Technical Skills and Procedures	3 Baclofen pump insertion, assessment of function and revision 3 Laminotomy for selective dorsal rhizotomy 3 Removal/revision of pulse generator units	Strongly recommended
Professional Skills	4 Consent in children	Strongly recommended

TOPIC	**Advanced surgical techniques**	
Category	Neuro-oncology	
Sub-category:	None	
Objective	*To achieve competence in the application of advanced surgical techniques to the management of patients with brain tumours*	
Knowledge	4 Indications for; applications of; advantages and disadvantages of various advanced surgical approaches and adjuncts	
Clinical Skills	4 Assessment, counselling and pre-operative preparation of patients undergoing neuro-oncological surgery 4 Selection of appropriate advanced techniques based on clinical and imaging information	Strongly recommended
Technical Skills and Procedures	4 Stereotactic craniotomy 4 Advanced image guidance techniques 4 Use of intraoperative chemotherapy wafers 3 Third ventriculostomy 2 Awake craniotomy 2 Intraoperative neurophysiological monitoring	Strongly recommended
Professional Skills	Generic	

TOPIC	**Low-grade intrinsic tumours**	
Category	Neuro-oncology	
Sub-category:	None	
Objective	*Achieve competence in the surgical and clinical management of low grade intrinsic tumours*	
Knowledge	4 Epidemiology, natural history, genetic characteristics, pathology and clinical features of low grade intrinsic cerebral tumours 4 Surgical and non-surgical management options for low grade intrinsic tumours	
Clinical Skills	4 Interpretation of CT, MRI and functional imaging in patients with low grade intrinsic tumours 4 Assessment, counselling and pre-operative preparation of patients with low grade intrinsic tumours 4 Continuing management of patients with low grade intrinsic tumours within a multidisciplinary team setting	Strongly recommended

Technical Skills and Procedures	4 Craniotomy for lobar low grade intrinsic tumours using appropriately selected advanced surgical techniques	Strongly recommended
Professional Skills	Generic	

TOPIC	**Tumours of the ventricular system and pineal**	
Category	Neuro-oncology	
Sub-category:	None	
Objective	*To achieve competence in the management of patients with intraventricular and pineal region tumours.*	
Knowledge	4 Epidemiology, natural history, genetic characteristics, pathology and clinical features of intraventricular and pineal region tumours Radiological and biochemical staging 4 Surgical and non-surgical management options for low grade intrinsic tumours 4 Surgical anatomy relevant to approaches to the lateral and third ventricles and the pineal region	
Clinical Skills	4 Counselling of patients regarding surgical treatment options for pineal and intraventricular tumours 4 Choice of operative approaches based on tumour location and imaging	Strongly recommended
Technical Skills and Procedures	3 Transcallosal and transcortical approaches to ventricular tumours 3 Microsurgical resection of lateral intraventricular tumour 2 Microsurgical resection of third ventricular tumour/colloid cyst 3 Transfrontal endoscopic biopsy and third ventriculostomy 2 Supracerebellar infratentorial approaches to the pineal 2 Occipital transtentorial approaches to the pineal	Strongly recommended
Professional Skills	Generic	

TOPIC	**Brainstem tumours**	
Category	Neuro-oncology	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multidisciplinary management of patients with intrinsic brainstem tumours*	
Knowledge	4 Epidemiology, natural history, genetic characteristics, pathology and clinical features of brain stem tumours 4 Management options for patient with brainstem tumours including open surgery, biopsy and radiotherapy	
Clinical Skills	4 Selection of open surgery and stereotactic biopsy for patients with brainstem lesions	Strongly recommended
Technical Skills and Procedures	4 Stereotactic biopsy of brainstem lesions 1 Open resection of exophytic brainstem tumours	Strongly recommended
Professional Skills	Generic	

TOPIC	**Radiosurgery and stereotactic radiotherapy**	
Category	Neuro-oncology	

Sub-category:	None	
Objective	*To achieve competence in the neurosurgical aspects of the multidisciplinary management of patients undergoing radiosurgery and stereotactic radiotherapy*	
Knowledge	4 The principles of radiosurgery and stereotactic radiotherapy 4 The indications for their use as adjunctive and/or primary treatment modalities	
Clinical Skills	4 Assessment of the suitability of these techniques for the treatment of metastatic and intrinsic tumours based on clinical presentation and imaging appearances 4 Counselling potential patients on the role of these techniques in tumour treatment	Strongly recommended
Technical Skills and Procedures	3 Application of stereotactic frames for radiosurgical treatment	Strongly recommended
Professional Skills	None	

TOPIC	**Surgical management of pain**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of patients with chronic pain syndromes*	
Knowledge	4 The aetiology and pathophysiology of chronic pain syndromes 4 Indications for medical, minimally-invasive and surgical management 4 Applied surgical anatomy 4 Complications of surgery and their management	
Clinical Skills	4 Surgical aspects of the multi-disciplinary assessment of chronic pain patients Pre-operative counselling and preparation	Strongly recommended
Technical Skills and Procedures	4 Spinal cord stimulation 2 DREZ lesion 2 Open cordotomy 2 Deep brain stimulation for pain	Strongly recommended
Professional Skills	Generic	

TOPIC	**Neurovascular compression syndromes**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*To achieve advanced competence in the surgical aspects of the multi-disciplinary management of patients with neurovascular compression syndromes*	
Knowledge	4 Aetiology, epidemiology and natural history of trigeminal neuralgia, and glossopharyngeal neuralgia 4 Differential diagnosis and management of related cranio-facial pain syndromes 4 Medical management of cranio-facial pain 4 Surface anatomy of the trigeminal nerve and microsurgical anatomy of	

	the CP angle 4 Indications for surgical management of trigeminal and glossopharyngeal neuralgia by peripheral neurectomy, percutaneous rhizotomy, radiofrequency rhizotomy, microvascular decompression 4 Complications of surgery and their management	
Clinical Skills	4 The assessment, counselling and pre-operative preparation of patients with trigeminal neuralgia 4 Interpretation of posterior fossa CT an MR and scans including MR sequences demonstrating neurovascular compression 4 Application and interpretation of intraoperative monitoring techniques	Strongly recommended
Technical Skills and Procedures	3 Percutaneous trigeminal rhizotomy 4 Trigeminal microvascular decompression	Strongly recommended
Professional Skills	Generic	

TOPIC	**Spasticity**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*4 To achieve competence in the surgical aspects of the multi-disciplinary management of patients with spasticity*	
Knowledge	4 The aetiology and pathophysiology of spasticity 4 Indications for medical, minimally-invasive and surgical management 4 Applied surgical anatomy 4 Complications of surgery and their management	
Clinical Skills	4 Surgical aspects of the multi-disciplinary assessment of patients with spasticity 4 Pre-operative counselling and preparation	Strongly recommended
Technical Skills and Procedures	4 Intrathecal drug delivery 3 Deep brain stimulation	Strongly recommended
Professional Skills	Generic	

TOPIC	**Epilepsy**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of patients with epilepsy*	
Knowledge	4 The pathophysiology of idiopathic and lesional epilepsy 4 Indications for medical and surgical management 3 Principles of ictal, interictal, sphenoidal and intraoperative EEG 3 Principles of video-EEG monitoring 4 Applied surgical anatomy 4 Complications of surgery and their management	
Clinical Skills	4 Surgical aspects of the multi-disciplinary assessment of epilepsy patients 4 Interpretation of CT, MRI and SPECT scans 4 Pre-operative counselling and preparation	Strongly recommended
Technical Skills and	2 Stereotactic placement of depth electrodes 3 Placement of subdural electrode-grids	Strongly recommended

Procedures	3 Image-guided resection of cortical lesions 3 Mesial temporal resection 3 Vagal nerve stimulation 1 Functional hemispherectomy 2 Corpus callosotomy	
Professional Skills	Generic	

TOPIC	**Movement disorders**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of patients with movement disorders*	
Knowledge	4 The aetiology and pathophysiology of movement disorders 4 Indications for medical, minimally-invasive and surgical management 4 Applied surgical anatomy 4 Complications of surgery and their management	
Clinical Skills	4 Surgical aspects of the multi-disciplinary assessment of patients with movement disorders 4 Interpretation of CT and MRI scans 4 Pre-operative counselling and preparation	Strongly recommended
Technical Skills and Procedures	3 Deep brain stimulation 3 Microvascular decompression for hemi-facial spasm	Strongly recommended
Professional Skills	Generic	

TOPIC	**Surgery for mental illness**	
Category	Functional Neurosurgery	
Sub-category:	None	
Objective	*To be familiar with current surgical treatment options for treatment resistant mental illness and in particular depression and obsessive compulsive disorder*	
Knowledge	3 Indications for surgical treatment of mental illness 3 Ethical and regulatory aspects of surgical treatment of mental illness 3 Surgical targets	
Clinical Skills	None	
Technical Skills and Procedures	None	
Professional Skills	Generic	

TOPIC	**Intracranial aneurysms**	
Category	Neurovascular surgery	
Sub-category:	None	

Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of patients with intracranial aneurysms*	
Knowledge	4 The epidemiology, natural history, aetiology and pathophysiology of unruptured and ruptured intracranial aneurysms 4 Vascular anatomy of the central nervous system 4 Indications for surgical and endovascular treatment of intracranial aneurysms 4 The principles of endovascular treatment 4 Indications for intra and extracranial bypass in the management of complex aneurysms	
Clinical Skills	4 Clinical assessment and management of patients with ruptured and unruptured intracranial aneurysms	Strongly recommended
Technical Skills and Procedures	4 Pterional approach 3 Interhemispheric approaches 3 Temporo-zygomatic and related approaches 2 Exposure of the basilar termination 2 Exposure of the vertebral artery and PICA 3 Clipping of saccular anterior circulation aneurysm 2 Clipping of complex anterior circulation aneurysm 3 Harvest of saphenous vein and radial artery grafts	Strongly recommended
Professional Skills	Generic	

TOPIC	**Intracranial arteriovenous malformations**	
Category	Neurovascular surgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of intracranial arteriovenous malformations (AVMs)*	
Knowledge	4 The epidemiology, classification, natural history, embryogenesis and pathophysiology of AVMs of the brain 4 The indications for surgical, radiosurgical and endovascular treatment of asymptomatic, symptomatic and ruptured brain AVMs	
Clinical Skills	4 The assessment and clinical management of patients undergoing treatment of AVMs of the brain	Strongly recommended
Technical Skills and Procedures	4 Evacuation of intracerebral haematoma associated with an AVM 3 Microsurgical resection of superficial cortical AVM 2 Microsurgical resection of paraventricular and posterior fossa AVM	Strongly recommended
Professional Skills	Generic	

TOPIC	**Intracranial dural arteriovenous fistulae**	
Category	Neurovascular surgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the multi-disciplinary management of intracranial dural arteriovenous fistulae (dAVFs)*	
Knowledge	4 Applied anatomy of the cerebral venous circulation 4 The epidemiology, classification, natural history, pathogenesis and pathophysiology of intracranial dAVFs 4 The indications for surgical and endovascular treatment of asymptomatic, symptomatic and ruptured intracranial dAVFs	

Clinical Skills	4 The assessment and clinical management of patients undergoing treatment of intracranial dAVFs	Strongly recommended
Technical Skills and Procedures	2 Exploration and closure of supratentorial dAFV	Strongly recommended
Professional Skills	Generic	

TOPIC	**Cerebral ischaemia**	
Category	Neurovascular surgery	
Sub-category:	None	
Objective	*To achieve competence in the surgical aspects of the management of patients with acute and chronic cerebral ischaemia*	
Knowledge	4 The epidemiology, natural history and pathophysiology of extra- and intracranial atherosclerotic occlusive disease 4 The epidemiology, natural history and pathophysiology of non-atherosclerotic occlusive diseases 3 Optimal medical management of occlusive and thrombo-embolic cerebrovascular disease 4 Imaging of the acutely ischaemic brain using CT and MRI 3 Principles of non-invasive and invasive imaging of the extra and intracranial vasculature using ultrasound, transcranial Doppler, CT, MRI and catheter angiography Principles of regional cerebral blood flow and metabolism measurement and imaging using CT and MRI perfusion techniques; SPECT and PET scanning 4 Indications for carotid endarterectomy 3 Indications for endovascular intervention including intra-arterial thrombolysis; carotid angioplasty and stenting; intracranial angioplasty 4 Principles of cerebral revascularisation by indirect synangiosis, low-flow EC-IC anastomosis and high flow EC-IC bypass grafting	
Clinical Skills	4 The assessment and clinical management of patients with acute and chronic cerebral ischaemia	Strongly recommended
Technical Skills and Procedures	2 Carotid endarterectomy 3 Saphenous and radial artery graft harvest 2 Extracranial vascular anastomosis 1 Intracranial microvascular anastomosis	Strongly recommended
Professional Skills	Generic	

TOPIC	**Cranial base meningiomas**	
Category	Skull-base surgery	
Sub-category:	None	
Objective	*To achieve competence in the neurosurgical aspects of the multidisciplinary management of cranial base meningiomas*	
Knowledge	4 Epidemiology, natural history, pathology and clinical presentation of meningiomas of the anterior, middle and posterior fossae 4 Indications for radical or subtotal resection of skull-base meningiomas 4 Indications for radiosurgical treatment 4 Applied surgical anatomy of the skull base and craniofacial skeleton 4 Selection of optimal approaches in relation presenting pathology and imaging	

Clinical Skills	4 Assessment and clinical management of patients with skull base meningiomas	Strongly recommended
Technical Skills and Procedures	4 Anterior interhemispheric, fronto-orbital, zygomatic and temporo-zygomatic approaches 4 Resection of anterior fossa meningioma: olefactory, planum sphenoidale and outer sphenoid wing 3 Resection of clinoidal and suprasellar meningioma Resection of occipital, lateral petrosal and tentorial meningioma 2 Resection of cavernous sinus and petroclival meningioma	Strongly recommended
Professional Skills	None	

TOPIC	**Pituitary and sellar region tumours**	
Category	Skull-base surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of patients with pituitary and sellar region tumours*	
Knowledge	4 Classification, epidemiology, natural history, pathology and clinical presentation of tumours of the pituitary and sellar region 4 Pathophysiology of the hypothalamic-pituitary axis 4 Investigation of the hypothalmic pituitary axis in patients with hypopituitarism and hypersecretion syndromes 4 Indications for surgery, radiosurgery and adjuvant radiotherapy 4 Selection of surgical approaches: sublabial, transnasal and endoscopic 4 Applied surgical anatomy of the skull base 4 Principles of peri-operative care 4 Complications of surgery and their management	
Clinical Skills	4 Peri-operative management of patients with established and threatened dysfunction of the hypothalamic-pituitary axis 4 Neurosurgical aspects of the continuing care of patients with pituitary tumours	Strongly recommended
Technical Skills and Procedures	4 Transphenoidal exposure of the pituitary fossa (microsurgical transnasal or sublabial)4 Transphenoidal resection of non-functioning macroadenoma 3 Transphenoidal selective microadenectomy 2 Endoscopic transphenoidal resection of non-functioning adenoma 3 Pterional craniotomy and microsurgical decompression of optic nerves and chiasm	Strongly recommended
Professional Skills	Generic	

TOPIC	**Acoustic neuromas**	
Category	Skull-base surgery	
Sub-category:	None	
Objective	*To achieve competence in the neurosurgical aspects of the multidisciplinary management of patients with acoustic neuromas*	
Knowledge	4 Epidemiology, natural history, pathology and clinical presentation of sporadic and NFII-related acoustic neuromas4 Relative indications for	

	surgery, radiosurgery and conservative management 4 Principles of intra-operative facial nerve and BAEP monitoring 4 Applied microsurgical anatomy of the CP angle, brainstem and lower cranial nerves 4 Relative indications for retrosigmoid, middle fossa, and translabyrinthine approaches with respect to hearing preservation, tumour size and position	
Clinical Skills	4 Neurosurgical aspects of the assessment and clinical management of patients undergoing acoustic neuroma surgery	Strongly recommended
Technical Skills and Procedures	4 Retrosigmoid approach 3 Retrosigmoid subtotal resection of acoustic neuroma 2 Retrosigmoid radical resection 2 Translabyrinthine resection of acoustic tumour	Strongly recommended
Professional Skills	4 Multidisciplinary working with neuro-otologists and oncologists 3 Role of hearing therapy	

TOPIC	**Other skull-base tumours**	
Category	Skull-base surgery	
Sub-category:	None	
Objective	*To achieve competence in the neurosurgical aspects of the multidisciplinary management of patients with benign and malignant cranial base tumours*	
Knowledge	4 Epidemiology, natural history, pathology and clinical presentation of benign and malignant tumours of the skull base including cranial nerve schwannomas, chordomas, paragangliomas, adenoid cystic carcinomas, angiofibromas and nasopharyngeal carcinomas 4 Indications for radical or subtotal resection of skull-base tumours 4 Indications for radiosurgical treatment 4 Applied surgical anatomy of the skull base and craniofacial skeleton 4 Selection of optimal approaches in relation presenting pathology and imaging	
Clinical Skills	4 Neurosurgical aspects of the multidisciplinary assessment and clinical management of patients with rarer skull base tumours	Strongly recommended
Technical Skills and Procedures	3 Frontobasal approaches to the anterior fossa and orbito-ethmoidal complex 2 Transfacial and mid-face approaches to the skull base 2 Lateral approaches to the infratemporal fossa and pterygo-palatine fossa 2 Transtemporal approaches to the jugular bulb and petrous apex	Strongly recommended
Professional Skills	4 Multidisciplinary working with neurotologists, maxillofacial surgeons and oncologists	

TOPIC	**Craniofacial repair**	
Category	Skull-base surgery	
Sub-category:	None	
Objective	*To achieve competence in the repair of skull base defects and the closure of CSF fistulae*	
Knowledge	4 Applied surgical anatomy of the cranial base floor and paranasal sinus 4 Indications for open surgical and endoscopic repair of spontaneous, post-traumatic and post-surgical skull base defects and CSF fistulae 4 Principles of simple, pedicled and free vascularised tissue transfer	
Clinical Skills	4 Neurosurgical aspects of the multi-disciplinary management of patients with skull base defects	Strongly recommended

Technical Skills and Procedures	4 Use of simple autologous grafts and substitutes (fascia, pericranium, fat etc) in closing small defects 4 Use of vascularised pericranial, temporalis muscle and galeal flaps for major defects 1 Endoscopic repair of anterior fossa defects 1 Free vascularised flap reconstruction following major cranio-facial resections	Strongly recommended
Professional Skills	4 Multi-disciplinary working with neurotologists and plastic surgeons	

TOPIC	**Spinal trauma**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the operative management of fracture-subluxations of the cervical and thoracolumbar spine*	
Knowledge	4 Pathophysiology of spinal cord injury 4 Classification of cervical and thoracolumbar fracture dislocations 4 Biomechanics of spinal instability 4 Indications for halo traction and external stabilisation 4 Indications for and principles of open reduction and stabilisation 4 Applied surgical anatomy of cervical and thoracolumbar fracture-subluxations 4 Relative indications for operative reduction and stabilisation by anterior and posterior approaches Management of post-traumatic spinal deformity and delayed sequelae	
Clinical Skills	4 Assessment and clinical management of patients with spinal injuries	Strongly recommended
Technical Skills and Procedures	4 Application of cranial-cervical traction 3 Instrumented stabilisation of subaxial fracture-dislocation by anterior cervical plate and/or lateral mass screws 2 Instrumented stabilisation of atlanto-axial fracture dislocation by anterior odonto-axial screws and/or posterior atlantoaxial screws/wiring 4 Application of halo-body jacket 3 Posterior reduction of thoracolumbar fractures by pedicle screw instrumentation and ligamentotaxis 2 Combined anterior and posterior reduction and instrumented stabilisation of thoracolumbar fractures	Strongly recommended
Professional Skills	Generic	

TOPIC	**Metastatic spinal disease**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of patients with malignant secondary spinal cord compression*	
Knowledge	4 The pathophysiology of spinal cord compression 4 The classification, aetiology and natural history of vertebral metastases 4 Spinal instability associated with vertebral malignancy 4 Indications for percutanous and open spinal biopsy 4 Role of primary radiotherapy and adjuvant radiotherapy or chemotherapy 4 Indications for spinal decompression with and without instrumented	

	spinal stabilisation	
Clinical Skills	4 Clinical assessment of patients with malignant spinal cord compression 4 Interpretation of plain radiology, CT and MRI scans 4 Liaison with medical oncologists and radiotherapist 4 Counselling and pre-operative preparation of patients with malignant spinal cord compression	Strongly recommended
Technical Skills and Procedures	4 Decompressive thoracic and lumbar laminectomy with extradural tumour resection and pedicle screw stabilisation 4 Anterior cervical corporectomy with anterior column re-construction and anterior cervical plating 3 Cervical lateral mass stabilisation 2 Posterior corporectomy with anterior column replacement and posterior stabilisation 2 Combined anterior and posterior total vertebrectomy with stabilisation	Strongly recommended
Professional Skills	Generic	

TOPIC	**Primary spinal tumours**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	N/A	
Knowledge	N/A	
Clinical Skills	N/A	
Technical Skills and Procedures	N/A	
Professional Skills	N/A	

TOPIC	**Intradural tumours**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of patients with intradural spinal tumours*	
Knowledge	4 Classification, epidemiology, natural history and pathology of intradural spinal tumours 4 Pathophysiology of spinal cord compression 4 Indications for biopsy, subtotal and radical surgery 4 Selection of surgical approaches 4 Applied surgical anatomy 4 Principles of peri-operative care 4 Complications of surgery and their management 4 Role of adjuvant treatment	
Clinical Skills	None	
Technical Skills and Procedures	4 Microsurgical excision of intradural extramedullary tumours 3 Microsurgical biopsy of intramedullary spinal cord tumour 3 Subtotal microsurgical resection of intramedullary tumour 4 Duroplasty	Strongly recommended

Professional Skills	Generic	

TOPIC	**Syringomyelia and hind brain anomalies**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of craniocervical stenosis and hindbrain herniation*	
Knowledge	4 The pathogenesis and natural history of hindbrain herniation, craniocervical stenosis, syringomyelia and syringobulbia 4 Indications for foramen magnum decompression 4 Applied surgical anatomy of the craniocervical junction 4 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	
Clinical Skills	4 Assessment and clinical management of patients with hindbrain herniation and syringomyelia	Strongly recommended
Technical Skills and Procedures	4 Foramen magnum decompression 3 Syringostomy and syringo-pleural shunting	Strongly recommended
Professional Skills	Generic	

TOPIC	**Advanced surgery of the ageing and degenerative spine**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the advanced surgery of the ageing and degenerative spine*	
Knowledge	4 Techniques for operative stabilization of the osteoporotic spine 4 Principles of surgery for degenerative scoliosis 4 Biomechanical principles of and indications for cervical and lumbar disc replacement 4 Biomechanical principles of and indications for non-fusion spinal stabilisation 3 Indications for, techniques and complications of vertebroplasty and Kyphoplasty 2 Principles of thoracoscopic and laparoscopic surgical techniques	
Clinical Skills	4 Assessment and clinical management of patients with degenerative spinal disorders	Strongly recommended
Technical Skills and Procedures	3 Pedicle screw instrumentation of the thoracic and lumbar spine 3 Lumbar interbody fusion by posterior(PLIF) and postero-lateral (TLIF) fusion 2 Lumbar anterior interbody fusion 3 Single and multi-level cervical corporectomy with anterior cervical plating 3 Anterior cervical discectomy and cervical arthroplasty 3 Cervical laminectomy with lateral mass and/or pedicle screw stabilisation 3 Cervical laminoplasty 3 Postero-lateral thoracic discectomy 2 Anterior (transthoracic) discectomy	Strongly recommended

	1 Thoracoscopic techniques	
Professional Skills	Generic	

TOPIC	**Surgery of the rheumatoid spine**	
Category	Spinal Surgery	
Sub-category:	None	
Objective	*To achieve competence in the management of rheumatoid atlanto-axial subluxation, cranial settling and related disorders*	
Knowledge	4 The pathology and natural history of rheumatoid spondylopathy 4 Indications for operative management of atlanto-axial subluxation, cranial settling and related disorders 4 Applied surgical anatomy of the craniocervical junction 4 Selection of surgical approaches 4 Principles of peri-operative care 4 Complications of surgery	

Table of Neurosurgery Simulation Curriculum Practical Simulations by Stage and Year

	Initial Stage			Intermediate		Final		Subspecialty
	ST1	ST2	ST3	ST4	ST5	ST6	ST7	ST8
	Consent							
Instruments	**Basic instruments and handling -Basic trays, suction and diathermy**	**Basic instruments and handling -Spinal instruments**	**Basic instruments and handling -Microscopic instruments**					
Positioning /Human Factors	**Neurosurgical positioning (including human factors) -Supine, use of gel padding, horseshoe, pins**	**Neurosurgical positioning (including human factors) -Prone, Salford seat**	**Neurosurgical positioning (including human factors) -Lateral**	**Neurosurgical positioning (including human factors) -Children**	**Neurosurgical positioning (including human factors) -Advanced positioning**	**Neurosurgical positioning (including human factors) -Advanced positioning**	**Neurosurgical positioning (including human factors) -Advanced positioning**	**Neurosurgical positioning (including human factors) -Advanced positioning**
Simulations	**Skin preparation and draping**	**EVD**	**Neurosurgical microscope use**	**Insertion of VP shunt**	**Stereotactic biopsy using image guidance**	**Spinal instrumentation**	**Advanced image guidance techniques**	**Teaching and assessing surgical practice**
	Burr holes	**Burr hole for CSDH**	**Image guidance/stereotaxy setup**	*Supratentorial craniotomy for ICH*	**Endoscopic third ventriculostomy**	*Craniotomy for transcallosal approach*	*Transsphenoidal approach*	*Temporal bone approaches*
	Lumbar Drains	**Convexity Craniotomy**	**Neurosurgical ultrasound**	*Lumbar microdiscectomy*	*Craniotomy for supratentorial tumour*	*Craniotomy for convexity meningioma*	*Craniotomy – pterional/sulcal dissection*	*Advanced human factors scenarios*
	Tapping of CSF reservoirs/EVD sampling	**Application of skull traction and halo vest**	*Posterior spinal approaches*	*Cervical laminectomy*	*Midline posterior fossa craniotomy*	*Thoracic spinal approaches*	*Craniotomy – lateral posterior fossa/Microvascular decompression*	*Craniotomy – peri-tentorial approach to pineal region*
	ICP Monitoring		*Supratentorial craniotomy over the midline (decompressive craniectomy)*	*Anterior cervical spine approach*	*Anterior cervical discectomy*			

STRONGLY RECOMMENDED
DESIRABLE

Professional Behaviour and Leadership

Overview

Click here to download a PDF copy of the 2010 syllabus.

Professional behaviour and leadership skills are integral to the specialty specific syllabuses relating to clinical practice. It is not possible to achieve competence within the specialty unless these skills and behaviours are evident. Professional behaviour and leadership skills are evidenced through clinical practice. By the end of each stage of training, the trainee must be able to demonstrate progress in acquiring these skills and demonstrating these behaviours across a range of situations as detailed in the syllabus.

Under each category heading there are learning objectives in the domains of knowledge, skills and behaviour together with example behaviours. These objectives underpin the activities that are found in the syllabus.

All the workplace based assessments contain elements which assess professional behaviour and leadership skills as illustrated in the matrix below.

WPBA	Good Clinical Care	Communicator	Teaching & Training	Keeping up to date	Manager	Promoting good health	Probity & ethics
CBD	✔✔	✔		✔	✔✔	✔	✔
MSF	✔✔	✔✔	✔	✔	✔	✔	✔✔
CEX	✔✔	✔✔		✔	✔	✔	
PBA	✔✔	✔✔		✔	✔	✔	✔
DOPS	✔✔	✔		✔		✔	✔

Covered ✔✔	Partly covered ✔	Not covered

Click on Workplace Based Assessments to view the assessment forms.

	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique	Areas in which simulation should be used to develop relevant skills
Category	**Good Clinical Care**, to include: • History taking (GMP Domains: 1, 3, 4) • Physical examination (GMP Domains: 1, 2,4) • Time management and decision making (GMP Domains: 1,2,3) • Clinical reasoning (GMP Domains: 1,2, 3, 4) • Therapeutics and safe prescribing (GMP Domains: 1, 2, 3) • Patient as a focus of clinical care (GMP Domains: 1, 3, 4) • Patient safety (GMP Domains: 1, 2, 3) • Infection control (GMP Domains: 1, 2, 3)	**Area 4.1**		
Objective	To achieve an excellent level of care for the individual patient		Mini CEX, CBD, Mini	Strongly recommended

	• To elicit a relevant focused history (See modules 2, 3, 4,5) • To perform focused, relevant and accurate clinical examination (See modules 2,3,4,5) • To formulate a diagnostic and therapeutic plan for a patient based upon the clinic findings (See modules 2,3,4,5) • To prioritise the diagnostic and therapeutic plan (See modules 2,3,4,5) • To communicate a diagnostic and therapeutic plan appropriately (See modules 2,3,4,5) To produce timely, complete and legible clinical records to include case-note records, handover notes, and operation notes To prescribe, review and monitor appropriate therapeutic interventions relevant to clinical practice including non – medication based therapeutic and preventative indications (See module 1,2,3,4,5) To prioritise and organise clinical and clerical duties in order to optimise patient care To make appropriate clinical and clerical decisions in order to optimise the effectiveness of the clinical team resource. To prioritise the patient's agenda encompassing their beliefs, concerns expectations and needs To prioritise and maximise patient safety: • To understand that patient safety depends on o The effective and efficient organisation of care o Health care staff working well together o Safe systems, individual competency and safe practice • To understand the risks of treatments and to discuss these honestly and openly with patients • To systematic ways of assessing and minimising risk • To ensure that all staff are aware of risks and work together to minimise risk To manage and control infection in patients, including: • Controlling the risk of cross-infection • Appropriately managing infection in individual patients • Working appropriately within the wider community to manage the risk posed by communicable diseases	**Area 4.1**	PAT, MRCS and Specialty FRCS	Patient safety Desirable: Human factors
Knowledge	**Patient assessment** • Knows likely causes and risk factors for			

	conditions relevant to mode of presentation • Understands the basis for clinical signs and the relevance of positive and negative physical signs • Recognises constraints and limitations of physical examination • Recognises the role of a chaperone is appropriate or required • Understand health needs of particular populations e.g. ethnic minorities • Recognises the impact of health beliefs, culture and ethnicity in presentations of physical and psychological conditions **Clinical reasoning** • Interpret history and clinical signs to generate hypothesis within context of clinical likelihood • Understands the psychological component of disease and illness presentation • Test, refine and verify hypotheses • Develop problem list and action plan • Recognise how to use expert advice, clinical guidelines and algorithms • Recognise and appropriately respond to sources of information accessed by patients • Recognises the need to determine the best value and most effective treatment both for the individual patient and for a patient cohort **Record keeping** • Understands local and national guidelines for the standards of clinical record keeping in all circumstances, including handover • Understanding of the importance of high quality and adequate clinical record keeping and relevance to patient safety and to litigation • Understand the primacy for confidentiality **Time management** • Understand that effective organisation is key to time management • Understand that some tasks are more urgent and/or more important than others • Understand the need to prioritise work according to urgency and importance • Maintains focus on individual patient needs whilst balancing multiple competing pressures • Outline techniques for improving time management **Patient safety** • Outline the features of a safe working environment • Outline the hazards of medical equipment in common use • Understand principles of risk assessment	**Area 4.1**		

	and management • Understanding the components of safe working practice in the personal, clinical and organisational settings • Outline local procedures and protocols for optimal practice e.g. GI bleed protocol, safe prescribing • Understands the investigation of significant events, serious untoward incidents and near misses **Infection control** • Understand the principles of infection control • Understands the principles of preventing infection in high risk groups • Understand the role of Notification of diseases within the UK • Understand the role of the Health Protection Agency and Consultants in Health Protection			
Skills	**Patient assessment** • Takes a history from a patient with appropriate use of standardised questionnaires and with appropriate input from other parties including family members, carers and other health professionals • Performs an examination relevant to the presentation and risk factors that is valid, targeted and time efficient and which actively elicits important clinical findings • Give adequate time for patients and carers to express their beliefs ideas, concerns and expectations • Respond to questions honestly and seek advice if unable to answer • Develop a self-management plan with the patient • Encourage patients to voice their preferences and personal choices about their care **Clinical reasoning** • Interpret clinical features, their reliability and relevance to clinical scenarios including recognition of the breadth of presentation of common disorders • Incorporates an understanding of the psychological and social elements of clinical scenarios into decision making through a robust process of clinical reasoning • Recognise critical illness and respond with due urgency • Generate plausible hypothesis(es) following patient assessment • Construct a concise and applicable problem list using available information • Construct an appropriate management plan			

	in conjunction with the patient, carers and other members of the clinical team and communicate this effectively to the patient, parents and carers where relevant **Record keeping** • Producing legible, timely and comprehensive clinical notes relevant to the setting • Formulating and implementing care plans appropriate to the clinical situation, in collaboration with members of an interdisciplinary team, incorporating assessment, investigation, treatment and continuing care • Presenting well documented assessments and recommendations in written and/or verbal form **Time management** • Identifies clinical and clerical tasks requiring attention or predicted to arise • Group together tasks when this will be the most effective way of working • Organise, prioritise and manage both team-members and workload effectively and flexibly **Patient safety** • Recognise and practise within limits of own professional competence • Recognise when a patient is not responding to treatment, reassess the situation, and encourage others to do so • Ensure the correct and safe use of medical equipment • Improve patients' and colleagues' understanding of the side effects and contraindications of therapeutic intervention • Sensitively counsel a colleague following a significant untoward event, or near incident, to encourage improvement in practice of individual and unit • Recognise and respond to the manifestations of a patient's deterioration or lack of improvement (symptoms, signs, observations, and laboratory results) and support other members of the team to act similarly **Infection control** • Recognise the potential for infection within patients being cared for • Counsel patients on matters of infection risk, transmission and control • Actively engage in local infection control procedures • Prescribe antibiotics according to local guidelines and work with microbiological services where appropriate	**Area 4.1**		

	• Recognise potential for cross-infection in clinical settings • Practice aseptic technique whenever relevant			
Behaviour	• Shows respect and behaves in accordance with Good Medical Practice • Ensures that patient assessment, whilst clinically appropriate considers social, cultural and religious boundaries • Support patient self-management • Recognise the duty of the medical professional to act as patient advocate • Ability to work flexibly and deal with tasks in an effective and efficient fashion • Remain calm in stressful or high pressure situations and adopt a timely, rational approach • Show willingness to discuss intelligibly with a patient the notion and difficulties of prediction of future events, and benefit/risk balance of therapeutic intervention • Show willingness to adapt and adjust approaches according to the beliefs and preferences of the patient and/or carers • Be willing to facilitate patient choice • Demonstrate ability to identify one's own biases and inconsistencies in clinical reasoning • Continue to maintain a high level of safety awareness and consciousness • Encourage feedback from all members of the team on safety issues • Reports serious untoward incidents and near misses and co-operates with the investigation of the same. • Show willingness to take action when concerns are raised about performance of members of the healthcare team, and act appropriately when these concerns are voiced to you by others • Continue to be aware of one's own limitations, and operate within them • Encourage all staff, patients and relatives to observe infection control principles • Recognise the risk of personal ill-health as a risk to patients and colleagues in addition to its effect on performance			
Examples and descriptors for Core Surgical Training	**Patient assessment** • Obtains, records and presents accurate clinical history and physical examination relevant to the clinical presentation, including an indication of patient's views • Uses and interprets findings adjuncts to basic examination appropriately e.g. internal examination, blood pressure measurement, pulse oximetry, peak flow • Responds honestly and promptly to patient questions • Knows when to refer for senior help • Is respectful to patients by ○ Introducing self clearly to patients			

	and indicates own place in team ○ Checks that patients comfortable and willing to be seen ○ Informs patients about elements of examination and any procedures that the patient will undergo **Clinical reasoning** • In a straightforward clinical case develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes **Record keeping** • Is able to format notes in a logical way and writes legibly • Able to write timely, comprehensive, informative letters to patients and to GPs **Time management** • Works systematically through tasks and attempts to prioritise • Discusses the relative importance of tasks with more senior colleagues. • Understands importance of communicating progress with other team members **Patient safety** • Participates in clinical governance processes • Respects and follows local protocols and guidelines • Takes direction from the team members on patient safety • Discusses risks of treatments with patients and is able to help patients make decisions about their treatment • Ensures the safe use of equipment • Acts promptly when patient condition deteriorates • Always escalates concerns promptly **Infection control** • Performs simple clinical procedures whilst maintaining full aseptic precautions • Follows local infection control protocols • Explains infection control protocols to students and to patients and their relatives • Aware of the risks of nosocomial infections.	**Area 4.1**		
Examples and descriptors for CCT	**Patient assessment** • Undertakes patient assessment (including history and examination) under difficult circumstances. Examples include: ○ Limited time available (Emergency situations, Outpatients, ward referral), ○ Severely ill patients			

	○ Angry or distressed patients or relatives • Uses and interprets findings adjuncts to basic examination appropriately e.g. electrocardiography, spirometry, ankle brachial pressure index, fundoscopy, sigmoidoscopy • Recognises and deals with complex situations of communication, accommodates disparate needs and develops strategies to cope • Is sensitive to patients cultural concerns and norms • Is able to explain diagnoses and medical procedures in ways that enable patients understand and make decisions about their own health care. **Clinical reasoning** • In a complex case, develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes **Record keeping** • Produces comprehensive, focused and informative records which summarise complex cases accurately **Time management** • Organises, prioritises and manages daily work efficiently and effectively • Works with, guides, supervises and supports junior colleagues • Starting to lead and direct the clinical team in effective fashion **Patient safety** • Leads team discussion on risk assessment, risk management, clinical incidents • Works to make organisational changes that will reduce risk and improve safety • Promotes patients safety to more junior colleagues • Recognises and reports untoward or significant events • Undertakes a root cause analysis • Shows support for junior colleagues who are involved in untoward events **Infection control** • Performs complex clinical procedures whilst maintaining full aseptic precautions • Manages complex cases effectively in collaboration with infection control specialists	**Area 4.1**		

	Professional Behaviour and Leadership	**Mapping to**	**Assessment**	**Areas in**

		Leadership Curriculum	technique	which simulation should be used to develop relevant skills
Category	*Being a good communicator* To include: • Communication with patients (GMP Domains: 1, 3, 4) • Breaking bad news (GMP Domains: 1, 3, 4) • Communication with colleagues (GMP Domains: 1, 3)	***N/A***		
Objective	**Communication with patients** • To establish a doctor/patient relationship characterised by understanding, trust, respect, empathy and confidentiality • To communicate effectively by listening to patients, asking for and respecting their views about their health and responding to their concerns and preferences • To cooperate effectively with healthcare professionals involved in patient care • To provide appropriate and timely information to patients and their families **Breaking bad news** • To deliver bad news according to the needs of individual patients **Communication with Colleagues** • To recognise and accept the responsibilities and role of the doctor in relation to other healthcare professionals. • To communicate succinctly and effectively with other professionals as appropriate • To present a clinical case in a clear, succinct and systematic manner		PBA, DOPS, Mini CEX, Mini PAT and CBD	Desirable: Human factors

Knowledge	**Communication with patients**
	• Understands questioning and listening techniques
	• Understanding that poor communication is a cause of complaints/ litigation
	
	Breaking bad news
	• In delivering bad news understand that:
	  ○ The delivery of bad news affects the relationship with the patient
	  ○ Patient have different responses to bad news
	  ○ Bad news is confidential but the patient may wish to be accompanied
	  ○ Once the news is given, patients are unlikely to take in anything else
	  ○ Breaking bad news can be extremely stressful for both parties
	  ○ It is important to prepare for breaking bad news			

	Communication and working with colleagues
	• Understand the importance of working with colleagues, in particular:
	  ○ The roles played by all members of a multi-disciplinary team
	  ○ The features of good team dynamics
	  ○ The principles of effective inter-professional collaboration
	  ○ The principles of confidentiality			

Skills	**Communication with patients** • Establish a rapport with the patient and any relevant others (e.g. carers) • Listen actively and question sensitively to guide the patient and to clarify information • Identify and manage communication barriers, tailoring language to the individual patient and others and using interpreters when indicated • Deliver information compassionately, being alert to and managing their and your emotional response (anxiety, antipathy etc.) • Use, and refer patients to appropriate written and other evidence based information sources • Check the patient's understanding, ensuring that all their concerns/questions have been covered • Make accurate contemporaneous records of the discussion • Manage follow-up effectively and safely utilising a variety if methods (e.g. phone call, email, letter) • Provide brief advice on health and self care e.g. use of alcohol and drugs. • Ensure appropriate referral and communications with other healthcare professional resulting from the consultation are made accurately and in a timely manner **Breaking bad news** • Demonstrate to others good practice in breaking bad news • Recognises the impact of the bad news on the patient, carer, supporters, staff members and self • Act with empathy, honesty and sensitivity avoiding undue optimism or pessimism **Communication with colleagues** • Communicate with colleagues accurately, clearly and promptly • Utilise the expertise of the whole multi-disciplinary team • Participate in, and co-ordinate, an effective hospital at night or hospital out of hours team • Communicate effectively with administrative bodies and support organisations • Prevent and resolve conflict and enhance			

	collaboration			
Behaviour	**Communication with patients** • Approach the situation with courtesy, empathy, compassion and professionalism • Demonstrate and inclusive and patient centred approach with respect for the diversity of values in patients, carers and colleagues **Breaking bad news** • Behave with respect, honest ant empathy when breaking bad news • Respect the different ways people react to bad news **Communication with colleagues** • Be aware of the importance of, and take part in, multi-disciplinary teamwork, including adoption of a leadership role • Foster an environment that supports open and transparent communication between team members • Ensure confidentiality is maintained during communication with the team • Be prepared to accept additional duties in situations of unavoidable and unpredictable absence of colleagues Act appropriately on any concerns about own or colleagues' health e.g. use of alcohol and/or other drugs.			
Examples and descriptors for Core Surgical Training	• Conducts a simple consultation with due empathy and sensitivity and writes accurate records thereof • Recognises when bad news must be imparted. • Able to break bad news in planned settings following preparatory discussion with seniors • Accepts his/her role in the healthcare team and communicates appropriately with all relevant members thereof			
Examples and descriptors for CCT	• Shows mastery of patient communication in all situations, anticipating and managing any difficulties which may occur • Able to break bad news in both unexpected and planned settings • Fully recognises the role of, and communicates appropriately with, all relevant team members • Predicts and manages conflict between			

	members of the healthcare team • Beginning to take leadership role as appropriate, fully respecting the skills, responsibilities and viewpoints of all team members			

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Category	**Teaching and Training** (GMP Domains: 1, 3)	N/A		
Objective	• To teach to a variety of different audiences in a variety of different ways • To assess the quality of the teaching • To train a variety of different trainees in a variety of different ways • To plan and deliver a training programme with appropriate assessments		Mini PAT, Portfolio assessment at ARCP	Strongly recommended Teaching and Assessment Desirable: Presentation skills Reflective practice
Knowledge	• Understand relevant educational theory and principles relevant to medical education • Understand the structure of an effective appraisal interview • Understand the roles to the bodies involved in medical education • Understand learning methods and effective learning objectives and outcomes • Differentiate between appraisal, assessment and performance review • Differentiate between formative and summative assessment • Understand the role, types and use of workplace-based assessments • Understand the appropriate course of action to assist a trainee in difficulty			
Skills	• Critically evaluate relevant educational literature • Vary teaching format and stimulus, appropriate to situation and subject • Provide effective feedback and promote reflection • Conduct developmental conversations as appropriate eg: appraisal, supervision, mentoring • Deliver effective lecture, presentation, small group and bed side teaching sessions • Participate in patient education • Lead departmental teaching programmes including journal clubs			

	• Recognise the trainee in difficulty and take appropriate action • Be able to identify and plan learning activities in the workplace			
Behaviour	• In discharging educational duties respect the dignity and safety of patients at all times • Recognise the importance of the role of the physician as an educator • Balances the needs of service delivery with education • Demonstrate willingness to teach trainees and other health workers • Demonstrates consideration for learners • Acts to endure equality of opportunity for students, trainees, staff and professional colleagues • Encourage discussions with colleagues in clinical settings to share understanding • Maintains honesty, empathy and objectivity during appraisal and assessment			
Examples and descriptors for Core Surgical Training	• Prepares appropriate materials to support teaching episodes • Seeks and interprets simple feedback following teaching • Supervises a medical student, nurse or colleague through a simple procedure • Plans, develops and delivers small group teaching to medical students, nurses or colleagues			
Examples and descriptors for CCT	• Performs a workplace based assessment including giving appropriate feedback • Devises a variety of different assessments (eg MCQs, WPBAs) • Appraises a medical student, nurse or colleague • Acts as a mentor to a medical student, nurses or colleague • Plans, develops and delivers educational programmes with clear objectives and outcomes • Plans, develops and delivers an assessment programme to support educational activities			

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Category	*Keeping up to date and understanding how to analyse information* ***Including*** • *Ethical research* (GMP Domains: 1) • Evidence and guidelines (GMP Domains: 1) • Audit (GMP Domains: 1, 2)	**Area 1.3**		

	• Personal development			
Objective	• To understand the results of research as they relate to medical practise • To participate in medical research • To use current best evidence in making decisions about the care of patients • To construct evidence based guidelines and protocols • To complete an audit of clinical practice • At actively seek opportunities for personal development • To participate in continuous professional development activities	**Area 1.3** **Area 1.3**	Mini PAT, CBD, Portfolio assessment at ARCP, MRCS and specialty FRCS	
Knowledge	• Understands GMC guidance on good practice in research • Understands the principles of research governance • Understands research methodology including qualitative, quantitative, bio-statistical and epidemiological research methods • Understands of the application of statistics as applied to medical practise • Outline sources of research funding • Understands the principles of critical appraisal • Understands levels of evidence and quality of evidence • Understands guideline development together with their roles and limitations • Understands the different methods of obtaining data for audit • Understands the role of audit in improving patient care and risk management • Understands the audit cycle • Understands the working and uses of national and local databases used for audit such as specialty data collection systems, cancer registries etc • To demonstrate knowledge of the importance of best practice, transparency and consistency	**Area 1.3**		
Skills	• Develops critical appraisal skills and applies these when reading literature • Devises a simple plan to test a hypothesis • Demonstrates the ability to write a scientific paper • Obtains appropriate ethical research approval • Uses literature databases • Contribute to the construction, review and updating of local (and national) guidelines of good practice using the principles of evidence based medicine • Designs, implements and completes audit cycles • Contribute to local and national audit projects as appropriate • To use a reflective approach to practice with an ability to learn from previous experience • To use assessment, appraisal, complaints and other feedback to discuss and develop an understanding of own development needs	**Area 1.3** **Area 1.3**		
Behaviour	• Follows guidelines on ethical conduct in research			

	and consent for research • Keep up to date with national reviews and guidelines of practice (e.g. NICE) • Aims for best clinical practice at all times, responding to evidence based medicine while recognising the occasional need to practise outside clinical guidelines • Recognise the need for audit in clinical practice to promote standard setting and quality assurance • To be prepared to accept responsibility • Show commitment to continuing professional development	**Area 1.3** **Area 1.3**		
Examples and descriptors for Core Surgical Training	• Defines ethical research and demonstrates awareness of GMC guidelines • Differentiates audit and research and understands the different types of research approach e.g. qualitative and quantitative • Knows how to use literature databases • Demonstrates good presentation and writing skills • Participates in departmental or other local journal club • Critically reviews an article to identify the level of evidence • Attends departmental audit meetings • Contributes data to a local or national audit • Identifies a problem and develops standards for a local audit • Describes the audit cycle and take an audit through the first steps • Seeks feedback on performance from clinical supervisor/mentor/patients/carers/service users	**Area 1.3** **Area 1.3**		
Examples and descriptors for CCT	• Demonstrates critical appraisal skills in relation to the published literature • Demonstrates ability to apply for appropriate ethical research approval • Demonstrates knowledge of research organisation and funding sources • Demonstrates ability to write a scientific paper • Leads in a departmental or other local journal club • Contributes to the development of local or national clinical guidelines or protocols • Organise or lead a departmental audit meeting • Lead a complete clinical audit cycle including development of conclusions, the changes needed for improvement, implementation of findings and re-audit to assess the effectiveness of the changes • Seeks opportunity to visit other departments and learn from other professionals	**Area 1.3** **Area 1.3**		

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**	**Areas in which simulation should be used to**

				develop relevant skills
Sub-category:	*Manager* ***including*** • Self Awareness and self management (GMP Domains: 1) • Team-working (GMP Domains: 1, 3) • Leadership (GMP Domains: 1, 2, 3) • Principles of quality and safety improvement (GMP Domains: 1, 3, 4) • Management and NHS structure (GMP Domains: 1)	**Area 1.1 and 1.2** **Area 2** **Area 4.2, 4.3, 4.4** **Area 3**		
Objective	**Self awareness and self management** • To recognise and articulate one's own values and principles, appreciating how these may differ from those of others • To identify one's own strengths, limitations and the impact of their behaviour • To identify their own emotions and prejudices and understand how these can affect their judgement and behaviour • To obtain, value and act on feedback from a variety of sources • To manage the impact of emotions on behaviour and actions • To be reliable in fulfilling responsibilities and commitments to a consistently high standard • To ensure that plans and actions are flexible, and take into account the needs and requirements of others • To plan workload and activities to fulfil work requirements and commitments with regard to their own personal health **Team working** • To identify opportunities where working with others can bring added benefits • To work well in a variety of different teams and team settings by listening to others, sharing information, seeking the views of others, empathising with others, communicating well, gaining trust, respecting roles and expertise of others, encouraging others, managing differences of opinion, adopting a team approach **Leadership** • To develop the leadership skills necessary to lead teams effectively. These include: • Identification of contexts for change • Application of knowledge and evidence to produce an evidence based challenge to systems and processes • Making decision by integrating values with evidence • Evaluating impact of change and taking	**Area 1.1 and 1.2** **Area 2** **Area 5** **Area 4.2, 4.3**	Mini PAT and CBD Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP	Desirable: Patient safety Human factors

	corrective action where necessary **Principles of quality and safety improvement** • To recognise the desirability of monitoring performance, learning from mistakes and adopting no blame culture in order to ensure high standards of care and optimise patient safety • To critically evaluate services • To identify where services can be improved • To support and facilitate innovative service improvement **Management and NHS culture** • To organise a task where several competing priorities may be involved • To actively contribute to plans which achieve service goals • To manage resources effectively and safely • To manage people effectively and safely • To manage performance of themselves and others • To understand the structure of the NHS and the management of local healthcare systems in order to be able to participate fully in managing healthcare provision	**and 4.4** **Area 3**	Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP	
Knowledge	**Self awareness and self management** • Demonstrate knowledge of ways in which individual behaviours impact on others; • Demonstrate knowledge of personality types, group dynamics, learning styles, leadership styles • Demonstrate knowledge of methods of obtaining feedback from others • Demonstrate knowledge of tools and techniques for managing stress • Demonstrate knowledge of the role and responsibility of occupational health and other support networks • Demonstrate knowledge of the limitations of self professional competence **Team working** • Outline the components of effective collaboration and team working • Demonstrate knowledge of specific techniques and methods that facilitate effective and empathetic communication • Demonstrate knowledge of techniques to facilitate and resolve conflict • Describe the roles and responsibilities of members of the multidisciplinary team • Outline factors adversely affecting a doctor's and team performance and methods to rectify these • Demonstrate knowledge of different leadership styles **Leadership** • Understand the responsibilities of the various Executive Board members and Clinical Directors	**Areas 1.1 and 1.2** **Area 2** **Area 5**		

	or leaders
	• Understand the function and responsibilities of national bodies such as DH, HCC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations
	• Demonstrate knowledge of patient outcome reporting systems within surgery, and the organisation and how these relate to national programmes.
	• Understand how decisions are made by individuals, teams and the organisation
	• Understand effective communication strategies within organisations
	• Demonstrate knowledge of impact mapping of service change, barriers to change, qualitative methods to gather the experience of patients and carers
	
	Quality and safety improvement
	• Understand the elements of clinical governance and its relevance to clinical care
	• Understands significant event reporting systems relevant to surgery
	• Understands the importance of evidence-based practice in relation to clinical effectiveness
	• Understand risks associated with the surgery including mechanisms to reduce risk
	• Outline the use of patient early warning systems to detect clinical deterioration
	• Keep abreast of national patient safety initiatives including National Patient Safety Agency , NCEPOD reports, NICE guidelines etc
	• Understand quality improvement methodologies including feedback from patients, public and staff
	• Understand the role of audit, research, guidelines and standard setting in improving quality of care
	• Understand methodology of creating solutions for service improvement
	• Understand the implications of change
	
	Management and NHS Structure
	• Understand the guidance given on management and doctors by the GMC
	• Understand the structure of the NHS and its constituent organisation
	• Understand the structure and function of healthcare systems as they apply to surgery
	• Understand the principles of:
	  • Clinical coding
	  • Relevant legislation including Equality and Diversity, Health and Safety, Employment law, European Working Time Regulations
	  • National Service Frameworks
	  • Health regulatory agencies (e.g., NICE, Scottish Government)
	  • NHS Structure and relationships
	  • NHS finance and budgeting
	  • Consultant contract
		Area 4.2, 4.3, 4.4
		
		Area 3		

	• Commissioning, funding and contracting arrangements • Resource allocation • The role of the independent sector as providers of healthcare • Patient and public involvement processes and role • Understand the principles of recruitment and appointment procedures • Understand basic management techniques			
Skills	**Self awareness and self management** • Demonstrate the ability to maintain and routinely practice critical self awareness, including able to discuss strengths and weaknesses with supervisor, recognising external influences and changing behaviour accordingly • Demonstrate the ability to show awareness of and sensitivity to the way in which cultural and religious beliefs affect approaches and decisions, and to respond respectfully • Demonstrate the ability to recognise the manifestations of stress on self and others and know where and when to look for support • Demonstrate the ability to□□alance personal and professional roles and responsibilities, prioritise tasks, having realistic expectations of what can be completed by self and others **Team working** • Preparation of patient lists with clarification of problems and ongoing care plan • Detailed hand over between shifts and areas of care • Communicate effectively in the resolution of conflict, providing feedback • Develop effective working relationships with colleagues within the multidisciplinary team • Demonstrate leadership and management in the following areas: ○ Education and training of junior colleagues and other members of the team ○ Deteriorating performance of colleagues (e.g. stress, fatigue) ○ Effective handover of care between shifts and teams • Lead and participate in interdisciplinary team meetings • Provide appropriate supervision to less experienced colleagues • Timely preparation of tasks which need to be completed to a deadline **Leadership** • Discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to surgery • Identify trends, future options and strategy relevant to surgery	**Area 1.2 and 1.2** **Area 2** **Area 5**		

	• Compare and benchmark healthcare services • Use a broad range of scientific and policy publications relating to delivering healthcare services • Prepare for meetings by reading agendas, understanding minutes, action points and background research on agenda items • Work collegiately and collaboratively with a wide range of people outside the immediate clinical setting • Evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities • Understand the wider impact of implementing change in healthcare provision and the potential for opportunity costs **Quality and safety improvement** • Adopt strategies to reduce risk e.g. Safe surgery • Contribute to quality improvement processes e.g. o Audit of personal and departmental performance o Errors / discrepancy meetings o Critical incident and near miss reporting o Unit morbidity and mortality meetings o Local and national databases • Maintenance of a personal portfolio of information and evidence • Creatively question existing practise in order to improve service and propose solutions **Management and NHS Structures** • Manage time and resources effectively • Utilise and implement protocols and guidelines • Participate in managerial meetings • Take an active role in promoting the best use of healthcare resources • Work with stakeholders to create and sustain a patient-centred service • Employ new technologies appropriately, including information technology • Conduct an assessment of the community needs for specific health improvement measures	**Area 4.2, 4.3, 4.4** **Area 3**		
Behaviour	**Self awareness and self management** • To adopt a patient-focused approach to decisions that acknowledges the right, values and strengths of patients and the public • To recognise and show respect for diversity and • differences in others • To be conscientious, able to manage time and delegate • To recognise personal health as an important issue **Team working** • Encourage an open environment to foster and explore concerns and issues about the functioning and safety of team working	**Area 1.1 and 1.2** **Area 2**		

	• Recognise limits of own professional competence and only practise within these. • Recognise and respect the skills and expertise of others • Recognise and respect the request for a second opinion • Recognise the importance of induction for new members of a team • Recognise the importance of prompt and accurate information sharing with Primary Care team following hospital discharge **Leadership** • Demonstrate compliance with national guidelines that influence healthcare provision • Articulate strategic ideas and use effective influencing skills • Understand issues and potential solutions before acting • Appreciate the importance of involving the public and communities in developing health services • Participate in decision making processes beyond the immediate clinical care setting • Demonstrate commitment to implementing proven improvements in clinical practice and services • Obtain the evidence base before declaring effectiveness of changes **Quality and safety improvement** • Participate in safety improvement strategies such as critical incident reporting • Develop reflection in order to achieve insight into own professional practice • Demonstrates personal commitment to improve own performance in the light of feedback and assessment • Engage with an open no blame culture • Respond positively to outcomes of audit and quality improvement • Co-operate with changes necessary to improve service quality and safety **Management and NHS Structures** • Recognise the importance of equitable allocation of healthcare resources and of commissioning • Recognise the role of doctors as active participants in healthcare systems • Respond appropriately to health service objectives and targets and take part in the development of services • Recognise the role of patients and carers as active participants in healthcare systems and service planning • Show willingness to improve managerial skills (e.g. management courses) and engage in management of the service	**Area 5** **Area 4.2, 4.3, 4.4** **Area 3**		
Examples and	**Self awareness and self management** • Obtains 360° feedback as part of an assessment	**Area 1.1 and 1.2**		

descriptors for Core Surgical Training	• Participates in peer learning and explores leadership styles and preferences • Timely completion of written clinical notes • Through feedback discusses and reflects on how a personally emotional situation affected communication with another person • Learns from a session on time management **Team working** • Works well within the multidisciplinary team and recognises when assistance is required from the relevant team member • Invites and encourages feedback from patients • Demonstrates awareness of own contribution to patient safety within a team and is able to outline the roles of other team members. • Keeps records up-to-date and legible and relevant to the safe progress of the patient. • Hands over care in a precise, timely and effective manner • Supervises the process of finalising and submitting operating lists to the theatre suite **Leadership** • Complies with clinical governance requirements of organisation • Presents information to clinical and service managers (eg audit) • Contributes to discussions relating to relevant issues e.g. workload, cover arrangements using clear and concise evidence and information **Quality and safety improvement** • Understands that clinical governance is the over-arching framework that unites a range of quality improvement activities • Participates in local governance processes • Maintains personal portfolio • Engages in clinical audit • Questions current systems and processes **Management and NHS Structures** • Participates in audit to improve a clinical service • Works within corporate governance structures • Demonstrates ability to manage others by teaching and mentoring juniors, medical students and others, delegating work effectively, • Highlights areas of potential waste	**Area 2** **Area 5** **Area 4.2, 4.3, 4.4** **Area 3**		
Examples and descriptors for CCT	**Self awareness and self management** • Participates in case conferences as part of multidisciplinary and multi agency team • Responds to service pressures in a responsible and considered way • Liaises with colleagues in the planning and implementation of work rotas **Team working** • Discusses problems within a team and provides an analysis and plan for change	**Area 1.1 and 1.2** **Area 2**		

	• Works well in a variety of different teams
	• Shows the leadership skills necessary to lead the multidisciplinary team
	• Beginning to leads multidisciplinary team meetings
	  ○ Promotes contribution from all team members
	  ○ Fosters an atmosphere of collaboration
	  ○ Ensures that team functioning is maintained at all times.
	  ○ Recognises need for optimal team dynamics
	  ○ Promotes conflict resolution
	• Recognises situations in which others are better equipped to lead or where delegation is appropriate			

	Leadership • Shadows NHS managers • Attends multi-agency conference • Uses and interprets departments performance data and information to debate services • Participates in clinical committee structures within an organisation	**Area 5**		
	Quality and safety improvement • Able to define key elements of clinical governance • Demonstrates personal and service performance • Designs audit protocols and completes audit cycle • Identifies areas for improvement and initiates improvement projects • Supports and participates in the implementation of change • Leads in review of patient safety issue • Understands change management	**Area 4.2, 4.3, 4.4** **Area 3**		
	Management and NHS Structure • Can describe in outline the roles of primary care, including general practice, public health, community, mental health, secondary and tertiary care services within healthcare • Participates fully in clinical coding arrangements and other relevant local activities • Can describe the relationship between PCTs/Health Boards, General Practice and Trusts including relationships with local authorities and social services • Participate in team and clinical directorate meetings including discussions around service development • Discuss the most recent guidance from the relevant health regulatory agencies in relation to the surgical specialty • Describe the local structure for health services and how they relate to regional or devolved administration structures • Discusses funding allocation processes from central government in outline and how that might impact on the local health organisation			

	Professional Behaviour and Leadership	Mapping to Leadership Curriculum	Assessment technique	Areas in which simulation should be used to develop relevant skills
Sub-category:	**Promoting good health** (GMP Domains: 1, 2, 3)			
Objective	• To demonstrate an understanding of the determinants of health and public policy in relation to individual patients • To promote supporting people with long term conditions to self-care • To develop the ability to work with individuals and communities to reduce levels of ill health and to remove inequalities in healthcare provision • To promote self care	N/A	MRCS, specialty FRCS, CBD, Mini PAT	
Knowledge	• Understand guidance documents relevant to the support of self care • Recognises the agencies that can provide care and support out with the hospital • Understand the factors which influence the incidence and prevalence of common conditions including psychological, biological, social, cultural and economic factors • Understand the screening programmes currently available within the UK • Understand the possible positive and negative implications of health promotion activities • Demonstrate knowledge of the determinants of health worldwide and strategies to influence policy relating to health issues • Outline the major causes of global morbidity and mortality and effective, affordable interventions to reduce these			
Skills	• Adapts assessment and management accordingly to the patients social circumstances • Assesses patient's ability to access various services in the health and social system and offers appropriate assistance • Ensures appropriate equipment and devices are discussed and where appropriate puts the patient in touch with the relevant agency • Facilitating access to appropriate training and skills to develop the patients' confidence and competence to self care • Identifies opportunities to promote change in lifestyle and to prevent ill health • Counsels patients appropriately on the benefits and risks of screening and health promotion activities			
Behaviour	• Recognises the impact of long term conditions on the patient, family and friends			

	• Put patients in touch with the relevant agency including the voluntary sector from where they can access support or equipment relevant to their care • Show willingness to maintain a close working relationship with other members of the multi-disciplinary team, primary and community care • Recognise and respect the role of family, friends and carers in the management of the patient with a long term condition • Encourage where appropriate screening to facilitate early intervention			
Examples and descriptors for Core Surgical Training	• Understands that "quality of life" is an important goal of care and that this may have different meanings for each patient • Promotes patient self care and independence • Helps the patient to develop an active understanding of their condition and how they can be involved in self management • Discusses with patients those factors which could influence their health			
Examples and descriptors for CCT	• Demonstrates awareness of management of long term conditions • Develops management plans in partnership with the patient that are pertinent to the patients long term condition • Engages with relevant external agencies to promote improving patient care • Support small groups in a simple health promotion activity • Discuss with small groups the factors that have an influence on their health and describe steps they can undertake to address these • Provide information to an individual about a screening programme offering specific guidance in relation to their personal health and circumstances concerning the factors that would affect the risks and benefits of screening to them as an individual.			

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**	**Areas in which simulation should be used to develop relevant skills**
Sub-category:	*Probity and Ethics* To include • Acting with integrity • Medical Error • Medical ethics and confidentiality (GMP Domains: 1, 2, 3, 4) • Medical consent (GMP Domains: 1, 3, 4) • Legal framework for medical practise (GMP Domains: 1, 2, 3)	Area 1.4		
Objective	• To uphold personal, professional ethics and values, taking into account the values of the	Area 1.4	Mini PAT and CBD,	Desirable:

	organisation and the culture and beliefs of individuals • To communicate openly, honestly and inclusively • To act as a positive role model in all aspects of communication • To take appropriate action where ethics and values are compromised • To recognise and respond the causes of medical error • To respond appropriately to complaints • To know, understand and apply appropriately the principles, guidance and laws regarding medical ethics and confidentiality as they apply to surgery • To understand the necessity of obtaining valid consent from the patient and how to obtain • To understand the legal framework within which healthcare is provided in the UK • To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice, taking into account local and national regulations • Understand ethical obligations to patients and colleagues • To appreciate an obligation to be aware of personal good health		PBA, DOPS, MRCS, specialty FRCS	Human factors
Knowledge	• Understand local complaints procedure • Recognise factors likely to lead to complaints • Understands the differences between system and individual errors • Outline the principles of an effective apology • Knows and understand the professional, legal and ethical codes of the General Medical Council and any other codes to which the physician is bound • Understands of the principles of medical ethics • Understands the principles of confidentiality • Understands the Data Protection Act and Freedom of Information Act • Understands the principles of Information Governance and the role of the Caldicott Guardian • Understands the legal framework for patient consent in relation to medical practise • Recognises the factors influencing ethical decision making including religion, personal and moral beliefs, cultural practices • Understands the standards of practice defined by the GMC when deciding to withhold or withdraw life-prolonging treatment • Understands the UK legal framework and GMC guidelines for taking and using informed consent for invasive procedures including issues of patient incapacity	Area 1.4		
Skills	• To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice taking into account local and national regulations • To create open and nondiscriminatory professional working relationships with colleagues awareness of the need to prevent bullying and harassment • Contribute to processes whereby complaints are reviewed and learned from	Area 1.4 Area 1.4		

	• Explains comprehensibly to the patient the events leading up to a medical error or serious untoward incident, and sources of support for patients and their relatives • Deliver an appropriate apology and explanation relating to error • Use and share information with the highest regard for confidentiality both within the team and in relation to patients • Counsel patients, family, carers and advocates tactfully and effectively when making decisions about resuscitation status, and withholding or withdrawing treatment • Present all information to patients (and carers) in a format they understand, checking understanding and allowing time for reflection on the decision to give consent • Provide a balanced view of all care options • Applies the relevant legislation that relates to the health care system in order to guide one's clinical practice including reporting to the Coroner's/Procurator Officer, the Police or the proper officer of the local authority in relevant circumstances • Ability to prepare appropriate medical legal statements for submission to the Coroner's Court, Procurator Fiscal, Fatal Accident Inquiry and other legal proceedings • Be prepared to present such material in Court			
Behaviour	• To demonstrate acceptance of professional regulation • To promote professional attitudes and values • To demonstrate probity and the willingness to be truthful and to admit errors • Adopt behaviour likely to prevent causes for complaints • Deals appropriately with concerned or dissatisfied patients or relatives • Recognise the impact of complaints and medical error on staff, patients, and the National Health Service • Contribute to a fair and transparent culture around complaints and errors • Recognise the rights of patients to make a complaint • Identify sources of help and support for patients and yourself when a complaint is made about yourself or a colleague • Show willingness to seek advice of peers, legal bodies, and the GMC in the event of ethical dilemmas over disclosure and confidentiality • Share patient information as appropriate, and taking into account the wishes of the patient • Show willingness to seek the opinion of others when making decisions about resuscitation status, and withholding or withdrawing treatment • Seeks and uses consent from patients for procedures that they are competent to perform while o Respecting the patient's autonomy o Respecting personal, moral or religious	Area 1.4 Area 1.4 Area 1.4		

	beliefs ○ Not exceeding the scope of authority given by the patient ○ Not withholding relevant information • Seeks a second opinion, senior opinion, and legal advice in difficult situations of consent or capacity • Show willingness to seek advice from the employer, appropriate legal bodies (including defence societies), and the GMC on medico-legal matters			
Examples and descriptors for Core Surgical Training	• Reports and rectifies an error if it occurs • Participates in significant event audits • Participates in ethics discussions and forums • Apologises to patient for any failure as soon as an error is recognised • Understands and describes the local complaints procedure • Recognises need for honesty in management of complaints • Learns from errors • Respect patients' confidentiality and their autonomy • Understand the Data Protection Act and Freedom of Information Act • Consult appropriately, including the patient, before sharing patient information • Participate in decisions about resuscitation status, withholding or withdrawing treatment • Obtains consent for interventions that he/she is competent to undertake • Knows the limits of their own professional capabilities	Area 1.4 Area 1.4 Area 1.4		

The Assessment System

Assessment and feedback

Overview of the assessment system

The curriculum adopts the following GMC definitions:

Assessment

A systematic procedure for measuring a trainee's progress or level of achievement, against defined criteria to make a judgement about a trainee.

Assessment system

An integrated set of assessments which is in place for the entire postgraduate training programme and which is blueprinted against and supports the approved curriculum.

Purpose of the assessment system

The purpose of the assessment system is to:

- Determine whether trainees are meeting the standards of competence and performance specified at various stages in the curriculum for surgical training.
- Provide systematic and comprehensive feedback as part of the learning cycle.
- Determine whether trainees have acquired the common and specialty-based knowledge, clinical judgement, operative and technical skills, and generic professional behaviour and leadership skills required to practise at the level of Certification in the designated surgical specialty.
- Address all the domains of Good Medical Practice and conform to the principles laid down by the GMC.

Components of the assessment system

The individual components of the assessment system are:

- Workplace-based assessments covering knowledge, clinical judgement, technical skills and professional behaviour and attitudes. These are complemented by the surgical logbook of procedures to support the assessment of operative skills
- Examinations held at key stages; during the early years of training and towards the end of specialty training
- The Learning Agreement and the Assigned Educational Supervisors' report
- An Annual Review of Competence Progression (ARCP)

In order to be included in the assessment system, the assessments methods selected have to meet the following criteria.

- **Valid** - To ensure face validity, the workplace based assessments comprise direct observations of workplace tasks. The complexity of the tasks increases in line with progression through the training programme. To ensure content validity all the assessment instruments have been blueprinted against all the standards of Good Medical Practice.

- **Reliable** - In order to increase reliability, there will be multiple measures of outcomes. ISCP assessments make use of several observers' judgements, multiple assessment methods (triangulation) and take place frequently. The planned, systematic and permanent programme of assessor training for trainers and Assigned Educational Supervisors (AESs) through the postgraduate deaneries/LETBs is intended to gain maximum reliability of placement reports.
- **Feasible** - The practicality of the assessments in the training and working environment has been taken into account. The assessment should not add a significant amount of time to the workplace task being assessed and assessors should be able to complete the scoring and feedback part of the assessment in 5-10 minutes.
- **Cost-effectiveness** – Once staff have been trained in the assessment process and are familiar with the ISCP website, the only significant additional costs should be any extra time taken for assessments and feedback and the induction of new Assigned Educational Supervisors. The most substantial extra time investment will be in the regular appraisal process for units that did not previously have such a system.
- **Opportunities for feedback** – All the assessments, both those for learning and of learning, include a feedback element. Structured feedback is a fundamental component of high quality assessment and should be incorporated throughout workplace based assessments.
- **Impact on learning** - The workplace-based assessments are all designed to include immediate feedback as part of the process. A minimum number of three appraisals with the AES per clinical placement are built into the training system. The formal examinations all provide limited feedback as part of the summative process. The assessment process thus has a continuous developmental impact on learning. The emphasis given to reflective practice within the portfolio also impacts directly on learning.

Assessment and feedback

Types of assessment

The assessment blueprint and framework

The Overarching Blueprint demonstrates that the curriculum is consistent with the four domains of Good Medical Practice: Knowledge, skills and performance; *Safety and quality; Communication, partnership and teamwork; Maintaining trust*. The specialty-specific syllabuses specify the knowledge, skills and performance required for different stages of training and have patient safety as their principal consideration. The professional behaviour and leadership skills syllabus specifies the standards for patient safety; communication, partnership and team-working and maintaining trust. The standards have been informed by the Academy Common Competency Framework and the Academy and NHS Leadership Competency Framework.

Curriculum assessment runs throughout training as illustrated in the Assessment Framework (PDF: 16kb) and is common to all disciplines of surgery.

Types of assessment

Assessments can be categorised as *for* learning or *of* learning, although there is a link between the two.

Assessment *for* Learning - is primarily aimed at aiding learning through constructive feedback that identifies areas for development. Alternative terms are Formative or Low-stakes assessment. Lower reliability is acceptable for individual assessments as they can and should be repeated frequently. This increases their reliability and helps to document progress. Such assessments are ideally undertaken in the workplace.

Assessments for learning are used in the curriculum as part of a developmental or on-going teaching and learning process and mainly comprise workplace-based assessments. They provide the trainee with educational feedback from skilled clinicians that should result in reflection on practice and an improvement in the quality of care. Assessments are collated in the trainee's learning portfolio. These are regularly reviewed during each placement, providing evidence that inform the judgement of the Assigned Educational Supervisors' (AES) reports to the Training Programme Director and the Annual Review of Competence Progression (ARCP). Assessments for learning therefore contribute to summative judgements of the trainee's progress.

Assessment *of* Learning - is primarily aimed at determining a level of competence to permit progression through training or for certification. Such assessments are undertaken infrequently (e.g. examinations) and must have high reliability as they often form the basis of decisions. Alternative terms are summative or high-stakes assessments [GMC].

Assessments of learning in the curriculum are focussed on the waypoints in the specialty syllabuses. For the most part these comprise the examinations and structured AES end of placement reports which, taken in the round, cover the important elements of the syllabus and ensure that no gaps in achievement are allowed to develop. They are collated at the ARCP panel, which determines progress or otherwise.

The balance between the two assessment approaches principally relates to the relationship between competence and performance. Competence (can do) is necessary but not sufficient for performance (does), and as trainees' experience increases so performance-based assessment in the workplace becomes more important.

Assessment and feedback

Workplace Based Assessment (WBA)

The purpose of WBA

The primary purpose of WBA is to provide short loop feedback between trainers and their trainees – a formative assessment to support learning. They are designed to be mainly trainee driven but may be triggered or guided by the trainer. The number of types and intensity of each type of WPBA in any one assessment cycle will be initially determined by the Learning Agreement fashioned at the beginning of a training placement and regularly reviewed. The intensity may be altered to reflect progression and trainee need. For example a trainee in difficulty would undertake more frequent assessments above an agreed baseline for all trainees. In that sense WPBAs meet the criterion of being adaptive.

WBAs are designed to:

- **Provide feedback to trainers and trainees as part of the learning cycle**

The most important use of the workplace-based assessments is in providing trainees with feedback that informs and develops their practice (formative). Each assessment is completed only for the purpose of providing meaningful feedback on one encounter. The assessments should be viewed as part of a process throughout training, enabling trainees to build on assessor feedback and chart their own progress. Trainees should complete more than the minimum number identified.

- **Provide formative guidance on practice**

Surgical trainees can use different methods to assess themselves against important criteria (especially that of clinical reasoning and decision-making) as they learn and perform practical tasks. The methods also encourage dialogue between the trainee and Assigned Educational Supervisor (AES), Clinical Supervisors (CS) and other trainers.

- **Encompass the assessment of skills, knowledge, behaviour and attitudes during day-to-day surgical practice**

WBA is trainee led; the trainee chooses the timing, the case and assessor under the guidance of the AES via the Learning Agreement. It is the trainee's responsibility to ensure completion of the required number of the agreed type of assessments by the end of each placement.

- **Provide a reference point on which current levels of competence can be compared with those at the end of a particular stage of training**

The primary aim is for trainees to use assessments throughout their training programmes to demonstrate their learning and development. At the start of a level it would be normal for trainees to have some assessments which are less than satisfactory because their performance is not yet at the standard for the completion of that level. In cases where assessments are less than satisfactory, trainees should repeat assessments as often as required to show progress.

- **Inform the AES's (summative) assessment at the completion of each placement**

Although the principal role of WBA is formative, the summary evidence will be used to inform the nnual review process and will contribute to the decision made as to how well the trainee is progressing.

- **Contribute towards a body of evidence held in the trainee's learning portfolio and be made available for the Annual Review of Competence Progression (ARCP)**

At the end of a period of training, the trainee's portfolio will be reviewed. The accumulation of formative assessments will be one of a range of indicators that inform the decision as to satisfactory completion of training at the ARCP.

Guidance on good practice use of the Workplace Based assessments (WBAs)

The assessment methods used are:

- CBD (Case Based Discussion)
- CEX (Clinical Evaluation Exercise)
- PBA (Procedure-based Assessment)
- DOPS (Direct Observation of Procedural Skills in Surgery)
- Multi Source Feedback (Peer Assessment Tool)
- Assessment of Audit
- Observation of Teaching

Assessment of Audit (AoA)

The AoA reviews a trainee's competence in completing an audit. Like all workplace-based assessments, it is intended to support reflective learning through structured feedback. It was adapted for surgery from an instrument originally developed and evaluated by the UK Royal Colleges of Physicians.

The assessment can be undertaken whenever an audit is presented or otherwise submitted for review. It is recommended that more than one assessor takes part in the assessment, and this may be any surgeon with experience appropriate to the process. Assessors do not need any prior knowledge of the trainee or their performance to date, nor do the assessors need to be the trainee's current Assigned Educational Supervisor.

Verbal feedback should be given immediately after the assessment and should take no more than 5 minutes to provide. A summary of the feedback with any action points should be recorded on the Assessment of Audit form and uploaded into the trainee's portfolio.

The Assessment of Audit guidance notes provide a breakdown of competences evaluated by this method.

Case Based Discussion (CBD)

The CBD was originally developed for the Foundation training period and was contextualised to the surgical environment. The method is designed to assess clinical judgement, decision-making and the application of medical knowledge in relation to patient care in cases for which the trainee has been directly responsible. The method is particularly designed to test higher order thinking and synthesis as it allows assessors to explore deeper understanding of how trainees compile, prioritise and apply knowledge. The CBD is not focused on the trainees' ability to make a diagnosis nor is it a viva-style assessment. The CBD should be linked to the trainee's reflective practice.

The CBD process is a structured, in-depth discussion between the trainee and the trainee's assessor (normally the Assigned Educational Supervisor) about how a clinical case was managed by the trainee; talking through what occurred, considerations and reasons for actions. By using clinical cases that offer a challenge to the trainee, rather than routine cases, the trainee is able to explain the complexities involved and the reasoning behind choices they made. It also enables the discussion of the ethical and legal framework of practice. It uses patient records as the basis for dialogue, for systematic assessment and structured feedback. As the actual record is the focus for the discussion, the assessor can also evaluate the quality of record keeping and the presentation of cases.

Most assessments take no longer than 15-20 minutes. After completing the discussion and filling in the assessment form, the assessor should provide immediate feedback to the trainee. Feedback would normally take about 5 minutes.

Clinical Evaluation Exercise (CEX) and Clinical Evaluation Exercise for Consent (CEXC)

The CEX/C is a method of assessing skills essential to the provision of good clinical care and to facilitate feedback. It assesses the trainee's clinical and professional skills on the ward, on ward rounds, in Accident and Emergency or in outpatient clinics. It was designed originally by the American Board of Internal Medicine and was contextualised to the surgical environment.

Trainees will be assessed on different clinical problems that they encounter from within the curriculum in a range of clinical settings. Trainees are encouraged to choose a different assessor for each assessment but one of the assessors must be the trainee's current Assigned Educational Supervisor. Each assessor must have expertise in the clinical problem.

The assessment involves observing the trainee interact with a patient in a clinical encounter. The areas of competence covered include: consent (CEXC), history taking, physical examination, professionalism, clinical judgement, communication skills, organisation/efficiency and overall clinical care. Most encounters should take between 15-20 minutes.

Assessors do not need to have prior knowledge of the trainee. The assessor's evaluation is recorded on a structured form that enables the assessor to provide developmental verbal feedback to the trainee immediately after the encounter. Feedback would normally take about 5 minutes.

Direct Observation of Procedural Skills (DOPS)

The DOPS is used to assess the trainee's technical, operative and professional skills in a range of basic diagnostic and interventional procedures, or parts of procedures, during routine surgical practice in order to facilitate developmental feedback. The method is a surgical version of an assessment tool originally developed and evaluated by the UK Royal Colleges of Physicians.

The DOPS is used in simpler environments and can take place in wards or outpatient clinics as well as in the operating theatre. DOPS is set at the standard for Core Surgical Training (CT1/ST1 and CT2/ST2) although some specialties may also use specialty level DOPS in higher specialty training.

The DOPS form can be used routinely every time the trainer supervises a trainee carrying out one of the specified procedures, with the aim of making the assessment part of routine surgical training practice. The procedures reflect the index procedures in each specialty syllabus which are routinely carried out in the trainees' workplace.

The assessment involves an assessor observing the trainee perform a practical procedure within the workplace. Assessors do not need to have prior knowledge of the trainee. The assessor's evaluation is recorded on a structured form that enables the assessor to provide verbal developmental feedback to the trainee immediately afterwards. Trainees are encouraged to choose a different assessor for each assessment but one of the assessors must be the current Assigned Educational Supervisor. Most procedures take no longer than 15-20 minutes. The assessor will provide immediate feedback to the trainee after completing the observation and evaluation. Feedback would normally take about 5 minutes.

The DOPS form is completed for the purpose of providing feedback to the trainee. The overall rating on any one assessment can only be completed if the entire procedure is observed. A judgement will be made on completion of the placement about the overall level of performance achieved in each of the assessed surgical procedures

Multi-Source Feedback (MSF)

Surgical trainees work as part of a multi-professional team with other people who have complementary skills. Trainees are expected to understand the range of roles and expertise of team members in order to communicate effectively to achieve high quality service for patients. The MSF, also known as peer and 360° assessment, is a method of assessing professional competence within a team-working environment and providing developmental feedback to the trainee.

Trainees should complete the MSF once a year. The trainee's Assigned Educational Supervisor (AES) may request further assessments if there are areas of concern at any time during training.

The MSF comprises a self-assessment and assessments of a trainee's performance from a range of co-workers. It uses up to 12 raters with a minimum of 8. Raters are chosen by the trainee and will always include the AES and a range of colleagues covering different grades and environments (e.g. ward, theatre, outpatients) but not patients.

The MSF process should be started in time for raters to submit their online assessments and the generation of the trainee's personalised feedback for discussion with the AES before the end of the placement, and for a further MSF to be performed before the end of the training year, if required. The MSF should, therefore, be undertaken:

- in the 3rd month of the first four-month placement in a training year
- in the 5th month of the first six-month placement in a training year
- in the 5th month of a one-year placement

The competences map across to the standards of Good Medical Practice and to the core objectives of the ISCP. The method enables serious concerns, such as those about a trainee's probity and health, to be highlighted in confidence to the AES, enabling appropriate action to be taken.

Feedback is in the form of a peer assessment chart that enables comparison of the self-assessment with the collated views received from co-workers for each of the 16 competences including a global rating, on a 3-point scale. Trainees are not given access to individual assessments, however, raters' written comments are listed verbatim. The AES should meet with the trainee to discuss the feedback on performance in the MSF. The AES makes comments and signs off the trainee's MSF assessment and can also recommend a repeat MSF.

Observation of Teaching (OoT)

The OoT provides formative feedback to trainees as part of the on-going culture of reflective learning that workplace-based assessment seeks to develop. It was adapted from the Teaching Observation Tool developed by the Joint Royal Colleges of Physicians' Training Board (JRCPTB) for use in surgery. It assesses instances of formal teaching delivered by the trainee as and when they arise.

The form is intended for used when teaching by a trainee is directly observed by the assessor. This must be in a formal situation where others are gathered specifically to learn from the speaker, and does not include bedside teaching or other occasions of teaching in the presence of a patient. Assessors may be any surgeon with suitable experience to review the teaching event; it is likely that these will be consultants for trainees in higher specialty levels.

Possible areas for consideration to aid assessment and evaluation are included in the guidance notes below. It should be noted that these are suggestions for when considering comments and observations rather than mandatory competences.

Procedure Based Assessment

The PBA assesses the trainee's technical, operative and professional skills in a range of specialty procedures or parts of procedures during routine surgical practice up to the level of certification. PBAs provide a framework to assess practice and facilitate feedback in order to direct learning. The PBA was originally developed by the Orthopaedic Competence Assessment Project (OCAP) for Trauma and Orthopaedic surgery and was further developed by the Specialty Advisory Committees for surgery for use in all the surgical specialties.

The assessment method uses two principal components:

- A series of competences within 5 domains. Most of the competences are common to all procedures, but a relatively small number of competences within certain domains are specific to a particular procedure.
- A global assessment that is divided into 8 levels of global rating. The highest rating is the ability to perform the procedure to the standard expected of a specialist in practice within the NHS (the level required for certification or equivalent).

The assessment form is supported by a worksheet consisting of descriptors outlining desirable and undesirable behaviours that assist the assessor in deciding whether or not the trainee has reached a satisfactory standard for certification, on the occasion observed, or requires development.

The procedures chosen should be representative of those that the trainee would normally carry out at that training level and will be one of an indicative list of index procedures relevant to the specialty. The trainee generally chooses the timing and makes the arrangements with the assessor. The assessor will normally be the trainee's, Clinical Supervisor or another surgical consultant trainer. One of the assessors must be the trainee's current Assigned Educational Supervisor. Some PBAs may be assessed by senior trainees depending upon their level of training and the complexity of the procedure. Trainees are encouraged to request assessments on as many procedures as possible with a range of different assessors.

Assessors do not need to have prior knowledge of the trainee. The assessor will observe the trainee undertaking the agreed sections of the PBA in the normal course of workplace activity (usually scrubbed). Given the priority of patient care, the assessor must choose the appropriate level of supervision depending on the trainee's stage of training. Trainees will carry out the procedure, explaining what they intend to do throughout. The assessor will provide verbal prompts, if required, and intervene if patient safety is at risk.

The practicalities of Workplace Based Assessment

Introduction

'I have no time to do this'

The clips located here are intended to illustrate the utility and versatility of the work based assessment tools (WPBA). They show that no more than ten minutes are required for any of these tools to be used meaningfully. They can be undertaken as a planned or as an opportunistic exercise. Any interaction with a trainee and trainer can be converted into a learning opportunity and then be evidenced for the benefit of the trainee and trainer as a WPBA.

The primary purpose of workplace-based assessments is for learning through constructive short loop feedback between trainers and their trainees that identifies areas for development. Collectively they are used as part of the Annual Review of Competence Progression (ARCP) which is a summative process. However, individually the tools are designed to develop trainees and are formative assessment tools which can:

- Trigger conversations between trainee and trainer;
- Enable observation and discussion of clinical practice;
- Record good practice and outline areas for development of knowledge, skills, judgement and professional behaviour;
- Formulate action plans for development;
- Enable trainees to analyse pattern recognition.

The tools are **not** intended to:

- Score trainees;
- Summate progress globally;
- Predict future performance;
- Be completed without a face to face feedback conversation.

These assessments can be divided into:

1. Observational tools

The purpose of the CEX, DOPS and PBA tools is to encourage trainee practice within a supported environment, followed by a developmental conversation (feedback) to identify elements of good practice and areas for development. Such development should be discussed in terms of follow up actions that will extend the trainee's technical proficiency and clinical skills.

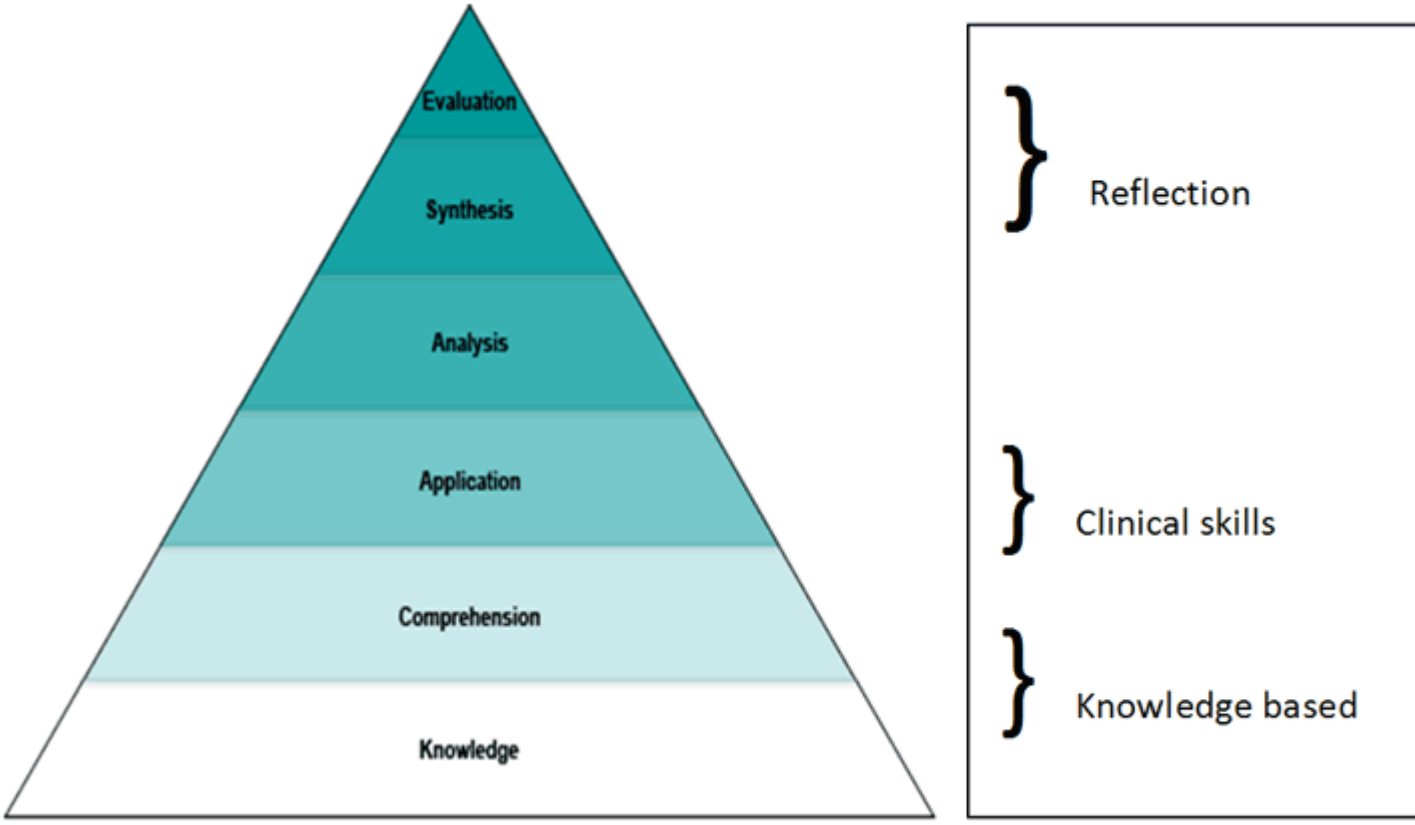
2. Discussion tools

The CBD can record any conversation that reviews a trainee's practice or their thoughts about practice. From an office based, time protected tutorial to the short conversation that happens in the theatre coffee room, or even the corridor, a CBD allows trainers to explore the thinking of their trainees, and to share understanding and professional thinking.

CBDs focus on knowledge and understanding and occur at different levels of Bloom's taxonomy (see figure below). A CBD that looks at knowledge addresses the knowledge base of the trainee e.g. a trainee might be asked for the classification of shock. The trainer could take the discussion beyond the classification to look at how that knowledge relates to the understanding of the patient's condition and the symptoms manifested by the patient. Application relates to the use of knowledge and understanding in practice and so the trainee may be asked to consider the possible treatment options for that patient. Analysis and synthesis are higher order levels of the thinking or cognitive function and CBDs that look at a situation reflectively, to break it down and consider what elements helped or hindered patient care, can be invaluable to trainees in reviewing and making sense of their experiences and in extending their critical thinking. At the evaluation level trainees

may well be engaging in discussions that relate to service improvement and changes in practice at a group level rather than an individual one.

Blooms Taxonomy



3. Insight tools

The Multi Source Feedback collects the trainee's self-assessment together with the subjective views of the trainee from a specified range of colleagues (consultants, specialty doctors, senior nurses and other healthcare providers.) The benefit of the MSF lies in the conversation between trainer and trainee to review and discuss the overview of the collated comments.

Practicalities

Trainers are under the pressure of training multiple trainees all at differing levels of competence and therefore with different training needs. EWTR and the constraints of managing a service as well as training require that we use our time smarter rather than working longer hours for both trainees and trainers. One educational opportunity whether in an operating theatre, on call or in a clinic can be developed into a targeted learning opportunity for individual but also multiple trainees.

The following videos will demonstrate how one case can:

1. allow targeted learning for multiple trainees
2. be alongside our normal surgical practice
3. make use of wastage time during our surgical practice
4. produce multiple items of evidence of trainee development for their portfolio

Each scenario demonstrated ensures that:

1. **Although the trainer facilitates the discussion, the recording of the case is undertaken by the trainee**

2. **Each discussion concludes with an action plan that tasks the trainee with further development**

Observational Tools

The purpose of the CEX, DOPS and PBA tools is to encourage trainee practice within a supported environment, followed by a developmental conversation (feedback) to identify elements of good practice and areas for development. Such development should be discussed in terms of follow up actions that will extend the trainee's technical proficiency and clinical skills.

The following clips demonstrate the versatility of surgical practice. An operation can be divided into several stages all of which can be used to develop trainees at differing levels of competence as well as developing teaching and training skills in the more senior trainees. The clips also demonstrate the use of DOPS and PBAs within a surgical team.

PBA/DOPS

Here a consultant is asked to provide feedback to two trainees on their DOPS (insertion of a catheter) and a PBA (laparoscopic port insertion) before the procedure begins and so this is trainee triggered. It is also possible that a list is designated as a training list and therefore all cases can be used in this way. It is important that trainees or trainers request that such tools be used prior to the procedure. DOPS, PBAs and CEXs are all observational tools and so if the observer is not aware that they are required to observe and provide feedback until after the event the quality of the observation and feedback will be compromised. Note that the consultant requested that the forms be available for her to use whilst observing and providing feedback to the trainees. This is to guide her in her evaluation and also to record comments for the trainees to document subsequently on the ISCP web-based forms.

The following clips are the discussions that occur in the coffee room after completing a laparoscopic cholecystectomy for a FY2, CTI and ST3.

Discussion Tools

The CBD can record any conversation that reviews a trainee's practice or their thoughts about practice. From an office based, time protected tutorial to the short conversation that happens in the theatre coffee room, or even the corridor, CBD allows trainers to explore the thinking of their trainees, and to share understanding and professional thinking.

CBDs that look at information are addressing the knowledge base of the trainee. This may be asking trainees for the classification of shock. A trainer could take the discussion beyond the classification to look at how that knowledge relates to the understanding of the patient's condition and the symptoms manifested by the patient. Application relates to the use of knowledge and understanding in practice and so the trainee may be asked to consider the possible treatment options for that patient. Analysis and synthesis are higher order levels of the thinking or cognitive function and CBDs that look at a situation reflectively, to break it down and consider what elements helped or hindered patient care, can be invaluable to trainees in reviewing and making sense of their experiences and in extending their critical thinking. At the evaluation level trainees may well be engaging in discussions that relate to service improvement and changes in practice at a group level rather than an individual one.

In the clips we see three CBDs focusing on the same case. The first looks at the knowledge base underpinning the case. The second looks at the clinical skills used by a CT2 - that is the application of knowledge and understanding. The third one looks at Reflection by the registrar involved in the case.

Overall Summary of case

A 23 year old man had arrived in Accident and Emergency (A&E) after being involved in a road traffic accident (RTA). He had been riding a bike and had been hit from the left hand side by a car, had got up and was shaken but sore. He was brought to A&E by ambulance and triaged by A&E. He was seen three hours later by the A&E SHO and fast tracked to SAU by a surgical CT1 at handover time. The incoming CT2 flagged him up as a case that should be reviewed by the Registrar on call. The CT2 had seen the patient in SAU as he had been transferred. Suspicious of a splenic injury with the clinical findings, he had requested a CT scan. The CT scan was carried out and was not reported for several hours. The patient was stable and so there was no real urgency but was discussed in the corridor with the consultant on call who had been angered by the clinical scenario and requested that the report be made readily available. The ST3 was busy on call and asked the CT2 to chase the report. Finally the scan result was available at 6pm just as the patient deteriorated and the ST3/ST5 was called urgently as blood pressure was falling. The patient needed urgent review and theatre that evening for a splenectomy. The procedure was carried out by an ST5 with consultant supervision.

Insight Tools

The Multi Source Feedback collects the trainee's self-assessment together with subjective views of the trainee from a specified range of colleagues (consultants, specialty doctors, senior nurses and other Health care providers.) The benefit of the MSF lies in the conversation between trainer and trainee to review and discuss the overview of the collated comments.

The Multi Source Feedback (previously known as Mini PAT) tool is used to provide a 360 degree range of feedback across a spectrum of professional domains which are closely related to the GMC duties of a good doctor. Trainees fill in their self-rating form and they ask a range of people for their ratings too, anonymously. When the data are collated electronically the Assigned Educational Supervisor will meet with the trainee to discuss the overview of the data.

The following two clips show two trainees, (played by the same actor) discussing their feedback with their Assigned Educational Supervisor.

In both clips the AES approaches the conversation in a similar way, explaining what she would like to discuss and then looking first at the strengths of the trainee and where these correlate to the strengths perceived by the other raters, before moving on to any developmental areas and finally compiling an action plan for further development.

Examinations

Examinations are held at two key stages: during initial training and towards the end of specialty training.

MRCS

The Membership Examination of the Surgical Royal Colleges of Great Britain and in Ireland (MRCS) is designed for candidates in the generality part of their specialty training. The purpose of the MRCS is to determine that trainees have acquired the knowledge, skills and attributes required for the completion of core training in surgery and, for trainees following the Intercollegiate Surgical Curriculum Programme, to determine their ability to progress to higher specialist training in surgery.
The MRCS examination has two parts: Part A (written paper) and Part B Objective Structured Clinical Examination (OSCE).

Part A (written paper)

Part A of the MRCS is a machine-marked, written examination using multiple-choice Single Best Answer and Extended Matching items. It is a four hour examination consisting of two papers, each of two hours' duration, taken on the same day. The papers cover generic surgical sciences and applied knowledge, including the core knowledge required in all surgical specialties as follows:

Paper 1 - Applied Basic Science
Paper 2 - Principles of Surgery-in-General

The marks for both papers are combined to give a total mark for Part A. To achieve a pass the candidate is required to demonstrate a minimum level of knowledge in each of the two papers in addition to achieving or exceeding the pass mark set for the combined total mark for Part A.

Part B (OSCE)

The Part B (OSCE) integrates basic surgical scientific knowledge and its application to clinical surgery. The purpose of the OSCE is to build on the test of knowledge encompassed in the Part A examination and test how candidates integrate their knowledge and apply it in clinically appropriate contexts using a series of stations reflecting elements of day-to-day clinical practice.

Further information can be obtained from www.intercollegiatemrcsexams.org.uk

DO-HNS and MRCS(ENT)

Otolaryngology trainees at CT1/2 level in ENT themed core surgical training posts should undertake Part A of the MRCS and the Part 2 (OSCE) of the Diploma in Otolaryngology – Head and Neck Surgery (DO-HNS) in order to acquire the Intercollegiate MRCS(ENT) Diploma. From August 2013, the MRCS(ENT) examination will be a formal exit requirement from Core Surgical Training for Otolaryngology trainees. It is also a mandatory requirement for entry into higher specialty training in ENT. The DO-HNS examination exists as a separate entity but is not a requirement for ST3 unless paired with the MRCS as explained above.

The purpose of the Diploma in Otolaryngology – Head and Neck Surgery (DO-HNS) is to test the breadth of knowledge, the clinical and communication skills and the professional attributes considered appropriate by the Colleges for a doctor intending to undertake practice within an otolaryngology department in a trainee position. It is also intended to provide a test for those who wish to practise within another medical specialty, but have an interest in the areas where that specialty interacts with the field of otolaryngology. It is also relevant for General Practitioners wishing to offer a service in minor ENT surgery.

FRCS

The Intercollegiate Specialty Examination (FRCS) is a summative assessment in each of the ten surgical specialties. It is a mandatory requirement for certification and entry to the Specialist Register. It forms part of the overall assessment system for UK and Irish surgical trainees who have participated in a formal surgical

training programme leading to UK certification or a Certificate of Eligibility for Specialist Registration via the Combined Programme (CESR CP) or, in the Republic of Ireland, a Certificate of Completion of Specialist Training (CCST).

Section 1 is a written test composed of two Multiple Choice Questions papers; Paper 1: Single Best Answer [SBA] and Paper 2: Extended Matching Items [EMI]. Candidates must meet the required standard in Section 1 in order to gain eligibility to proceed to Section 2.

Section 2 is the clinical component of the examination. It consists of a series of carefully designed and structured interviews on clinical topics, some being scenario-based and some being patient-based. Further information can be obtained from www.intercollegiate.org.uk

Feedback

All the assessments in the curriculum, both those *for* learning and *of* learning, include a feedback element. Workplace based assessments are designed to include immediate feedback for learning as part of two-way dialogue towards improving practice. Formal examinations provide limited feedback as part of the summative process. Assigned Educational Supervisors are able to provide further feedback to each of their trainees through the regular planned educational review and appraisal that features at the beginning, middle and end of each placement. Feedback is based on the evidence contained in the portfolio.

Educational feedback:

- Enhances the validity of the assessment and ensures trainees receive constructive criticism on their performance.
- Is given by skilled clinicians, thereby enhancing the learning process.

Constructive formative feedback should include three elements:

- An outline of the strengths the trainee displayed,
- Suggestions for development,
- Action plan for improvement.

Feedback is complemented by the trainee's reflection on his/her practice with the aim of improving the quality of care.

The Annual Review of Competence Progression (ARCP)

Purpose of the ARCP (adapted from the Gold Guide):

The ARCP is a formal Deanery/LETB process which scrutinises each surgical trainee's suitability to progress to the next stage of, or complete, the training programme. It follows on from the appraisal process and bases its recommendations on the evidence that has been gathered in the trainee's learning portfolio during the period between ARCP reviews. The ARCP records that the required curriculum competences and experience are being acquired, and that this is at an appropriate rate. It also provides a coherent record of a trainee's progress. The ARCP is not in itself an assessment exercise of clinical or professional competence.

The ARCP should normally be undertaken on at least an annual basis for all trainees in surgical training. Some Deaneries/Local Education and Training Boards (LETBs) plan to arrange two ARCPs each year in the early years of training. An ARCP panel may be convened more frequently if there is a need to deal with progression issues outside the normal schedule.

The surgical Specialty Advisory Committees (SACs) use the opportunity afforded, through their regional Liaison Member on the panel, to monitor the quality of training being delivered by the programme and/or its components.

Further information on this process can be found in the Reference Guide to Postgraduate Specialty Training in the UK.

Preparation for the ARCP

The trainee's learning portfolio provides the evidence of progress. It is the trainee's responsibility to ensure that the documentary evidence is complete in good time for the ARCP.

The SAC representatives on ARCP Panels will monitor trainees' progress throughout their training to assess whether they are on course to obtain certification or a Certificate of Eligibility for Specialist Registration via a Combine Programme; CESR(CP). Particular attention will be paid in the final two years of training to ensure that any remedial action can be taken, if necessary, to enable individual trainees to successfully complete their training.

The ARCP Panel

Please note that during the time of the panel meeting, members of an ARCP panel will have access to the portfolios of the trainees they review. Panel members are appointed by the Deanery/LETB and are likely to include the following:

- Postgraduate Dean / Associate Director / Associate Dean
- Training Programme Director
- Chair of the Specialty Training Committee
- College/Faculty representatives (e.g. liaison member from the surgical specialty SAC)
- Assigned Educational Supervisors (who have not been directly responsible for the trainee's placements)
- Associate Directors/Deans
- Academic representatives (for academic programmes, who have not been directly responsible for the trainee's placements)
- A representative from an employing authority
- Lay/patient representative
- External trainer
- Representative from an employing organisation

ARCP Outcomes

The ARCP panel will make one of the following recommendations about each trainee based on the evidence put before them:

Satisfactory progress

1. Achieving progress and competences at the expected rate

Unsatisfactory progress

2. Development of specific competences required – additional training time not required
3. Inadequate progress by the trainee – additional training time required
4. Released from training programme with or without specified competences

Insufficient evidence

5. Incomplete evidence presented – additional training time may be required

Recommendation for completion of the training programme (core or higher)

6. Gained all required competences for the programme

(Similar outcomes are made for those in Locum Appointment for Training (LAT) / Fixed-term Specialty Training Appointment (FTSTA) / Out of programme (OOP) and Top-up training).

The training system

Roles and responsibilities

Schools of Surgery/LETBs/Deaneries

Schools of Surgery or their equivalent have been created nationally within each Postgraduate Medical Deanery and/or Local Education and Training Board (LETB) and the Scottish Surgical Specialties Training Board (SSSTB) within NHS Education for Scotland (NES). They provide the structure for educational, corporate and financial governance and co-ordinate the educational, organisational and quality management activities of surgical training programmes. The Schools draw together the representatives and resources of Deaneries/LETBs/SSTB, JCST, trusts, NHS service providers and other relevant stakeholders in postgraduate medical education and training. They ensure the implementation of curricula and assessment methodologies with associated training requirements for educational supervision. In the Republic of Ireland, these roles are undertaken by the Medical Council, HSE National Doctors Training and Planning (NDTP) and the Royal College of Surgeons in Ireland (RCSI).

Who is involved in training?

The key roles involved in teaching and learning are Training Programme director (TPD), Assigned Educational Supervisor (AES), Clinical Supervisor (CS), Assessor and Trainee.

Training Programme Director

The majority of Training Programme Directors (TPDs) manage specialty programmes; there are, however, a number TPDs who manage Core Surgical Training programmes TPD (CST).

TPDs are responsible for:

- Organising, managing and directing the training programmes, ensuring that the programmes meet curriculum requirements;
- Identifying and supporting local faculty (i.e. AES, CS) including organising their induction and training where necessary;
- Overseeing progress of individual trainees through the levels of the curriculum; ensuring that appropriate levels of supervision, training and support are in place;
- Helping the Postgraduate Dean and AES manage trainees who are running into difficulties by identifying remedial placements and resources where required;
- Working with delegated Specialty Advisory Committee (SAC) representatives (SAC Liaison Members) and College representatives (e.g. college tutors) to ensure that programmes deliver the specialty curriculum;
- Ensuring that Deanery/LETB administrative support are knowledgeable about curriculum delivery and are able to work with SACs, trainees and trainers;
- Administering and chairing the Annual Review of Competence Progression meetings (ARCP).

Assigned Educational Supervisor

Educational supervision is a fundamental conduit for delivering teaching and training in the NHS. It takes advantage of the experience, knowledge and skills of expert clinicians / consultant trainers and their familiarity with clinical situations. It ensures interaction between an experienced clinician and a trainee. This is the desired link between the past and the future of surgical practice, to guide and steer the learning process of the trainee. Clinical supervision is also vital to ensure patient safety and the high quality service of trainees. The curriculum requires trainees reaching the end of their training to demonstrate competence in clinical supervision before Certification. The Joint Committee on Surgical Training (JCST) also acknowledges that the process of gaining competence in supervision must start at an early stage in training with trainees supervising more junior trainees. The example set by the educational supervisor is the most powerful influence upon the standards of conduct and practice of a trainee.

In the UK, the GMC's plan for recognition and approval of trainers will take full effect from 31 July 2016. In addition to the GMC's statutory requirements for approval of GP trainers, postgraduate deans and medical schools will formally recognise medical trainers who are named Assigned Educational Supervisors and named Clinical Supervisors.

The Assigned Educational Supervisor (AES) is responsible for between 1 and 4 trainees at any time. The number will depend on factors such as the size of the unit and the availability of support such as a Clinical Supervisors (CSs) or Clinical Tutors (CTs). The role of the Assigned Educational Supervisor is to:

- Have overall educational and supervisory responsibility for the trainee in a given placement;
- Ensure that an induction to the unit (where appropriate) has been carried out;
- Ensure that the trainee is familiar with the curriculum and assessment system relevant to the level/stage of training and undertakes it according to requirements;
- Ensure that the trainee has appropriate day-to-day supervision appropriate to their stage of training;
- Act as a mentor to the trainee and help with both professional and personal development;
- Agree a Learning Agreement, setting, agreeing, recording and monitoring the content and educational objectives of the placement;
- Discuss the trainee's progress with each trainer with whom a trainee spends a period of training and involve them in the formal report to the annual review process;
- Undertake regular formative/supportive appraisals with the trainee (typically one at the beginning, middle and end of a placement) and ensure that both parties agree to the outcome of these sessions and keep a written record;
- Ensure a record is kept in the portfolio of any serious incidents for concerns and how they have been resolved;
- Regularly inspect the trainee's learning portfolio and ensure that the trainee is making the necessary clinical and educational progress;
- Inform trainees of their progress and encourage trainees to discuss any deficiencies in the training programme, ensuring that records of such discussions are kept;
- Ensure patient safety in relation to trainee performance by the early recognition and management of those doctors in distress or difficulty;
- Keep the Training Programme Director informed of any significant problems that may affect the trainee's training;
- Provide an end of placement AES report for the Annual Review of Competence Progression (ARCP).

In order to become an AES, a trainer must be familiar with the curriculum and have a demonstrated an interest and ability in teaching, training, assessing and appraising. They must have appropriate access to teaching resources and time for training allocated to their job plan (approx. 0.25 PA per trainee). AESs must have undertaken training in a relevant Training the Trainers course/programme offered by an appropriate educational institution and must keep up-to-date with developments in training. They must have access to the support and advice of their senior colleagues regarding any issues related to teaching and training and to keep up-to-date with their own professional development.

Clinical Supervisor

Clinical supervisors (CS) are responsible for delivering teaching and training under the delegated authority of the AES. They:

- Carry out assessments as requested by the AES or the trainee. This will include delivering feedback to the trainee and validating assessments;
- Ensure patient safety in relation to trainee performance;
- Liaise closely with other colleagues, including the AES, regarding the progress and performance of the trainee with whom they are working during the placement;
- Keep the AES informed of any significant problems that may affect the trainee's training;
- Provide regular CS Reports which contribute to the AES's end of placement report for the ARCP.

The training of CSs should be similar to that of the AES.

Assessor

Assessors will carry out a range of assessments and provide feedback to the trainee and the AES, which will support judgements made about a trainee's overall performance. Assessments during training will usually be carried out by clinical supervisors (consultants) and other members of the surgical team, including (for the MSF). Those who are not medically qualified may also be tasked with this role.

Those carrying out assessments must be appropriately qualified in the relevant professional discipline and trained in the methodology of workplace based assessment (WBA). This does not apply to MSF raters.

Trainee

The trainee is required to take responsibility for his/her learning and to be proactive in initiating appointments to plan, undertake and receive feedback on learning opportunities. The trainee is responsible for ensuring that

- a Learning Agreement is carried out in each placement;
- opportunities to discuss progress are identified;
- assessments are undertaken and validated by assessors in good time;
- evidence is systematically recorded in the learning portfolio.

Teaching

The detail of clinical placements will be determined locally by Training Programme Directors (TPD). In order to provide sufficient teaching and learning opportunities, the placements need to be in units that:

- Are able to provide sufficient clinical resource;
- Have sufficient trainer capacity.

The JCST has developed a series of Quality Indicators (QIs) to help identify good and poor quality training placements. The QIs are measured through the JCST trainee survey.

The PDs and AESs define the parameters of practice and monitor the delivery of training to ensure that the trainee has exposure to:

- A sufficient range and number of cases in which to develop the necessary technical skills (according to the stage of training) and professional judgement (to know when to carry out the procedure and when to seek assistance);
- Managing the care of patients in the case of common conditions that are straightforward, patients who display well known variations to common conditions, and patients with ill-defined problems;
- Detailed feedback.

Development of professional practice can be supported by a wide variety of teaching and learning processes, including role modelling, coaching, mentoring, reflection, and the maximising of both formal and informal opportunities for the development of expertise on the job. Learning opportunities need to be related to changing patterns of healthcare delivery.

The training system

Training roles

Training roles will exist, with minor, locally agreed variation, in all Deaneries/LETBs/Schools and are a requirement of the ISCP.

In accordance with GMC and curriculum standards:

- There must be an adequate number of appropriately qualified and experienced staff in place to deliver an effective training programme.
- Trainers must have the time within their job plan to support the role.
- Subject areas of the curriculum must be taught by staff with relevant specialist expertise and knowledge.
- Individuals undertaking educational roles must undergo a formal programme of training and be subject to regular review.
- Training programmes should include practise exercises covering an understanding of the curriculum, workplace-based assessment methodology and how to give constructive feedback. They should also include equality and diversity training.

The main surgical training roles fall into one of two broad categories:

- Those to do with managing individual trainees (i.e. Clinical Supervisor, Assigned Educational Supervisor, Training Programme Director)
- Those to do with managing the system. Included within these roles would be important aspects such as the provision of common learning resources and quality control of the training being provided. Training Programme Directors would fall into this category.

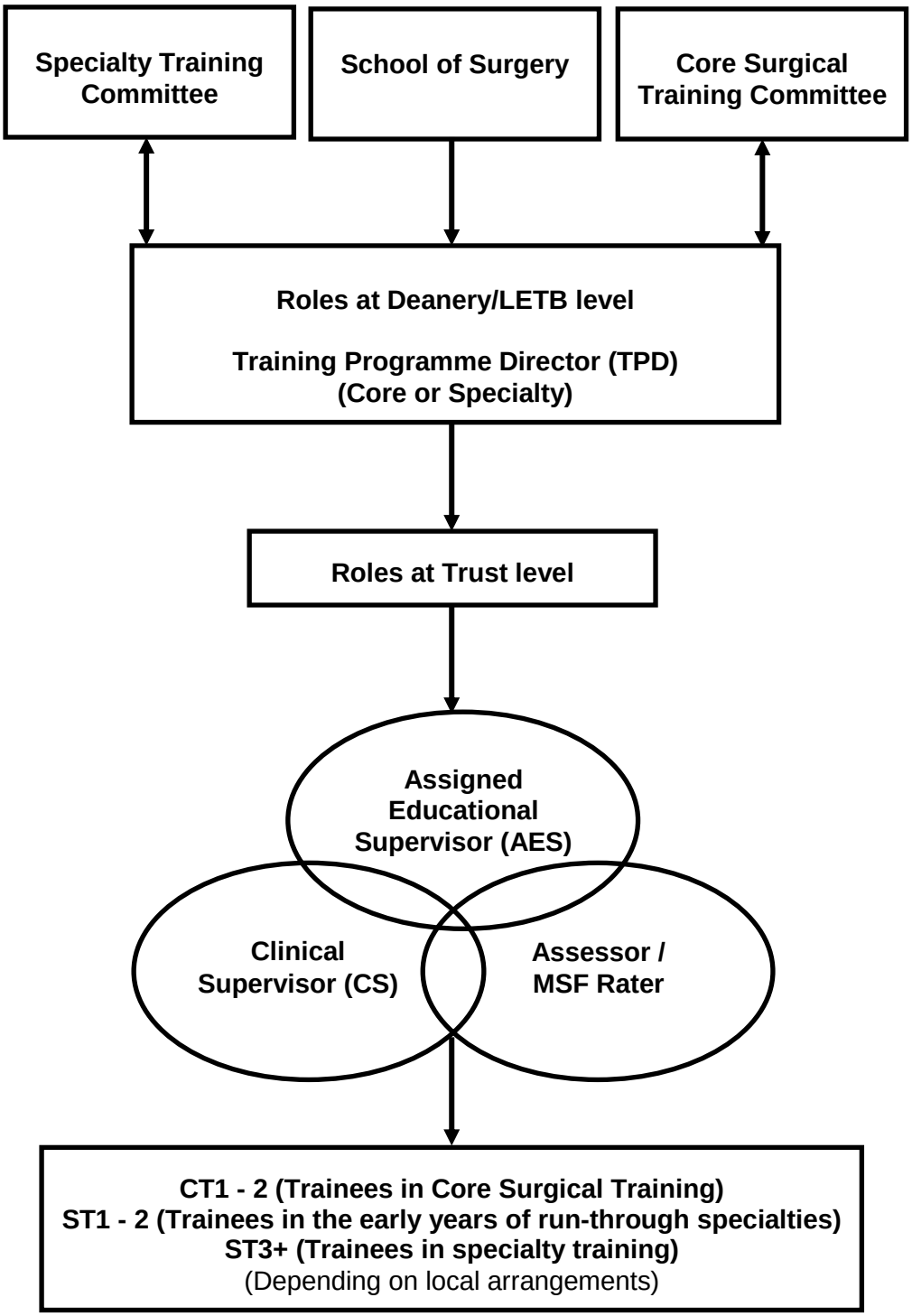
It may be entirely appropriate for a surgeon involved in training to hold more than one role (e.g. Assigned Educational Supervisor, Clinical Supervisor and Assessor) where the workload is manageable and the trainee continues to receive training input from several sources. The role of assessor is not intended to be used as a formal title, but describes a function that will be intrinsic to many of the roles described in the ISCP.

The ISCP requires adherence to a common nomenclature for the trainers who are working directly with the trainee and these are highlighted on the website. These roles are Training Programme Director (core surgical training or specialty training), Assigned Educational Supervisor, Clinical Supervisor, Trainee and Assessor. This is to support the interactive parts of the website, access levels etc. and it is strongly recommended that Deaneries/LETBs use the titles outlined here in the interests of uniformity.

There is great variation in the number of trainees being managed at the various levels within Deaneries/LETBs/Schools of Surgery. This is particularly the case during the early years of training. For this reason, many Deaneries/LETBs will find that the Training Programme Director roles may have to be subdivided. It is recommended that the suffix or prefix ‘deputy’ is used in conjunction with the main title rather than devising a completely new title. This will make clear the general area in which the surgeon is working and should help to avoid confusion.

Wherever possible these roles are harmonised with the Gold Guide but there may be minor variations in nomenclature and tasks that reflect the intercollegiate approach to surgical specialty training.

Training Governance Structure



Multi-professional team

The Training System

Quality assurance of the training system

The General Medical Council (GMC) has overall responsibility for the quality assurance of medical education and training in the UK, as outlined in its Quality Improvement Framework (QIF) but it delegates some responsibility in this respect to the Postgraduate Medical Deaneries and/or Local Education and Training Boards (LETBs) and their Schools of Surgery, the Joint Committee on Surgical Training (JCST) and Local Education Providers (LEPs). In the Republic of Ireland, these roles are undertaken by the Medical Council (MC) and by the Royal College of Surgeons in Ireland (RCSI).

Deaneries and LETBs are responsible for the quality management of training programmes and posts and must implement processes to ensure training within their region meets national standards and is implemented in accordance with the GMC-approved curricula. LEPs deliver training and are responsible for its quality control. In the Republic of Ireland, this is overseen by the MC and the RSCI.

As part of its role in the quality management of surgical training, the JCST has developed its own quality assurance strategy based upon its quality indicators, trainee surveys, Certification Guidelines and the annual specialty report. For more information on the quality assurance of surgical training, please visit the Quality assurance page on the JCST website.

Quality Indicators

- The JCST, in conjunction with the Schools of Surgery, has developed a series of quality indicators (QIs) in order to assess the quality of surgical training placements in each of the surgical specialties and at core level.
- The QIs, which are measured through the JCST trainee survey, enable good and poor quality training placements to be identified so appropriate action may be taken.

The QIs for each surgical specialty and core surgical training are available to download from the JCST Quality Indicators page of the JCST website.

JCST trainee survey

- The JCST launched the trainee survey in November 2011, which was developed in conjunction with the Schools of Surgery.
- The survey is run through the ISCP website and trainees are notified through their ISCP account of when they should complete it. This should be towards the end of each placement and prior to their ARCP.
- Confirmation of completion of all relevant surveys will be part of the evidence assessed at the trainees' ARCP.

For more information on the trainee survey, please visit the JCST Trainee Survey page of the JCST website.

Certification Guidelines

- Each SAC has produced a series of guidelines to identify what trainees applying for Certification will normally be expected to have achieved during their training programme. The guidelines cover such aspects of training as: clinical and operative experience; operative competency; research; quality improvement; and management and leadership.
- Trainees and trainers should use the guidelines to inform decisions about the experiences that trainees need to gain during their 5/6 year programme.
- Trainees will be monitored against the guidelines throughout their training programmes to ensure they are receiving appropriate exposure to all aspects of training.

For more information and to download a copy of the guidelines for each specialty, please visit the Certification Guidelines page of the JCST website.

Annual Specialty Report

The JCST submits an Annual Specialty Report (ASR) to the GMC to provide both a national overview of the status of surgical training and an update on any major developments.

For more information on the ASR, please visit the GMC Quality Improvement Framework (QIF) page.

Teaching and Learning

Principles of surgical education

The balance between didactic teaching and learning in clinical practice will change as the trainee progresses through the training programme, with the former decreasing and the latter increasing.

A number of people from a range of professional groups will be involved in teaching. In accordance with GMC standards, subject areas of the curriculum must be taught by staff with relevant specialist expertise and knowledge. Specialist skills and knowledge are usually taught by consultants and more advanced trainees; whereas the more generic aspects of practice can also be taught by the wider multi-disciplinary team. The Assigned Educational Supervisor (AES) is key as he/she agrees with each trainee how he/she can best achieve his or her learning objectives within a placement.

Establishing a learning partnership creates the professional relationship between the teacher (AES, CS or assessor) and the learner (trainee) that is essential to the success of the teaching and learning programme.

The learning partnership is enhanced when:

- The teacher understands:
    - Educational principles, values and practices and has been appropriately trained;
    - The role of professional behaviour, judgement, leadership and team-working in the trainee's learning process;
    - The specialty component of the curriculum;
    - Assessment theory and methods.
- The learner:
    - Understands how to learn in the clinical practice setting, recognising that everything they see and do is educational;
    - Recognises that although observation has a key role to play in learning, action (doing) is essential;
    - Is able to translate theoretical knowledge into surgical practice and link surgical practice with the relevant theoretical context.
    - Uses reflection to improve and develop practice (see self-directed learning);
- There is on-going dialogue in the clinical setting between teacher and the learner;
- There are adequate resources to provide essential equipment and facilities;
- There is adequate time for teaching and learning.

Trainee-led learning

The ISCP encourages a learning partnership between the trainee and AES in which learning is trainee-led and trainer-guided. Trainees are expected to take a proactive approach to learning and development and towards working as a member of a multi-professional team. Trainees are responsible for:

- Utilising opportunities for learning throughout their training;
- Triggering assessments and appraisal meetings with their trainers, identifying areas for observation and feedback throughout placements;
- Maintaining an up to date learning portfolio;
- Undertaking self and peer assessment;
- Undertaking regular reflective practice.

Learning opportunities

There are many learning opportunities available to trainees to enable them to develop their knowledge, clinical and professional judgement, technical and operative ability and conduct as a member of the profession of surgery. The opportunities broadly divide into three areas:

- Learning from practice otherwise known as learning on-the-job or in the workplace. This can be informal and opportunistic or planned and structured
- Learning from formal situations
- Self-directed learning

Learning from practice

The workplace provides learning opportunities on a daily basis for surgical trainees, based on what they see and what they do. Whilst in the workplace, trainees will be involved in supervised clinical practice, primarily in a hospital environment in wards, clinics or theatre. The trainees' role in these contexts will determine the nature of the learning experience.

Learning will start with observation of a trainer (not necessarily a doctor) and will progress to assisting a trainer; the trainer assisting/supervising the trainee and then the trainee managing a case independently but with access to expert help. The level of supervision will decrease and the level of complexity of cases will increase as trainees become proficient in the appropriate technical skills and are able to demonstrate satisfactory professional judgement. Continuous systematic feedback, both formal and informal, and reflection on practice are integral to learning from practice, and will be assisted by assessments for learning (formative assessment methods) such as surgical Direct Observation of Procedural Skills in Surgery (DOPS), Procedure Based Assessment (PBA), Clinical Evaluation Exercise (CEX) and Case Based Discussion (CBD), each of which has been developed for the purpose.

Trainees are required to keep a surgical logbook to support the assessment of operative skills, using corresponding supervision levels:

Assisting (A):

The trainer completes the procedure from start to finish
The trainee performs the approach and closure of the wound
The trainer performs the key components of the procedure

Supervised - trainer scrubbed (S-TS):

The trainee performs key components of the procedure (as defined in the relevant PBA) with the trainer scrubbed

Supervised - trainer unscrubbed (S-TU):

The trainee completes the procedure from start to finish
The trainer is unscrubbed and is:
- in the operating theatre throughout
- in the operating theatre suite and regularly enters the operating theatre during the procedure (70% of the duration of the procedure)

Performed (P):

The trainee completes the procedure from start to finish
The trainer is present for <70% of the duration of the procedure
The trainer is not in the operating theatre and is:
- scrubbed in the adjacent operating theatre
- not in the operating suite but is in the hospital

Training more junior trainee (T):

A non-consultant grade surgeon training a junior trainee

Observed (O):

Procedure observed by an unscrubbed trainee

In the Workplace – Informal

Surgical learning is largely experiential in its nature with any interaction in the workplace having the potential to become a learning episode. The curriculum encourages trainees to manage their learning and to reflect on practice. Trainees are encouraged to take advantage of clinical cases, audit and the opportunities to shadow peers and consultants.

Theatre (training) lists

Training lists on selected patients enable trainees to develop their surgical skills and experience under supervision. The lists can be carried out in a range of settings, including day case theatres, main theatres endoscopy suites and minor injuries units.

Each surgical procedure can be considered an integrated learning experience and the formative workplace assessments provide feedback to the trainee on all aspects of their performance, from pre-operative planning and preparation, to the procedure itself and subsequent post-operative management.

The syllabus is designed to ensure that teaching is systematic and based on progression. The level of supervision will decrease and the level of complexity of cases will increase as trainees become proficient in the appropriate technical skills and are able to demonstrate satisfactory professional judgement. By Certification time trainees will have acquired the skills and judgement necessary to provide holistic care for patients normally presenting to their specialty and referral to other specialists as appropriate. Feedback on progress is facilitated by the DOPS and PBA.

Clinics (Out Patients)

Trainees build on clinical examination skills developed during the Foundation Programme. There is a progression from observing expert clinical practice in clinics to assessing patients themselves, under direct observation initially and then independently, and presenting their findings to the trainer. Trainees will assess new patients and will review/follow up existing patients.

Feedback on performance will be obtained primarily from the CEX and CBD workplace assessments together with informal feedback from trainers and reflective practice.

Ward Rounds (In Patient)

As in the other areas, trainees will have the opportunity to take responsibility for the care of in-patients appropriate to their level of training and need for supervision. The objective is to develop surgeons as effective communicators both with patients and with other members of the team. This will involve taking consent, adhering to protocols, pre-operative planning and preparation and post-operative management. Progress will be assessed by MSF, CBD, CEX, DOPS and PBA.

Learning from formal situations

Work based practice is supplemented by an educational programme of courses, local postgraduate teaching sessions arranged by the Specialty Training Committees (STCs) or Schools of Surgery and regional, national and international meetings. Courses have a role at all levels, for example basic surgical skills courses using skills centres and specialty skills programmes. These focus on developing specific skills using models, tissue in skills labs and deceased donors as appropriate and are delivered by the colleges, specialty associations and locally by Deaneries/LETBs.

It is recognised that there is a clear and increasingly prominent role for off the job learning through specific intensive courses to meet specific learning goals. Trainees must show evidence that they have gained competence in the management of trauma through a valid certificate of the Advanced Trauma Life Support (ATLS®), Advanced Paediatric Life Support (APLS) or equivalent, at the completion of core training. In the following specialties, trainees need to show that this certificate of competence is being maintained up to Certification.

- Neurosurgery
- Oral and Maxillofacial Surgery
- Paediatric Surgery (APLS)
- Plastic Surgery
- Trauma and Orthopaedic Surgery

Learning from simulation

Simulation in this context means any reproduction or approximation of a real event, process, or set of conditions or problems e.g. taking a history in clinic, performing a procedure or managing post-operative care. Trainees have the opportunity of learning in the same way as they would in the real situation but in a patient-safe environment. Simulation can be used for the development of both individuals and teams.

Simulation training is often classified as either high or low fidelity. The fidelity of simulation refers to how accurately or closely the simulation resembles the situation being reproduced. The realism of the simulation may reflect the environment in which simulation takes place, the instruments used or the emotional and behavioural features of the real situation. Simulation training does not necessarily depend on the use of expensive equipment or complex environments e.g. it may only require a suturing aid or a role play.

Simulation training has several purposes:
- supporting learning and keeping up to date;
- addressing specific learning needs;
- situational awareness of human factors which can influence people and their behaviour;
- enabling the refining or exploration of practice in a patient-safe environment;
- promoting the development of excellence;
- improving patient care.

The use of simulation in surgical training should be regarded as part of a blended approach to managing teaching and learning concurrent with supervised clinical practice. The use of simulation on its own cannot replace supervised clinical practice and experience or authorise a doctor to practice unsupervised.

Provision of feedback and performance debriefing are integral and essential parts of simulation-based training. Feedback can be assisted by workplace-based assessments and recorded in the learning portfolio. Simulation training should broadly follow the same pattern of learning opportunities offering insight into the development of technical skills, team-working, leadership, judgement and professionalism.

Self-directed learning

Self-directed learning is encouraged. Trainees are encouraged to establish study groups, journal clubs and conduct peer review; there will be opportunities for trainees to learn with peers at a local level through postgraduate teaching and discussion sessions; and nationally with examination preparation courses. Trainees are expected to undertake personal study in addition to formal and informal teaching. This will include using study materials and publications and reflective practice. Trainees are expected to use the developmental feedback they get from their trainers in appraisal meetings and from assessments to focus further research and practice.

Reflective practice is a very important part of self-directed learning and is a vital component of continuing professional development. It is an educational exercise that enables trainees to explore with rigour, the complexities and underpinning elements of their actions in surgical practice in order to refine and improve them.

Reflection in the oral form is very much an activity that surgeons engage in already and find it useful and developmental. Writing reflectively adds more to the oral process by deepening the understanding of surgeons about their practice. Written reflection offers different benefits to oral reflection which include: a record for later review, a reference point to demonstrate development and a starting point for shared discussion.

Some of this time will be taken as study leave. In addition there are the web based learning resources which are on the ISCP website and specialty association websites.

Supervision

In accordance with the requirements of Good Medical Practice, the ultimate responsibility for the quality of patient care and the quality of training lies with the supervisor. Supervision is designed to ensure the safety of the patient by encouraging safe and effective practice and professional conduct. The level of supervision will change in line with the trainee's progression through the stages of the curriculum, enabling trainees to develop independent learning. Those involved in the supervision of trainees must undertake appropriate training.

Trainees must be placed in approved posts that meet the required training and educational standards. Individual trusts must take responsibility for ensuring that clinical governance and health and safety standards are met.

Clinical Supervisors and other trainers must have the relevant qualifications, experience and training to undertake the role. There is an expectation that supervision and feedback are part of the on-going relationship between trainees and their trainers and assessors, and that it will take place informally on a daily basis.

The syllabus content details the level of knowledge, clinical, technical/operative and professional skills expected of a trainee at any given stage of training. The surgical logbook provides a record of the trainee's operative experience and supervision levels corresponding to the operative levels of: *Observed (O); Assisting (A); Supervised - trainer scrubbed (S-TS); Supervised - trainer unscrubbed (S-TU); Performed (P) and Training a more junior trainee (T).*

Trainees must work at a level commensurate with their experience and competence, and this should be explicitly set down by the Assigned Educational Supervisor in the Learning Agreement. There is a gradual reduction in the level of supervision required until the level of competence for independent practice is acquired.

In keeping with Good Medical Practice and Good Clinical Care, trainees have a responsibility to recognise and work within the limits of their professional competence and to consult with colleagues as appropriate. The development of good judgement in clinical practice is a key requirement of the curriculum. The content of the curriculum dealing with professional behaviour emphasises the responsibilities of the trainee to place the well-being and safety of patients above all other considerations. Throughout the curriculum, great emphasis is laid on the development of good judgement and this includes the ability to judge when to seek assistance and advice. Appropriate consultation with trainers and colleagues for advice and direct help is carefully monitored and assessed.

The Learning Agreement

The Learning Agreement is a written statement of the mutually agreed learning goals and strategies negotiated between a trainee (learner) and the trainee's Assigned Educational Supervisor (AES). It is agreed at the initial objective setting meeting and covers the period of the placement. The agreement is based on the learning needs of the individual trainee undertaking the learning as well as the formal requirements of the curriculum. The web-based Learning Agreement form is accessed through the secure area of the website and is completed on-line. The AES and trainee complete the Learning Agreement together and are guided by the Training Programme Director's (TPD's) Global Objective. A blank Learning Agreement Form (for illustrative purposes only) is available in the Help area of the website.

Training Programme Director's (TPD's) Global Objective

The TPD's global objective is a statement which the TPD can set for the trainee's training year, informing placement objectives. The broad global objectives, derived from the syllabuses, are included in the Learning Agreement and highlight what the trainee should achieve during a period that may encompass several placements. They normally cover the period between the annual reviews.

The global objective for early years training would normally cover the following components:

- Run-through programmes: the common surgical syllabus, specialty-specific competences in the chosen specialty and professional behaviour and leadership skills for the stage.
- Themed programmes: the common surgical syllabus, specialty-specific competences in a number of complementary specialties and professional behaviour and leadership skills for the stage.
- Un-themed, broad-based programmes: the common surgical syllabus, sampling of specialty-specific competences in a number of specialties (topping up in specific specialties later in the stage) and professional behaviour and leadership skills for the stage.

For those wishing to pursue an academic surgical career, a proportion of competences might emphasise additional academic pursuits including research and teaching.

Together, the global and placement objectives are the means used by the TPD, AES and trainee to ensure curriculum coverage.

The content of the Learning Agreement will be influenced by the:

- Requirements set by the surgical specialty in its syllabus for the stage of training;
- Learner's previous experience;
- Learner's knowledge and skills;
- Learner's personal aspirations set down in a Personal Development Plan;
- Local circumstances of the placement.

Although the Learning Agreement is a statement of expected outcomes there is equal emphasis on learning opportunities and how the outcomes can be met. Trainees use it to keep track of which objectives have been completed and which have not; AESs use it to set down the educational strategies that are suited to the experiential learning appropriate to the placement, to monitor progress and make a summative report to the annual review. TPDs use it to oversee the process and to ensure that the correct training is delivered appropriate to the achievement of learning outcomes.

Each stage in the process allows the trainee and the AES to make individual comments on the training and appraisal process and to sign it off. The trainee also has the right of appeal to the TPD through the process. The trainee will meet the AES at the start of each placement to agree the learning and development plan and at mid-point and end of placement to review and report on progress. The frequency of meetings can be increased if required. The Learning Agreement provides a mechanism for the trainee and AES to meet and discuss feedback and guidance.

Stages in the Learning Agreement

There are three stages to the Learning Agreement that should be completed in sequence: Objective Setting; Interim Review; and Final Review.

In the Objective Setting stage, the trainee and the AES:

- Agree the learning objectives for the placement according to the trainee's needs and the learning that can be delivered in the placement and with reference to the TPD's global objective;
- Identify learning opportunities in the workplace such as in theatre, ward, clinic and simulated settings;
- Agree on the workplace-based assessments that can be undertaken to obtain formative feedback and demonstrate progress matched to areas of the syllabus e.g. DOPS for central venous line insertion;
- Identify the resources required so that the trainee can achieve his/her learning objectives, for example, time in clinic and theatre, equipment, reflective practice, trainers;
- Identify formal learning opportunities, activities or events in the educational programme, that the trainee should attend e.g. seminars, presentations, peer reviews.
- Consider the examinations the trainee is required to take whilst in the placement and courses the trainee plans to attend.
- Consider opportunities for audit and quality improvement activities, research and other projects.

Once these aspects have been agreed, the trainee and the AES sign off the Learning Agreement.

Although the objective setting stage of the Learning Agreement is the agreed plan for the placement, it can be modified during training if circumstances change and this can be recorded during the interim or final review.

Interim Review occurs at the mid-point of the placement. This stage is encouraged even for 4-month placements to check that progress is in line with the placement objectives. In the event that difficulties are being experienced, focussed training and repeat assessments should be initiated. The objectives for progress and further action plans agreed at the meeting are recorded on the Interim Review form and are signed off by the trainee and AES.

Final Review occurs towards the end of the placement. The trainee and AES review what the trainee has learned in the placement against the placement objectives set down in the Learning Agreement. Evidence would typically include the following:

- Workplace-based assessments and feedback (these should occur frequently with a range of assessors)
- Surgical logbook
- Audit and quality improvement
- Courses and seminars
- Examinations
- Meetings and conferences
- Patient feedback
- Presentations and posters
- Projects
- Publications
- Reflective practice (includes self MSF, reflective CBD, reflections in the journal and workplace-based assessment)
- Research
- Teaching

Each tool captures elements of judgment in action and maps to standards of Good Medical Practice. Over the training period they reveal the trainee's particular strengths, areas for development and progress.

Assigned Educational Supervisor's Report: The AES is responsible for synthesising the portfolio evidence at the end of the placement. The process of judging the evidence also involves the Trainee's

Clinical Supervisors. The AES's evidence-based report is written in terms of the trainee's progress and specific learning outcomes and is facilitated by the learning portfolio. The report will be a key document for the Annual Review of Competence Progression (ARCP).

The TPD takes a holistic view of progress over the whole training period.

The Learning Portfolio

he trainee's portfolio has been designed to store evidence of the trainee's competence and fitness to practise. It serves as a repository of evidence that a trainee is progressing and meeting all the requirements of the curriculum. The portfolio is the vehicle used by the Annual Review of Competence Progression (ARCP) to recommend the trainee's continuing training or Certification.

The portfolio is organised into discrete sections, each designed to help trainees along the training pathway. The main sections of the portfolio include the Learning Agreement from each placement, reports from the trainee's Assigned Educational Supervisor (AES) and Clinical Supervisors (CSs); workplace-based assessment (WBA), a summary of the surgical logbook, other evidence of workplace activity and the ARCP.

The trainee is solely responsible for the contents of the portfolio both in terms of quality and veracity. Submission of information known to be false, if discovered, will have very serious consequences. All entries to the portfolio must respect the confidentiality of colleagues and patients and should not contain names or numbers to identify patients or staff. Portfolio evidence must be collected and documented systematically by the trainee as they progress through each placement.

Trainees must record all assessments that are conducted during the training period. WBA is considered to be formative and those that are of a less than satisfactory standard, if reflected upon appropriately, need not necessarily be seen as negative because they provide developmental feedback to drive learning and so improve practice. Where assessments have been unsatisfactory they should be repeated after focussed training until successful. The portfolio should enable the AES at the end of placement to assess the trainee in the round.

As part of the their professional obligations, trainees are also required to sign an educational contract which defines, in terms of education and training, their relationships, duties and obligations. It also makes explicit the basic framework the trainee can expect from each placement and what is expected by the AES in return. Statements of health and probity statement are also obligatory because doctors must have integrity and honesty and must take care of their own health and well-being so as not to put patients at risk.

Appendix C – ACGME Case Requirements for Graduates 2021 and present

Neurological Surgery Case Log Defined Case Categories and Required Minimum Numbers

Review Committee for Neurological Surgery

Effective 7/1/2019[1]

Defined Case Category	Required Minimum Number	
Cranial	**Senior + Lead Cases***	**Lead Cases***
Cranial: Tumor General	60	30
Cranial: Tumor Sellar/Parasellar	20	10
Cranial: Trauma/Other	60	30
Cranial: Vascular Open	10	--
Cranial: Vascular Endovascular	10	--
Total Cranial Vascular	**60**	**30**
Cranial: CSF Diversion/ETV/Other	20	10
Cranial/Extracranial: Pain	10	5
Cranial/Extracranial: Functional Disorder	10	5
Cranial/Extracranial: Epilepsy	10	5
Total Cranial	**300**	**150**
Spinal	**Senior + Lead Cases**	**Lead Cases**
Spinal: Anterior Cervical	30	15
Spinal: Posterior Cervical	30	15
Spinal: Thoracic/Lumbar/Sacral/Instrumentation/Fusion	30	15
Spinal: Lumbar Laminectomy/Laminotomy	30	15
Spinal: Stimulation/Lesion/Pump/Other	10	5
Total Spinal	**300**	**150**
Peripheral Nerve	**10**	**5**
Radiosurgery	**10**	**5**
Peripheral Device Management	**20**	**10**
Critical Care	**Senior + Lead Cases**	**Lead Cases**
Airway Management	--	10
Angiography	--	20
Arterial Line Placement	--	10
CVP Line Placement	--	10
EVD/Transdural Monitor Placement	--	30
Lumbar/Other Puncture/Drain Placement	--	10
Percutaneous Tap of CSF Reservoir	--	10
Total Critical Care	**--**	**100**
Pediatric* **	**Senior + Lead Cases**	**Lead Cases**
Pediatric: Cranial Tumor	5	-
Pediatric: Cranial Trauma/Other	10	5
Pediatric: CSF Diversion/ETV/Other	10	5
Pediatric: Spinal	5	-
Total Pediatric	**40**	**20**
TOTAL ALL DEFINED CASE CATEGORIES	**800**	**400**
Intradural Microdissection**	**--**	**80**

***See Case Log Guidelines for participation level definitions**

****See Case Log Guidelines for microdissection definition and case types that could potentially involve microdissection and count toward microdissection; must be designated when logging a case**

*****Pediatric cases must be designated when logging a case in order to count toward pediatric minimums**

[1]Residents graduating in 2021 and beyond reviewed for compliance with these minimums.

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