The Intercollegiate Surgical Curriculum

Educating the surgeons of the future

Vascular Surgery Curriculum

August 2014

Including Simulation

(Updated 2015 and 2016)

ISCP INTERCOLLEGIATE SURGICAL CURRICULUM PROGRAMME

Approved 30 August 2016, for implementation August 2016

Contents

Introduction	**3**
The Educational Principles of the Curriculum	**4**
Components of the Curriculum	**5**
Educational Framework	**6**
The Purpose and Structure of the Training Programme	**11**
The Training Pathway	**13**
The Syllabus	**16**
Overview and Objectives of the Vascular Surgery Curriculum	**17**
Key Topics	**23**
Index Procedures	**24**
Core Stage Overview	**30**
Core Stage Topics	**35**
Intermediate and Final Stage syllabus	**52**
Professional Behaviour and Leadership Syllabus	**103**
The Assessment System	**132**
The Training System	**155**
Teaching and Learning	**163**

This document was updated 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. It was further updated in 2016 to include amendments to skills levels approved by the GMC.

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

Overview and Objectives of the Vascular Surgery Curriculum

Trainees in Vascular Surgery will undergo core training (CT1-2) followed by a period of 6 indicative years of specialty training (ST3- ST8). The purpose of this curriculum is to train vascular surgeons up to CCT level who will be able to work independently and to the standard of a consultant or equivalent. As such, most of their skills will relate to the management of 'everyday' vascular elective and emergency surgery and this forms the basis of the curriculum, with the competencies, both non-operative and operative being completed by the final year of training. This curriculum also allows a degree of flexibility to respond to the changing needs of our patients and the development of new models of healthcare delivery, and to incorporate technological advances, particularly in the endovascular field. The syllabus includes elective and emergency Vascular Surgery topics which need to be completed by all trainees to enable them to manage the conditions listed in the Scope and Standards of Vascular Surgical Practice key topics.

The syllabus also includes specific competencies in elective and emergency gastro-intestinal surgery to complement the management of intra-abdominal vascular conditions and these will normally be obtained during one indicative year of upper and lower gastro-intestinal surgery to be undertaken during intermediate training in ST3/ST4.

Some complex vascular and endovascular procedures are performed in only a few specialised centres and so do not require every trainee to reach a stage of full competence by the time of CCT. It is expected that trainees wishing to work in such centres will seek further experience and mentorship after CCT, although all trainees will be expected to have knowledge of these procedures so that they can initiate appropriate referral to a specialist centre**.**

The Specialty of Vascular Surgery

Vascular Surgery is a new surgical specialty in the UK and has evolved out of the specialty of general surgery. During recent years, and in common with many other disciplines, there has been a trend towards further specialisation within general surgery. This has lead to the development of Vascular Surgery as a separate stand alone specialty.

The vascular syllabus and the ability at the completion of training to manage a vascular emergency 'take', provide a common purpose across the specialty of Vascular Surgery.

The major areas of special interest associated with the specialty of Vascular Surgery are listed below, each involving the acquisition of both open and endovascular/endovenous competencies to include relevant imaging skills:

Aortic
Carotid
Limb salvage
Venous
Vascular Access
Renovascular

In addition to these clearly defined disease-based areas of special interest there are others that are less well developed within the syllabus but represent substantial areas of practice:

Vascular Surgery related to trauma
The Vascular Surgery of Childhood
Academic Vascular Surgery
Vascular medicine

The variations in the scope of practices within the specialty are highly variable and largely shaped by local circumstances, the needs of the service and the personal development of the surgeons delivering those services. All vascular surgeons will be given the opportunity to develop an area of special expertise by the time they gain their CCT and some will then go on to include that area as a major part of their consultant practice as their individual careers develop.

There is also significant shared ('Interface') practice with other specialties and sub-specialties such as interventional radiology, cardiology, cardiothoracic surgery, diabetic medicine, care of the elderly medicine, renal medicine, transplant surgery and stroke medicine.

The Medical Staff Delivering Vascular Surgery Services

These comprise Consultants, Trainees (Specialty trainees, Core surgical trainees, Foundation trainees) and Non-Consultant Career Grades (Associate Specialists and Staff Grades & Clinical Fellows). Other grades supporting the delivery of the service include Surgical Assistants (surgical care practitioners) and specialist nurses.

Consultant surgeons have admitting rights for patients in the hospitals in which they work. Patients so admitted remain under their care at all times unless specific arrangements are made to devolve the care of those patients to another named consultant colleague.

Consultant vascular surgeons, while taking the responsibility for the care of their own patients, usually work as part of a larger team (e.g. Surgical Directorates, Multi-disciplinary teams) and in turn lead their own surgical teams. Most, but not all, consultant surgeons will take on one or more of a number of training roles. Other aspects of workforce disposition may be found on the appropriate sections of the Royal College and Specialty Association web sites.

Trainees who, for whatever reason, do not complete their training through to CCT level in UK training schemes may seek to take up a non-career grade post (SAS). The scope of practice will depend very much on the individual proficiencies and the specification of the post. Surgeons in such posts work under the direction of a named consultant(s) and are important members of the team.

Areas of Special Interest

Vascular surgeons treat patients with peripheral vascular disease i.e. vascular disease affecting the vessels of the neck, trunk and limbs. It is characterised by a high volume of urgent and emergency admissions and the requirement for an extensive supporting infra structure from interventional radiologists, cardiothoracic surgeons, cardiologists and ultrasonographers.

There is a close relationship between vascular surgical practice and vascular medicine and interventional radiology. Endovascular procedures are often performed jointly by surgeons and radiologists. The interface between the provision of vascular surgical services and renal transplantation, especially with regard to access for haemodialysis, has always been close and is likely to remain so.

Most vascular consultants will develop areas of special interest either as a part of their training or following appointment to post. These may include any of the topics listed in the intermediate and final stages of the Vascular Section of the ISCP syllabus:

Superficial venous disease
Deep venous disease
Lower limb ischaemia (acute and chronic)
Upper limb ischemia (acute and chronic)
Aortic aneurysmal disease
Peripheral artery aneurysms
Vascular access
Renovascular disease
Carotid artery disease
Mesenteric vascular disease
Vascular trauma
Hyperhidrosis
Lymphoedema
Endovascular surgery
Thoracic outlet syndrome
Diabetic foot
Vascular anomalies
Vasospastic disorders and vasculitis

Academic Vascular Surgery

Academic vascular surgery provides an exciting and challenging career for those who wish to combine clinical surgery with a major commitment to research and undergraduate teaching.

Trainees interested in this career pathway will, in addition to completing clinical training in Vascular Surgery (and developing an area of special interest), acquire a high level of competency in research (and teaching).

After completing their clinical training those committed to an academic career will pursue a position in a university department as a senior lecturer with a longer-term view to promotion to a chair in Vascular Surgery.

For further information on training in academic medicine the reader is referred to the following web address:

- http://www.surgicalresearch.org.uk/PDFs/MMC%20UKCRC%20Draft%20Document.pdf
- http://www.asgbi.org.uk/download.cfm?docid=E6B29CE7-CF46-4947-8A9BEA8B50956C5A

For further information about Vascular Surgery in the UK the reader is referred to the Vascular Society at www.vascularsociety.org.uk

The Scope and Practice of Vascular Surgery at CCT

Consultants in the specialty of Vascular Surgery will be in possession of a CCT or CESR in Vascular Surgery. At the completion of surgical training a CCT/CESR holder will be competent to manage an unselected emergency vascular surgical 'take' and will have a developed interest in one or more of the areas of special interest associated with Vascular Surgery.

The scope of practice and proficiencies will qualify the CCT/CESR holder to apply for a consultant post in the specialty, and thereafter to develop his/her practice in accordance with the specifications of the post and further personal development. Some will wish to maintain a broad portfolio of practice and emergency care; others may seek to practice exclusively in the area of special interest.

This list of Key Topics defines, in general terms, the essential skills and levels of clinical expertise expected of a surgeon emerging from training having completed the vascular surgical specialty CCT. It is unlikely that the expertise will be confined to the descriptions that follow as most surgeons will have developed additional interests and competencies (special interests) by the time that they emerge from training. There is flexibility within the curricula to accommodate this.

It should be understood that as a surgical career develops following CCT, the range and levels of expertise will change in response to the demands of the service, personal aspirations and the needs of patients.

Taking into account the present and future requirements of the service, the vascular surgeon emerging from training at CCT level will expect to see patients presenting with a range of problems. As it is used here, the term 'manage' equates to diagnosis, assessment and treatment or referral as appropriate. The levels of expertise expected are further expressed within the detail of the syllabus.

The Vascular Surgery trainee who has satisfactorily completed training will possess the professional skills associated with consultant surgical practice in the UK (including those outlined in Good Medical Practice). This will include the ability to assess published evidence in relation to clinical practice and ability to teach others.

Key Topics

- Have knowledge of both open and endovenous treatments for varicose veins and treat patients with varicose veins from start to finish
- Assessment, resuscitation and management of patients with acutely ischaemic legs.
- Recognition of critical ischaemia and claudication in patients with peripheral vascular disease and knowledge of treatment option including angioplasty, stent and bypass techniques.
- Diagnosis and treatment of patients with acute upper limb ischaemia.
- Ability to diagnose and manage patients with femoral false aneurysms.
- Recognition and management of severe vascular infections, involving native vessels and synthetic grafts
- Recognise and know the principles of treatment of patients with ruptured abdominal aortic aneurysms.
- Safely assess the multiply injured patient (includes ATLS certification)
- Identify and manage traumatic and iatrogenic vascular injuries
- Diagnosis and management, including operative management of abdominal and peripheral aortic aneurysms. Have knowledge of both open and endovascular repair of aortic aneurysms.
- Diagnosis and management of carotid artery disease including endovascular techniques.
- A basic knowledge of vascular access techniques and the treatment of arterio-venous malformations.
- Recognition and management of patients with vasospastic and arteritic conditions of their upper and lower limbs.
- Diagnosis and treatment of patients with lymphoedema.
- Have knowledge of the diagnosis and management of thoracic outlet syndrome.
- Know how to manage patients with hyperhidrosis
- Have knowledge of the techniques involved in renovascular surgical intervention.
- Ability to assess published evidence in relational to clinical practice and ability to teach others

Index Procedures

In Vascular Surgery these are generally groups of procedures which are common and/or are seen as representing important areas of technical expertise. In the trainee surgical logbook peer comparison graphs are produced for these procedures to give information about the amount of experience gained. The more common procedures are also used during assessment by Surgical Directly Observed Procedural Skills (Surgical DOPS) and Procedure Based Assessments (PBAs).

- Aortic aneurysm
    - Elective open repair tube graft
    - Elective open repair bifurcated graft
    - Endovascular repair
    - Ruptured aneurysm repair
- Carotid endarterectomy
- Infra-inguinal bypass
    - Above knee run-off
    - Below knee popliteal run off
    - Calf vessel run off
    - Popliteal artery exclusion bypass
- Emergency Lower Limb
    - Femoral Embolectomy
    - 4 compartment fasciotomy
    - Repair of false femoral artery aneurysm
- Upper Limb
    - Brachial artery embolectomy
- Re-do Vascular Surgery
    - Removal of infected graft
- Varicose vein surgery
    - Sapheno-femoral and sapheno-popliteal ligation.
    - Endovenous LSV and SSV ablation
    - Foam injection sclerotherapy
- Vascular access
- AV fistula at wrist, upper arm
- Revision of failed AV fistula

Training In the Specialty of Vascular Surgery

The purpose of training in the specialty of Vascular Surgery is to produce surgeons competent to work as consultant vascular surgeons in the UK.

This includes:

- Competence to manage patients presenting on an unselected emergency vascular surgical 'take' diagnosing, assessing and treating or referring on as appropriate.

- Competence in the management of patients presenting with the range of symptoms and elective conditions as specified in the syllabus for the specialty of Vascular Surgery.

- Competence in the knowledge of specific complex conditions of Vascular Surgery by virtue of appropriate training and assessment opportunities obtained during training.

- Professional competencies as specified in the syllabus and derived from the Good Medical Practice documents of the General Medical Council of the UK.

Stages of Training

The syllabus may be considered in 3 stages. Satisfactory completion of the core (early years), intermediate and final stages will lead to the award of a CCT and the opportunity to apply for appointment as a Consultant Vascular Surgeon. Included are the areas of diagnosis, investigation, operative and non-operative management for and communication with those in his/her care. In addition, the programme should allow the trainee to develop generic skills that allow effective interaction with other professionals (clinical and non-clinical) involved in the delivery of health care to patients.

Core stage

In the core stage (early years training), the Vascular Surgery trainee may not have even decided upon a career in Vascular Surgery. They will undergo broad based core surgical training, while being able to sample a range of surgical specialties. The objectives will be to attain the knowledge skills and behaviours required of all surgeons (i.e. the common competencies), together with some initial competencies relevant to the specialty of Vascular Surgery. At the end of this period of training, the trainee will have decided upon a career in Vascular Surgery, and will seek to enter Vascular Surgery training.

Intermediate stage

Following successful competitive national application and interview for entry into vascular training at ST3 level, the Intermediate stage (ST3 & 4) emergency and elective vascular surgical experience is developed to enable the trainee to have a breadth of experience of the common vascular surgical emergencies as well as gaining exposure to all of the elective vascular specialist areas. In addition, competence to manage patients undergoing vascular procedures within the abdomen will require training for one year in gastrointestinal surgery to include emergency general surgery experience.

Final stage

The Final stage (ST5 - 8) includes both vascular surgical and endovascular procedures and it is expected that by the end of ST8 the trainee will be able to manage competently unselected vascular surgical emergencies when on call. It is anticipated that certain complex emergencies may still need the assistance of more experienced or subspecialist colleagues. The specialty components of the Final stage include the breadth of conditions likely to be encountered in specialist practice. The degree of specialisation may vary depending on individual career aims. The necessary skills should be acquired in four indicative years.

All the training stages involve the application of generic Professional Behaviour and Leadership Skills.

The training pathway in Vascular Surgery is designed to provide logical break points for those leaving or rejoining training below CCT level.

Structure of Training

All three stages of Vascular Surgery training allow exposure to emergency care. All trainees should include a regular on-call commitment in their job plans. In addition the use of 6 month rotating posts, with trainees working for different consultants every six months, allows a breadth of experience to cover all of the subspecialty areas of Vascular Surgery.

The syllabus is designed in a flexible way to allow a modular approach for those who wish to combine areas of special interest.

Training Progression

Progression through training is demonstrated by acquisition of the levels of knowledge and clinical and technical skills determined for each stage. In the Early years trainees attain the required competencies to enter specialty training at the ST3 level. In the Intermediate and Final stages for each topic within each section of the syllabus levels have been set for the end of intermediate training at ST4, the middle of final training at ST6 and the end of final training at ST8. Stages have been divided in this way so that during the ARCP process trainees progress can be assessed and modified to ensure all necessary skills are acquired. Thus at the end of ST3 for example it is anticipated that a trainee will have acquired some of the competencies expected by the end of ST4. It should be possible for the trainee and the Training Programme Director (TPD) to decide the priorities for the coming year to ensure the remaining skills are attained and allocate the most appropriate training post(s). The levels of competence expected by the end of ST4 are common for all trainees.

The same principle of progression through levels will be applied at ST5 and ST7. The design of the specialty sections is comprehensive. However for some trainees acquisition of every single topic may not be appropriate or necessary. The level of expertise can be chosen by the trainee in discussion with the TPD according to career aspirations. Furthermore in some areas it is unlikely that full competence will be gained because of technical complexity. The levels of skill have been adjusted accordingly in these areas.

It is incumbent on the trainee that the levels of competence achieved are recorded in the appropriate logbooks together with relevant research, records of training courses and an audit of personal cases performed. This portfolio will continue into consultant practice.

Specialty Induction in Vascular Surgery

There is a recognised need for induction into specialty training, the benefits of which have been clearly described.
This proposed curriculum change would require Vascular Surgery trainees to receive specialty specific induction at the start of their specialty training.
The proposed content of this induction has been piloted on all appointees to Vascular Surgery since 2013.

Aims of Specialty Induction in Vascular Surgery

The general aims are to:

1) prepare trainees in Vascular Surgery to be able to interact with, assess and treat patients with vascular disease in a safe and professional manner
2) prepare trainees in Vascular Surgery to be able to maximise every training opportunity by teaching them the basic, generic skills and capabilities

The specific aims are to:

1) give a full explanation of the syllabus
2) provide instruction in the use of Workplace Based Assessments
3) provide instruction in the use of the Intercollegiate Surgical Curriculum Programme (ISCP) to build an on line portfolio
4) provide an introduction to and instruction in the important basic clinical capabilities required in Vascular Surgery
   - generic vascular patient assessment
   - generic vascular treatment principles
   - generic vascular ultrasound skills
   - generic endovascular skills
   - generic open vascular surgery skills
   - generic professional capabilities required in vascular surgery to manage ward patients, emergency admissions, outpatient clinics and operating lists

5) provide instruction in the use and findings of the National Vascular Registry – the surgical outcomes system used nationally in vascular surgery

Timing of Specialty Induction in Vascular Surgery

Trainees appointed to Vascular Surgery training programmes at ST3 will be expected to receive this induction early in their specialty training

Detailed Learning Outcomes

1) Training structure and governance

   Trainees should understand and be able to describe:

   a. An overview of the curriculum and syllabus
   b. The use of Workplace Based Assessments, logbook and ISCP web portfolio
   c. The National Vascular Registry
   d. The principles of Radiation Protection
   e. The importance of career planning
   f. The place of academic vascular surgery

   A number of teaching methods are available to achieve these outcomes. Pilot work has shown the success of small group discussion.

2) Clinical skills in patient assessment and treatment

   Trainees should be able to describe the important aspects of patient assessment in, and treatment for, the following conditions:

   a. Ruptured aneurysm
   b. Acute ischaemia
   c. Vascular trauma
   d. Haemorrhage
   e. Carotid disease
   f. Critical ischaemia
   g. Varicose veins
   h. Vascular access for haemodialysis

   A number of teaching methods are available to achieve these outcomes. Pilot work has shown the success of small group discussion using simulated patient scenarios.

3) Consent for vascular procedures

   Trainees should understand the general principles involved in taking informed consent.
   Trainees should understand and be able to describe the principles of common vascular interventions along with their risks and benefits.
   A number of teaching methods are available to achieve these outcomes. Pilot work has shown the success of small group discussion using simulated patient scenarios.

4) Impact of human factors on patient safety

   Trainees should understand how human behaviour and factors may impact on patient safety and how to mitigate against these.
   Trainees should be able to describe the key non-technical skills in surgery and how situational awareness, decision making, communication, teamwork and leadership all interact.
   A number of teaching methods are available to achieve these outcomes. Pilot work has shown the success of small group discussion.

5) Technical skills in patient assessment and treatment

   Trainees should be able to describe the key principles of, and have the opportunity to start learning and practicing the skills involved in, the following:

a. Generic Vascular Ultrasound Skills (see Annex 1 for more detail)
    i. B mode ultrasound, spectral Doppler and colour duplex
    ii. aortic ultrasound
    iii. ultrasound guided vascular access
b. Generic Endovascular Skills (see Annex 1 for more detail)
    i. the safe use of guidewires, sheaths and catheters
    ii. the exchange principle
    iii. available intervention options
    iv. cannulation for access
    v. guidewire manipulation
    vi. angiography
    vii. angioplasty
c. Generic Open Vascular Surgery Skills
    i. patch angioplasty
    ii. end to side anastomosis
    iii. proximal aortic anastomosis

A number of teaching methods are available to achieve these outcomes. Pilot work has shown the success of simulation training using a combination of jigs and live models.

Assessment

The intention of specialty induction is to provide an introduction to the key principles involved in the specialty and to prepare trainees for future learning opportunities. As such, there will be no summative assessment directed at the specific learning outcomes. It is anticipated that achievement of the learning outcomes will feed into improved learning which will be assessed through the usual ARCP process.

Formative assessment and structured feedback should be integrated into the teaching methods employed during the induction process. Existing Workplace Based Assessments may be used where appropriate.

Evidence to Support the use of Induction and Simulation in Teaching

There is a significant body of evidence to support the use of simulation in surgical and endovascular training[1-6]. Induction has been shown to be an effective educational strategy to improve trainees' clinical skills, knowledge and confidence[7]. Cognitive test results in training have been shown to correlate with the American Board of Surgery In-Training examination scores[8].

Annex 1

Generic Vascular Ultrasound Skills

Ankle Brachial Pressure Indices and waveform interpretation
Able to choose the appropriate ultrasound probe
Able to optimize grey scale imaging
Able to optimize colour flow imaging
Able to optimize pulsed wave settings
Able to perform superficial venous ultrasound studies
Able to screen for AAA and measure the AP diameter
Hand-held Doppler assessment of varicose veins
Percutaneous puncture of saphenous vein under US control
Percutaneous puncture of femoral artery under US control

Generic Endovascular Skills

Ultrasound guided arterial and venous puncture
Obtains secure vascular access with sheath, flushes catheters and sheaths appropriately
Positions guidewire using fluoroscopy and places non-selective catheter in aorta

Obtain satisfactory intra-operative angiograms
Chooses appropriate equipment e.g. catheter , sheath, guidewire, balloon, stent
Perform selective catheterization
Manipulate catheter and wire across stenosis
Performs balloon angioplasty in various vascular territories
Performs primary stenting in various vascular territories

References

1) Development of a PROficiency-Based StePwise Endovascular Curricular Training (PROSPECT) Program.
   Maertens H, Aggarwal R, Desender L, Vermassen F, Herzeele IV
   J Surg Educ. 2015 Aug 11. pii: S1931-7204(15)00186-5. doi: 10.1016/j.jsurg.2015.07.009. [Epub ahead of print]
2) National Simulation-Based Training of Fellows: The Vascular Surgery Example.
   Sheahan MG1, Duran C2, Bismuth J2
   Surg Clin North Am. 2015 Aug;95(4):781-90. doi: 10.1016/j.suc.2015.04.008. Epub 2015 Jun 18.
3) Bedside ultrasound training using web-based e-learning and simulation early in the curriculum of residents.
   Beaulieu Y, Laprise R, Drolet P, Thivierge RL, Serri K1, Albert M, Lamontagne A, Bélliveau M, Denault AY, Patenaude JV.
   Crit Ultrasound J. 2015 Jan 21;7:1. doi: 10.1186/s13089-014-0018-9. eCollection 2015.
4) Evaluation of surgical training in the era of simulation.
   Shaharan S1, Neary P1.
   World J Gastrointest Endosc. 2014 Sep 16;6(9):436-47. doi: 10.4253/wjge.v6.i9.436
5) Virtual reality simulation for the optimization of endovascular procedures: current perspectives.
   Rudarakanchana N1, Van Herzeele I2, Desender L2, Cheshire NJ1.
   Vasc Health Risk Manag. 2015 Mar 10;11:195-202. doi: 10.2147/VHRM.S46194. eCollection 2015.
6) The role of simulation in the development of technical competence during surgical training: a literature review
   Matthew P Thomas
   Int J Med Educ 2013; 4: 48-58
7) Effects of Postgraduate Medical Education "Boot Camps" on Clinical Skills, Knowledge, and Confidence: A Meta-Analysis.
   Blackmore C, Austin J, Lopushinsky SR, Donnon T.
   J Grad Med Educ. 2014 Dec;6(4):643-52. doi: 10.4300/JGME-D-13-00373.1.
8) Boot Camp: educational outcomes after 4 successive years of preparatory simulation-based training at onset of internship.
   Fernandez GL1, Page DW, Coe NP, Lee PC, Patterson LA, Skylizard L, St Louis M, Amaral MH, Wait RB,Seymour NE.
   J Surg Educ. 2012 Mar-Apr;69(2):242-8. doi: 10.1016/j.jsurg.2011.08.007.

Core Stage Overview

The purpose of the core stage (early years CT1 – CT2) is to allow the trainee to develop the core basic and fundamental surgical skills common to all surgical specialties.

The outcome of early years training is to achieve the competences required of surgeons entering ST3. These competences include:

- 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, to include all the core elements relevant to vascular surgery.
- Professional competences as specified in the syllabus and derived from Good Medical Practice documents of General Medical Council of the UK

By the end of CT2, trainees, including those following an academic pathway, will have acquired to the defined level:

- Generic skills to allow team working, and management of general surgical 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 including laparoscopy

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: Health promotion

- To promote good health.

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. CCT).

The Framework for Appraisal, Feedback and Assessment

The curriculum is consistent with the four Good Medical Practice domains contained in the GMC's Framework for Appraisal and Assessment:

- Knowledge skills and performance
- Safety and quality
- Communication, partnership and teamworking
- 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**.**

Core Stage Topics

Module 1	**Basic sciences**
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
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 • 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 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, radionuclide scanning

Module 2	**Common Surgical Conditions**	
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 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	To include the following conditions • Appendicitis • Gastrointestinal malignancy • Inflammatory bowel disease • Diverticular disease • Intestinal obstruction

	• Gastrointestinal haemorrhage • Rectal bleeding • Dysphagia • Dyspepsia • Jaundice	• Adhesions • Abdominal hernias • Peritonitis • Intestinal perforation • Benign oesophageal disease • Peptic ulcer disease • Benign and malignant hepatic, gall bladder and pancreatic disease • 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 occupying 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 and subcutaneous 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 neck • Acute endocrine crises	To include the following conditions • Thyroid and parathyroid disease • Adrenal gland disease • Diabetes

Module 3	**Basic surgical 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

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
Clinical Skills	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 Preparation of a patient for surgery • Creation of a sterile field • Antisepsis • Draping
Technical Skills and Procedures	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

	Incision of skin and subcutaneous tissue: • Ability to use scalpel, diathermy and scissors Closure of skin and subcutaneous tissue: • Accurate and tension free apposition of wound edges Knot tying: • Single handed • Double handed • Instrument • Superficial • Deep Haemostasis: • Control of bleeding vessel (superficial) • Diathermy • Suture ligation • Tie ligation • Clip application • Transfixion suture Tissue retraction: • Tissue forceps • Placement of wound retractors Use of drains: • Insertion • Fixation • Removal Tissue handling: • Appropriate application of instruments and respect for tissues • Biopsy techniques Skill as assistant: • Anticipation of needs of surgeon when assisting

Module 4	**The assessment and management of the surgical patient**
Objective	To demonstrate the relevant knowledge, skills and attitudes in assessing the patient and manage the patient, and propose surgical or non-surgical management.
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.
Clinical Skills	Surgical history and examination (elective and emergency) Construct a differential diagnosis Plan investigations Clinical decision making Team working and planning Case work up and evaluation; risk management Active participation in clinical audit events Appropriate prescribing Taking consent for intermediate level intervention; emergency and elective

	Written clinical communication skills Interactive clinical communication skills: patients Interactive clinical communication skills: colleagues

Module 5	**Peri-operative care**
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)
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 • 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 • 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	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 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 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 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 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 Antibiotics: • Appropriate prescription of antibiotics 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 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	Central venous line insertion Urethral catheterisation

Module 6	**Assessment and management of patients with trauma (including the multiply injured patient)**
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 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 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 History and examination Investigation Referral to appropriate surgical subspecialties Resuscitation and early management of patient who has sustained thoracic, head, spinal, abdominal or limb injury according to ATLS® and APLS guidelines Resuscitation and early management of the multiply injured patient 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	Central venous line insertion Chest drain insertion Diagnostic peritoneal lavage Urethral catheterisation Suprapubic catheterisation

Module 7	**Surgical care of the Paediatric patient**
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
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 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	History and examination of the neonatal surgical patient History and examination of paediatric surgical patient Assessment of respiratory and cardiovascular status Undertake consent for surgical procedures (appropriate to the level of training) in paediatric patients

Module 8	**Management of the dying patient**
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.
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
Clinical Skills	Palliative Care: • Symptom control in the terminally ill patient Principles of organ donation: • Assessment of brain stem death • Certification of death

Module 9	**Organ and Tissue transplantation**
Objective	To understand the principles of organ and tissue transplantation
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

Eligibility Requirements for ST3 in Vascular Surgery

In order to meet the job specification of an ST3 trainee, an early years trainee must take a clear role in the Vascular Surgery team, managing clinic and ward based patients under supervision, including the management of acute admissions. They will need to be able to take part in an outpatient clinic and see both new and old patients themselves with the consultant available for advice.

It is therefore necessary in these early years of CT1 and CT2 to address the specifics of a developing interest in Vascular Surgery. This means that it is desirable to spend 6 months in Vascular Surgery and a minimum of 4 months in General Surgery in a service which gives trainees access to the appropriate learning opportunities. 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 and day-case), and actually perform some surgery under appropriate supervision. They must manage all patients in the ward environment, both preoperatively and post operatively. This includes recognising and initiating the management of common complications and emergencies.

Early training in Vascular Surgery		
		Areas in which simulation should be used to develop relevant skills
Objective	Provide experience in the early care of patients with common vascular surgery problems: • The common emergency problems are abdominal aortic aneurysm, acute limb ischaemia and vascular trauma. • The common elective problems include aneurysm disease, extracranial carotid artery disease, chronic vascular insufficiency and varicose veins Provide some operative experience of primary varicose vein surgery and intra-abdominal surgery	
Knowledge	Basic science relevant to the management of patients with the common elective and emergency problems, (including anatomy, physiology, pharmacology, and radiology) Clinical presentation and pathology of common elective and emergency conditions. Principles of management of patients presenting with the common elective and emergency problems	Strongly recommended: Life support Critical care Desirable Anatomy Team-Based Human Factors
Clinical Skills	4 Pre-operative and postoperative assessment of patients with elective and emergency presentations of vascular surgical conditions. This should include assessment of co-morbidity in the context of the planned surgical procedure. 3 Management of fluid balance and nutritional support; postoperative analgesia; thromboprophylaxis; wound management. 3 Assessment and planning investigation of new and follow-up patients in outpatient clinics.	Strongly recommended: Basic surgical skills Tissue handling/suturing Desirable • Anastomosis • Arterial Access

	3 Assessment and management of patients with emergency conditions including primary and secondary survey and determining appropriate investigations.	
Technical Skills and Procedures	3 Chest drain insertion 3 Central venous line insertion 3 Suprapubic catheter insertion 3 Rigid sigmoidoscopy 4 Excision biopsy of benign skin or subcutaneous lesions 2 Induction of pneumoperitoneum for laparoscopy 2 Open and close midline laparotomy incision 2 Inguinal hernia repair 2 Primary abdominal wall hernia repair 2 Primary varicose vein surgery	Desirable

Assessment

All trainees will have a formal learning agreement at the start of each post. The trainees will maintain an online logbook on the ISCP website of all procedures performed, detailing whether they were the assistant or the primary operator and what level of supervision they required. Assessment in CT1 and CT2 will be workplace based and comprise case based discussions (CBD), clinical evaluation exercises assessing the trainee's interaction with patients (CEX), multi-source feedback (MSF) used to undertake 360º assessment from co-workers and direct observation of procedural skills (surgical DOPS) used to assess the trainee's technical and procedural skills at procedures in the CT1/CT2 syllabus. Each trainee will have an assigned educational supervisor in their workplace and confirmation that the trainee has participated in these formative assessments will form part of that supervisor's annual report to the Annual Report of Competence Progression (ARCP) panel, who will review the trainee's progress on an annual basis to assess their acquisition of competencies against the ISCP CT1/2 syllabus and make recommendations regarding their further progress in training.

Following progression to specialist training in ST3 - ST8, trainees will continue to undertake CBDs, CEXs and MSFs as well as moving on to procedure based assessments (PBAs), which are an advanced form of surgical DOPS designed to provide formative assessment of the trainee's progress with technical and operative skills relevant to the specialist procedures listed in the ST3 – ST8 syllabus on the ISCP website. Trainees at all levels are expected to undertake at least one formative assessment per week, with one MSF per year. Again this forms part of the assigned educational supervisor's report to the annual ARCP panel, which will assess the trainee's logbooks and progress through training to ensure they are attaining the relevant competencies specified for each year of training on the ISCP website. Satisfactory completion of ARCP assessments throughout training will form part of the documentation required for the recommendation of a CCT, along with a structured report from the training programme director. Specific evidence includes:

Assessment type	Subject
DOPS a selection of types and numbers of each type according to learning agreements	Urethral catheterisation. Suprapubic catheterisation Chest drain insertion Central venous line insertion Rigid sigmoidoscopy Excision biopsy of benign skin or subcutaneous lesions Induction of pneumoperitoneum for laparoscopy Open and close midline laparotomy incision
Case Based Discussion	At least one per month
CEX	Clinical assessment of patients with common conditions
PBAs	Inguinal hernia repair Primary varicose vein surgery
MSF	One per year
Training Supervisors report	Evidenced by the above WPBAs
ARCP for each specified training interval	As per local Deanery specifications

INTERMEDIATE & FINAL STAGE SYLLABUS

VASCULAR ANATOMY

OBJECTIVE

Knowledge of anatomy and embryology of the vascular system

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Anatomy of venous, arterial and lymphatic system	4	4	4	Strongly recommended
Normal and abnormal embryological development of the circulation	4	4	4	
Anatomy of the peripheral nervous system	3	4	4	

CLINICAL SKILLS

Able to relate anatomy to imaging and to operative findings	3	4	4	Desirable
Palpation of peripheral pulses	4	4	4	
Palpation of the abdominal aorta	4	4	4	
Can explain vascular anatomy to patients and colleagues	3	4	4	Strongly recommended

TECHNICAL SKILLS

N/A

VASCULAR PHYSIOLOGY

OBJECTIVE

Knowledge of the physiology of the circulation

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Detailed knowledge of the control of blood pressure and factors affecting it	4	4	4	
Detailed knowledge of blood flow, haemostasis and the effects of haemorrhage	4	4	4	
Detailed knowledge of the effects of ischaemia and reperfusion	4	4	4	
Detailed knowledge of microcirculatory and lymphatic physiology	4	4	4	
CLINICAL SKILLS				
Able to safely manage a patient in the early post-operative phase after major vascular interventions e.g. cardiac, respiratory and renal monitoring and support	3	4	4	Strongly recommended
Able to correct clotting abnormalities in patients undergoing vascular interventions	3	4	4	
Able to undertake prophylactic and therapeutic anticoagulation	4	4	4	
Can explain vascular physiology to patients and colleagues	3	4	4	

TECHNICAL SKILLS

N/A

VASCULAR PATHOLOGY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Knowledge of the diseases (congenital and acquired) of the circulation				
KNOWLEDGE				
Is aware of the congenital and pathological conditions that affect the circulation	4	4	4	
A detailed knowledge of atherosclerosis and its associated risk factors, venous disease, lymphatic disease, thrombo-embolic disease, vasospastic and vasculitic disease	3	4	4	
A detailed understanding of the mechanisms of vascular trauma	3	4	4	
Causes of peripheral neuropathy	3	4	4	
Alternative causes for limb pain (neurological and musculoskeletal)	3	4	4	
CLINICAL SKILLS				
Able to take detailed history from patient with arterial or venous disease	4	4	4	
Examination of ischaemia and aneurysmal disease	4	4	4	
Examination of varicose veins and swollen leg	4	4	4	
Can detect pathological arterial and venous abnormalities	4	4	4	
Able to prioritise - recognises patients who need to be seen or treated urgently	4	4	4	
Selects appropriate investigations tailored to the individual patient	3	4	4	Desirable
Can explain vascular disease to patients and colleagues	3	4	4	Desirable
TECHNICAL SKILLS				
Hand-held Doppler assessment of varicose veins	4	4	4	Desirable
Ankle Brachial Pressure Indices and waveform interpretation	4	4	4	Desirable
Duplex ultrasound assessment of varicose veins	2	3	3	Desirable

VASCULAR EPIDEMIOLOGY

OBJECTIVE
Knowledge of the epidemiology of vascular disease

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Principles of epidemiology, including basic study design and relevant terms.	4	4	4	
Epidemiology of peripheral arterial disease.	4	4	4	
Epidemiology of venous disorders including varicose veins and venous thromboembolism.	4	4	4	
Epidemiology and interactions of major vascular risk factors including smoking demographics	4	4	4	
CLINICAL SKILLS				
Explanation of risk factors to a patient with vascular disease	3	4	3	Strongly recommended

TECHNICAL SKILLS

N/A

SCREENING AND SURVEILLANCE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Knowledge of the principles of screening				
KNOWLEDGE				
Key elements of design and delivery of screening tests in general	4	4	4	
AAA screening and surveillance programme	3	4	4	
Governance and quality control of AAA screening	3	4	4	
EVAR/TEVAR and vein graft surveillance	3	4	4	Desirable
CLINICAL SKILLS				
Counselling a patient undergoing screening or who has a positive screening test	3	4	4	Strongly recommended
TECHNICAL SKILLS				
Measure AAA diameter in US scan	2	3	4	Desirable

RISK FACTOR MODIFICATION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Knowledge of vascular risk factors and risk-factor modification				
KNOWLEDGE				
Blood pressure control	3	4	4	
Lipid lowering therapy	3	4	4	
Management of diabetes	3	3	3	
Smoking cessation	3	4	4	
Antiplatelet and anticoagulant therapy	3	4	4	
Exercise and exercise therapy	3	4	4	
Dietary factors and weight control	3	4	4	
Guidelines for hypertension and hyperlipidaemia management (BHS, NICE, RCP, SIGN)	2	3	4	
CLINICAL SKILLS				
Explanation of risk factor modification to a patient	3	4	4	Strongly recommended
Ability to assess and prescribe blood pressure and other risk factor medication	3	3	3	
Understanding of main drug interactions and side effects of key risk reduction drugs (e.g. statins, antiplatelet agents & anti-hypertensives)	4	4	4	
Smoking cessation counselling	3	4	4	
Dietary and exercise advice to PAD patients	3	4	4	
Interpretation of a lipid screen and other relevant biochemical screens	3	4	4	
TECHNICAL SKILLS				
Set up an insulin sliding scale	4	4	4	

VASCULAR CONDITIONS OF CHILDHOOD

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of children with developmental and traumatic conditions of their circulatory system					
KNOWLEDGE					
Principles of surgery in children		2	3	3	Strongly recommended: Critical Care Child protection Desirable Team-working
Vascular conditions of childhood (including trauma and vascular anomalies)	Haemangiomas, venous malformations, AV malformations and lymphatic malformations	2	3	3	
Treatment options	Medical	1	3	3	
	Endovascular	1	2	3	
	Surgical	2	3	3	
CLINICAL SKILLS					
History and examination of children		2	3	3	
Communication with parents and /or carers		2	3	3	Desirable
Examination of vascular anomalies		1	2	3	
Investigation of vascular anomalies	Hand-held Doppler	1	3	4	Desirable
	Duplex ultrasound	1	2	3	Desirable
	Arteriography	1	2	2	
Management strategy	Medical (including compression)	1	3	4	
	Endovascular	1	2	3	
	Surgical	2	3	3	
TECHNICAL SKILLS					
	Arterial repair (e.g. following supracondylar fracture	1	2	3	

Vascular access	1	2	2	

NUTRITION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Recognise the need for artificial nutritional support, assess whether this is appropriate and arrange treatment				
KNOWLEDGE				
Effects of malnutrition, both excess and depletion	3	3	4	
Methods of screening and assessment	2	3	4	
CLINICAL SKILLS				
Arrange access to suitable artificial nutritional support, preferably via a nutrition team	2	3	4	
Dietary supplements	2	3	4	
Enteral nutrition	2	3	4	
Parenteral nutrition	2	3	4	
TECHNICAL SKILLS				
Placement of nasojejunal feeding tube at operation	2	3	4	
Insertion of feeding jejunostomy at operation	2	3	4	
Insertion of un-tunnelled central venous catheter	1	3	4	Desirable
Insertion of tunnelled central venous catheter (Hickman or port)	1	2	3	

CARDIO-RESPIRATORY DISEASE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVES				
Assessment and management of patients with co-existent cardiac and/or respiratory disease				
KNOWLEDGE				
Anatomy of the heart and lungs	3	4	4	
Cardio-respiratory physiology	3	4	4	
Cardio-respiratory pathology (IHD, MI, heart failure, COPD, ARDS)	3	4	4	
Prognosis and impact upon patients undergoing major vascular surgery	3	4	4	
Therapeutic options including pharmacology and drug interactions	3	3	3	
Current guidelines on resuscitation	4	4	4	
Define indications for and haemo-dynamic consequences of positive pressure ventilation	3	3	3	
CLINICAL SKILLS				
Examination of the heart and lungs	4	4	4	
Select patients who require pre-operative investigations (ECG, echo, MUGA, 24hr tape, CXR, CT, respiratory function, CPX testing)	3	4	4	
Interpretation of results	2	3	4	
Identify patients unsuitable for vascular intervention	2	3	4	
TECHNICAL SKILLS				
Arterial blood gas sampling and interpretation of the results	4	4	4	Desirable
Basic management of acute MI/heart failure	3	4	4	
Cardiopulmonary resuscitation (ALS)	4	4	4	Strongly recommended: Life support Critical care ALS/ATLS
Insertion of chest drain and management	4	4	4	
Mini-tracheostomy	4	4	4	

HAEMATOLOGY

OBJECTIVES

Competent in relevant aspects of blood transfusion, bleeding disorders and drugs that affect clotting

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Coagulation and fibrinolysis pathways	4	4	4	
Epidemiology, natural history, and molecular basis of haemophilia and thrombophilia	3	4	4	
Pharmacology of unfractionated heparin, LMWH, warfarin and antiplatelet agents	4	4	4	
Principles of donor selection and preparation of blood components including donor selection, preparation of blood products and viral safety	3	3	3	
Coagulation factors and their side effects	4	4	4	
Principles of clinical blood transfusion including hazards of blood transfusion, SHOT report and the role of the hospital transfusion committee	4	4	4	
Methods of blood conservation including pre-donation and intra-operative cell salvage	4	4	4	
Mechanism of DIC, effect of massive, transfusion, renal and hepatic disease	3	4	4	

CLINICAL SKILLS

Interpretation of laboratory results	4	4	4	
Methods and complications of reversing anti-coagulation in patients with and without haemorrhage	3	4	4	
Management of haemophilia and thrombophilia in terms of treatment and prophylaxis before vascular surgery	3	3	3	
Initiation and monitoring of anticoagulation	4	4	4	
Initiation of antiplatelet therapy in various situations	3	4	4	
Appropriate use of blood and blood products	4	4	4	
Management of complications from blood transfusion	3	3	3	

TECHNICAL SKILLS

Intra-operative use of heparin, monitoring techniques (TEG) and reversal using protamine	3	4	4	

CLINICAL AUDIT, RESEARCH & HEALTH ECONOMICS

OBJECTIVE
An understanding of the relevance of clinical audit, research and health economics to the practice of vascular surgery

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
National Vascular Database	3	4	4	
Principles of audit and quality control	3	4	4	
Principles of clinical research and systematic review	2	3	4	
Evidence-based vascular practice	2	3	4	
Knowledge of key health economic terms	2	3	4	
Important generic QoL tools for venous and arterial disease	2	3	4	
Relevance of QALYS and calculation of incremental cost effectiveness ratios	2	3	4	
Types of health economic analyses	2	3	4	
Planning and budgeting vascular services	2	3	4	

CLINICAL SKILLS

Participation in local and national audit of outcomes	3	4	4	
Conducting a morbidity and mortality meeting	3	4	4	
Conducting a journal club	3	4	4	
Participation in clinical research	3	4	4	
Presentations at vascular meetings (e.g. VSGBI and ESVS)	3	4	4	
Publications in vascular journals (e.g. EJVES and JVS)	3	4	4	
Can explain the principles of health economics to patients, colleagues and managers	2	3	4	

TECHNICAL SKILLS
N/A

OUTPATIENT, WARD and MDT MEETINGS

OBJECTIVE
Assess individual vascular outpatients and inpatients
Manage an outpatient clinic, ward round and MDT meeting

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE					
Individual patient assessment	Relevant vascular anatomy, physiology and clinical knowledge	3	4	4	
Outpatient and inpatient service	Understanding of hospital organisation	2	3	4	
	Understanding of multi-disciplinary team and meetings	3	4	4	
	Relevant guidelines for vascular disease management	2	3	4	
CLINICAL SKILLS					
Individual patient assessment:	Focused history taking and examination	3	4	4	Desirable
	Organise appropriate investigations	3	4	4	
Management of an outpatient clinic, ward round and MDT meeting	Presentation of patients on ward round and at MDT	2	3	4	
	Ability to allocate management of patients to appropriate team members	2	3	4	
	Appropriate referral to other specialists when indicated	2	3	4	
	Liaison with critical care and other support services (e.g. pain team, physiotherapy, rehab)	2	3	4	
	Ability to prioritise urgent patient appointments, investigations and interventions	2	3	4	
	Prompt and clear clinic letters and discharge summaries	3	4	4	

TECHNICAL SKILLS
N/A

PRINCIPLES OF VASCULAR IMAGING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Radiation safety, principles and indications for vascular imaging				
KNOWLEDGE Principles of ultrasound, CT and MR imaging and catheter angiography	3	4	4	Required component of Specialty Induction
Dangers of ionizing radiation and safe practice	3	4	4	
Monitoring of ionizing radiation and how exposure can be reduced	3	4	4	
Regulations and requirements in use of ionizing radiation	3	4	4	
Indications and factors determining appropriate investigation for a patient with vascular disease	3	4	4	
Vascular contrast agents and associated hazards	3	4	4	
CLINICAL SKILLS				
Explanation of various imaging modalities to a patient	3	4	4	Strongly recommended
Selection of appropriate investigation	3	4	4	
Evaluate patient for procedure	3	4	4	
Identify factors that increase risk for patient	3	4	4	

VASCULAR ULTRASOUND

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand and be able to perform basic vascular ultrasound				
KNOWLEDGE				
Understand the principles of Doppler ultrasound	3	4	4	
Understand limitations of US scanning	2	3	4	
Understand ultrasound spatial resolution in relation to scan plane	2	3	4	
Understand the requirements for imaging different vascular territories	2	3	4	
Ultrasound image interpretation	2	3	4	Required component of Specialty Induction
CLINICAL SKILLS				
Explanation of ultrasound to a patient	3	4	4	Strongly recommended
TECHNICAL SKILLS				
Able to choose the appropriate ultrasound probe	2	3	4	Required component of Specialty Induction
Able to optimize grey scale imaging	2	3	4	Required component of Specialty Induction
Able to optimize colour flow imaging	2	3	4	Required component of Specialty Induction
Able to optimize pulsed wave settings	2	3	4	Required component of Specialty Induction
Able to perform superficial venous ultrasound studies	2	3	4	Required component of Specialty Induction
Able to perform arterial ultrasound studies for intra-operative quality control	2	3	4	
Able to screen for AAA and measure the AP diameter	2	3	4	Required component of Specialty Induction
Percutaneous puncture of saphenous vein under US control	2	3	4	Required component of Specialty Induction
Percutaneous puncture of femoral artery under US control	2	3	4	Strongly recommended

Approved 30 August 2016, for implementation August 2016

COMPUTED TOMOGRAPHIC IMAGING

OBJECTIVE
To understand, interpret and manipulate CT imaging and CT angiography

KNOWLEDGE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
Understand how CT images are generated	3	4	4	
Understand concepts of helical and multi-slice scanning	2	3	4	
Understand that scans are performed in the axial plane	3	4	4	
Understand CT spatial resolution	2	3	4	
Recognise X-ray dose and risks associated with study	3	3	4	
Recognise the need to tailor individual scan to clinical problem e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous	2	3	4	
Understand basic principles of image reformatting in various planes	2	3	4	
Understand the principle behind image reconstruction and MIP images	2	3	4	
Understand the use of intravascular and oral contrast agents	3	4	4	
Recognise risks of intravascular contrast and how to avoid them	3	4	4	
Understand common artifacts	3	4	4	

CLINICAL SKILLS

Explanation of CT and the risks to a patient	3	4	4	Strongly recommended
Able to manage contrast reactions	3	4	4	
Able to recognise normal cross-sectional anatomy	3	4	4	Desirable
Able to recognise vascular pathology on scans	3	4	4	Desirable

TECHNICAL SKILLS

Able to manipulate images on the console	1	2	3	Desirable
Able to obtain appropriate measurements of blood vessels	1	2	3	Strongly recommended

MAGNETIC RESONANCE IMAGING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand, interpret and manipulate MR imaging and MR angiography				
KNOWLEDGE				
Understand how MR images generated	3	4	4	
Recognise the risks of MRI	3	4	4	
Understand that scans are performed in any plane	3	4	4	
Understand MR spatial resolution in relation to scan plane	2	3	4	
Recognise the need to tailor individual scan to clinical problem e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous	3	4	4	
Understand the principles of non-contrast MR angiographic techniques	3	4	4	
Understand the principles of contrast enhanced MR angiographic techniques	3	4	4	
Understand basic principles of image reformatting in various planes	2	3	4	
Understand the principle behind image reconstruction and MIP images	2	3	4	
Understands the different types of MR angiographic contrast	2	3	4	
Recognise common MR artifacts	2	3	4	
CLINICAL SKILLS				
Explanation of MRA and the risks to a patient	3	4	4	Strongly recommended
Able to recognise normal cross-sectional anatomy	3	4	4	Strongly recommended
Able to recognise vascular pathology on scans	3	4	4	Strongly recommended
TECHNICAL SKILLS				
Able to manipulate images on the console	1	2	3	Desirable
Able to obtain appropriate measurements of blood vessels	1	2	3	Desirable

CATHETER ANGIOGRAPHY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand and perform intra-operative catheter angiography				
KNOWLEDGE				
Commonly used arterial and venous access sites	3	4	4	
Commonly used contrast agents, including CO2	2	3	4	
Road-mapping, parallax, measurement techniques, hand and power injection	1	2	3	
Measures to improve angiographic imaging e.g. breath holding, multi-masking, centering, collimation, frame rate, antegrade etc	1	2	3	
Risks of angiography	3	4	4	
Guidewire and catheter types, characteristics and indications	1	2	3	Required component of Specialty Induction
Introducer, dilator and sheath types, characteristics and indications	1	2	3	Required component of Specialty Induction
CLINICAL SKILLS				
Explanation of catheter angiography and the risks to a patient	3	4	4	Required component of Specialty Induction
TECHNICAL SKILLS				
Retrograde femoral artery puncture	1	2	3	Required component of Specialty Induction
Antegrade femoral artery puncture	1	2	3	Required component of Specialty Induction
Ultrasound guided arterial and venous puncture	1	2	3	Required component of Specialty Induction
Obtains secure vascular access with sheath, flushes catheters and sheaths appropriately	1	2	3	Required component of Specialty Induction
Pressure measurement	1	2	3	
Positions guidewire using fluoroscopy and places non-selective catheter in aorta	1	2	3	Required component of Specialty Induction
Keep radiation dose to minimum by use of appropriate e.g. fluoroscopy, collimation, runs	1	2	3	
Obtain satisfactory intra-operative angiograms	1	2	3	Required component of Specialty Induction
Recognize inadequate study and need for alternative angiographic views	1	2	3	

ENDOVASCULAR PROCEDURES

OBJECTIVE

To gain endovascular knowledge and skills

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Indications and outcomes for endovascular intervention	2	3	4	
The complementary role of endovascular therapy to medical and surgical therapy	2	3	4	
Balloon and stent types, characteristics and indications	2	3	4	
Stent-graft types, characteristics and indications	2	3	4	
Materials used for embolisation, characteristics and indications	2	3	4	
Closure devices, characteristics and indications	2	3	4	
CLINICAL SKILLS				
Explanation of endovascular intervention and the risks to a patient	2	3	4	Strongly recommended
Undertakes preoperative checks and team briefing	3	4	4	
Demonstrates good patient, personal and team safety	3	4	4	
Ensures good asepsis, especially when prosthetic materials are involved	3	4	4	
Good communication with patient and all members of the angio team	3	4	4	Desirable
Accurate procedural record and post-procedural instructions	3	4	4	
Recognizes complications e.g. dissection, embolisation	2	3	4	
Uses drugs appropriately e.g. vasodilators, anticoagulants, analgesics, sedatives, anti-peristaltics	2	3	4	
TECHNICAL SKILLS				
Chooses appropriate equipment e.g. catheter , sheath, guidewire, balloon, stent	1	2	3	Required component of Specialty Induction
Perform selective catheterization	1	1	2	Required component of Specialty Induction
Manipulate catheter and wire across stenosis	1	1	2	Required component of Specialty Induction
Performs balloon angioplasty in various vascular territories	1	1	2	Required component of Specialty Induction
Performs primary stenting in various vascular territories	1	1	2	Desirable
Performs selective embolisation	1	1	2	
Use of closure devices	1	1	2	Desirable

OPEN VASCULAR SURGERY

OBJECTIVE

To gain open vascular surgical knowledge and skills

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Knows the importance of preoperative checks and team briefing for patient safety	4	4	4	
Antibiotic prophylaxis and anticoagulation	4	4	4	
Blood transfusion and the management of transfusion-related complications	4	4	4	
Intra-operative cell salvage and the use of other blood products	3	4	4	
Principles of local anaesthesia and local blocks e.g. metatarsal	3	4	4	
Common vascular skin incisions and exposures	3	4	4	
Methods of vascular control	3	4	4	
Principles of vascular reconstruction	3	4	4	
Intervention for VVs	3	4	4	
Selection of amputation level	3	4	4	
Types and characteristics of bypass grafts, anastomoses and vascular sutures	3	4	4	
Types and characteristics of vascular instruments	3	4	4	
CLINICAL SKILLS				
Explanation of open vascular surgery and the risks to a patient	3	4	4	Strongly recommended
Demonstrates good patient, personal and team safety	3	4	4	Desirable
Ensures good asepsis, especially when prosthetic materials are involved	3	4	4	
Good communication with patient and all members of the theatre team	3	4	4	Desirable
Accurate procedural record and post-procedural instructions	3	4	4	
TECHNICAL SKILLS				
Wound debridement	3	4	4	Desirable
Local amputation (e.g. toes)	3	4	4	Desirable
Major amputation (e.g. BKA)	2	3	4	Desirable
Harvesting of long saphenous (or other) vein	3	4	4	
Exposure and control of veins (e.g. SFJ)	3	4	4	Desirable
Exposure and control of arteries (e.g. common femoral)	3	4	4	Desirable
Arteriotomy and direct or patch repair	2	3	4	Required component of Specialty Induction
End-to-end and end-to-side anastomosis	2	3	4	Required component of Specialty Induction
Embolectomy + on-table arteriogram/thrombolysis	2	3	4	

ACUTE LOWER LIMB ISCHAEMIA

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Ability to recognise acute lower limb ischaemia and institute emergency management					
KNOWLEDGE					
Anatomy of arterial system		3	4	4	
Lower limb neurology		3	4	4	
Pathophysiology of acute limb ischaemia	Embolism	3	4	4	
	Thrombosis	3	4	4	
	Trauma (blunt penetrating)	3	4	4	
	Fractures & dislocations	2	3	3	
	Iatrogenic injury	3	4	4	
Pathophysiology of compartment syndrome		1	3	4	
Investigations	Doppler/Duplex	3	4	4	
	Angiography	3	4	4	
	Compartment pressures	3	4	4	
	Intra-operative angiogram	2	3	4	
	ECG & echocardiogram	3	4	4	
Management	Conservative	2	3	4	
	Embolectomy	2	3	4	
	Thrombolysis	2	3	4	
	Primary amputation	2	3	4	
CLINICAL SKILLS					
History		4	4	4	
Examination		4	4	4	
Co-ordination with trauma team		3	4	4	Desirable
TECHNICAL SKILLS					
Hand-held Doppler assessment		3	4	4	Desirable
Duplex ultrasound assessment		1	2	3	Desirable
Measurement of compartment pressures		3	4	4	
Surgical approaches to the arterial tree		2	3	4	Desirable
Surgical control of lower limb blood vessels		2	3	4	Desirable
Embolectomy (blind & directed, femoral/popliteal)		2	3	4	
On table angiography and thrombolysis		1	3	4	Desirable
Emergency arterial reconstruction		1	2	4	
Vascular shunts		2	3	4	
Lower leg fasciotomy		2	3	4	Desirable
Emergency venous reconstruction		1	2	3	

Percutaneous thrombolysis	1	2	2	
Percutaneous clot aspiration	1	2	2	

VASCULAR TRAUMA

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Identification, assessment and management of injuries to blood vessels and associated injuries					
KNOWLEDGE					
Surgical anatomy relative to fractures, nerves and associated structures		3	4	4	
Mechanisms of vascular injury (penetrating, blunt and iatrogenic)		3	4	4	
Low energy and high energy transfer injury		3	4	4	
Pathophysiology of trauma, muscle ischaemia and shock lung		3	4	4	
Pathophysiology of A-V fistula		2	3	4	
Investigations for bleeding/ischaemia (Duplex, CTA, on-table arteriography)		2	3	4	
Operative approach to specific injuries	Cervical, thoracic, abdominal, limb	2	3	4	
	Combined arterial and venous	2	3	4	
	Combined fractures and nerve injury	2	3	4	
CLINICAL SKILLS					
Symptoms and signs of acute arterial / venous injury		3	4	4	Desirable
Investigation (ABPI, Duplex, angiography)		2	3	4	Desirable
Assessment of multiply injured patient		3	4	4	Strongly recommended
Manage systemic effects of arterial trauma (e.g. rhabdomyolysis)		2	3	4	
TECHNICAL SKILLS					
Arrest haemorrhage by pressure, pack, tourniquet		3	4	4	Desirable
Recognise and treat sucking chest wound		3	3	4	
Chest drain		3	4	4	Strongly recommended
Proximal vascular control		2	3	4	Desirable
Emergency thoracotomy		1	2	3	Desirable
Ligation		2	3	4	Desirable
Lateral suture repair		2	3	4	Desirable
End to end anastomosis		2	3	4	Required component of Specialty Induction

Interposition graft	1	2	4	Desirable
Panel / spiral grafts	1	2	3	Desirable
Fasciotomy	2	3	4	Desirable
Shunts	2	3	4	Desirable
On-table arteriography	1	2	2	
Endovascular balloon control	1	2	3	
Embolisation	1	1	1	
Insertion of covered stent	1	1	2	

CHRONIC LOWER LIMB ISCHAEMIA

	ST4	**ST6**	**ST8**	**Areas in which simulation should be used to develop relevant skills**
OBJECTIVE Management of the chronically ischaemic lower limb, including intervention				
KNOWLEDGE				
Anatomy and embryological development of arteries supplying the lower limb.	3	4	4	
Pathology of atherosclerosis, thrombosis and complications.	3	4	4	
Pathology of non –atherosclerotic arterial conditions (e.g. fibromuscular dysplasia, Buerger's disease, vasculitis and pyoderma gangrenosum)	2	4	4	
Vascular anomalies (e.g. persistent sciatic artery, cystic adventitial disease and popliteal entrapment)	2	4	4	
Role of medical treatment/exercise therapy	3	4	4	
Wound dressings & VAC	3	4	4	Desirable
CLINICAL SKILLS				
Selection for revascularisation or amputation	2	3	4	
Management of postoperative wound infection and graft complications	2	3	4	
Graft surveillance	2	3	4	
Amputation level selection	2	3	4	Desirable
Rehabilitation after amputation	2	3	3	
Lower limb prostheses	2	3	3	
TECHNICAL SKILLS				
Exposure of infrarenal aorta, iliac, femoral, popliteal, tibial and pedal vessels	1	3	4	Strongly recommended
Aorto-iliac & aorto-femoral bypass	1	2	4	Strongly Recommended
Axillo-femoral bypass	1	2	4	Strongly Recommended
Femoral and profunda endarterectomy and patch	1	3	4	Strongly Recommended
Ilio-fem and fem-fem bypass	1	3	4	Strongly Recommended

Above and below-knee fem-popliteal bypass	1	3	4	Strongly Recommended
Distal bypass (AT, PT, peroneal & pedal)	1	2	4	Strongly Recommended
Vein preparation in-situ/reversed/arm vein/SSV	2	4	4	Strongly Recommended
Vein cuff / patch	2	4	4	Strongly Recommended
Intra-operative assessment with Doppler and angiography	1	3	4	Strongly Recommended
Wound debridement	3	4	4	Strongly Recommended
Angioplasty/stenting aorta/iliac/SFA/popliteal/tibial	1	1	2	Desirable
Sartorius muscle flap	1	3	4	Desirable
Digital/ray amputation	2	4	4	Strongly recommended
Transmetatarsal/transtibial (Burgess, skew)/through knee/above knee amputation	1	3	4	Strongly recommended
Hindquarter amputation	1	2	3	

VASCULAR COMPLICATIONS OF DIABETES

	ST4	ST6	ST8	**Areas in which simulation should be used to develop relevant skills**
OBJECTIVE Assessment and management of patients with complications of diabetes affecting the leg/foot				
KNOWLEDGE				
Anatomy of the foot	3	4	4	Strongly recommended
Complications of diabetes affecting the foot including neuropathy, ulceration, osteomyelitis and Charcot	3	4	4	
Investigations (XRay, ultrasound & MR of foot, arteriography)	3	4	4	
Prevention of complications	3	4	4	
Orthotic devices and principles of offloading	3	4	4	
Interpretation of microbiology data and selection of antibiotics	3	4	4	
Emergency treatment for infection	3	4	4	
Revascularisation procedures	2	4	4	
CLINICAL SKILLS				
Explanation of principles of foot care to diabetic patients	3	4	4	Strongly recommended
Examination of diabetic foot/ulceration	3	4	4	
ABPI, pole test, 10g monofilament test	3	4	4	
Setting up a sliding scale	4	4	4	
TECHNICAL SKILLS				
Surgical debridement of foot	2	3	4	Strongly Recommended
Wound care	3	4	4	Strongly Recommended

VASCULAR DISEASE OF THE UPPER LIMB

OBJECTIVE
Ability to recognise and manage: (i) acute upper limb ischaemia, (ii) chronic upper limb ischaemia and (iii) thoracic outlet syndrome

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE					
Anatomy	Upper limb vasculature	3	4	4	
	Upper limb neurology	3	4	4	
	Thoracic outlet	2	3	4	
Pathology	Thromboembolic disease	3	4	4	
	Atherosclerotic disease	3	4	4	
	Thoracic outlet syndrome	2	3	4	
	Subclavian steal syndrome	2	3	4	
	Vasospastic disease	2	3	4	
	Trauma	2	3	4	
Management	Conservative (physiotherapy)	2	3	4	
	Pharmacological (anticoagulant/prostacyclin	2	3	4	
	Endovascular (angioplasty/stent)	2	3	4	
	Surgical (rib resection, embolectomy, bypass)	2	3	4	
CLINICAL SKILLS					
Take a relevant history and examine the upper limb vessels and nerves including provocation tests		3	4	4	
Role of Doppler, duplex ultrasound, CT, MRA and conventional angiography.		3	4	4	
Selection for surgical/endovascular intervention		2	3	4	
TECHNICAL SKILLS					
Exposure of subclavian, vertebral, axillary, brachial and radial arteries		1	3	4	Desirable
Brachial embolectomy		2	3	4	Desirable
Subclavian aneurysm repair		1	2	3	
Subclavian to brachial bypass		1	2	3	
Subclavian transposition		1	2	3	Desirable
Subclavian to carotid bypass		1	2	3	Desirable
Excision of cervical rib		1	2	3	Desirable
Thoracic outlet decompression (supraclavicular, infraclavicular and transaxillary approaches)		1	2	3	Desirable
Intra-operative arteriography and thrombolysis		1	3	4	

Subclavian artery angioplasty/ stenting	1	1	2	

HYPERHYDROSIS

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of patients with hyperhidrosis (palmar and axillary)				
KNOWLEDGE				
Anatomy and physiology of sympathetic nervous system	3	4	4	
Pathophysiology of hyperhydrosis	3	4	4	
Treatment options (antiperspirants, iontophoresis, thoracoscopic sympathectomy, botox, curettage)	3	4	4	
CLINICAL SKILLS				
History and examination	3	4	4	
Management strategy	2	3	4	
TECHNICAL SKILLS				
Axillary Botox therapy	1	2	3	
Thoracoscopic sympathectomy	1	2	3	
Axillary curettage	1	2	3	

VASOSPASTIC DISORDERS AND VASCULITIS

OBJECTIVE

Assessment and management of patients with vasospastic disorders (primary and secondary) and vasculitis

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy and physiology of sympathetic nervous system	3	4	4	
Pathophysiology of primary and secondary vasospastic disorders (e.g. Raynaud's disease, thoracic outlet compression, Vibration White Finger)	2	3	4	
Connective tissue disease (systemic sclerosis, SLE, rheumatoid arthritis)	2	3	4	
Vasculitis (Buerger's disease, Takayasu's, giant cell arteritis, PAN, HIV, TB)	2	3	4	
Investigations (Cold provocation, blood tests, nail-fold capillaroscopy)	2	3	4	
Treatment options (Cold avoidance, smoking cessation, vasodilators (e.g. calcium channel blockers), digital sympathectomy, chemotherapy, retroviral therapy)	2	3	4	
CLINICAL SKILLS				
History and examination	3	4	4	
Management strategy	2	3	4	
TECHNICAL SKILLS				
Skin biopsy	2	4	4	Strongly Recoomended
Digital sympathectomy	1	1	1	
Thoracic outlet decompression	1	2	3	Desirable

CAROTID ARTERY DISEASE

OBJECTIVE

Assessment and management of patients with cerebrovascular disease. Surgical management of patients with carotid artery territory symptoms

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy and pathophysiology of stroke	3	4	4	
Classification of stroke	2	4	4	
Stroke severity score	2	4	4	
Definition of TIA and differential diagnosis	3	4	4	
Aetiology and epidemiology of stroke	2	4	4	
Guidelines for management of hypertension and hyperlipidaemia (BHS, NICE, RCP, SIGN)	2	4	4	
Indications and use of investigations (CT/A, MRI/A, carotid duplex, echocardiogram)	2	4	4	
Indications for medical or interventional treatment	2	4	4	
Acute intervention including thrombolysis	2	4	4	
Stroke prevention (antiplatelets, anticoagulants)	1	4	4	
Selection for carotid endarterectomy and stenting	1	4	4	
Carotid body tumours	1	2	3	
Carotid dissection	1	2	3	
Carotid trauma	1	2	4	
CLINICAL SKILLS				
Medical management (antiplatelet agents, hypertension, hyperlipidaemia)	3	4	4	
Communication of risks and benefits of intervention	3	4	4	Strongly recommended
Assess post-op complications (stroke, bleeding, airway obstruction, cranial nerve injury)	3	4	4	
TECHNICAL SKILLS				
Cervical block	1	2	3	
Standard and retrojugular approach	1	3	4	Desirable
Standard and eversion endarterectomy	1	3	4	Desirable
Use of carotid shunts	1	3	4	Desirable
Distal intimal tacking sutures	1	3	4	Desirable
Primary and patch closure	1	3	4	Desirable
Use and interpretation of intra-operative quality control: (angioscopy, duplex ultrasound or completion arteriography)	1	3	4	Desirable
Re-do carotid endarterectomy	1	2	3	
Placement of guidewire and catheter	1	1	2	
Placement of cerebral protection device	1	1	2	

Endovascular stent	1	1	2	

ANEURYSM - ELECTIVE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Assessment and management of elective aneurysms				
KNOWLEDGE				
Anatomy of aorta and main branches	4	4	4	
Pathology of aortic aneurysms (atherosclerotic inflammatory, mycotic, collagen disorders, post-dissection, vasculitic)	3	4	4	
Aortic dissection	2	3	4	
Thoracoabdominal aneurysms	2	3	4	
Pathology of other aneurysms (popliteal, visceral, carotid, subclavian, false aneurysms)	2	3	4	
Investigation – US, CT A, MRA and PET	3	4	4	
Treatment options (medical, open, EVAR, hybrid)	2	3	4	
CLINICAL SKILLS				
History and examination, palpation of aorta	3	4	4	
Assessment of comorbidity, cardiorespiratory/renal	3	4	4	
Endovascular planning	2	3	4	Strongly recommended
Ability to recognise/manage postop. complications: bleeding, thrombosis, embolism, organ failure, endoleak, infection	2	3	4	
TECHNICAL SKILLS				
Open repair infrarenal AAA	1	3	4	Strongly Recommended
Inflammatory AAA repair	1	2	3	
Internal iliac aneurysm repair	1	2	3	
Juxta-renal AAA repair	1	2	3	Desirable
Supra-renal AAA repair	1	2	3	Desirable
Thoraco-abdominal aneurysm open repair	1	2	2	
Thoraco-abdominal aneurysm hybrid repair	1	2	2	
Popliteal aneurysm repair	1	3	4	
Visceral aneurysm repair	1	2	3	
Carotid aneurysm repair	1	2	3	
Subclavian aneurysm repair	1	2	3	
Repair femoral false aneurysm	2	3	4	
Re-operation for infected graft	1	2	3	
Endovascular repair infrarenal AAA	1	2	3	Required component of Specialty Induction

Internal iliac artery/aneurysm coiling	1	1	2	
Aorto-uniliac stent-graft, iliac occluder & crossover graft	1	2	3	Desirable
Juxta-renal or suprarenal AAA – fenestrated /branched stent	1	1	2	Desirable
Thoracic aneurysm/dissection stentgraft	1	1	2	Desirable
Correction of endoleak	1	1	1	
Stenting of peripheral/visceral aneurysm	1	1	1	

ANEURYSM - EMERGENCY

OBJECTIVE

Assessment and management of emergency aneurysms

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Risk factors for aneurysm rupture	4	4	4	
Appropriate/timely investigation of an emergency aneurysm (acute/ruptured)	3	4	4	Desirable
Open and endovascular treatment options	3	4	4	Desirable
Surgical methods of immediate aortic control - supra- coeliac and infrarenal	3	4	4	
Intra-abdominal compartment syndrome	3	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Assessment of co-morbidity	3	4	4	
Selection of patients for conservative management, open or endovascular repair	2	3	4	Desirable
Recognise/manage complications	2	3	4	
TECHNICAL SKILLS				
Open repair ruptured infrarenal AAA	1	2	4	
Suprarenal/supracoeliac clamp	1	3	4	Desirable
Femoral thrombectomy and or additional lower limb revascularisation.	1	2	4	
Balloon control of aorta	1	2	4	
Endovascular repair ruptured infrarenal AAA	1	2	3	Desirable
Endovascular stenting of acute aortic dissection	1	1	2	Desirable
Endovascular stenting of acute aortic transection	1	1	2	Desirable
Aorto-uniliac stent-graft, iliac occluder and crossover graft	1	2	2	

VASCULAR ACCESS (VA)

OBJECTIVE
To describe need for VA, common methods of VA, establish VA
and manage complications of VA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of upper and lower limb arteries and veins	3	4	4	
List indications for VA	3	4	4	
Knowledge of methods of renal support; advantages and disadvantages	3	4	4	
Physiology of arterio-venous fistulae	2	3	4	
Knowledge of conduit material	2	3	4	
List complications of VA	3	4	4	
Knowledge of preoperative investigations including ultrasound	2	3	4	
CLINICAL SKILLS				
Pre-operative assessment and choice of VA	1	2	4	
Arrange appropriate investigations	1	2	4	
Ultrasound assessment of patient needing vascular access	1	1	3	
TECHNICAL SKILLS				
Radio-cephalic AVF	1	2	4	Desirable
Brachiocephalic fistula	1	2	4	Desirable
Basilic vein transposition AV fistula	1	2	4	Desirable
Create forearm loop graft	1	2	3	Desirable
Create thigh loop graft	1	2	3	Desirable
Saphenous vein transposition AV fistula	1	2	3	
On-table fistulogram/angioplasty	1	2	3	
Graft thrombectomy and revision	1	2	3	
Ligation/excision of fistula or graft	1	2	4	
DRIL or other salvage procedure	1	2	3	
Complex revision procedures	1	1	3	
Percutaneous fistulography and endovascular intervention	1	1	2	
Ultrasound-guided cannulation of jugular vein and femoral artery	1	2	3	Desirable
Insert central venous dialysis catheter	1	2	3	Strongly Recommended
Insert peritoneal dialysis catheter	2	3	4	Strongly Recommended

RENOVASCULAR DISEASE AND TRANSPLANTATION

OBJECTIVE

Knowledge and management of vascular problems related to renal disease and vascular surgical problems in patients with renal disease and renal transplantation

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Renal & reno-vascular anatomy	2	3	4	
Role of kidney in control of blood pressure	2	3	4	
Role of kidney in calcium homeostasis	2	3	4	
Pathophysiology of chronic kidney disease	2	3	4	
Pathophysiology of acute kidney injury	2	3	4	
Pre-renal: shock, trauma, sepsis, atherosclerosis	2	3	4	
Renal: intrinsic renal disease, toxins	2	3	4	
Post renal: obstruction, stone, tumour	2	3	4	
CLINICAL SKILLS				
Pre-operative assessment	2	3	4	
Arrange appropriate investigations	1	2	4	
Role of CT angiography in assessing renal disease	2	3	4	
Indications for renal angiography/angioplasty	2	3	4	
Indications for retrograde Ureteric imaging	1	2	3	
Indications for isotope renography	2	3	3	
Indications for selective renal vein sampling	2	3	3	
Indications for renal biopsy	2	3	3	
TECHNICAL SKILLS				
Open approach to kidney	2	3	4	Desirable
Laparoscopic approach to kidney	1	2	2	
Exposure of renal vessels	2	3	4	Desirable
Renal artery Endarterectomy/bypass	2	3	3	
Open surgical nephrectomy	1	2	3	
Radiological access to renal arteries	1	2	3	Desirable
Renal artery embolisation	1	2	2	

Renal artery angioplasty	1	2	2	
Living kidney donor nephrectomy open/laparoscopic	1	2	2	
Renal autotransplant	1	2	3	
Renal allotransplant	1	2	3	
Transplant nephrectomy	1	1	2	

MESENTERIC VASCULAR DISEASE

OBJECTIVE
Assessment and management of patients with acute and chronic mesenteric ischaemia

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of mesenteric arterial and venous system	3	4	4	
Physiology of mesenteric vasculature	3	4	4	
Pathophysiology of mesenteric ischaemia	3	4	4	
Presentation of mesenteric vascular disease - acute and chronic	3	4	4	
Investigation - Mesenteric angiography, CT	2	3	4	Desirable
Treatment - Medical, surgical, endovascular	1	2	3	
Complications	2	3	4	
CLINICAL SKILLS				
History and examination of acute and chronic presentation	2	3	4	
Resuscitation	3	4	4	
Interpretation of investigations	2	3	4	
General management	2	3	4	
TECHNICAL SKILLS				
Radiological intervention (lysis, angioplasty, stenting)	1	1	1	
Mesenteric thromboembolectomy	1	2	3	
Mesenteric bypass	1	2	3	

SUPERFICIAL VENOUS DISEASE

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of varicose veins, including recurrent veins and complications				
KNOWLEDGE				
Anatomy of the superficial venous system	3	4	4	
Physiology of venous dynamics	3	4	4	
Graduated support	4	4	4	
Pathology of superficial venous incompetence	3	4	4	
Neovascularisation	1	2	4	
Recanalisation	1	2	4	
Pelvic venous reflux	1	2	4	
Complications of venous hypertension	2	3	4	
Oedema, lipodermatosclerosis, ulceration, bleeding, recurrence	2	3	4	
CLINICAL SKILLS				
Presenting symptoms and complications	4	4	4	
Examination varicosities and venous incompetence	4	4	4	
Identify complications	3	3	4	
Interpretation of venous duplex	2	3	4	Required component of Specialty Induction
Interpretation of venography	1	2	3	Desirable
Interpretation of plethysmography	1	2	3	
Management options (conservative, sclerotherapy, endovenous thermal ablation, surgery)	3	4	4	
TECHNICAL SKILLS				
Apply compression bandage	2	3	4	
Injection sclerotherapy	2	3	4	
Truncal foam sclerotherapy	1	3	4	
Cannulate long and short saphenous veins under US control	1	3	4	Required component of Specialty Induction
Endovenous thermal ablation (EVLT/VNUS)	1	3	4	Desirable
Surgery (multiple phlebectomies, sapheno-femoral junction ligation, sapheno-popliteal junction ligation, long saphenous vein strip)	3	4	4	
Recurrent varicose vein surgery	2	3	4	

DEEP VENOUS THROMBOSIS

OBJECTIVE

Assessment and management of patient with deep venous thrombosis

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Anatomy of deep veins lower limb / pelvis	3	4	4	
Pathophysiology of thrombosis and DVT	2	3	4	
Management of uncomplicated DVT	3	4	4	
Early / late complications of DVT	2	3	4	
Thrombophilia	2	3	4	
Thromboprophylaxis	4	4	4	
Investigations(Ultrasound, duplex, V/Q scans, CTPA)	3	4	4	
Indications for intervention (caval filters, thrombolysis, surgical thrombectomy	2	3	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Investigation (Duplex, interpretation MRV and CTPA)	2	3	4	Desirable
	2	4	4	
TECHNICAL SKILLS				
Endovenous therapy (thrombolysis)	1	2	3	
Venous thrombectomy	1	2	3	
Insertion and removal of caval filter	1	2	2	

DEEP VENOUS INSUFFICIENCY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment and management of patient with deep venous insufficiency				
KNOWLEDGE				
Pathology of deep venous insufficiency (DVT, valvular dysfunction, valvular agenesis)	2	3	4	
Management options (compression systems, valvuloplasty, valve transplant, bypass, amputation)	2	3	4	
CLINICAL SKILLS				
History - identify risk factors	2	4	4	
Examination - diagnose complications	2	4	4	
Investigation – Duplex, venography, plethysmography)	2	3	4	
TECHNICAL SKILLS				
Apply compression bandage	2	3	4	
Biopsy of leg ulcer	2	4	4	
Perforator ligation	1	3	4	
Deep venous reconstruction	1	2	3	
Venous bypass (e.g. Palma)	1	2	3	
Iliac venous stent	1	1	1	

LYMPHOEDEMA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE				
Assessment and management of patients with lymphoedema				
KNOWLEDGE				
Anatomy of lymphatic system	2	3	4	
Physiology	2	3	4	
Pathophysiology	2	3	4	
Classification of lymphoedema (primary and secondary)	1	3	4	
Clinical features	2	3	4	
Complications - chronic effects	1	3	4	
Investigation – lymphoscintigraphy, lymphangiogram, CT/ MRI	1	3	4	
Management – manual compression, compression bandaging, compression hosiery, surgical options	1	3	4	
CLINICAL SKILLS				
History and examination	2	3	4	
Interpretation of investigations	1	3	4	
Management plan	1	2	4	
TECHNICAL SKILLS				
Application of compression bandage	1	2	3	Desirable
Treatment of lymphocoeles and lymphatic leaks	2	3	4	

SUPERFICIAL SEPSIS INCLUDING NECROTISING INFECTIONS

OBJECTIVE
Diagnosis and basic management of gas gangrene and other necrotising infections.

		ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE					
Superficial abscess	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Treatment (aspiration or incision and drainage)	4	4	4	
Cellulitis	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Antibiotic therapy	4	4	4	
Gas gangrene and other necrotising Infections	Aetiology	4	4	4	
	Bacteriology	4	4	4	
	Risk factors (diabetes, atherosclerosis, steroids and immunocompromised)	4	4	4	
	Antibiotic therapy and debridement	4	4	4	
Mechanisms of septic shock		4	4	4	
Appropriate antibiotic therapy		4	4	4	
Necrotising fasciitis		4	4	4	
CLINICAL SKILLS					
Superficial abscess	History, examination and management	4	4	4	
Cellulitis	History, examination and management	4	4	4	
Necrotising fasciitis	History, examination and management	4	4	4	
TECHNICAL SKILLS					
Superficial abscess	Abscess drainage or aspiration under ultrasound control	2	3	3	Desirable
Necrotising fasciitis	Debridement or radical excisional surgery	2	3	4	Desirable

ABDOMINAL WALL

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Management of abnormalities of the abdominal wall, excluding hernia				
KNOWLEDGE				
Anatomy of the abdominal wall	4	4	4	
Pathology of acute and chronic conditions (haematoma, sarcoma, desmoid tumours)	4	4	4	
CLINICAL SKILLS				
Ability to determine that a swelling is in the abdominal wall	3	4	4	
Initiate appropriate investigation (e.g. ultrasound, biopsy)	3	4	4	
TECHNICAL SKILLS				
Conservative management of haematoma	3	4	4	

LAPAROSCOPIC SURGERY

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE To understand the principles of laparoscopic surgery including technical aspects and common complications				
KNOWLEDGE				
Physiology of pneumoperitoneum	4	4	4	
Technology of video imaging, cameras and insufflator	4	4	4	
Laparoscopic instruments, clips, staplers and port types	4	4	4	
Use and dangers of diathermy	4	4	4	
Management of equipment failure	3	3	3	
Anaesthetic problems in laparoscopic surgery	3	3	3	
Informed consent for laparoscopic procedures	4	4	4	
Recognition and management of laparoscopic complications	3	3	3	
CLINICAL SKILLS				
Pre and postoperative management of laparoscopic cases	4	4	4	
TECHNICAL SKILLS				
Closed and open techniques for port insertion	4	4	4	Desirable
Diagnostic laparoscopy	3	3	3	Strongly recommended
Laparoscopic suturing and knotting	3	3	3	
Control of laparoscopic bleeding	3	3	3	

ELECTIVE HERNIA

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Diagnosis and management, including operative management of primary and most recurrent abdominal wall hernia				
KNOWLEDGE				
Anatomy of inguinal region including inguinal canal, femoral canal, abdominal wall and related structures e.g. adjacent retro-peritoneum and soft tissues.	4	4	4	
Relationship of structure to function of anatomical structures.	4	4	4	
Natural history of abdominal wall hernia including presentation, course and possible complications	4	4	4	
Treatment options	4	4	4	
Current methods of operative repair including open mesh, laparoscopic mesh and posterior wall plication, to include the underlying principles, operative steps, risks, benefits, complications and process of each	4	4	4	
CLINICAL SKILLS				
Diagnose and assess a patient presenting with common abdominal wall hernias, including inguinal, femoral, epigastric, umbilical and paraumbilical.	4	4	4	
Supervise the postoperative course	4	4	4	
TECHNICAL SKILLS				
Hernia repair-femoral	3	3	3	
Hernia repair-inguinal	3	3	3	Strongly Recommended
Hernia repair-incisional	3	3	3	
Hernia repair- TEPS	3	3	3	
Hernia repair- TAPS	3	3	3	

ACUTE ABDOMEN

	ST 4	ST 6	ST 8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment, resuscitation and management of patients with acute abdomen				
KNOWLEDGE				
Abdominal anatomy	4	4	4	
Causes of the acute abdomen	4	4	4	
Pathophysiology of shock	4	4	4	
Pathophysiology of peritonitis and sepsis	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	Desirable
Resuscitation	4	4	4	Desirable
Arrange Investigation (ultrasound, CT)	4	4	4	
Indication for surgery	4	4	4	
TECHNICAL SKILLS				
Central line insertion under US guidance	3	3	3	Strongly Recommended
Diagnostic laparotomy	4	4	4	Desirable
Diagnostic laparoscopy	3	3	3	Strongly Recommended
Abdominal lavage	4	4	4	

ACUTE INTESTINAL OBSTRUCTION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Recognise and manage most cases of postoperative intestinal obstruction in conjunction with abdominal surgeons				
KNOWLEDGE				
Abdominal anatomy	4	4	4	
Aetiology of intestinal obstruction	4	4	4	
Pathophysiology of shock / sepsis	4	4	4	
Differential diagnosis	4	4	4	
Treatment options	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	
Resuscitation	4	4	4	
Arrange investigation (CT and contrast studies)	4	4	4	
Nutritional support	4	4	4	
TECHNICAL SKILLS				
Central line insertion under US guidance	3	3	3	Strongly Recommended
Laparotomy and division of adhesions	4	4	4	
Small bowel resection	4	4	4	Strongly Recommended
Large bowel resection/stoma	3	3	3	

GASTROINTESTINAL BLEEDING

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Assessment of all cases of gastrointestinal bleeding, management and referral to subspecialists as needed				
KNOWLEDGE				
Blood loss and hypotension/physiology of hypovolaemia	4	4	4	
Coagulopathy	4	4	4	
Recognition of all causes of GI bleeding	4	4	4	
Role of endoscopy and CT angiography	3	3	3	
Indications for operation	3	3	3	
Role of endoscopic procedures and therapeutic radiology	3	3	3	
Postoperative care and fluid balance	4	4	4	
CLINICAL SKILLS				
Resuscitation of hypotensive patient	4	4	4	Desirable
HDU care	3	3	3	
Clinical assessment of cause of bleeding	4	4	4	
Organise appropriate endoscopy or other investigation	4	4	4	
Advise appropriate surgery	3	3	3	
Recognition of re-bleeding and postoperative problems	3	3	3	
Treatment of complications	3	3	3	
TECHNICAL SKILLS				
Laparotomy for bleeding	3	3	3	

ABDOMINAL INJURIES

	ST 4	ST6	ST 8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Identify and manage the majority of abdominal injuries				
KNOWLEDGE				
Anatomy of abdomen	4	4	4	
Aetiology	4	4	4	
Pathophysiology of shock	4	4	4	
Differences in Children	4	4	4	
Principles of management of severely injured patients	4	4	4	
Importance of mechanism of injury (gun shot, stabbing, seat belt)	4	4	4	
Indications for un-crossmatched blood	4	4	4	
Coagulopathy	4	4	4	
Pathophysiology of peritonitis and sepsis	4	4	4	
Principles of damage control surgery	4	4	4	
CLINICAL SKILLS				
History and examination	4	4	4	Strongly Recommended
Resuscitation	4	4	4	Strongly Recommended
Investigation	4	4	4	Strongly Recommended
Appropriate use of CT and FAST scanning	4	4	4	Strongly Recommended
Indications for intervention	4	4	4	Strongly Recommended
Recognition of injuries requiring other specialties	4	4	4	Strongly Recommended
Management of hollow organ injury	3	3	3	Strongly Recommended
TECHNICAL SKILLS				
Central line insertion	3	3	3	Strongly Recommended
Laparotomy	4	4	4	Desirable
Laparoscopy	3	3	3	Desirable
Liver trama - debridement / packing	2	2	2	Desirable
Pancreatectomy - distal	2	2	2	

Splenectomy	3	3	3	Desirable
Splenic repair	2	2	2	
Small bowel repair/resection	4	4	4	Strongly Recommended
Large bowel resection/stoma	3	3	3	
Nephrectomy	2	2	2	

GASTRIC STASIS, PARALYTIC ILEUS AND CONSTIPATION

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVE Management of postoperative gastric stasis, pseudo-obstruction and constipation				
KNOWLEDGE				
Normal gastric, small bowel and colonic physiology (including gut hormones and peptides) and the process of defaecation	4	4	4	
Classification of types and causes of postoperative gastric stasis, pseudo-obstruction and constipation	4	4	4	
Prokinetic and anti-emetic agents	4	4	4	
Different types of laxatives and describe the indications, contraindications, modes of action, and complications of each: stimulant, osmotic, bulk-forming, lubricant	4	4	4	
CLINICAL SKILLS				
Take a history from a patient with postoperative vomiting, abdominal distension or constipation and perform an appropriate physical examination	4	4	4	
Arrange appropriate investigations and management	4	4	4	
TECHNICAL SKILLS				
Insertion of NG tube	4	4	4	

ISCHAEMIC AND INFECTIOUS COLITIS

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
OBJECTIVES Management of ischaemic colitis and clostridium difficile colitis.				
KNOWLEDGE				
Vascular anatomy of the colon	4	4	4	
Epidemiology, aetiology, pathogenesis, investigation, medical management and indications for surgery of ischaemic colitis	4	4	4	
Epidemiology, aetiology, pathogenesis, investigation and treatment of clostridium difficile colitis	4	4	4	
CLINICAL SKILLS				
Management of ischaemic and infective colitis	4	4	4	
Manage ischaemic colitis after abdominal aortic aneurysm repair	3	3	4	
Management of clostridium difficile	4	4	4	
TECHNICAL SKILLS				
Sigmoid colectomy in conjunction with colorectal surgeons	3	3	3	

RETICULO-ENDOTHELIAL SYSTEM

OBJECTIVE
Management of conditions affecting the reticulo-endothelial and haemopoetic systems.

	ST4	ST6	ST8	Areas in which simulation should be used to develop relevant skills
KNOWLEDGE				
Causes of lymphadenopathy	3	3	4	
Indications for elective splenectomy-haemolytic anaemia, ITP, thrombocytopaenia, myeloproliferative disorders	3	3	3	
Indications for emergency splenectomy	4	4	4	
Sequelae of splenectomy	4	4	4	
Role of splenic embolisation	3	3	3	
CLINICAL SKILLS				
Planning appropriate diagnostic tests for lymphatic conditions	3	3	3	
Planning appropriate treatment schedule for conditions involving the spleen in consultation with haematologist	2	3	3	
TECHNICAL SKILLS				
Lymph node FNA	4	4	4	Desirable
Lymph node biopsy-groin, axilla	4	4	4	Desirable
Block dissection lymph nodes	1	2	3	
Emergency splenectomy	3	3	3	

Professional Behaviour and Leadership

Professional Behaviour and Leadership Syllabus

The Professional Behaviour and leadership elements are mapped to the leadership curriculum as laid out by the Academy of Medical Royal Colleges. The assessment of these areas is a thread running through the curriculum and this makes them common to all of the disciplines of surgery. For this reason, assessment techniques for this element of the curriculum are summarised in the final column.

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**
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 • 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	**Area 4.1**	CEX, CBD, MSF, MRCS and Specialty FRCS

	To prioritise and maximise patient safety:
	• To understand that patient safety depends on
	  ○ The effective and efficient organisation of care
	  ○ Health care staff working well together
	  ○ 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		

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	**Area 4.1**	

	• Understand principles of risk assessment 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	**Area 4.1**	

	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 • 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
		Area 4.1	

	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.		

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,
		Area 4.1	

	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		

	Professional Behaviour and Leadership	**Mapping to Leadership Curriculum**	**Assessment technique**
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		PBA, DOPS, CEX, MSF and CBD

	• 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		
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: o The delivery of bad news affects the relationship with the patient o Patient have different responses to bad news o Bad news is confidential but the patient may wish to be accompanied o Once the news is given, patients are unlikely to take in anything else o Breaking bad news can be extremely stressful for both parties o It is important to prepare for breaking bad news **Communication and working with colleagues** • Understand the importance of working with colleagues, in particular: o The roles played by all members of a multi-disciplinary team o The features of good team dynamics o The principles of effective inter-professional collaboration o The principles of confidentiality		

Skills	**Communication with patients** • Establish a rapport with the patient and any relevant others (eg 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 (eg phone call, email, letter) • 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		
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**
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		MSF, Portfolio assessment at ARCP
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**
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) • Personal development	**Area 1.3**	
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**	MSF, 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**

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	**Area 1.1 and 1.2**	MSF and CBD
	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	**Area 2**	MSF, CBD and Portfolio assessment during ARCP
	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	**Area 5** **Area 4.2, 4.3 and 4.4**	MSF, CBD and Portfolio assessment during ARCP MSF, CBD and Portfolio

	• Evaluating impact of change and taking 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	**Area 3**	assessment during ARCP MSF, 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 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	**Areas 1.1 and 1.2** **Area 2** **Area 5** **Area 4.2, 4.3, 4.4**	

	• 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
	  • 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
		Area 3	

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: o Education and training of junior colleagues and other members of the team o Deteriorating performance of colleagues (e.g. stress, fatigue) o 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 • 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	**Area 1.2 and 1.2** **Area 2** **Area 5**	

	• 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 • 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	**Area 1.1 and 1.2** **Area 2** **Area 5** **Area 4.2, 4.3, 4.4** **Area 3**	

	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		

Examples and descriptors for Core Surgical Training	**Self awareness and self management** • Obtains 360° feedback as part of an assessment • 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 1.1 and 1.2** **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 • Works well in a variety of different teams • Shows the leadership skills necessary to lead the multidisciplinary team • Beginning to leads multidisciplinary team meetings o Promotes contribution from all team members o Fosters an atmosphere of collaboration o Ensures that team functioning is maintained at all times. o Recognises need for optimal team dynamics o 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 **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 **Management and NHS Structure** • Can describe in outline the roles of primary care, including general practice, public health,	**Area 1.1 and 1.2** **Area 2** **Area 5** **Area 4.2, 4.3, 4.4** **Area 3**	

	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**
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, MSF
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
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 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	Area 1.4	MSF and CBD, PBA, DOPS, MRCS, specialty FRCS
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	Area 1.4	

	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		
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 • 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,	Area 1.4 Area 1.4	

	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 beliefs o Not exceeding the scope of authority given by the patient o 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	Area 1.4 Area 1.4 Area 1.4	
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	Area 1.4 Area 1.4 Area 1.4	

	• 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		
Examples and descriptors for CCT	• Recognises and responds to both system failure and individual error • Provides timely accurate written responses to complaints when required • Counsels patients on the need for information distribution within members of the immediate healthcare team • Seek patients' consent for disclosure of identifiable information • Discuss with patients with whom they would like information about their health to be shared • Understand the importance the possible need for ethical approval when patient information is to be used for any purpose • Understand the difference between confidentiality and anonymity • Know the process for gaining ethical approval for research • Able to assume a full role in making and implementing decisions about resuscitation status and withholding or withdrawing treatment • Able to support decision making on behalf of those who are not competent to make decisions about their own care • Obtains consent for interventions that he/she is competent to undertake, even when there are communication difficulties • Identifies cases which should be reported to external bodies • Identify situations where medical legal issues may be relevant • Work with external bodies around cases that should be reported to them. • Collaborating with external bodies by preparing and presenting reports as required		

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.

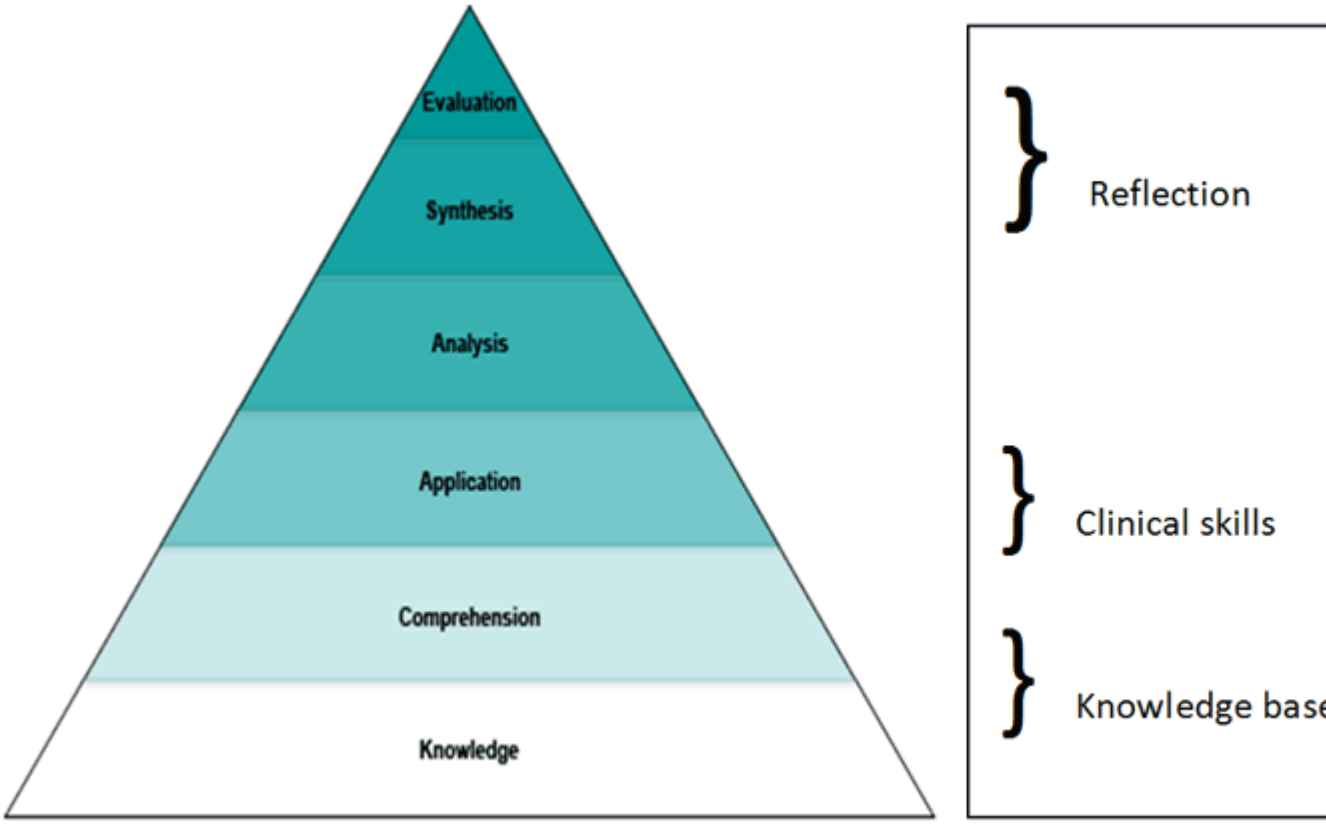
2. Discussion tools

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.

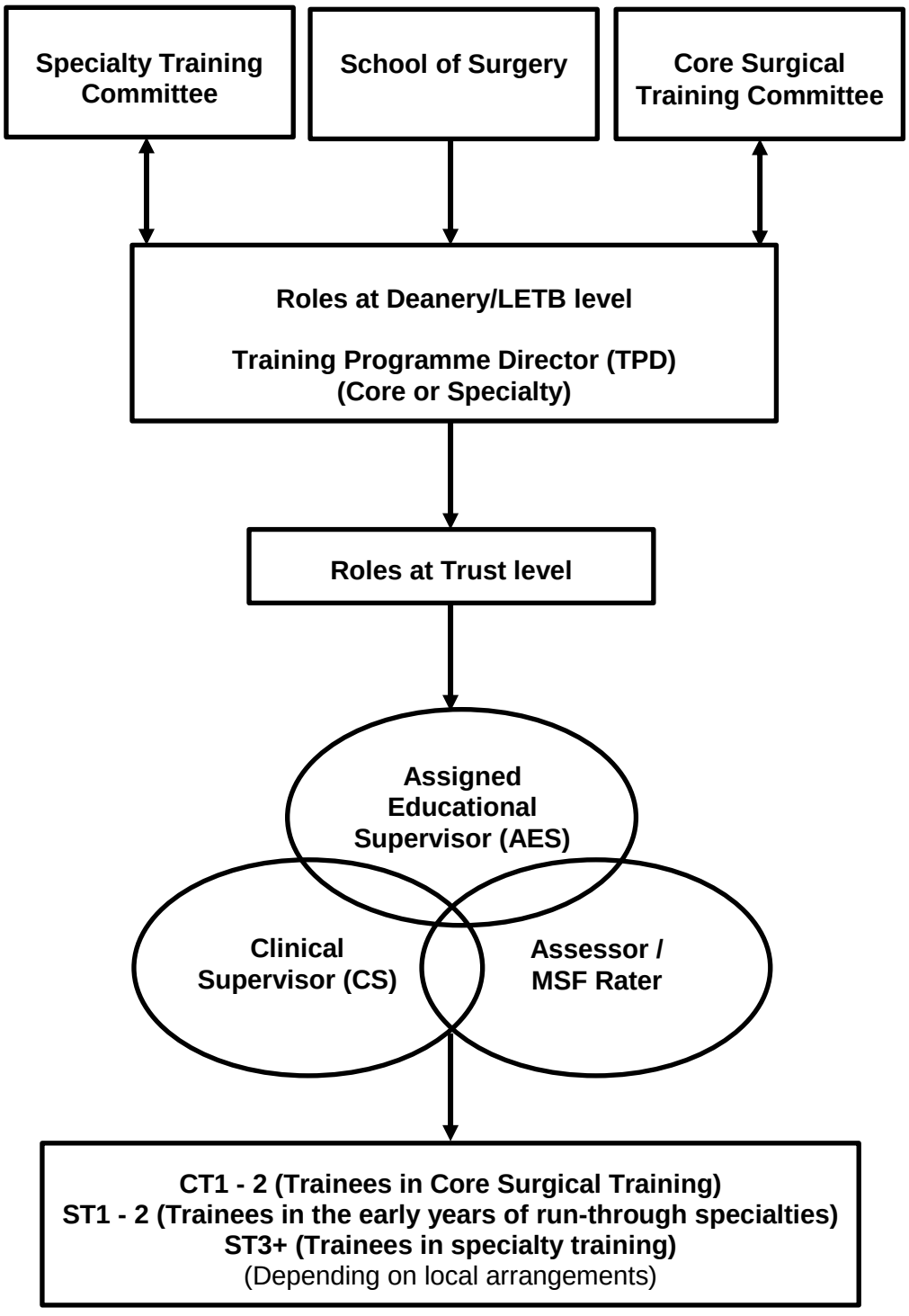
It may be entirely appropriate for a surgeon involved in training to hold more than one role (e.g. Assigned Educational Supervisor, Clinical Supervisor and Assessor) where the workload is manageable and the trainee continues to receive training input from several sources. The role of assessor is not 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.

In the Workplace - Planned and Structured

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

The 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.