ISCP INTERCOLLEGIATE SURGICAL CURRICULUM PROGRAMME

Vascular Surgery Curriculum

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VERTICAL LINE INDICATES UPDATES

THE INTERCOLLEGIATE
SURGICAL CURRICULUM PROGRAMME

Educating the surgeons of the future

Acknowledgements

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1 Introduction

The curriculum provides the approved United Kingdom (UK) framework for the training of doctors to the level of independent consultant practice in Vascular Surgery, addressing the requirements of patients, the population and the strategic health services. The curriculum will also be followed for training in the Republic of Ireland. General Medical Council (GMC) approval of the curriculum pertains to UK training programmes while those in the Republic of Ireland are governed by the Royal College of Surgeons in Ireland (RCSI) and the Medical Council of Ireland.

2 Purpose

2.1 Purpose of the curriculum

The purpose of the curriculum for Vascular Surgery is to produce, at certification, competent doctors, able to deliver excellent outcomes for patients as consultant vascular surgeons in the UK and Ireland. The curriculum will provide consultant vascular surgeons with the generic professional and specialty-specific capabilities needed to manage patients presenting with the full range of acute and elective vascular conditions, inclusive of the operation or procedure. Trainees will be entrusted to undertake the role of the Vascular Surgery Specialty Registrar (StR) during training and will be qualified at certification to apply for consultant posts in Vascular Surgery in the UK. Within these areas the model of consultant Vascular Surgery practice is consistent, in that it follows the creation of vascular networks with a hub and spoke working pattern around an arterial centre. This model is followed throughout the British Isles and Ireland and is consistent with the structure described in the *Provision of Vascular Services*[1] document.

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

The curriculum covers the three phases of the vascular training pathway. In phase 1 the trainee will achieve core surgical competencies with a view to entering the vascular training pathway through national selection at ST3 or having followed vascular themed run-through training having been appointed at ST1. In phase 2 the trainee will acquire the relevant general surgery skills and so allow introduction to all aspects of Vascular Surgery. The progression of vascular competence is guided, and benchmarked by the respective ST4 and ST6 Annual Review of Competence Progression (ARCP) decision guides. The completion of phase 2 will be marked by the trainee reaching the level of knowledge and clinical and professional skills required to be assessed as a day-one consultant in Vascular Surgery and so be eligible to sit the Intercollegiate Speciality Board examination in Vascular Surgery. In phase 3 trainees will continue to develop the full range of vascular skills required for certification as defined by the syllabus objectives.

[1] The Provision of Services for Patients with Vascular Disease 2018

It will be possible for trainees to develop further advanced competencies based on patient need in a geographical area or to deliver a specialist service requirement. This technical development may be undertaken as post-certification activity and recognised with a credentialing process beyond the remit of this curriculum.

Whilst the indicative time for vascular surgical training will be six years for uncoupled and eight years for run-through training, the actual length of training may be shorter or longer than the indicative time according to the rate at which competencies are achieved.

This purpose statement has been endorsed by the GMC's Curriculum Oversight Group and confirmed as meeting the needs of the health services of the countries of the UK.

2.2 Rationale and development of a new curriculum

The *Shape of Training* (SoT) review[2] and *Excellence by Design: standards for postgraduate curricula*[3] provided opportunities to reform postgraduate training. The curriculum will produce a workforce fit for the needs of patients, producing doctors who are more patient-focused, more general and who have more flexibility in their career structure. The GMC's introduction of updated standards for curricula and assessment processes laid out in *Excellence by Design* requires all medical curricula to be based on high-level outcomes. The high-level outcomes in this curriculum are called Capabilities in Practice (CiPs) and integrate parts of the syllabus to describe the professional tasks within the scope of specialty practice. At the centre of each of these groups of tasks are Generic Professional Capabilities[4] (GPCs), interdependent essential capabilities that underpin professional medical practice and are common to all who practise medicine. The GPCs are in keeping with Good Medical Practice (GMP)[5]. Equipping all trainees with these transferable capabilities should result in a more flexible, adaptable workforce.

All the shared CiPs are transferable to other surgical specialties and some may be transferable to non-surgical specialties (see section 2.3.1). In addition, core knowledge and skills gained in any surgical specialty training programme are transferable for entry into Vascular Surgery. Trainees who choose to move from a different speciality training programme having previously gained skills transferable to Vascular Surgery may be able to have a shorter than usual training pathway in their new training programme. While most of the specialty syllabus is not transferable because the knowledge and detailed technical skills are specific to Vascular Surgery, some limited areas of the syllabus may be transferable. This flexible approach, with acquisition of transferable capabilities, allows surgical training to adapt to current and future patient and workforce needs and change in the requirements of surgery with the advent of new treatments and technologies.

2.3 Progression through training

Uncoupled trainees will enter phase 2 after completion of core surgical training (phase 1) and successfully gaining a National Training Number (NTN) through the national selection process.

[2] Shape of training: Securing the future of excellent patient care
[3] Excellence by design: standards for postgraduate curricula
[4] Generic professional capabilities framework
[5] Good Medical Practice

Run-through trainees in the Improving Surgical Training (IST) pilot will enter phase 2 after having achieved an outcome 1 at their ARCP at the end of ST2. These trainees will not be required to attend ST3 national selection interviews.

Trainees will learn in a variety of settings using a range of methods, including workplace-based experiential learning in a variety of environments, formal postgraduate teaching, simulation-based education and through self-directed learning.

Vascular Surgery training is outcome-based rather than time-based. However, it will normally be completed in an indicative time of eight years (two years in phase 1, four years in phase 2 and two years in phase 3) for those entering run-through training at ST1 and six years for uncoupled trainees entering at ST3 (four years in phase 2 and two years in phase 3). There will be options for those trainees who demonstrate exceptionally rapid development and acquisition of capabilities to complete training more rapidly than the current indicative time. There may also be a small number of trainees who develop more slowly and will require an extension of training in line the Reference Guide for Postgraduate Specialty Training in the UK (the Gold Guide[6]).

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

The programme will be divided into three phases:

- Phase 1 will follow the Core Surgical Training curriculum for acquisition of both technical and non-technical generic skills, with a Vascular Surgery theme (of at least six months) to the first two years of training for run-through trainees. Run-through trainees in the IST pilot and trainees on an academic training pathway will progress to phase 2 after the award of an outcome 1 at the ARCP at ST2. Those uncoupled trainees, including the military trainees, completing core surgical training or equivalent would enter phase 2 of vascular training at ST3 via national selection.

- Phase 2 will take an indicative time of four years during which trainees will gain the GPCs and the knowledge, clinical skills and professional behaviours of Vascular Surgery expected of a day-one consultant in the specialty, as defined in the CiPs and the syllabus. At the start of phase 2 the trainee will be placed in General Surgery for one year to gain skills in safe navigation of abdominal contents and peri-operative management in elective and emergency settings. There will be the facility to undertake a further year of general surgery on call, along with vascular progression, to ensure the development of the required competencies. Trainees will then be exposed to all aspects of the generality of emergency and elective Vascular Surgery during the rest of phase 2. There will be a critical progression point at the end of phase 2, satisfaction of which will permit application to sit the ISB examination in Vascular Surgery.

- Phase 3 will take an indicative time of two years during which time trainees will gain all the skills necessary in the generality of Vascular Surgery to deliver all of the open and endovascular emergency, urgent and elective procedures, of the Vascular Surgery curriculum that are necessary to perform safely as a day-one consultant. The further development of certain aspects of the curriculum for a trainee can be facilitated based on the needs of the service

[6] Gold Guide 10th edition

(either local or national), the preference of the trainee, trainees skills and the ability of the programme to support the trainee in that development. Where a programme cannot facilitate the additional curriculum development of trainees, Out of Programme Training (OOPT) can be utilised. On completion of phase 3 trainees will be eligible for certification and for recommendation to enter the specialist register. Trainees who do not meet the requirements of phase 3 within the expected two years may require an extension of training time in accordance with the Gold Guide.

2.3.1 Interdependence with other specialties

Vascular Surgery has several areas of interdependence with other specialties that are variable in their extent based on local service requirements and patient needs. The specialties of Cardiothoracic Surgery, Cardiology, Diabetes Medicine, Interventional Radiology, Renal Medicine, Stroke Medicine and Transplant Surgery all have a degree of interdependence with Vascular Surgery. Some of this interdependence relates to multi-disciplinary team (MDT) working and would be assessed as part of the GPCs and so it would be entirely appropriate for a specialty representative to teach, feedback on or assess a Vascular Surgery trainee and for Vascular Surgery trainers to reciprocate.

With respect to interdependence of technical skills, the variation of delivery will relate to local service requirements and structure. The development of these technical skills may be delivered by another specialty or in partnership to mirror the local pathways and so ensuring that no specialty has any curriculum compliance issues. Where there is the ability to deliver collaborative care / procedures for the patients benefit this is described within the objectives of the syllabus.

In practice the largest collaboration is between Vascular Surgery and Interventional Radiology where the co-operative approach is based on MDT working. This integrated management is based on an inclusive decision-making environment to ensure optimal patient outcomes. The training of endovascular procedures represents an area of common ground between the two curricula and the delivery will be guided by the local service structure. It will be ensured that all trainees obtain the training to allow appropriate practice as a day-one consultant within their specialty. The Vascular Surgery curriculum has identified where collaboration occurs within cases and as such where trainers of either specialty may be delivering the education. By undertaking combined open and endovascular cases, Vascular Surgery will relieve some of the burden of providing the endovascular education to Vascular Surgery trainees as well as reciprocating to Interventional Radiology trainees. This common ground of training can ensure appropriate exposure and integrated decision making.

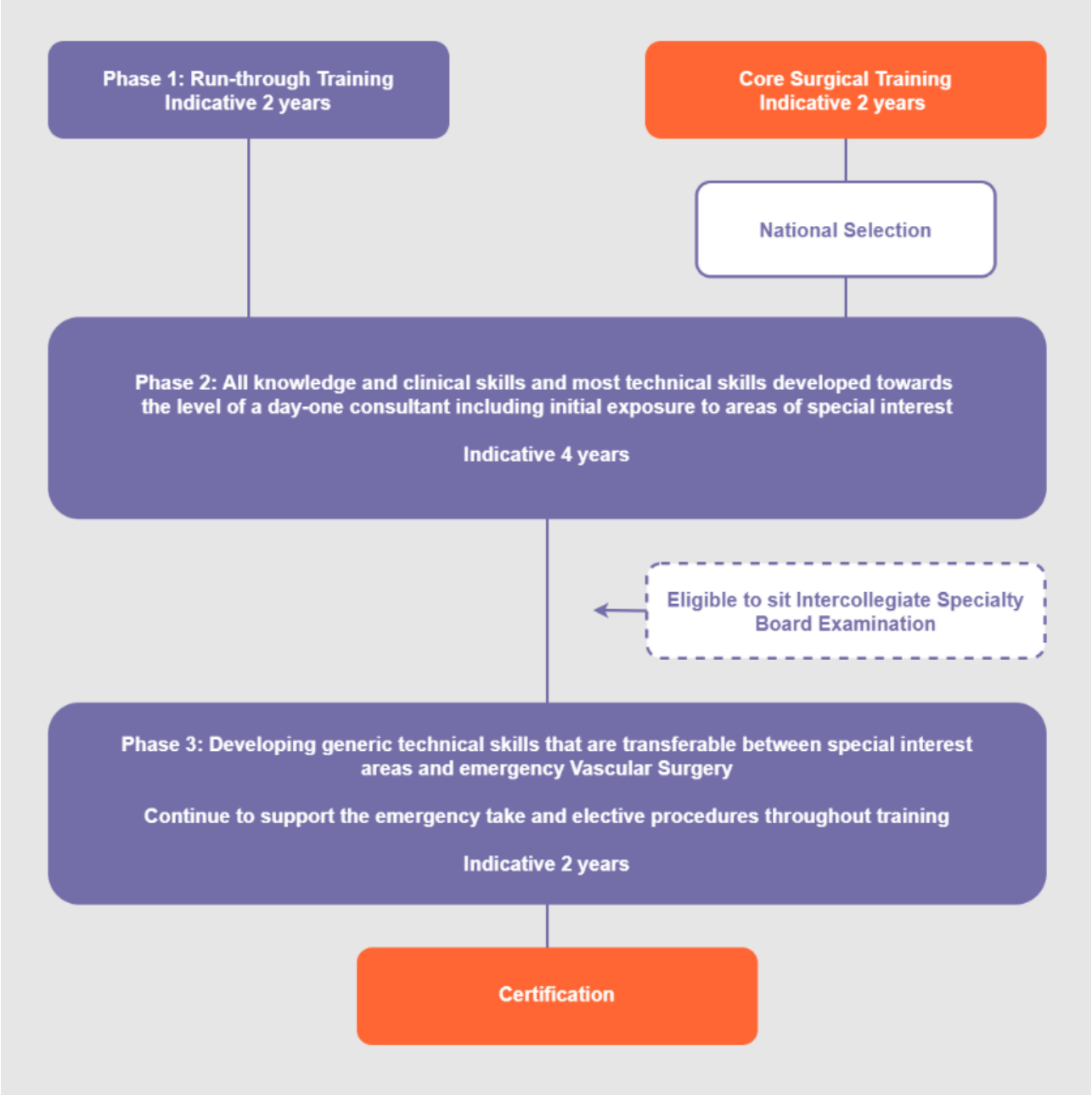

Figure 1. Vascular Surgery Training Pathway. Trainees can enter Vascular Surgery training at phase 1, following the curriculum for core training in surgery and running through without further selection onto phase 2 of the Vascular Surgery curriculum, or trainees can enter at phase 2, having successfully completed the curriculum for core surgical training and been successful at a national selection process into Vascular Surgery training. Core surgical training is uncoupled from specialty training for the majority of trainees. The availability of posts is at the discretion of the statutory postgraduate medical education bodies.

3 Programme of Learning

This section covers the expected learning outcomes, learning methods, breadth of experience and levels of performance at critical progression points in the training programme and the levels of performance expected of those completing training.

3.1 What has to be learnt to complete the Vascular Surgery curriculum

The practice of Vascular Surgery requires the generic and specialty knowledge, clinical and technical skills and behaviours to manage patients presenting with all aspects of elective and emergency Vascular Surgery. It involves the development of competence in diagnostic reasoning, managing uncertainty, dealing with co-morbidities, and recognising when another specialty opinion or care is required (as well as developing technical skills in the areas described by the objectives in the syllabus as shown in appendix 2). The main areas for learning are described by the CiPs which are the high-level learning outcomes for training in Vascular Surgery described below and shown in full in appendix 1.

3.2 Capabilities in Practice (the high-level outcomes of training)

Training is designed to produce a person capable of safely and effectively performing the role of a first day consultant surgeon. The role of a consultant surgeon can be thought of as a sum of all the various tasks which need to be performed through a working week. These tasks are the high-level outcomes of the curriculum and grouping these together describe the role of a consultant surgeon. To perform a high-level clinical task as a consultant a surgeon requires trainees to be able to integrate the objectives of learning from all parts of the syllabus, including knowledge, clinical skills, professional skills and technical skills. In addition, a consultant surgeon will need to have acquired the generic skills, behaviours and values shared by all doctors in order to perform this task safely and well. A capability is a set of skills that can be developed through training from novice to expert and therefore these high-level clinical outcomes are known as Capabilities in Practice. They are common across all surgical specialties and are delivered within the context of the GPCs and the specialty syllabus.

There are five CiPs which are shared between all surgical specialties:

1) Manages an out-patient clinic
2) Manages the unselected emergency take
3) Manages ward rounds and the on-going care of in-patients
4) Manages an operating list
5) Manages multi-disciplinary working

The generic knowledge, skills, behaviours and values shared by all doctors are described in the GPC framework. The GPCs are essential components and have equal weight to the CiPs in the training and assessment of clinical capabilities and responsibilities in the training programme.

The GPC framework has nine domains:

Domain 1: Professional values and behaviours

Domain 2: Professional skills
Practical skills
Communication and interpersonal skills
Dealing with complexity and uncertainty
Clinical skills

Domain 3: Professional knowledge
Professional requirements
National legislative requirements
The health service and healthcare system in the four countries

Domain 4: Capabilities in health promotion and illness prevention

Domain 5: Capabilities in leadership and team working

Domain 6: Capabilities in patient safety and quality improvement
Patient safety
Quality improvement

Domain 7: Capabilities in safeguarding vulnerable groups

Domain 8: Capabilities in education and training

Domain 9: Capabilities in research and scholarship

Simply put, the CiPs and GPCs are the constituent parts of the role of a consultant in Vascular Surgery. Each part is as important as the next, and doctors are required to be capable in all parts of the role in order to be able to practice independently. In order to complete training and be recommended to the GMC for certification and entry to the specialist register, the doctor must demonstrate that they are capable of unsupervised practice in all the CiPs and GPCs. For example, managing the unselected emergency take (CiP 2) requires the integration of knowledge, clinical and diagnostic skills, and technical skills described within the syllabus objectives as well as communication and interpersonal skills, time management skills and many other generic skills described in the GPCs in order to be delivered safely, professionally and effectively. This will be assessed using the Multiple Consultant Report (MCR) as described below. The full content of the five CiPs can be found in appendix 1.

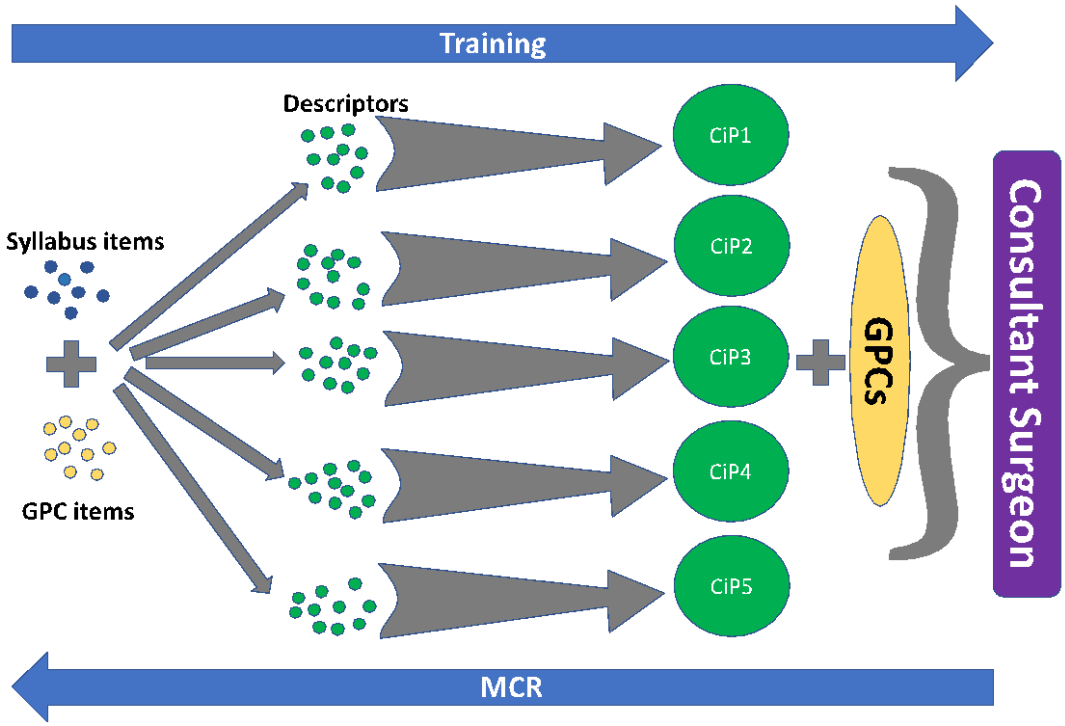

Figure 2 - The interrelationship of the GPCs, the syllabus, the CiPs and their descriptors to the role of a consultant surgeon. Items from the syllabus are combined with items taken from the GPC framework to form the small tasks which are the CiP descriptors. When the small tasks of the descriptors are integrated they comprise the constituent parts of the role of a consultant surgeon (the CiPs). When the CiPs are taken together, along with the GPCs, the role of a consultant surgeon (the overall outcome of the curriculum), is described. Each of these CiPs will be developed through training until the level required of a day-one consultant is reached. Assessment in an outcomes-based curriculum through the MCR examines the trainee from the perspective of the outcome (a consultant surgeon), and compares performance in each CiP and in the GPCs to that level. If the outcome level is not reached, then targeted feedback and development plans can be made with reference to the CiP descriptors and beyond to the syllabus items and GPC items that combine to form the descriptors.

3.3 Descriptors for CiPs

The five CiPs taken together describe the role of a consultant in Vascular Surgery but more detail is needed to help trainees develop that capability through training via detailed feedback and focused development goals.

We can break the CiPs down into smaller tasks. Each of these smaller tasks is a CiP descriptor. For example, managing the unselected emergency take (CiP 2), includes the need to promptly assess acutely unwell and deteriorating patients and deliver resuscitative treatment and initial management and ensure sepsis is recognised and treated in compliance with protocol (see appendix 1). If a trainee has not yet reached the level required of a new consultant in a CiP then the descriptors can be used to describe in standard language what needs to be improved through learning and training to allow the trainee to get closer towards the outcome of training. By describing component parts of a CiP, descriptors also aid decisions on assessment of the level of supervision required by a trainee at the time of that assessment, providing prompts for feedback of performance by allowing identification of areas of excellence or specific detail on areas for development, including in behavioural and professional domains. Descriptors can, therefore, help

trainees identify where to focus their efforts to become competent and safe independent practitioners. More detail about assessment and feedback is given in section 5, the Programme of Assessment.

Each CiP is judged against a scale that describes the level of supervision required to perform the CiP to the standard of certification. The level of supervision changes in line with the trainee's progression, consistent with safe and effective care for the patient. Typically, there should be a gradual reduction in the level of supervision required and an increase in the complexity of cases managed until the level of competence for independent practice is acquired. In the early years, therefore, it would be normal for trainees to achieve a lower supervision level and progress as experience is gained.

The supervision levels are:

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

3.4 Critical progression points

The training pathway described above (figure 1) shows that after phase 1 all trainees will complete two further phases. There is a single critical progression point at the end of phase 2. To move from phase 2 to phase 3 trainees must demonstrate knowledge, clinical skills and professional behaviours commensurate with certification and, therefore, become eligible to sit the ISB examination in Vascular Surgery. Table 1 shows supervision levels required to complete phases 2 and 3, and a trainee becomes eligible for certification when supervision Level IV has been achieved in each CiP as well as acquiring all of the skills described in the GPC framework (in addition to the other certification requirements) as confirmed by the ARCP.

Excellence will be recognised by:
a) Achievement of SL V in any of the CiPs
b) Exceeding the supervision level expected for the end of phase 2 or 3
c) Achievement of a supervision level at an earlier stage than would normally be expected
d) Recognition of particularly good performance in any of the descriptors within a CiP.

Capabilities in Practice	Indicative Supervision Level (end of phase 2)	Supervision Level (end of phase 3 and certification)
Manages an out-patient clinic	SL III	SL IV
Manages the unselected emergency take	SL III	SL IV
Manages ward rounds and the on-going care of in-patients	SL III	SL IV
Manages the operating list	SLII	SL IV
Manages multi-disciplinary working	SLII	SL IV

Table 1: Supervision levels to be achieved by the end of each phase of training

3.5 Breadth of experience required during training in Vascular Surgery

The curriculum requires trainees to accrue a rich experience that promotes deep learning of knowledge, clinical skills, technical skills, professional behaviour, leadership and all other generic professional skills that are considered necessary to ensure patient safety throughout the training process and specifically at the end of training. The scope of practice of a day-one consultant in Vascular Surgery is described in the syllabus objectives. In addition, there are certain skills and conditions within the syllabus that are of such central and fundamental importance to safe practice of Vascular Surgery that they are highlighted as critical conditions, key topics and index procedures.

3.5.1 The syllabus

The syllabus, shown in appendix 2, provides a detailed description of the specialty-specific objectives incorporating the knowledge, clinical and technical skills required for each phase of training and for certification in Vascular Surgery. The syllabus is organised by topics which are the presenting conditions of patients in relation to the specialty. Trainees are expected to have exposure to all topics in phase 2 of training.

As surgical practice continues to evolve, it is essential for trainees to develop competencies in areas that are shaping the future of healthcare. The following three areas of practice are becoming increasingly relevant to the delivery of surgery and patient care. While these areas are not written into the syllabus in detail, they are recognised as critical aspects of practice that trainees should be aware of and integrate where appropriate. Given that surgical specialties and healthcare systems adopt these advancements at different rates, trainees are expected to stay informed and adapt their practice accordingly.

Whilst these areas are of growing importance and relevance, they are not expected to be fully evidenced by all trainees at this stage due to current disparities in training opportunities. Where feasible, trainee engagement in these emerging areas is encouraged, with continued focus on demonstrating the essential skills and behaviours in the GPC framework.

Genomics
Knowledge of genomics is increasingly important for surgical trainees, aiding them in patient screening, enhancing diagnostics and treatments leading to better targeted care. Genomic

technologies allow for the identification of genetic mutations and variations that contribute to disease, enabling treatment plans tailored to individual genetic profiles. Additionally, it is important for understanding hereditary and familial conditions, allowing surgeons to provide better-informed consent and management options for patients and their families. Although some specialties are likely to adopt genomic medicine into their clinical practice sooner than others, trainees will be expected to stay current with these developments and integrate genetic insights into their own clinical practice where appropriate. Trainees can demonstrate their application of genomics to patient care using workplace-based assessment methods such as the CEX, CBD, AoA and through presentations and quality improvement projects. [7] [8] [9]

Clinical Informatics

The use of Clinical informatics is a critical area of knowledge for surgical trainees as it encompasses the use of information technology to improve patient care. Proficiency in clinical informatics enables surgeons to efficiently manage electronic health records, use clinical decision support systems, and analyse health data to enhance surgical outcomes. Furthermore, clinical informatics supports evidence-based practice by providing access to the latest research and guidelines, facilitating continuous learning and improvement. Trainees will be expected to demonstrate the use of digital applications and the ability to access critical information for administrative efficiency, making informed surgical decisions and improving patient care. Trainees can demonstrate their knowledge, understanding and application of clinical informatics to patient care using workplace-based assessment methods such as the CEX, CBD, AoA, OoT and through presentations, research, quality improvement projects and health service management related activity. [10] [11] [12]

Sustainability

The use of sustainable practices is an increasingly important consideration in surgery, given the environmental impact of healthcare activities. By adopting sustainable practices, surgeons can contribute to the broader effort of making healthcare more environmentally friendly while still providing high-quality patient care. Trainees will be expected to keep up to date with knowledge of sustainable practices, including an understanding of the environmental implications of surgical procedures, the use of sustainable materials, and the implementation of energy-efficient practices within the operating room. Trainees should demonstrate that they can incorporate sustainability into their own practice and encourage a culture of environmental responsibility and stewardship.

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[7] https://www.aomrc.org.uk/wp-content/uploads/2021/11/Genomics_syllabus_1121.pdf

[8] https://www.england.nhs.uk/long-read/accelerating-genomic-medicine-in-the-nhs/

[9] https://www.nationalhealthexecutive.com/articles/nhs-scotland-first-genomic-medicine-strategy-launches

[10] https://www.england.nhs.uk/long-read/digital-skills-health-informatics-competency-standards-frameworks-and-tools-for-healthcare-professionals/

[11] https://digital-transformation.hee.nhs.uk/

[12] https://www.aomrc.org.uk/wp-content/uploads/2020/09/Doctors_Download_exploring_doctors_digital_priorities-_for-_action_0320.pdf

Trainees can demonstrate their commitment to sustainability using workplace-based assessment methods such as DOPS, PBA, CEX, CBD, OoT, AoA and through quality improvement projects, and reflective practice. [13]

3.5.2 Critical conditions and key topics

From the syllabus, a list of critical conditions and key topics (appendix 3) has been identified. The critical conditions are of significant importance for patient safety and demonstration of a safe breadth of practice. Across surgery, these are defined as any condition where a misdiagnosis could be associated with devastating consequences for life or limb. These critical conditions are assessed individually by means of the Case Based Discussion (CBD) and Clinical Evaluation Exercise (CEX), which both include an assessment of clinical judgement and decision-making. They provide formative feedback to the trainee and feed into the summative assessment of the Assigned Educational Supervisor (AES) via the AES report for the ARCP. A list of critical conditions for Vascular Surgery is given in appendix 3 and is included in the certification requirements in this curriculum. The scope of Vascular Surgery is highlighted by the key topics. These critical conditions and key topics were decided following wide consultation with clinicians, trainers and trainees in the specialty.

3.5.3 Index procedures

In addition to the critical conditions, a list of index procedures has been identified. Index procedures are common but important operations central to the specialty, competence in which is essential to the delivery of safe patient care. Taken together they form a representative sample of the breadth of operative procedures in the specialty. Learning in the index procedures is indicative of learning in the broad range of technical procedures in the syllabus and surgical logbook and is, therefore, of significant importance for patient safety and demonstration of a safe breadth of practice. Each of these index procedures is assessed individually by means of the Procedure Based Assessment (PBA) which provides formative feedback to the trainee and feeds into the summative AES report for the ARCP. The list of index procedures is given in appendix 4 and includes the indicative numbers of cases necessary before certification as trainees would not normally be expected to have achieved sufficient experience to be able to manage the range of pathology they encounter unless these numbers were met. It is recognised that competence could be achieved with fewer cases, if supported by evidence from other assessments. Meeting the numbers does not, in itself, imply competence. These index procedures and indicative numbers were decided following wide consultation with clinicians and trainers in the specialty.

The certification requirements, shown in section 5.4, summarise the experience trainees need to achieve by the end of the training programme.

4 Teaching and Learning

4.1 How the Vascular Surgery curriculum is delivered

The curriculum is used to help design training programmes locally that ensure all trainees can develop the necessary skills and knowledge in a variety of settings and situations. The curriculum is designed to ensure it can be applied in a flexible manner, meeting service needs as well as supporting each trainee's own tailored learning and development plan. The requirements for

[13] https://www.aomrc.org.uk/publication/sustainability-resources/

curriculum delivery have not changed as a result of this new curriculum. All training must comply with the GMC requirements presented in *Promoting excellence: standards for medical education and training*[14] (2017). This stipulates that all training must comply with the following ten standards:

Theme 1: learning environment and culture

S1.1 The learning environment is safe for patients and supportive for learners and educators. The culture is caring, compassionate and provides a good standard of care and experience for patients, carers and families.

S1.2 The learning environment and organisational culture value and support education and training, so that learners are able to demonstrate what is expected in Good Medical Practice and to achieve the learning outcomes required by their curriculum.

Theme 2: educational governance and leadership

S2.1 The educational governance system continuously improves the quality and outcomes of education and training by measuring performance against the standards, demonstrating accountability and responding when standards are not being met.

S2.2 The educational and clinical governance systems are integrated, allowing organisations to address concerns about patient safety, the standard of care, and the standard of education and training.

S2.3 The educational governance system makes sure that education and training is fair and is based on the principles of equality and diversity.

Theme 3: supporting learners

S3.1 Learners receive educational and pastoral support to be able to demonstrate what is expected in Good Medical Practice, and to achieve the learning outcomes required by their curriculum.

Theme 4: supporting educators

S4.1 Educators are selected, inducted, trained, and appraised to reflect their education and training responsibilities.

S4.2 Educators receive the support, resources and time to meet their education and training responsibilities.

Theme 5: developing and implementing curricula and assessments

S5.1 Medical school curricula and assessments are developed and implemented so that medical students are able to achieve the learning outcomes required for graduates.

S5.2 Postgraduate curricula and assessments are implemented so that doctors in training are able to demonstrate what is expected in Good Medical Practice, and to achieve the learning outcomes required by their curriculum.

It is the responsibility of NHS England, NHS Education for Scotland (NES), the Wales Deanery, the Northern Ireland Medical and Dental Training Agency (NIMDTA) and the Health Service Executive

[14] Promoting excellence: standards for medical education and training

(HSE) in the Republic of Ireland to ensure compliance with these standards for Vascular Surgery training. Training delivery must also comply with the latest edition of the Gold Guide. Appendix 7 outlines the quality management arrangements for the curriculum.

4.2 Learning opportunities

A variety of educational approaches are used by education providers in order to help trainees develop the knowledge, clinical and technical skills, professional judgement, values and behaviours required by the curriculum. Taken together, these educational approaches ensure that the CiPs and GPCs are taught appropriately in order that the purpose of the curriculum is met. These educational approaches divide into three areas:

- Self-directed learning
- Learning from practice
- Learning from formal situations

4.2.1 Self-directed learning

The curriculum is trainee-led and self-directed learning is encouraged. 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 encouraged to establish study groups, journal clubs and conduct peer reviews. They should take the opportunity of learning 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 attending formal and informal teaching. This includes using study materials and publications and reflective practice. Trainees are expected to use the developmental feedback they get from their trainers in learning agreement meetings and from assessments to focus further research and practice.

Reflective practice is an important part of self-directed learning and 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 order to refine and improve them. Reflection in the oral form is very much an activity that surgeons engage in and find useful and developmental. Writing reflectively adds more to the oral process by deepening the understanding of 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. Whatever the modality of reflection, it is important that it takes place and that there is a record of it having taken place, whether or not the specific subject or content of the reflection is recorded[15]. Self-directed learning permits development in all five CiPs and the GPCs, especially when there is effective reflection on all aspects of learning at the centre of self-directed learning.

4.2.2 Learning from clinical practice

Surgical learning is largely experiential in nature with any interaction in the workplace having the potential to become a learning episode. The workplace provides learning opportunities on a daily basis for surgical trainees, based on what they see and what they do. Trainees are placed in clinical placements determined locally by Training Programme Directors (TPDs) which provide teaching and learning opportunities. The placements must be in units that are able to provide sufficient clinical resource and have sufficient trainer capacity.

While in the workplace, trainees are involved in supervised clinical practice, primarily in a hospital environment in wards, clinics or theatre. There are strong links to practitioners working in primary

[15] Improving feedback and reflection to improve learning. A practical guide for trainees and trainers

care and training environments may include private settings and, where available for training, a variety of community settings where the necessary facilities and governance arrangements are in place. The trainee role in these contexts determines the nature of the learning experience.

Learning begins with observation of a trainer (not necessarily a doctor) and progresses to assisting a trainer; the trainer assisting/supervising the trainee and then the trainee managing a case independently but with access to their supervisor. The level of supervision changes in line with the trainee's progression through the phases of the curriculum. As training progresses, trainees should have the opportunity for increased autonomy, consistent with safe and effective care for the patient. Typically, there should be a gradual reduction in the level of supervision required and an increase in the complexity of cases managed until the level of competence for independent practice is acquired.

The CiPs are best taught, particularly in the early phases of training, by a specifically selected trainer directly watching and supervising while the trainee carries out the activity. This type of training is known as Professionalised Training and requires more time (and so, consequently, a reduced clinical workload) than conventional methods. It permits more thorough teaching, more rapid achievement of skill and earlier recognition of difficulties. Continuous systematic feedback and reflection are integral to learning from clinical practice. CiP and GPC descriptors through the MCR assessment provide detailed feedback and identify specific, timely and relevant goals for development through training. Education providers should make every attempt to ensure that each trainee has exposure to Professionalised Training appropriate to their phase of progression through the curriculum. It is recommended that this be one session per week per trainee in the early years. Trainees are required to keep a surgical logbook to support their reflection and the assessment of their operative skills.

4.2.3 Learning from formal situations

Learning from clinical practice is supplemented by an educational programme of courses and teaching sessions arranged at local, regional and national levels. These should be mapped to the CiPs and the Vascular Surgery syllabus and may include a mixture of formal talks including attendance at national conferences relevant to the specialty, small group discussion, case review and morbidity and mortality meetings, literature review and skills teaching. Mandatory courses for trainees are shown in the certification requirements (section 5.4 below) and appendix 5.

4.2.4 Simulation

Teaching in formal situations often involves the use of simulation. In this context simulation can be 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-free environment. Simulation can be used for the development of both individuals and teams. 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 with scenarios.

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 is 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. Simulation training broadly follows the same pattern of learning opportunities offering insight into the development of technical skills, team-working, leadership, judgement and professionalism. Education providers should use all teaching methods available, including simulation teaching, to ensure that the full breadth of the syllabus is covered. Where there is a need for specific intensive courses to meet specific learning outcomes, there may be a number of equivalent providers.

4.3 Supervision

Supervision is fundamental in the delivery of safe and effective training. It takes advantage of the experience, knowledge and skills of expert clinicians and ensures interaction between an experienced clinician and a trainee. 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. A number of people from a range of professional groups are involved in teaching and training with subject areas of the curriculum being taught by staff with relevant specialist expertise and knowledge. Those involved in the supervision of trainees must have the relevant qualifications, experience and training to undertake the role. Specialist skills and knowledge are usually taught by consultants and senior trainees whereas the more generic aspects of practice can also be taught by the wider MDT.

The key roles involved in teaching and learning are the Training Programme Director, Assigned Educational Supervisor, Clinical Supervisor, Assessor and Trainee. Their responsibilities are described in appendix 6 and further information is given in the Gold Guide.

In the UK, the GMC's process for the recognition and approval of trainers[16] enables Deaneries to formally recognise AESs and Clinical Supervisors (CSs) and ensure they meet the specified criteria. Trainees must be placed in approved placements that meet the required training and educational standards of the curriculum. In each placement, trainees have a named AES and one or more CS, responsible for overseeing their education. Depending on local arrangements, these roles may be combined into a single role of AES.

All elements of work in training posts must be supervised. The level of supervision varies according to the experience of the trainee, the clinical exposure and the case mix undertaken. As training

[16] GMC recognition and approval of trainers

progresses trainees should have the opportunity for increased autonomy, consistent with safe and effective care for the patient. Achievement of supervision level IV in any of the five CiPs indicates that a trainee is able to work at an independent level, with advice from their trainer at this level being equivalent to a consultant receiving advice from senior colleagues within an MDT. However, within the context of a training system, trainees are always under the educational and clinical governance structures of the Health Service.

4.4 Supporting feedback and reflection

Effective feedback is known to enhance learning, and combining self-reflection[8] with feedback promotes deeper learning. Trainees are encouraged to seek feedback on all they do, either informally, through verbal feedback at the end of a learning event, or formally through workplace-based assessments (WBAs). The MCR and use of the CiP and GPC descriptors provide regular opportunities for detailed and specific feedback. Trainee self-assessment of CiPs provides a regular opportunity for focused and structured reflection and development of self-directed goals for learning as well as developing these goals through dialogue with trainers. All the assessments in the curriculum are designed to include a feedback element as well as to identify concerns in multiple ways:

- *Learning agreement:* appraisal meetings with the AES at the beginning, middle and end of each placement
- *WBA:* immediate verbal dialogue after a learning episode
- *CBD:* meeting with a consultant trainer to discuss the management of a patient case
- *MSF:* meeting with the AES to discuss the trainee's self-assessment and team views
- *MCR (mid-point formative):* meeting with the AES or CS to discuss the trainee's self-assessment and CSs' views on CiPs
- *MCR (final formative, contributing to the AES's summative Report):* meeting with the AES or CS to discuss the trainee's self-assessment and CSs' views on CiPs
- *Formal examinations:* summative feedback on key areas of knowledge and skills
- *ARCP:* a feedback meeting with the TPD or their representative following an ARCP.

Constructive feedback is expected to include three elements i) a reflection on performance ii) identification of the trainee's achievements, challenges and aspirations and iii) an action plan.

4.5 Academic training

All trainees are required to satisfy the learning outcomes in domain 9 of the GPC framework; *Capabilities in research and scholarship*. Trainees are encouraged to participate in clinical research and collaborative trials to achieve these outcomes, as well as in journal clubs, literature review and systematic review and to a make major contribution to the publication of novel findings in peer reviewed journals. An understanding of the principles of research, its interpretation and safe implementation of evidenced-based new methods, processes and techniques is essential for the modern, progressive practice of surgery and in the interests of patients and the service. Some trainees choose to take time out of training for a formal period of research, as specified in the Gold Guide[5]. For the majority, this leads to the award of a higher degree in an area related to their chosen specialty. Some also choose to focus a significant part of their training time on academic medicine but need to complete all the essential elements of their specialty curriculum satisfactorily in order to achieve certification. The rate of progression through the clinical component of their training is determined by the ARCP process to ensure that all clinical requirements are met in keeping with the curriculum. Arrangements for academic training differ in

detail across the nations of the UK and Republic of Ireland. Details of arrangements can be found on the webpages of the relevant National Health Education body.

5 Programme of Assessment

5.1 Purpose of assessment

Assessment of learning is an essential component of any curriculum. This section describes the assessment system and the purpose of its individual components which are blueprinted to the curriculum as shown in appendix 9. The focus is on good practice, based on fair and robust assessment principles and processes in order to ensure a positive educational impact on learners and to support assessors in making valid and reliable judgements. The programme of assessment comprises an integrated framework of examinations, assessments in the workplace and judgements made about a learner during their approved programme of training. Its purpose is to robustly evidence, ensure and clearly communicate the expected levels of performance at critical progression points in, and to demonstrate satisfactory completion of, training as required by the curriculum. The assessment programme is shown in figure 3 below.

Assessments can be described as *helping* learning or *testing* learning - referred to as formative and summative, respectively. There is a link between the two; some assessments are purely formative (shown in green in figure 3), others are explicitly summative with a feedback element (shown in blue) while others provide formative feedback while contributing to summative assessment (shown in orange).

The purposes of formative assessment are to:

- assess trainees' actual performance in the workplace.
- enhance learning by enabling trainees to receive immediate feedback, understand their own performance and identify areas for development.
- drive learning and enhance the training process by making it clear what is required of trainees and motivating them to ensure they receive suitable training and experience.
- enable supervisors to reflect on trainee needs in order to tailor their approach accordingly.

The purposes of summative assessment are to:

- provide robust, summative evidence that trainees are meeting the curriculum requirements during the training programme.
- ensure that trainees possess the essential underlying knowledge required for their specialty, including the GPCs to meet the requirements of GMP.
- inform the ARCP, identifying any requirements for targeted or additional training where necessary and facilitating decisions regarding progression through the training programme.
- identify trainees who should be advised to consider changes of career direction.
- provide information for the quality assurance of the curriculum.

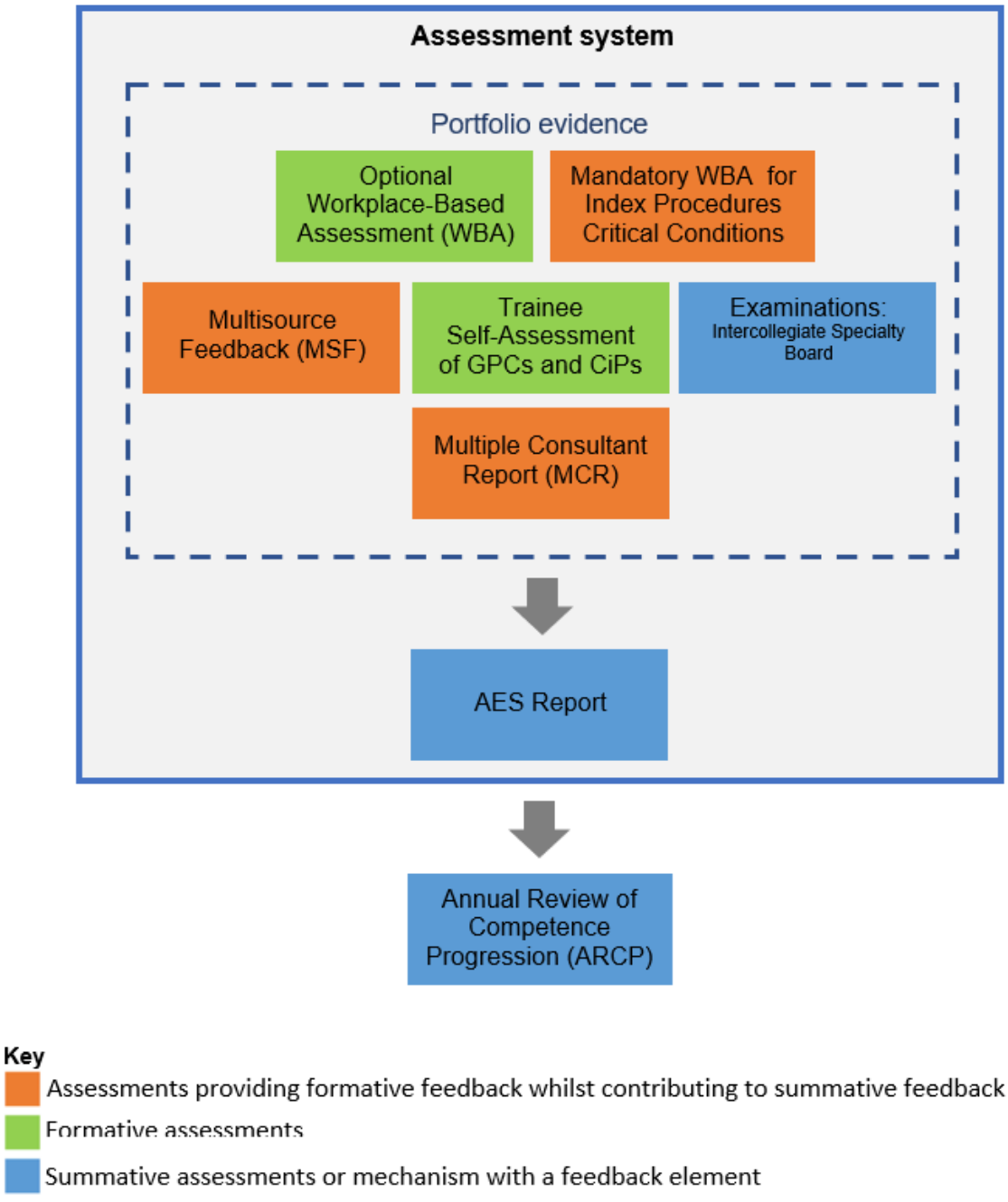

Figure 3: Assessment framework.

5.2 Delivery of the programme of assessment

The programme of assessment is comprised of several different types of assessment needed to meet the requirements of the curriculum. These together generate the evidence required for global judgements to be made about satisfactory trainee performance, progression in, and completion of, training. These include the ISB examination and WBAs. The primary assessment in the workplace is the MCR, which, together with other portfolio evidence, contributes to the AES report for the ARCP. Central to the assessment framework is professional judgement. Assessors are responsible and accountable for these judgements and these judgements are supported by structured feedback to trainees. Assessment takes place throughout the training programme to allow trainees to continually gather evidence of learning and to provide formative feedback to the trainee to aid progression.

Reflection and feedback are also integral components of all WBAs. In order for trainees to maximise the benefit of WBA, reflection and feedback should take place as soon as possible after the event. Feedback should be of high quality that should include a verbal dialogue between trainee and assessor in reflection on the learning episode, attention to the trainee's specific questions, learning needs and achievements as well as an action plan for the trainee's future development. Both trainees and trainers should recognise and respect cultural differences when giving and receiving feedback[17]. The assessment framework is also designed to identify where trainees may be running into difficulties. Where possible, these are resolved through targeted training, practise and assessment with specific trainers and, if necessary, with the involvement of the AES and TPD to provide specific remedial placements, additional time and additional resources.

5.3 Assessment framework components

Each of the components of the assessment framework are described below.

1.3.1 The sequence of assessment

Training and assessment take places within placements of six to twelve months' duration throughout each phase of training (figure 4). Assessments are carried out by relevant qualified members of the trainee's multi-professional team whose roles and responsibilities are described in appendix 6. Trainee progress is monitored primarily by the trainee's AES through learning agreement meetings with the trainee. Throughout the placement trainees must undertake WBAs while specialty examinations are undertaken towards at the higher end of the programme after satisfactory completion of phase 2. The trainee's CSs must assess the trainee on the five CiPs and nine GPC domains using the MCR. This must be undertaken towards the mid-point of each placement in a formative way and at the end of the placement when the formative assessment will contribute to the AES's summative assessment at the final review meeting of the learning agreement. The placement culminates with the AES report of the trainee's progress for the ARCP. The ARCP makes the final decision about whether a trainee can progress to the next level or phase of training. It bases its decision on the evidence that has been gathered in the trainee's learning portfolio during the period between ARCP reviews, particularly the AES report in each training placement.

[17] https://www.iscp.ac.uk/courses/culturalawarenesscourse.aspx

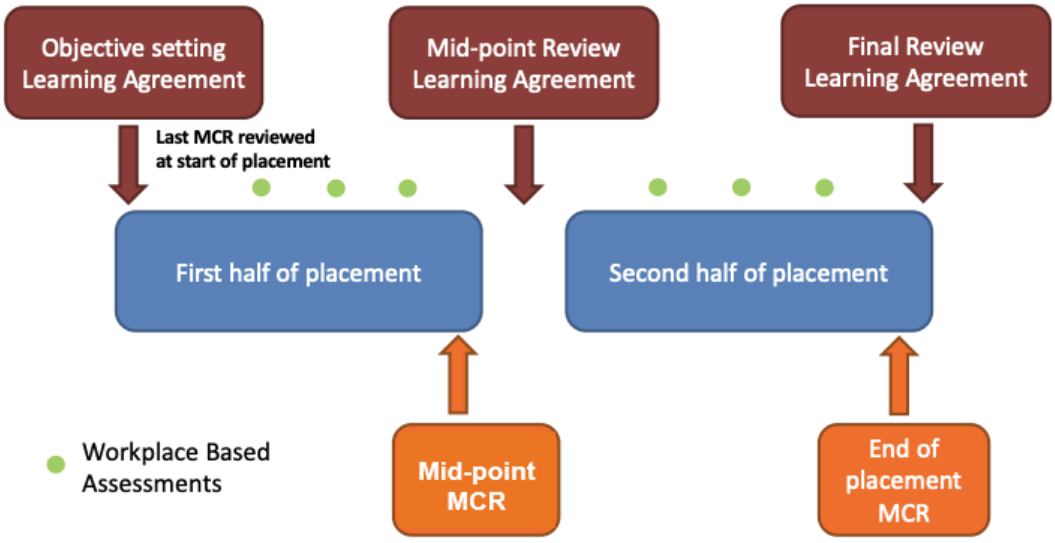

Figure 4: The sequence of assessment through a placement.

5.3.2 The learning agreement

The learning agreement is a formal process of goal setting and review meetings that underpin training and is formulated through discussion. The process ensures adequate supervision during training, provides continuity between different placements and supervisors and is one of the main ways of providing feedback to trainees. There are three learning agreement meetings in each placement and these are recorded in the trainee's learning portfolio. Any significant concerns arising from the meetings should be fed back to the TPD at each point in the learning agreement.

Objective-setting meeting

At the start of each placement the AES and trainee must meet to review the trainee's progress so far, agree learning objectives for the placement ahead and identify the learning opportunities presented by the placement. The learning agreement is constructively aligned towards achievement of the high-level outcomes (the CiPs and GPCs) and, therefore, the CiPs and GPCs are the primary reference point for planning how trainees will be assessed and whether they have attained the learning required. The learning agreement is also tailored to the trainee's progress, phase of training and learning needs. The summative MCR from the previous placement will be reviewed alongside the most recent trainee self-assessment and the action plan for training. Any specific targeted training objectives from the previous ARCP should also be considered and addressed though this meeting and form part of the learning agreement.

Mid-point review meeting

A meeting between the AES and the trainee must take place at the mid-point of a placement (or each three months within a placement that is longer than six months). The learning agreement must be reviewed, along with other portfolio evidence of training such as WBAs, the logbook and the formative mid-point MCR, including the trainee's self-assessment. This meeting ensures training opportunities appropriate to the trainee's own needs are being presented in the placement, and are adjusted if necessary, in response to the areas for development identified through the MCR. Particular attention must be paid to progress against targeted training objectives and a specific plan for the remaining part of the placement made if these are not yet achieved. There should be a dialogue between the AES and CSs if adequate opportunities have not

been presented to the trainee, and the TPD informed if there has been no resolution. Discussion should also take place if the scope and nature of opportunities should change in the remaining portion of the placement in response to areas for development identified through the MCR.

Final review meeting

Shortly before the end of each placement trainees should meet with their AES to review portfolio evidence including the final MCR. The dialogue between the trainee and AES should cover the overall progress made in the placement and the AES's view of the placement outcome.

AES report

The AES must write an end of placement report which informs the ARCP. The report includes details of any significant concerns and provides the AES's view about whether the trainee is on track in the phase of training for completion within the indicative time. If necessary, the AES must also explain any gaps and resolve any differences in supervision levels which came to light through the MCR.

5.3.3 The Multiple Consultant Report

The assessment of the CiPs and GPCs (high-level outcomes of the curriculum) involves a global professional judgement of a range of different skills and behaviours to make decisions about a learner's suitability to take on particular responsibilities or tasks that are essential to consultant practice at the standard of certification. The MCR assessment must be carried out by the consultant CSs involved with a trainee, with the AES contributing as necessary to some domains (e.g. *Quality Improvement*, *Research and Scholarship*). The number of CSs taking part reflects the size of the specialty unit and is expected to be no fewer than two. The exercise reflects what many consultant trainers do regularly as part of a faculty group.

The MCR includes a global rating in order to indicate how the trainee is progressing in each of the five CiPs. This global rating is expressed as a supervision level recommendation described in table 2. Supervision levels are behaviourally anchored ordinal scales based on progression to competence and reflect a judgment that has clinical meaning for assessors. Using the scale, CSs must make an overall, holistic judgement of a trainee's performance on each CiP. Levels IV and V, shaded in grey, equate to the level required for certification and the level of practice expected of a day-one consultant in the Health Service (level IV) or beyond (level V). Figures 5 and 6 show how the MCR examines performance from the perspective of the outcome of the curriculum, the day-one consultant surgeon, in the GPCs and CiPs. If not at the level required for certification the MCR can identify areas for improvement by using the CiP or GPC descriptors or, if further detail is required, through free text. The assessment of the GPCs can be performed by CSs, whilst GPC domains 6-9 might be more relevant to assessment by the AES in some placements.

CSs will be able to recommend supervision levels because they observe the performance of the trainee in person on a day-to-day basis. The CS group, led by a Lead CS, should meet at the mid-point and towards the end of a placement to conduct a formative MCR. Through the MCR, they agree which supervision level best describes the performance of a trainee at that time in each of the five CiPs and also identify any areas of the nine GPC domains that require development. It is possible for those who cannot attend the group meeting, or who disagree with the report of the group as a whole, to add their own section (anonymously) to the MCR for consideration by the AES. The AES will provide an overview at the end of the process, adding comments and signing off the MCR.

The MCR uses the principle of highlight reporting, where CSs do not need to comment on every descriptor within each CiP but use them to highlight areas that are above or below the expected level of performance. The MCR can describe areas where the trainee might need to focus development or areas of particular excellence. Feedback must be given for any CiP that is not rated as level IV and in any GPC domain where development is required. Feedback must be given to the trainee in person after each MCR and, therefore, includes a specific feedback meeting with the trainee using the highlighted descriptors within the MCR and/or free text comments.

The mid-point MCR feeds into the mid-point learning agreement meeting. At the mid-point it allows goals to be agreed for the second half of the placement, with an opportunity to specifically address areas where development is required. Towards the end of the placement the MCR feeds into the final review learning agreement meeting, helping to inform the AES report (figure 4). It also feeds into the objective-setting meeting of the next placement to facilitate discussion between the trainee and the next AES.

The MCR, therefore, gives valuable insight into how well the trainee is performing, highlighting areas of excellence, areas of support required and concerns. It forms an important part of detailed, structured feedback to the trainee at the mid-point and before the end of the placement, and can trigger any appropriate modifications for the focus of training as required. The final formative MCR, together with other portfolio evidence, feeds into the AES report which in turn feeds into the ARCP. The ARCP uses all presented evidence to make the definitive decision on progression.

MCR Rating Scale (CiPs)	**Anchor statements**	**Trainer input at each supervision level**			
		Does the trainee perform part or all of the task?	Is guidance required?	Is it necessary for a trainer to be present for the task?	Is the trainee performing at a level beyond that expected of a day one consultant? [c]
Supervision Level I:	Able to observe only: no execution.	no	n/a	n/a	n/a
Supervision Level IIa:	Able and trusted to act with direct supervision: The supervisor needs to be physically present throughout the activity to provide direct supervision.	yes	all aspects	Through out	n/a
Supervision Level IIb:	Able and trusted to act with direct supervision: The supervisor needs to be physically present for part of the activity.	yes	all aspects	will be necessary for part	n/a

	The supervisor needs to guide all aspects of the activity. This guidance may partly be given from another setting.				
Supervision Level III:	Able and trusted to act with indirect supervision: The supervisor may be required to be physically present on occasion. The supervisor does not need to guide all aspects of the activity. For those aspects which do need guidance, this may be given from another setting.	yes	some aspects	may be necessary for part	n/a
Supervision Level IV:	Able and trusted to act at the level of a day-one consultant.	yes	None [a,b]	None [a, b]	n/a
Supervision Level V:	Able and trusted to act at a level beyond that expected of a day-one consultant.	yes	None[a]	None [a]	yes

Table 2: MCR anchor statements and guide to recommendation of appropriate supervision level in each CiP.

a This equates to the level of practice expected of a day-one consultant in the Health Service. It is recognised that advice from senior colleagues within an MDT is an important part of consultant practice. Achievement of supervision level IV indicates that a trainee is able to work at this level, with advice from their trainer at this level being equivalent to a consultant receiving advice from senior colleagues within an MDT. It is recognised that within the context of a training system that trainees are always under the educational and clinical governance structures of the Health Service.

b Where the PBA level required by the syllabus is less than level 4 for an operative procedure, it would be expected that mentorship is sought for such procedures and this would fall within the scope of being able to carry out this activity without supervision (level IV), i.e. be a level commensurate with that of a day-one consultant.

c Achievement of this level across the entirety of an activity would be rare, although free text could describe aspects of an activity where this level has been reached.

In making a supervision level recommendation, CSs should take into account their experience of working with the trainee and the degree of autonomy they were prepared to give the trainee during the placement. They should also take into account all the descriptors of the activities, knowledge and skills listed in the detailed descriptions of the CiPs. If, after taking all this into account, the CSs feel the trainee is able to carry out the activity without supervision (level IV) then no further detail of this assessment is required, unless any points of excellence are noted. If the trainee requires a degree of supervision to carry out the activity then the CSs should indicate which of the descriptors of the activities, knowledge and skills require further development (to a limit of five items per CiP, so as to allow targets set at feedback to be timely, relevant and achievable). Similarly, if a trainee excels in one or more areas, the relevant descriptors should be indicated. Examples of how the online MCR will look are shown in figures 5 and 6. Figure 7 describes the MCR as an iterative process involving the trainee, CSs the AES and the development of specific, relevant, timely and achievable action plans.

Multiple Consultant Report – assessment of the GPCs

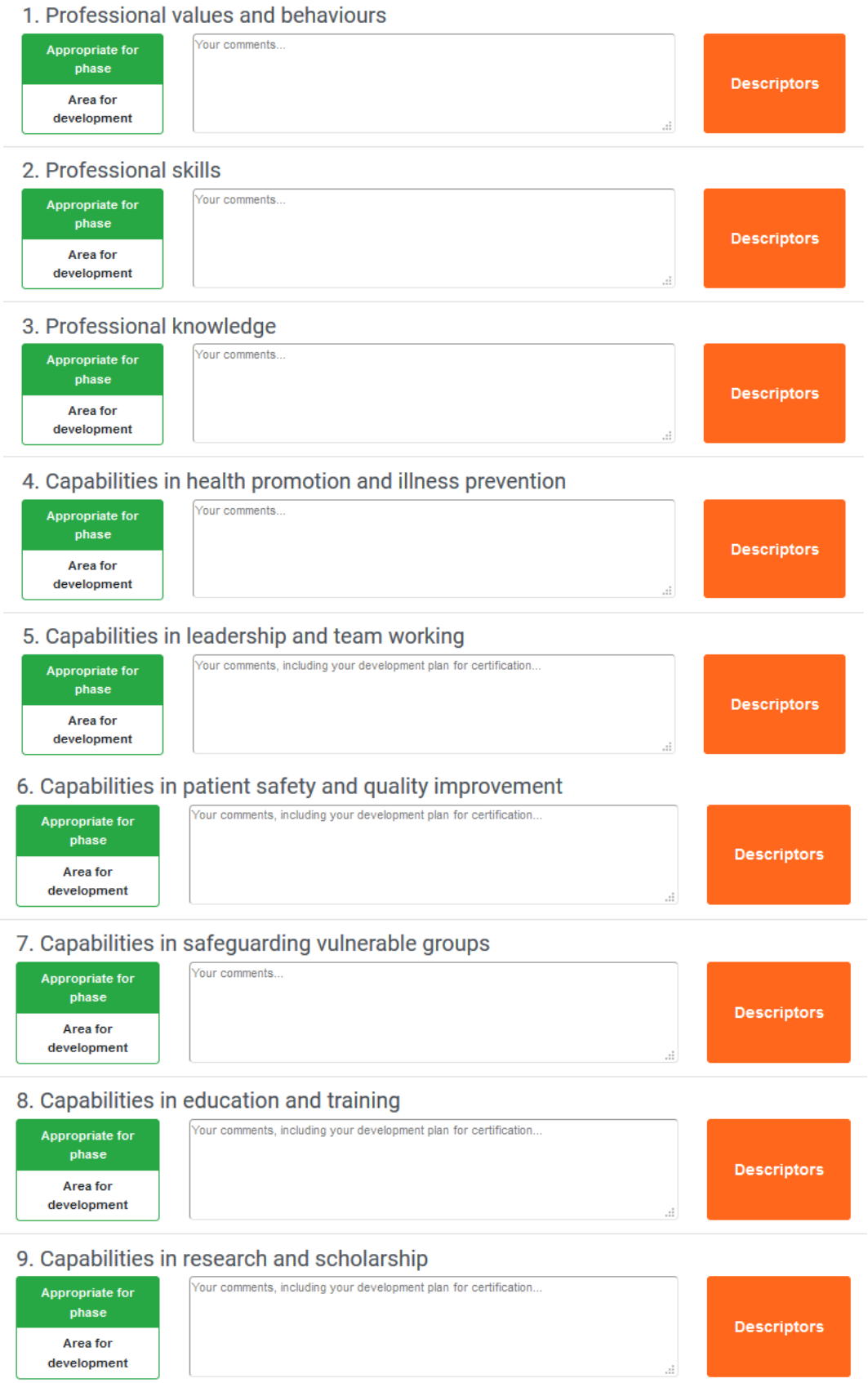

Figure 5: An example of how the GPCs are assessed through the MCR. CSs would consider whether there are areas for development in any of the nine GPC domains. If not, then nothing further need be recorded. If there are areas for development identified then CSs are obliged to provide

feedback through the MCR. This feedback can be recorded as free text in the comments box indicated. The Descriptors box expands to reveal descriptors taken from the GPC framework. These can be used as prompts for free text feedback or verbatim as standardised language used to describe professional capabilities.

Multiple Consultant Report – assessment of the CiPs

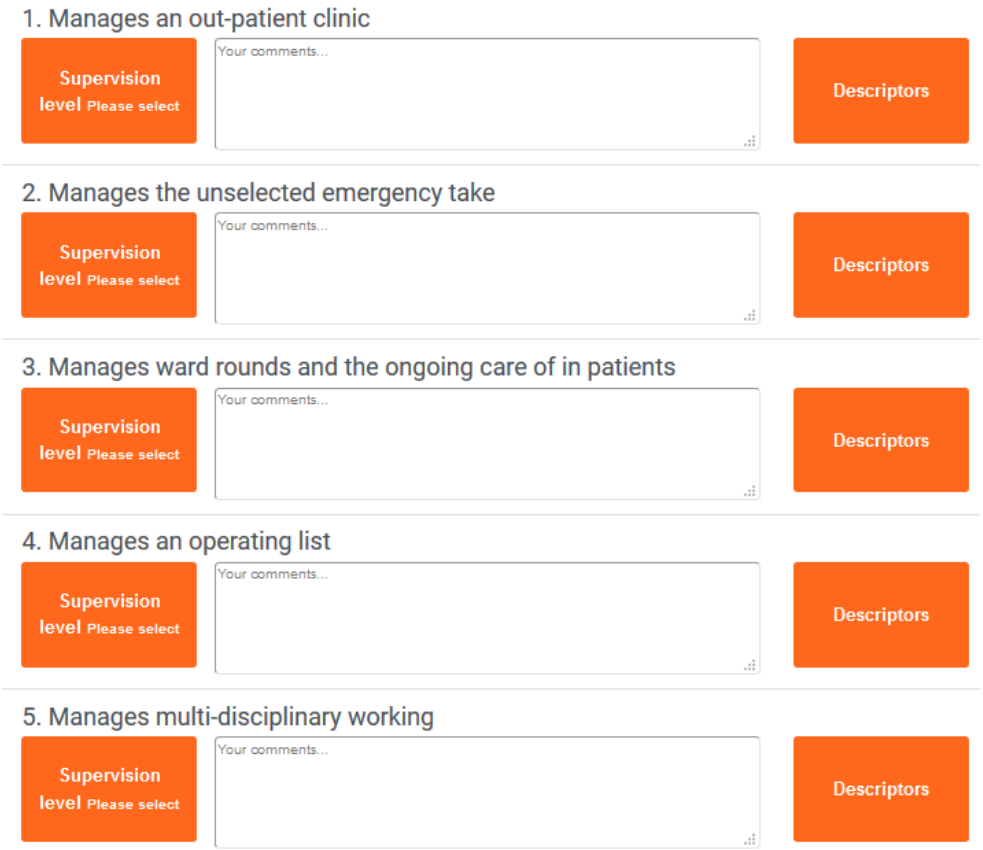

Figure 6: An example of how the CiPs are assessed through the MCR. The CSs would decide what supervision level to recommend for each of the CiPs and record this for each through the Supervision Level box. If the level recommended is IV or V then no further comment need be recorded, unless the CSs wished to capture areas of particular excellence for feedback. If levels I to III are recommended then the CSs are obliged to provide feedback through the MCR. This feedback can be recorded as free text in the comments box indicated. The Descriptors box expands to reveal CiP descriptors. These can be used as prompts for free text feedback or verbatim as standardised language to describe the clinical capabilities.

5.3.4 Trainee self-assessment

Trainees should complete the self-assessment in the same way as CSs complete the MCR, using the same form and describing self-identified areas for development with free text or using CiP or GPC descriptors. Reflection for insight on performance is an important development tool and self-recognition of the level of supervision needed at any point in training enhances patient safety. Self-assessments are part of the evidence reviewed when meeting the AES at the mid-point and end of a placement. Wide discrepancy between the self-assessment of recommendation by CSs in the MCR allows identification of over or under confidence and for support to given accordingly.

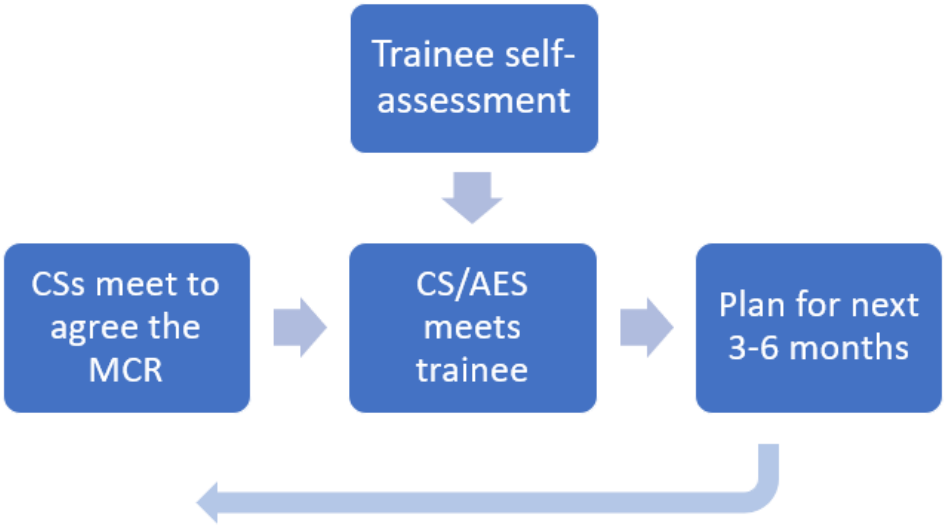

Figure 7: The iterative process of the MCR, showing the involvement of CSs, self-assessment by trainees, face to face meetings between trainees and supervisors and the development of an action plan focused on identified learning needs over the next three to six months of training. Progress against these action plans is reviewed by the AES and at the subsequent MCRs.

5.3.5 Workplace-based assessment (WBA)

Each individual WBA is designed to assess a range of important aspects of performance in different training situations. Taken together the WBAs can assess the breadth of knowledge, skills and performance described in the curriculum. They also constructively align with the clinical CiPs and GPCs as shown in appendix 9 and will be used to underpin assessment in those areas of the syllabus central to the specialty i.e. the critical conditions and index procedures, as well as being available for other conditions and operations as determined by the trainee and supervisors and especially where needed in the assessment of a remediation package to evidence progress in areas of training targeted by a non-standard ARCP outcome. The WBAs described in this curriculum have been in use for over ten years and are now an established component of training.

The WBA methodology is designed to meet the following criteria:

- *Validity* – the assessment actually does test what is intended; that methods are relevant to actual clinical practice; that performance in increasingly complex tasks is reflected in the assessment outcome
- *Reliability* - multiple measures of performance using different assessors in different training situations produce a consistent picture of performance over time
- *Feasibility* – methods are designed to be practical by fitting into the training and working environment
- *Cost-effectiveness* – the only significant additional costs should be in the training of trainers and the time investment needed for feedback and regular appraisal, this should be factored into trainer job plans
- *Opportunities for feedback* – structured feedback is a fundamental component
- *Impact on learning* – the educational feedback from trainers should lead to trainees' reflections on practice in order to address learning needs.

WBAs use different trainers' direct observations of trainees to assess the actual performance of trainees as they manage different clinical situations in different clinical settings and provide more granular formative assessment in the crucial areas of the curriculum than does the more global

assessment of CiPs in the MCR. WBAs are primarily aimed at providing constructive feedback to trainees in important areas of the syllabus throughout each placement in all phases of training. Trainees undertake each task according to their training phase and ability level and the assessor must intervene if patient safety is at risk. It would be normal for trainees to have some assessments which identify areas for development because their performance is not yet at the standard for the completion of that training.

Each WBA is recorded on a structured form to help assessors distinguish between levels of performance and prompt areas for their verbal developmental feedback to trainees immediately after the observation. Each WBA includes the trainee's and assessor's individual comments, ratings of individual competencies (e.g. *Satisfactory*, *Needs Development* or *Outstanding*) and global rating (using anchor statements mapped to phases of training). Rating scales support the drive towards excellence in practice, enabling learners to be recognised for achievements above the level expected for a level or phase of training. They may also be used to target areas of under-performance. As they accumulate, the WBAs for the critical conditions and index procedures also contribute to the AES report for the ARCP.

WBAs are formative and may be used to assess and provide feedback on all clinical activity. Trainees can use any of the assessments described below to gather feedback or provide evidence of their progression in a particular area. WBAs are only mandatory for the assessment of the critical conditions and index procedures (see appendices 3 and 4). They may also be useful to evidence progress in targeted training where this is required e.g. for any areas of concern.

WBAs for index procedures and critical conditions will inform the AES report along with a range of other evidence to aid the decision about the trainee's progress. All trainees are required to use WBAs to evidence that they have achieved the learning in the index procedures or critical conditions by certification. However, it is recognised that trainees will develop at different rates, and failure to attain a specific level at a given point will not necessarily prevent progression if other evidence shows satisfactory progress.

The assessment blueprint (appendix 9) indicates how the assessment programme provides coverage of the CiPs, the GPC framework and the syllabus. It is not expected that the assessment methods will be used for each competency and additional evidence may be used to help make a supervision level recommendation. The principle of assessment is holistic; individual GPC and CiP descriptors and syllabus items should not be assessed, other than in the critical conditions and index procedures or if an area of concern is identified. The programme of assessment provides a variety of tools to feedback to and assess the trainee.

Case Based Discussion (CBD)

The CBD assesses the performance of a trainee in their management of a patient case to provide an indication of competence in areas such as clinical judgement, decision-making and application of medical knowledge in relation to patient care. The CBD process is a structured, in-depth discussion between the trainee and a consultant supervisor. The method is particularly designed to test higher order thinking and synthesis as it allows the assessor to explore deeper understanding of how trainees compile, prioritise and apply knowledge. By using clinical cases that offer a challenge to trainees, rather than routine cases, trainees are 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. The CBD is important for assessing the critical conditions (appendix 3). Trainees are assessed against the standard for the completion of their phase of training.

Clinical Evaluation Exercise (CEX) / CEX for Consent (CEX(C))

The CEX or CEX(C) assesses a clinical encounter with a patient to provide an indication of competence in skills essential for good clinical care such as communication, history taking, examination and clinical reasoning. These can be used at any time and in any setting when there is a trainee and patient interaction and an assessor is available. The CEX or CEX(C) is important for assessing the critical conditions (appendix 3). Trainees are assessed against the standard for the completion of their phase of training.

Direct Observation of Procedural Skills (DOPS)

The DOPS assesses the trainee's technical, operative and professional skills in a range of basic diagnostic and interventional procedures during routine surgical practice in wards, outpatient clinics and operating theatres. The procedures reflect the common and important procedures. Trainees are assessed against the standard for the completion of core surgical training.

Multi-source Feedback (MSF)

The MSF assesses professional competence within a team working environment. It comprises a self-assessment and the assessments of the trainee's performance from a range colleagues covering different grades and environments (e.g. ward, theatre, out-patients) including the AES. The competencies map to the standards of GMP and enable 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, enabling comparison of the self-assessment with the collated views received from the team and includes their anonymised but verbatim written comments. The AES should meet with the trainee to discuss the feedback on performance in the MSF. Trainees are assessed against the standard for the completion of their training level.

Procedure Based Assessment (PBA)

The PBA assesses advanced technical, operative and professional skills in a range of specialty procedures or parts of procedures during routine surgical practice in which trainees are usually scrubbed in theatre. The assessment covers pre-operative planning and preparation; exposure and closure; intra-operative elements specific to each procedure and post-operative management. The procedures reflect the routine or index procedures relevant to the specialty. The PBA is used particularly to assess the index procedures. Trainees are assessed against the standard for certification.

Surgical logbook

The logbook is tailored to each specialty and allows the trainee's competence as assessed by the DOPS and PBA to be placed in context. It is not a formal assessment in its own right, but trainees are required to keep a log of all operative procedures they have undertaken including the level of supervision required on each occasion using the key below. The logbook demonstrates breadth of experience which can be compared with procedural competence using the DOPS and the PBA and will be compared with the indicative numbers of index procedures defined in the curriculum (appendix 4).

Observed (O)
Assisted (A)
Supervised - trainer scrubbed (S-TS)
Supervised - trainer unscrubbed (S-TU)
Performed (P)
Training more junior trainee (T)

The following WBAs may also be used to further collect evidence of achievement, particularly in the GPC domains of *Quality improvement*, *Education and training* and *Leadership and team working*:

Assessment of Audit (AoA)

The AoA reviews a trainee's competence in completing an audit or quality improvement project. It can be based on documentation or a presentation of a project. Trainees are assessed against the standard for the completion of their phase of training.

Observation of Teaching (OoT)

The OoT assesses the trainee's ability to provide formal teaching. It can be based on any instance of formalised teaching by the trainee which has been observed by the assessor. Trainees are assessed against the standard for the completion of their phase of training.

The forms and guidance for each WBA method can be found on the ISCP website (see section 7).

5.3.6 Intercollegiate Specialty Board Examination

The ISB examination is governed by the Joint Committee on Intercollegiate Examinations (JCIE, www.jcie.org.uk) on behalf of the four surgical Royal Colleges. The JCIE is served by an Intercollegiate Specialty Board in each specialty. The examination is a powerful driver for knowledge and clinical skill acquisition. It has been in existence for over twenty years and is accepted as an important, necessary and proportionate test of knowledge, clinical skill and the ability to demonstrate the behaviours required by the curriculum. The examination is taken after successful completion of phase 2 and the standard is set at having the knowledge, clinical and professional skills at the level of a day-one consultant in the generality of the specialty, and must be passed in order to complete the curriculum. The examination components have been chosen to test the application of knowledge, clinical skills, interpretation of findings, clinical judgement, decision making, professionalism, and communication skills described within the curriculum. The examination also assesses components of the CiPs and GPCs (as shown in appendix 9) and feeds into the same process as WBA for review by the AES and ARCP.

There are two sections to the exam:

- Section 1 is a computer-based assessment comprising two papers taken on the same day. These are both Single Best Answer (SBA) papers designed to test the application of knowledge and clinical reasoning.
- Section 2 comprises the clinical component of the examination. It consists of a series of carefully designed and structured interviews on clinical topics – some scenario-based and others patient-based. The construct of section 2 allows assessment of the application of knowledge, clinical interpretation, decision-making, clinical judgement and professionalism.

Standard setting:

- Section 1 is standard set by the modified Angoff method with one set being added to the Angoff cut score to generate the eligibility to proceed mark. Section 1 is computer marked. Any questions identified as anomalous (possible wrong answers, negative discriminators etc.) are discussed at the standard setting meeting prior to the Angoff and, if necessary, removed.
- The Section 2 clinical and oral components are calibrated prior to the start of each diet. It is independently marked by examiners working in pairs but with reference to the marking descriptors and the standard agreed at the calibration meeting.

Feedback:

Following section 1, candidates will receive a formal letter from the Board Chair confirming the result and a Final Performance Report which shows:

Paper 1 (Single Best Answer) Score %
Paper 2 (Single Best Answer) Score %
Combined Score %

Following section 2, candidates will receive a formal letter from the Board Chair confirming the result. Unsuccessful candidates will also receive a Final Performance Report showing the name of each station and its pass mark, and the mark achieved by a candidate in each of the stations.

Attempts:

Trainees have a maximum of four attempts at each section of the examination with no re-entry. A pass in section 1 is required to proceed to section 2 and must be achieved within two years of the first attempt. The time limit for completion of the entire examination process is seven years. Pro-rata adjustments are permissible to these timescales for LTFT trainees. Trainees in Vascular Surgery become eligible to sit section 1 following an ARCP outcome 1 at the end of phase 2 of specialty training).
Further details can be found at https://www.jcie.org.uk/content/content.aspx?ID=12

5.3.7 Annual Review of Competence Progression (ARCP)

The ARCP is a formal Deanery process overseen and led by the TPD. It scrutinises the trainee's suitability to progress through the training programme. It bases its decisions on the evidence that has been gathered in the trainee's learning portfolio during the period between ARCP reviews, particularly the AES report in each training placement. The ARCP would normally be undertaken on an annual basis for all trainees in surgical training. A panel may be convened more frequently for an interim review or to deal with progression issues (either accelerated or delayed) outside the normal schedule. The ARCP panel makes the final summative decision that determines whether trainees are making appropriate progress to be able to move to the next level or phase of training or to achieve certification.

5.4 Completion of training in Vascular Surgery

The following requirements are applied to all trainees completing the curriculum and applying for certification and entry to the specialist register.

All seeking certification in Vascular Surgery must:

a) be fully registered with the GMC and have a licence to practise (UK trainees) or be registered with the Medical Council in Ireland (Republic of Ireland trainees)
b) have successfully passed the ISB examination
c) have achieved level IV or V in all the CiPs
d) have achieved the competencies described in the nine domains of the GPC framework
e) have been awarded an outcome 6 at a final ARCP (if applying for specialist registration through certification).

In order to be awarded an outcome 6 at the final ARCP trainees must be able to satisfy the following specialty-specific certification requirements:

a) Generic requirements shared between surgical specialities

Research - Trainees must provide evidence of having met the relevant requirements for research and scholarship. For UK trainees, this can be found in the GMC's GPC framework. Broadly, this includes capabilities in 4 areas: 1. The demonstration of evidence-based practice 2. Understanding how to critically appraise literature and conduct literature searches and reviews 3. Understanding and applying basic research principles 4. Understanding the basic principles of research governance and how to apply relevant ethical guidelines to research activities.	
Quality Improvement - evidence of an understanding of, and participation in, audit or service improvement as defined in the curriculum	Trainees must complete or supervise an indicative number of three audit or quality improvement projects during specialty training. In one or more of these, the cycle should be completed.
Medical Education and Training - evidence of an understanding of, and participation in, medical education and training as defined in the curriculum	Trainees must provide evidence of being trained in the training of others and present written structured feedback on their teaching uploaded to the ISCP portfolio.
Management and Leadership - evidence of an understanding of management structures and challenges of the health service across relevant health services and the variations between nations	Trainees must provide evidence of training in health service management and leadership and having taken part in a management related activity e.g. rota administration, trainee representative, membership of working party etc. or of having shadowed a management role within the hospital.

b) Requirements specific to Vascular Surgery

Additional courses / qualifications - evidence of having attended specific courses/gained specific qualifications as defined in the curriculum	The Advanced Trauma Life Support® (ATLS®), European Trauma Course, Definitive Surgical Trauma Skills course or equivalent locally provided course(s) meeting the outcomes described Trainees should demonstrate constructive use of study leave by undertaking, and having gained, professionally relevant training and experience above and beyond the basic programme.
Specialist Educational conferences - evidence of having attended conferences and meetings as defined in the curriculum appropriate to the specialty	It is recommended that trainees attend national or international meetings during training (e.g. annual meetings of specialty associations or major international equivalents).
Clinical experience - evidence of the breadth of clinical experience defined in the specialty syllabus, and experience in one specialty interests.	To ensure opportunities to acquire the breadth of curricular competencies in a variety of learning environments and cultures, trainees should, where geographically possible, complete a training programme that includes rotation through multiple units or sites. This recognises the importance of an ability to constructively compare different approaches to delivering surgical patient care and work-based cultures. Trainees must be able to demonstrate wide exposure to elective and emergency vascular and endovascular surgery objectives defined in the curriculum. This must include out-patient and ward-based work. At the completion of Phase 3 of the curriculum the trainee must be able to demonstrate supervision level IV for the out-patient and ward management.
Operative experience - consolidated logbook evidence of the breadth of operative experience of elective ad emergency vascular surgery, for both open and endovascular exposures as defined in the specialty syllabus objectives.	Trainees will be expected to demonstrate a wide range of procedures, from their logbooks and PBAs, to the level of competency outlined in the curriculum objectives.

Index Procedures – Index procedures are of significant importance for patient safety and to demonstrate a safe breadth of practice.	By certification there should be documented evidence of performance at the level of a day-one consultant in the portfolio by means of the PBA (to level 4 and the indicative numbers as shown in appendix 4).
Critical Conditions - To ensure that trainees have the necessary skills in the critical conditions.	Trainees must be able to demonstrate knowledge and understanding of the management of the following critical conditions: 1. Acute Limb Ischaemia 2. Abdominal Aortic Aneurysms 3. Fulminant Diabetic Foot Sepsis These will have been formally assessed by the ISB examination in Vascular Surgery. By certification (the end of phase 3) there should also be documented evidence in the form of CBDs and CEXs to level 4 as shown in appendix 3, a satisfactory logbook and an outcome 1 at previous ARCPs.

Table 3: Requirements for completion of training in Vascular Surgery: a) generic requirements shared between all surgical specialties and b) requirements specific to Vascular Surgery. Attainment of these requirements contribute to evidence that outcomes of training have been met.

Once these requirements have been met, the ARCP panel may consider the award of outcome 6 having reviewed the portfolio and AES report. Award of outcome 6 allows the trainee to seek recommendation for certification and entry onto the specialist register.

6 Recording progress in the ISCP learning portfolio

This curriculum is available through the JCST's Intercollegiate Surgical Curriculum Programme (ISCP) training management system at www.iscp.ac.uk. Trainees and all involved with training must register with the ISCP and use the curriculum as the basis of their discussion and to record assessments and appraisals. Both trainers and trainees are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme. Each trainee must maintain their learning portfolio by developing learning objectives, undergoing assessments, recording training experiences and reflecting on their learning and feedback.

The ISCP learning portfolio can be used to build a training record of trainee conduct and practice as follows:

- Trainees can initiate the learning agreement and WBAs directly with supervisors. They can record logbook procedures and other evidence using a variety of forms. They can also link WBAs with critical conditions and index procedures.

- TPDs can validate trainees in their placements, monitor training and manage the ARCP.
- Deanery administrators can support the TPD, JCST trainee enrolment and ARCP process.
- AES's can complete trainee appraisal through the learning agreement, monitor trainee portfolios and provide end of placement AES reports.
- CSs complete the MCR at the mid-point and end of each placement.
- Assessors can record feedback and validate WBAs.
- Other people involved in training can access area the trainee portfolios according to their role and function.

Appendix 1: Capabilities in Practice

In each of the CiPs the word 'manage' is defined as clinical assessment, diagnosis, investigation and treatment (both operative and non-operative) and recognising when referral to more specialised or experienced surgeons is required for definitive treatment. Trainees are expected to apply syllabus defined knowledge and skills in straightforward and unusual cases across the breadth of the specialty across all CiPs.

Shared Capability in Practice 1:

Manages an out-patient clinic

Good Medical Practice Domains 1,2,3,4

Description

Manages all the administrative and clinical tasks required of a consultant surgeon in order that all patients presenting as out-patients in the specialty are cared for safely and appropriately.

Example descriptors:

- Assesses and prioritises GP and inter-departmental referrals and deals correctly with inappropriate referrals
- Assesses new and review patients using a structured history and a focused clinical examination to perform a full clinical assessment, and determines the appropriate plan of action, explains it to the patient and carries out the plan
- Carries out syllabus defined practical investigations or procedures within the out-patient setting
- Adapts approach to accommodate all channels of communication (e.g. interpreter, sign language), communicates using language understandable to the patient, and demonstrates communication skills with particular regard to breaking bad news. Appropriately involves relatives and friends
- Takes co-morbidities into account
- Requests appropriate investigations, does not investigate when not necessary, and interprets results of investigations in context
- Selects patients with urgent conditions who should be admitted from clinic
- Manages potentially difficult or challenging interpersonal situations, including breaking bad news and complaints
- Completes all required documentation
- Makes good use of time
- Uses consultation to emphasise health promotion

Specialty specific requirements:

See critical conditions (appendix 3 of the curriculum)

Supervision levels:

Level I: Able to observe only

Level II: Able and trusted to act with direct supervision:

a) Supervisor present throughout
b) Supervisor present for part

Level III:	Able and trusted to act with indirect supervision
Level IV:	Able and trusted to act at the level expected of a day-one consultant
Level V:	Able and trusted to act at a level beyond that expected of a day-one consultant

Shared Capability in Practice 2:

Manages the unselected emergency take

Good Medical Practice Domains 1,2,3,4

Description

Manages all patients with an emergency condition requiring management within the specialty. Able to perform all the administrative and clinical tasks required of a consultant surgeon in order that all patients presenting as emergencies in the specialty are cared for safely and appropriately.

Example descriptors:

- Promptly assesses acutely unwell and deteriorating patients, delivers resuscitative treatment and initial management, and ensures sepsis is recognised and treated in compliance with protocol
- Makes a full assessment of patients by taking a structured history and by performing a focused clinical examination, and requests, interprets and discusses appropriate investigations to synthesise findings into an appropriate overall impression, management plan and diagnosis
- Identifies, accounts for and manages co-morbidity in the context of the surgical presentation, referring for specialist advice when necessary
- Selects patients for conservative and operative treatment plans as appropriate, explaining these to the patient, and carrying them out
- Demonstrates effective communication with colleagues, patients and relatives
- Makes appropriate peri- and post-operative management plans in conjunction with anaesthetic colleagues
- Delivers ongoing post-operative surgical care in ward and critical care settings, recognising and appropriately managing medical and surgical complications, and referring for specialist care when necessary
- Makes appropriate discharge and follow up arrangements
- Carries out all operative procedures as described in the syllabus
- Manages potentially difficult or challenging interpersonal situations
- Gives and receives appropriate handover

Specialty specific requirements:

- See critical conditions (appendix 3 of the curriculum)
- Trauma course (ATLS or equivalent)

Supervision levels:

Level I:	Able to observe only
Level II:	Able and trusted to act with direct supervision:

a) Supervisor present throughout
b) Supervisor present for part

Level III: Able and trusted to act with indirect supervision

Level IV: Able and trusted to act at the level expected of a day-one consultant

Level V: Able and trusted to act at a level beyond that expected of a day-one consultant

Shared Capability in Practice 3:

Manages ward rounds and the on-going care of in-patients

Good Medical Practice Domains 1,2,3,4

Description

Manages all hospital in-patients with conditions requiring management within the specialty. Able to perform all the administrative and clinical tasks required of a consultant surgeon in order that all in-patients requiring care within the specialty are cared for safely and appropriately.

Example descriptors:

- Identifies at the start of a ward round if there are acutely unwell patients who require immediate attention
- Ensures that all necessary members of the multi-disciplinary team are present, knows what is expected of them and what each other's roles and contributions will be, and contributes effectively to cross specialty working
- Ensures that all documentation (including results of investigations) will be available when required and interprets them appropriately
- Makes a full assessment of patients by taking a structured history and by performing a focused clinical examination, and requests, interprets and discusses appropriate investigations to synthesise findings into an appropriate overall impression, management plan and diagnosis
- Identifies when the clinical course is progressing as expected and when medical or surgical complications are developing, and recognises when operative intervention or re-intervention is required and ensures this is carried out
- Identifies and initially manages co-morbidity and medical complications, referring on to other specialties as appropriate
- Contributes effectively to level 2 and level 3 care
- Makes good use of time, ensuring all necessary assessments are made and discussions held, while continuing to make progress with the overall workload of the ward round
- Identifies when further therapeutic manoeuvres are not in the patient's best interests, initiates palliative care, refers for specialist advice as required, and discusses plans with the patient and their family
- Summarises important points at the end of the ward rounds and ensures all members of the multi-disciplinary team understand the management plans and their roles within them
- Gives appropriate advice for discharge documentation and follow-up

Specialty specific requirements:

See critical conditions (appendix 3 of the curriculum)

Supervision levels:

Level I: Able to observe only

Level II: Able and trusted to act with direct supervision:

a) Supervisor present throughout
b) Supervisor present for part

Level III: Able and trusted to act with indirect supervision

Level IV: Able and trusted to act at the level expected of a day-one consultant

Level V: Able and trusted to act at a level beyond that expected of a day-one consultant

Shared Capability in Practice 4:

Manages an operating list

Good Medical Practice Domains 1,2,3,4

Description

Manages all patients with conditions requiring operative treatment within the specialty. Able to perform all the administrative and clinical tasks required of a consultant surgeon in order that all patients requiring operative treatment receive it safely and appropriately.

Example descriptors:

- Selects patients appropriately for surgery, taking the surgical condition, co-morbidities, medication and investigations into account, and adds the patient to the waiting list with appropriate priority
- Negotiates reasonable treatment options and shares decision-making with patients
- Takes informed consent in line with national legislation or applies national legislation for patients who are not competent to give consent
- Arranges anaesthetic assessment as required
- Undertakes the appropriate process to list the patient for surgery
- Prepares the operating list, accounting for case mix, skill mix, operating time, clinical priorities, and patient co-morbidity
- Leads the brief and debrief and ensures all relevant points are covered for all patients on the operating list
- Ensures the WHO checklist (or equivalent) is completed for each patient at both the beginning and end of each procedure
- Understands when prophylactic antibiotics should be prescribed and follows local protocol
- Synthesises the patient's surgical condition, the technical details of the operation, co-morbidities and medication into an appropriate operative plan for the patient
- Carries out the operative procedures to the required level for the phase of training as described in the specialty syllabus
- Uses good judgement to adapt operative strategy to take account of pathological

findings and any changes in clinical condition
- Undertakes the operation in a technically safe manner, using time efficiently
- Demonstrates good application of knowledge and non-technical skills in the operating theatre, including situation awareness, decision-making, communication, leadership, and teamwork
- Writes a full operation note for each patient, ensuring inclusion of all post-operative instructions
- Reviews all patients post-operatively
- Manages complications safely, requesting help from colleagues where required

Specialty specific requirements:

- Trainees must be able to integrate safe endovascular working within the theatre environment with the application of IRMER
- Trainees must be able to determine where the cases / procedures would be best undertaken be it the operating theatre/ hybrid or endovascular suite and to be able to apply all the descriptors to optimally manage patients in all those environments

Supervision levels:

Level I: Able to observe only

Level II: Able and trusted to act with direct supervision:

a) Supervisor present throughout
b) Supervisor present for part

Level III: Able and trusted to act with indirect supervision

Level IV: Able and trusted to act at the level expected of a day-one consultant

Level V: Able and trusted to act at a level beyond that expected of a day-one consultant

Shared Capability in Practice 5:

Manages multi-disciplinary working

Good Medical Practice Domains 1,2,3,4

Description

Manages all patients with conditions requiring inter-disciplinary management (or multi-consultant input as in trauma or fracture meetings in Trauma and Orthopaedic Surgery) including care within the specialty. Able to perform all the administrative and clinical tasks required of a consultant surgeon in order that safe and appropriate multi-disciplinary decisions are made on all patients with such conditions requiring care within the specialty.

Example Descriptors:

Appropriately selects patients who require discussion at the multi-disciplinary team

Follows the appropriate administrative process

Deals correctly with inappropriate referrals for discussion (e.g. postpones discussion if information is incomplete or out-of-date)

Presents relevant case history, recognising important clinical features, co-morbidities and

investigations

Identifies patients with unusual, serious or urgent conditions

Engages constructively with all members of the multi-disciplinary team in reaching an agreed management decision, taking co-morbidities into account, recognising when uncertainty exists, and being able to manage this

Effectively manages potentially challenging situations such as conflicting opinions

Develops a clear management plan and communicates discussion outcomes and subsequent plans by appropriate means to the patient, GP and administrative staff as appropriate

Manages time to ensure the case list is discussed in the time available

Arranges follow up investigations when appropriate and knows indications for follow up

Specialty specific requirements:

Trainees must be able to undertake and develop multi-disciplinary working in a collaborative manner, seeking common ground and supportive development, allowing development of service delivery based on available local services.

Supervision levels:

Level I: Able to observe only

Level II: Able and trusted to act with direct supervision:

a) Supervisor present throughout
b) Supervisor present for part

Level III: Able and trusted to act with indirect supervision

Level IV: Able and trusted to act at the level expected of a day-one consultant

Level V: Able and trusted to act at a level beyond that expected of a day-one consultant

Appendix 2: Vascular Surgery Syllabus

Within Vascular Surgery, the syllabus is presented as topics, each with objectives incorporating the knowledge, clinical and technical skills required to deliver the Vascular Surgery day-one consultant. The delivery of the objectives will be developed through the two phases of training and assessed within the CiPs and GPCs high-level outcomes. In addition, to ensure the appropriate procedural and clinical competence, there are nominated index procedures (appendix 4) that will require assessment through PBAs and critical conditions (appendix 3) that will require assessment through CBDs or CEXs as appropriate. Other than for the critical conditions, index procedures or where they have been identified to address a concern, WBAs are optional for formative feedback and, therefore, trainees do not need to use WBAs to evidence learning against each syllabus topic.

The delivery of the training of all components of the Vascular Surgery curriculum will be quality assessed by the Vascular Surgery Specialty Advisory Committee (SAC) as explained in appendix 7.

The Curriculum has been agreed in collaboration with the specialty of Interventional Radiology, within the Royal College of Radiologists, with agreement to deliver the endovascular training alongside Vascular Surgery, utilising a collaborative working model to the benefit of the trainees in both specialties, so promoting the MDT working of day-one consultants.

The syllabus objectives are the guide to the breadth and specifics of the indicative knowledge and skills required to acquire certification within Vascular Surgery.

Vascular Surgery Generic Topics		
	Phase 2	Phase 3
VASCULAR ANATOMY		
OBJECTIVES		
To understand and interpret the anatomy and embryology of the vascular system, in order to recognise and act upon variation or abnormality, alongside an understanding of the peripheral nervous system.	*	*
To be able to relate anatomy findings on examination to imaging and to operative findings and so plan management.	*	*
To be able to palpate the abdominal aorta and peripheral pulses and explain examination findings and anatomy to both patients and colleagues.	*	*
VASCULAR PHYSIOLOGY		
OBJECTIVES		
To be able to interpret and manage vascular physiology inclusive of blood flow and pressure, haemostasis, haemorrhage, ischaemia and reperfusion.	*	*
To be able to interpret the microcirculation, venous and lymphatic perfusions.	*	*
To obtain a detailed knowledge of vascular physiology in order to manage patients through major vascular interventions inclusive of cardiac, respiratory and renal monitoring / support.	*	*
To be able to manage all aspects of prophylactic and therapeutic anticoagulation inclusive of the ability to correct clotting abnormalities when intervention is required.	*	*
To be able to explain vascular physiology to both patients and colleagues.	*	*

VASCULAR PATHOLOGY		
OBJECTIVES		
To be able to recognise, prioritise and manage the diseases of the circulation, both congenital and acquired.	*	*
To have a detailed knowledge of atherosclerosis and its associated risk factors, venous disease, lymphatic disease, thrombo-embolic disease, vasospastic and vasculitic disease, along with an understanding of the mechanisms of vascular trauma.	*	*
To be aware of the causes of peripheral neuropathy and of other causes of limb pain (neurological and musculoskeletal).	*	*
To be able to take a detailed patient history of arterial or venous disease and be able to undertake the relevant examinations of ischaemia, aneurysmal disease, leg swelling and varicose veins.	*	*
To be able to detect pathological arterial and venous abnormalities and so prioritise those needing urgent treatment.	*	*
To be able to select the appropriate investigations and also explain vascular disease to patients and colleagues.	*	*
To be able to select and then undertake clinical investigations inclusive of both handheld doppler and duplex ultrasound assessment of varicose veins. To also undertake Ankle Brachial Pressure Indices and interpret the waveforms.	*	*
VASCULAR EPIDEMIOLOGY		
OBJECTIVES		
To understand the principles of vascular epidemiology, including basic study design and the interactions with major risk factors for arterial and venous disorders.	*	*
To understand the epidemiology of peripheral arterial disease, venous disorders including varicose veins and venous thromboembolism, and so be able to explain the epidemiology and interactions of major vascular risk factors (including smoking demographics) to patients.	*	*
SCREENING AND SURVEILLANCE		
OBJECTIVES		
To have knowledge of the key elements of design and delivery of screening tests in general and of AAA screening, EVAR/TEVAR follow-up and bypass graft surveillance in particular.	*	*
To be able to counsel a patient undergoing surveillance or who has a positive screening test.	*	*
To be able to undertake the measurement of AP AAA diameter on US scan in the out-patient clinic to monitor growth.	*	*
RISK FACTOR MODIFICATION		
OBJECTIVES		
To have full knowledge of vascular risk factors and risk-factor modification inclusive of lipid modification, smoking cessation and all drug interactions.	*	*
To be able to explain the rationale to patients and effect appropriate risk-factor modification.	*	*

To have a full understanding of the management of; blood pressure control, lipid lowering therapy, diabetes control, smoking cessation, antiplatelet and anticoagulation therapy. To be able to utilise this in providing counselling or advice to patients.	*	*
To have a full understanding of exercise and exercise therapy, along with dietary factor management within weight control.	*	*
To be able to interpret the guidelines for hypertension and hyperlipidaemia management.	*	*
To be able to undertake diabetes control peri-procedures, inclusive of setting up a sliding scale.	*	*
VASCULAR CONDITIONS OF CHILDHOOD		
OBJECTIVES		
To understand the surgical principles in childhood and apply these to the management of the vascular conditions of childhood (including trauma and vascular anomalies) Haemangiomas, venous malformations, AV malformations and lymphatic malformations.	*	*
To be able to obtain a full history and examination of children incorporating communication with parents and/or carers. To be able to examine vascular abnormalities and utilise the appropriate investigation modalities in order to plan the appropriate management strategy - (medical (including, compression), endovascular and surgical.)	*	*
To understand and recognise the roles for open, endovascular and medical treatment for paediatric vascular conditions and be able to safely apply this knowledge in the assessment and treatment of emergency paediatric conditions in the presence/ or with the help of a consultant colleague. This would allow for arterial repair (such as following a supracondylar fracture) and the provision of vascular access in a child.	*	*
NUTRITION		
OBJECTIVES		
To be able to recognise and assess nutritional requirements of the patient and appropriate routes of administration of nutrition, inclusive of artificial nutritional support where appropriate.	*	*
To understand the methods of screening and assessment and the effects of malnutrition on the patient (both excess and depletion).	*	*
To understand the role of nutritional support and access to this via the nutritional team, including the options for dietary supplements, and both enteral or parenteral nutrition.	*	*
To be able to provide the access for feeding at operation with placement of NG - feeding tubes or recognise the requirement of collaboration to provide naso-jejunal or direct feeding jejunostomy access.	*	*
To be able to utilise imaging to insert both tunnelled (Hickman or Port) and un-tunnelled central venous catheters. To be able to provide a service to remove these.	*	*

CARDIO-RESPIRATORY DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with co-existent cardiac and/or respiratory disease, especially relating to the prognosis and impact on patients undergoing major vascular surgery.	*	*
To have full knowledge of the heart and lung anatomy and physiology. To be able to utilise this to understand the pathology (IHD, MI, heart failure, COPD, ARDS) and how this effects the prognosis / has impact upon patients undergoing major vascular surgery.	*	*
To be aware of the therapeutic options / the pharmacology and drug interactions / the current resuscitation guidelines and the indications for/ the haemodynamic consequences of positive pressure ventilation.	*	*
To be able to obtain a full examination of the heart and lungs and so select who requires pre-operative investigation (including indications for CPEX).	*	*
To be able to interpret those results and determine which patients are unsuitable for vascular intervention	*	*
To be able to undertake the adjunctive procedures of arterial blood gas sampling and interpretation along with obtaining arterial line access.	*	*
To be able to undertake the basic management of an acute Myocardial Infarction and heart failure along with leading a cardiopulmonary resuscitation.	*	*
To be able to provide acute respiratory support with the insertion and management of a chest drain. To then understand the process of respiratory support and the role of all forms of tracheostomy.	*	*
HAEMATOLOGY		
OBJECTIVES		
To be competent in relevant aspects of blood transfusion, bleeding disorders and drugs that affect clotting and have an understanding of the methods of blood conservation including pre-donation and intra-operative cell salvage.	*	*
To understand the coagulation and fibrinolysis pathways (including coagulation factors and their side effects) in order to interpret laboratory results.	*	*
To understand the epidemiology, natural history, and molecular basis of haemophilia and thrombophilia.	*	*
To understand the pharmacology of unfractionated heparin, LMWH, warfarin and antiplatelet agents.	*	*
To understand principles of donor selection and preparation of blood components including donor selection, preparation of blood products and viral safety.	*	*
To understand the principles of clinical blood transfusion including hazards of blood transfusion, SHOT report and the role of the hospital transfusion committee.	*	*

To understand the mechanism of DIC, effect of massive transfusion, renal and hepatic disease.	*	*
To understand and utilise the methods and complications of reversing anti-coagulation in patients with and without haemorrhage.	*	*
To understand and utilise the management of haemophilia and thrombophilia in terms of treatment and prophylaxis before vascular surgery.	*	*
To be able to initiate and monitor anticoagulation, and/ or antiplatelet therapy. This includes the intra-operative use of heparin, it's monitoring (i.e. by TEG or ACT) and the reversal using protamine.	*	*
To be able to use blood and blood products appropriately and manage the complications of blood transfusion.	*	*
CLINICAL AUDIT, RESEARCH & HEALTH ECONOMICS		
OBJECTIVES		
To understand the relevance of clinical audit, research and health economics to the practice of vascular surgery. To understand how the data of the National Vascular Registry is interpreted and supported by an evidence-based vascular practice. Then to be able to explain the principles of this to patients, colleagues and managers.	*	*
To understand the principles of audit, quality control, clinical research and systematic review.	*	*
To have knowledge of key health economic terms.	*	*
To understand the importance of generic QoL tools for venous and arterial disease, along with understanding the relevance of QALYS and calculation of incremental cost effectiveness ratios.	*	*
To understand planning and budgeting of vascular services along with the relevant types of health economic analysis.	*	*
To participate in local and national audit of outcomes, to conduct morbidity and mortality meetings and journal club learning.	*	*
To participate in clinical research.	*	*
To present at Vascular meetings (e.g. VSGBI, ESVS and SVS).	*	*
To publish in Vascular journals (e.g. EJVES and JVS).	*	*
OUTPATIENT, WARD and MDT MEETINGS		
OBJECTIVES		
To assess individual vascular outpatients and inpatients. Manage an outpatient clinic, ward round and MDT meeting and be able to undertake inter and multi-disciplinary working for operative and interventional cases.	*	*
To undertake individual patient assessment, focused history taking and examination, utilising the relevant vascular anatomy, physiology and clinical knowledge. To be able to organise the appropriate investigations.	*	*
To have an understanding of hospital organisation, of multi-disciplinary teams and meetings, of the relevant guidelines for vascular disease management in both outpatient and inpatient services.	*	*

To undertake the management of an outpatient clinic, ward round and MDT meeting; to undertake the presentation of patients on ward round and at MDT; to have the ability to allocate management of patients to appropriate team members; to have the ability to make appropriate referrals to other specialists where indicated and the ability to liaise with critical care and other support services (e.g. pain team, physiotherapy, rehab).	*	*
Within the management of an outpatient clinic, ward round and MDT meetings, to have the ability to prioritise urgent patient appointments, investigations and interventions, then produce prompt and clear clinic letters and discharge summaries.	*	*

Vascular Surgery Imaging		
	Phase 2	Phase 3
PRINCIPLES OF VASCULAR IMAGING		
OBJECTIVES		
To have competency in radiation safety with understanding of the principles and indications for vascular imaging. To have undertaken appropriate training at Specialty Induction (at ST3) and at trust level and supported by British Institute of Radiology e-learning, in order to have appropriate IRMER certification to undertake procedures.	*	*
To understand the dangers of ionizing radiation and safe practice, with full awareness of the regulations and requirements of usage, inclusive of how ionizing radiation is monitored and how exposure can be reduced.	*	*
To understand the principles of ultrasound, CT and MR imaging and catheter angiography, the indications and factors determining appropriate investigation for a patient with vascular disease and all aspects of vascular contrast agents and associated hazards.	*	*
To be able to explain to patients the various imaging modalities, to select the appropriate investigations, evaluate the patient prior to the investigation / or procedure and identify any factors that increase risk for the patient.	*	*
VASCULAR ULTRASOUND		
OBJECTIVES		
To understand and be able to perform basic vascular ultrasound. With an understanding of the principles and limitations of ultrasound scanning along with the ability to interpret vascular ultrasound imaging.	*	*
To understand ultrasound spatial resolution in relation to scan plane and the requirements for imaging different vascular territories. Subsequently, to be able to explain vascular ultrasound and its findings to patients.	*	*
To undertake Vascular Ultrasound to allow the delivery of a Vascular Surgery outpatient practice in being able to choose the appropriate probe, to optimise the grey scale and colour flow imaging along with optimising pulsed wave settings. This is in order to assess and plan treatment of	*	*

superficial venous disease and screen and assess growth of AAA.		
To undertake Vascular Ultrasound to allow the delivery of Vascular Surgery procedures by being able to undertake intra-operative arterial quality control assessments and allow control of percutaneous venous and arterial punctures.	*	*
COMPUTED TOMOGRAPHIC IMAGING		
OBJECTIVES		
To understand, interpret and manipulate CT imaging and CT angiography in order to manage vascular patients and plan vascular treatment. To be able to manage vascular patients by being able to discriminate vascular pathology from normal cross-sectional appearance.	*	*
To understand how CTA images are generated in order to be able to interpret vascular pathology. This includes the concept of helical, multi-slice scanning, scanning in the axial plane and CT spatial resolution in order to generate vascular imaging.	*	*
To recognise X-ray dose and risks associated with study.	*	*
To recognise the need to tailor individual scans to the vascular presentation e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous.	*	*
To understand the basic principles of vascular image reformatting in various planes, of image reconstruction and MIP images. To understand the common artifacts that effect these. This is to allow manipulation of images on the console and to be able to make measurements to appropriately plan and undertake the treatment of vascular patients.	*	*
To understand the use of intra-vascular and oral contrast agents, along with the risks of intra- vascular contrast and how to avoid these. Subsequently, to be able to explain the CT scan and the risks to a vascular patient. To be able to manage contrast reactions should they occur.	*	*
MAGNETIC RESONANCE IMAGING		
OBJECTIVES		
To understand, interpret and manipulate MR imaging and MR angiography in order to manage vascular patients and plan vascular treatment. Inclusive of recognising the risks of MR in vascular patients and be able to explain these and the role of MRA to patients.	*	*
To be able to manage vascular patients by being able to discriminate vascular pathology from normal cross-sectional appearances on MRA.	*	*
To understand how MRA images are generated in order to be able interpret vascular pathology. To appreciate the planes used along with spatial resolution and thereby be able to manipulate images on the console. Thereby to be able to understand the appropriate measurements of blood vessels in order to be able to plan vascular treatment of patients.	*	*
To recognise the need to tailor individual scans to clinical problems e.g. AAA elective vs. emergency, mesenteric/renal, carotid, peripheral, venous.	*	*

To understand the principles of both contrast and non-contrast angiographic techniques in vascular patients, the reformatting of images in various planes, of image reconstruction and MIP images, along with the effect of common artefacts.	*	*
To understand the different types of MR angiographic contrast.	*	*
CATHETER ANGIOGRAPHY		
OBJECTIVES		
To understand and perform intra-operative catheter angiography, with knowledge of the contrast agents, including CO2 and the risks of angiography. The teaching of this topic will be collaborative between vascular surgery and interventional radiology balanced by the requirements for reciprocal training in each specialty practice. It will utilise simulation and be initiated at specialty induction.	*	*
To understand the techniques of road-mapping, parallax, measurement, hand and power injection. To understand, and where required undertake intra-operative pressure measurements.	*	*
To understand measures to improve angiographic imaging e.g. breath holding, multi-masking, centring, collimation, frame rate, antegrade etc and thereby to keep radiation dose to the minimum required.	*	*
To understand the guidewire, catheter, introducer, dilator and sheath types, characteristics and indications, in order to obtain secure vascular access with a sheath, to position a guidewire using fluoroscopy, to place a non-selective catheter in aorta and flush the catheters and sheaths appropriately.	*	*
To understand the commonly used intra-operative arterial and venous access sites and so undertake femoral artery punctures both open and ultrasound guided. To subsequently be able to obtain satisfactory intra-operative angiograms and recognise an inadequate study with the need for alternative angiographic views.	*	*
To be able explain catheter angiography and the risks to a patient for the process of consent.	*	*

VASCULAR SURGERY Generic Procedures 1		
	Phase 2	Phase 3
OPEN VASCULAR SURGERY		
OBJECTIVES		
To gain open vascular surgical knowledge and skills in order to optimally manage vascular patients.	*	*
To know the importance of pre-operative checks and team briefing for patient safety.	*	*
To understand antibiotic prophylaxis and anticoagulation.	*	*
To understand blood transfusion and the management of transfusion-related complications.	*	*

To understand intra-operative cell salvage and the use of other blood products.	*	*
To understand the principles of local anaesthesia and local blocks e.g. metatarsal.	*	*
To know the common vascular skin incisions and exposures.	*	*
To understand the different methods of vascular control.	*	*
To understand the principles of vascular reconstruction.	*	*
To know the interventional options for varicose veins.	*	*
To understand the process of amputation level selection.	*	*
To know the types and characteristics of bypass grafts, anastomoses, and vascular sutures.	*	*
To know the types, characteristics and uses of vascular instruments.	*	*
To be able to explain open vascular surgery and the risks to a patient.	*	*
To demonstrate good patient, personal and team safety.	*	*
To ensure good asepsis, especially when prosthetic materials are involved.	*	*
To undertake good communication with patients and all members of the theatre team.	*	*
To produce accurate procedural records and post-procedural instructions.	*	*
To be able to plan and undertake appropriate wound debridement, and be able to manage the wound thereafter.	*	*
To be able to undertake Foot debridement inclusive of Digital and Ray amputations.	*	*
To be able to undertake the common major amputations, inclusive of trans-metatarsal/ trans-tibial (Burgess and Skew techniques)/ through knee and above knee amputations. Also to understand the prosthetic options for each of these operations.	*	*
To understand the indications for hindquarter amputations and, due to their rarity, be able to undertake this with a consultant colleague.	*	*
To be able to harvest superficial veins safely, without damage and then prepare for use as an arterial conduit. To understand the techniques / consequences of deep vein harvesting and due to their rarity, be able to undertake this with a consultant colleague.	*	*
To be able to undertake exposure and control of veins, such as the sapheno-femoral junction.	*	*
To be able to undertake exposure and control of arteries such as the common femoral artery, and understand the additional adjuncts for control.	*	*
To develop the open operative skills to be able to; 1: undertake an arteriotomy, 2: repair an arterial wall either directly or by patch repair and 3: go on to perform an anastomosis (both end-to-end and end-to-side).	*	*
To be able to manage acute presentations by embolectomy and go on to utilise on table angiography both diagnostically and as quality control. To be able to undertake thrombolysis if indicated, by catheter or via open arteriotomy and be able to manage the complications of this.	*	*

VASCULAR SURGERY Generic Procedures 2		
	Phase 2	Phase 3
ENDOVASCULAR PROCEDURES		
OBJECTIVES		
To be able to gain endovascular knowledge and skills in order to optimally manage patients within all aspects of vascular surgery. To be able to explain the respective roles, advantages, disadvantages, risks and benefits of endovascular options within the spectrum of options available to treat vascular disease to a patient in order to be able to make management recommendations and to be able to undertake full consent. To be able to work collaboratively with allied healthcare colleagues, inclusive of interventional radiology, radiographers, and vascular scientists, to facilitate multidisciplinary decision making.	*	*
To be able to explain the equipment, processes, procedures, and augmentations available to optimise imaging and outcomes in endovascular therapy.	*	*
To be able to recognise complications of endovascular treatment and to be able to explain the procedures, risks and benefits of endovascular rescue options and their role in relation to open surgical rescue options.	*	*
To be able to undertake pre-operative checks and team briefing, demonstrating good patient, personal and team safety. To understand the equipment required (i.e. catheter, sheath, guidewire, balloon and stent) inclusive of the different types, their indications and characteristics, such that can incorporate their usage within a practice appropriate for a day 1 consultant in vascular surgery.	*	*
To be able to undertake endovascular procedures via percutaneous or open surgical approaches whilst under the supervision of a vascular surgeon and/or interventional radiologist.	*	*
To have been supervised undertaking the component endovascular skills inclusive of; the usage of a closure device, the ability to pass a catheter into a vessel and manipulate a guidewire across a stenosis with a view to providing angioplasty and stenting.	*	*

Vascular Surgery Disease Specific Topics	Phase 2	Phase 3
ACUTE LOWER LIMB ISCHAEMIA		
OBJECTIVES		
To have the ability to recognise all presentations of acute lower limb ischaemia (Embolism, Thrombosis, trauma (blunt and penetrating) and fracture / dislocations) and institute emergency management. To be able to work collaboratively with the trauma team when required.	*	*
To understand the pathophysiology of acute limb ischaemia and compartment syndrome, through a full knowledge of lower limb arterial anatomy and neurology. To be able to obtain a full history and accurate examination.	*	*
To understand the investigation options and rationale for use. Including Doppler/ Duplex, Angiography, Intra-operative angiogram, compartment pressures, ECG and Echocardiogram.	*	*
To understand the management options and instigate the most appropriate (inclusive of Conservative, Endovascular Embolectomy, Open Embolectomy, Thrombolysis or Primary amputation).	*	*
To be able to undertake and interpret hand-held doppler assessments.	*	*
To be able to utilise and (where able to be reviewed) undertake arterial assessment of acute ischaemia.	*	*
To be able to undertake and interpret the measurement of lower limb compartment pressures.	*	*
In acute cases to be able to undertake the surgical approaches to the arterial tree and obtain surgical control of the lower limb blood vessels.	*	*
To be able to undertake an embolectomy (blind and directed/ over the wire) from femoral and popliteal access. To be able to quality control by undertaking on-table angiography and if necessary proceed to surgically/ catheter directed thrombolysis.	*	*
To be able to undertake emergency arterial reconstruction, utilising shunts where required. Subsequently be able to undertake emergency venous control and reconstruction.	*	*
To be able to undertake lower limb fasciotomies to prevent or treat lower limb compartment syndrome.	*	*

VASCULAR TRAUMA		
OBJECTIVES		
To undertake the identification, assessment and management of injuries to blood vessels (penetrating, blunt and iatrogenic) and associated injuries relative to fractures, nerves and associated structures.	*	*
To understand the pathophysiology of trauma, muscle ischaemia, shock lung and A-V Fistula and then how to investigate for bleeding and ischaemia (Duplex, CTA, on-table arteriography).	*	*
To understand and initiate the operative approach to specific injuries (cervical, thoracic, abdominal, limb) inclusive of where combined arterial and venous or involved fractures and nerve injuries.	*	*
To have an understanding and be able to initiate OR undertake both small and large bowel resections (with stoma formation) in collaboration with General Surgery.		
To be able to recognise and manage vascular injuries caused by laparoscopic or robotic surgery		
To be able to recognise the signs and symptoms of acute arterial / venous injury, undertake the assessment of a multiply injured patient and investigate appropriately.	*	*
To be able to manage the systemic effects of arterial trauma (e.g. rhabdomyolysis).	*	*
To be able to utilise endovascular skills to aid intra-operative management (on table angiography) and have understanding of the usage of the adjuncts of balloon control, embolisation and covered stents to gain control of haemorrhage.	*	*
To be able to utilise open surgical skills to arrest haemorrhage by pressure, packing or with use of a tourniquet.	*	*
To be able to manage chest trauma inclusive of being able to recognise and treat a sucking chest wound, be able to insert a chest drain and with assistance be able to undertake an emergency thoracotomy.	*	*
To be able to undertake all aspects of vascular trauma, with the ability to obtain proximal control (either by clamp or balloon occlusion), understand when an artery can be ligated and be able to do so.	*	*
To be able, in a trauma case, to utilise the skills of lateral suture repair, end to end anastomosis, interposition grafts and the formation of panel / spiral grafts.	*	*

CHRONIC LOWER LIMB ISCHAEMIA		
OBJECTIVES		
To be able to undertake the management of the chronically ischaemic lower limb, inclusive of intervention, the role of medical treatment/exercise therapy and wound dressings & VAC.	*	*
To understand the pathology of atherosclerosis, thrombosis, and their complications along with non –atherosclerotic arterial conditions (e.g. fibromuscular dysplasia, Buerger's disease, vasculitis, and pyoderma gangrenosum).	*	*
To understand the presence of Vascular anomalies (e.g. persistent sciatic artery, cystic adventitial disease and popliteal entrapment).	*	*
To be able to select the appropriate method of revascularisation or level of amputation.	*	*
To be able to manage all postoperative wound infection and graft complications. To then be able to plan appropriate follow-up and graft surveillance.	*	*
To understand and be able to initiate the rehabilitation requirements of amputation and the options for lower limb prosthesis use.	*	*
To be able to undertake the appropriate surgical management to deliver limb salvage and wound healing.	*	*
To understand and utilise the appropriate angioplasty and stenting skills within the lower limbs with the extent and range delivered collaboratively with interventional radiology and inclusive of reciprocal training between specialties.	*	*
To be able to work in collaboration with interventional radiology to undertake combined open with endovascular reconstruction, with the extent and range delivered collaboratively with interventional radiology and inclusive of reciprocal training between specialties.	*	*
To be able to undertake operative exposure of the infrarenal aorta, iliac, femoral, popliteal, tibial and pedal vessels.	*	*
To be able to undertake Intra-operative assessment with doppler and angiography. To be able to utilise this for the quality control of operations.	*	*
To be able to undertake open operative treatment of Aorto-iliac disease by Aorto-iliac, Aorto-femoral and Axillo-femoral bypasses.	*	*
To be able to undertake open operative treatment of iliofemoral level disease with Femoral and Profunda endarterectomy with patch-plasty, along with Ilio-femoral / Femoral-femoral crossover bypass grafting.	*	*
To be able to undertake Combined open vascular and endovascular reconstruction from common femoral access.	*	*
To be able to undertake infra-inguinal bypasses with the ability to prepare and utilise vein in-situ / reversed/ use arm vein/ SSV and be able to form vein cuffs or patches when combining with prosthetic grafts.	*	*
To be able to undertake operative bypass of occlusive and aneurysmal disease by above and below-knee femoral to popliteal bypass grafting.	*	*

To be able to undertake distal bypass graft from both femoral and popliteal origins to crural (AT, PT and Peroneal) and pedal targets.	*	*
To be able to utilise rotational muscle flaps (Sartorius/ Gracilis/ Rectus Femoris) to cover groin vessels in complex surgery.	*	*
To be able to undertake wound debridement of lower limb wounds including the surgical debridement of the foot and the use of Digital / Ray amputations.	*	*
To be able to undertake all levels of lower limb amputation surgery inclusive of: Transmetatarsal/transtibial (Burgess, skew)/through knee/above knee amputation (+/- myodesis).	*	*
To be able, in collaboration with Orthopaedics or with dual Vascular Consultant operating, undertake a hindquarter amputation.	*	*

VASCULAR COMPLICATIONS OF DIABETES		
OBJECTIVES		
To be able to undertake the assessment and management of patients with complications of diabetes affecting the leg/foot including neuropathy, ulceration, osteomyelitis and Charcot.	*	*
To understand the prevention of complications, the role of orthotic devices and the principles of offloading.	*	*
To be able to interpret the microbiology data and select the most appropriate antibiotics. To be able to initiate urgent control of blood sugar and set up a sliding scale.	*	*
To be able to recognise and act upon the requirement for emergency treatment of infection. To know when revascularisation should be considered and initiated.	*	*
To be able to work collaboratively with allied healthcare colleagues, including endocrinologists/diabetes nurse specialists, podiatrists etc, as part of a Diabetic Foot MDT. Subsequently be able to explain the importance of foot care and surveillance principles to patients with diabetes.	*	*
To be able to undertake a full assessment of the foot of a patient with diabetes inclusive of ABPI, tissue oxygen and monofilament testing.	*	*
To be able to surgically debride the foot and undertake both in and out-patient wound management.	*	*
To be able to manage Diabetic Foot Infection / Necrosis by debridement in both theatre and in the out-patients.	*	*
To be able to undertake operative management of Fulminant Diabetic Foot sepsis.	*	*

VASCULAR DISEASE OF THE UPPER LIMB		
OBJECTIVES		
To be able to recognise and manage; (1) upper limb ischaemia, (ii) chronic upper limb ischaemia and (iii) thoracic outlet syndrome.	*	*
To have a full understanding of upper limb vasculature and neurology and how this relates to the thoracic outlet. Therefore, be able to take a relevant history and examine the upper limb vessels and nerves including provocation.	*	*
To understand the pathology of upper vascular conditions (Thromboembolism, Atherosclerosis, Thoracic Outlet Syndrome, Subclavian Steal syndrome, Vasospastic Disease and Trauma). To be able to select the appropriate investigation and intervention.	*	*
To understand the full range of management options - Conservative (Physiotherapy), Pharmacological (anticoagulant/ prostacyclin), Endovascular (angioplasty/ stent) and Surgical (rib resection, embolectomy and bypass).	*	*
To understand and have observed the role of endovascular intervention (both stenting and angioplasty) in the subclavian artery.	*	*
To be able to undertake operative exposure of the subclavian, vertebral, axillary, brachial and radial arteries.	*	*
To be able to understand and be at the level to undertake dual consultant operating for Subclavian to carotid, Subclavian to brachial bypasses, Subclavian transposition and Subclavian Aneurysm repair.	*	*
To be able to undertake a Brachial access embolectomy, inclusive of over the wire and utilise on table angiography as quality control and plan / undertake surgically directed thrombolysis.	*	*
To be able to understand and develop a practice of thoracic outlet decompression, inclusive of cervical rib excision. Be aware of the differing supraclavicular, infraclavicular and trans-axillary approaches.	*	*
HYPERHIDROSIS		
OBJECTIVES		
To be able to undertake assessment and management of patients with hyperhidrosis (palmar and axillary), with a full understanding of the treatment options (antiperspirants, iontophoresis, thoracoscopic sympathectomy, Botox, curettage).	*	*
To understand the anatomy and physiology of the sympathetic nervous system and the pathophysiology of hyperhidrosis.	*	*
To be able to undertake Axillary Botox therapy or surgical curettage where indicated.	*	*
To understand the technique of thoracoscopic sympathectomy and be able to undertake if it is delivered within the learning environment.	*	*

VASOSPASTIC DISORDERS AND VASCULITIS		
OBJECTIVES		
To be able to undertake the assessment and management of patients with vasospastic disorders (primary and secondary) and vasculitis.	*	*
To understand the pathophysiology of primary and secondary vasospastic disorders (e.g. Raynaud's disease, thoracic outlet compression, Vibration White Finger).	*	*
To understand the pathophysiology of connective tissue disease (systemic sclerosis, SLE, rheumatoid arthritis), and also of Vasculitis (Buerger's disease, Takayasu's, giant cell arteritis, PAN, HIV, TB). To know the treatment options (cold avoidance, smoking cessation, vasodilators (e.g. calcium channel blockers), digital sympathectomy, chemotherapy, retroviral therapy.	*	*
To understand the investigations (cold provocation, blood tests, nail-fold capillaroscopy).	*	*
To be able to undertake a skin or vessel biopsy.	*	*
To understand and ideally have observed or assisted a digital sympathectomy.	*	*

CAROTID ARTERY DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with cerebrovascular disease. Surgical management of patients with carotid artery territory symptoms (understand the selection for Carotid Endarterectomy and stenting).	*	*
To understand all components of Stroke; anatomy and physiology, the classification, the Stroke Severity Score, the aetiology and epidemiology, the definition of TIA and the differential diagnosis.	*	*
To know the guidelines for management of hypertension and hyperlipidaemia (BHS, NICE, RCP, SIGN).	*	*
To know the indications and use of investigations (CT/A, MRI/A, carotid duplex, echocardiogram).	*	*
To understand the indications for either medical or interventional treatment, the role of endovascular embolectomy and thrombolysis.	*	*
To understand the stoke risk reduction options (antiplatelets, anticoagulants).	*	*
To understand the presentation and treatment options for Carotid Body tumours, Carotid dissection and trauma.	*	*
To be able to plan the medical management of a stroke patient (antiplatelet agents, hypertension and hyperlipidaemia), be able to assess post-operative complications of Carotid endarterectomy and be able to communicate to patients and their relatives the risks and benefits of intervention.	*	*
To understand the technique and indications for carotid stenting and understand the usage of the component parts (guidewire, catheter and protection device placements).	*	*
To understand the technique of superficial and deep cervical blocks and be able to undertake where appropriate.	*	*

To be able to undertake Standard and eversion Carotid endarterectomy by both standard and retro-jugular approaches. To be able to use Carotid shunts and implement distal intimal tacking sutures.	*	*
To be able to perform primary and patch closures and then use and interpret appropriate intra-operative quality control: (angioscopy, duplex ultrasound or completion arteriography).	*	*
To understand the techniques of re-do carotid surgery and be able to undertake with an experienced Vascular Consultant colleague.	*	*
To be able to undertake a direct Carotid cut done and gain control to perform a repair after trauma or percutaneous carotid access.	*	*
ANEURYSM - ELECTIVE		
OBJECTIVES		
To be able to undertake the assessment and management of elective aneurysms. Including the full range of investigations US, CTA, MRA and PET and the subsequent treatment options (Medical, open, EVAR, FEVAR, Hybrid).	*	*
To understand the pathology of aortic aneurysms (atherosclerotic inflammatory, mycotic, collagen disorders, post-dissection, vasculitic).	*	*
To understand the anatomy and pathology of; aortic dissection, thoracoabdominal aneurysms and less common aneurysms (popliteal, visceral, carotid, subclavian and false aneurysms).	*	*
On taking a full history and examination be able to assess the comorbidity / operative fitness.	*	*
To be able to undertake endovascular planning including collaboration for complex cases and also recognise/ manage postop. complications: bleeding, thrombosis, embolism, organ failure, endoleak, infection.	*	*
To understand the endovascular techniques to treat endoleaks and undertake collaborative working with interventional radiology to correct these.	*	*
To understand the techniques and indication to stent visceral aneurysms.	*	*
To understand and undertake endovascular stenting of peripheral aneurysms with the extent and range dependent on the local service delivery needs.	*	*
To be able to undertake completely the open repair of an infrarenal AAA.	*	*
To be able to undertake an Endovascular repair of an infra renal AAA as part of a collaborative team. Where required with the collaborative team delivery be able to undertake an Aorto-uni-iliac stent-graft, iliac occluder & crossover graft.	*	*
To be able to undertake, under supervision, Internal iliac artery/aneurysm coiling as part of EVAR repair with collaborative team delivery.	*	*
To be able to undertake, ideally with dual Consultant operating, complex AAA, including repair of: Inflammatory AAA, Internal iliac aneurysm, Juxta-renal and Supra-renal AAA.	*	*
To aim for the level of being guided through Juxta-renal or suprarenal AAA – fenestrated /branched stents, within a collaborative team delivery.	*	*

To understand the technical skills of open and hybrid Thoraco-abdominal aneurysm repairs and where able to undertake, aim for the level of being guided though the case.	*	*
To aim for the level of being guided through Thoracic aneurysm/dissection stent grafts within a collaborative team delivery.	*	*
To able to undertake the management of Femoral artery closure devices, inclusive of being able to deal with the complication and convert to open repair.	*	*
To be able to obtain open surgical control and repair a femoral false aneurysm.	*	*
To be able to undertake operative repair of Femoral and Popliteal aneurysms.	*	*
To be able to undertake, ideally with dual Consultant operating, the repair of less common aneurysms, inclusive of: Carotid aneurysm repair, Subclavian aneurysm repair, Visceral aneurysm repair and as part of a consultant team undertake a re-operation of an infected infrarenal AAA graft.	*	*
ANEURYSM - EMERGENCY		
OBJECTIVES		
To be able to undertake the assessment and subsequent management of emergency aneurysms inclusive of appropriate and timely investigation and both the open and endovascular treatment options.	*	*
To be aware of the surgical methods of immediate aortic control - supra-coeliac and infrarenal and the post procedure complications such as abdominal compartment syndrome.	*	*
To be able to undertake timely team-working with theatres and interventional radiology and provide collaborative endovascular management of emergency aneurysms.	*	*
To be able to undertake the Open repair of a ruptured infrarenal AAA (inclusive of dual consultant operating). Where required be able to place a Suprarenal/supra coeliac clamp or obtain Balloon control of the aorta .	*	*
To be able to recognise limb ischaemia and be able to undertake a Femoral thrombectomy and / or additional lower limb revascularisation.	*	*
To be able to undertake an Endovascular repair of a ruptured infra renal AAA as part of a collaborative team. Where required with the collaborative team delivery be able to undertake an Aorto-uni-iliac stent-graft, iliac occluder & crossover graft.	*	*
To aim for the level of being guided through Endovascular stenting of acute aortic dissection or acute aortic transection within a collaborative team delivery.	*	*

VASCULAR ACCESS (VA)		
OBJECTIVES		
To be able to describe need for VA, common methods of VA, establish VA and manage complications of VA. Inclusive of an understanding of the physiology of A-V fistula along with the advantages and disadvantages of the various methods of renal support.	*	*
To have a full understanding of the upper and lower limb arteries and veins. To know the pre-operative assessment and choice of VA and arrange the appropriate investigations. Ideally to be able to undertake the duplex assessment of the pre-dialysis patient.	*	*
To understand the techniques to maintain and revise Vascular Access inclusive of ultrasound and percutaneous fistulography. To understand the roles of endovascular intervention and utilise perioperatively where appropriate. To be able to utilise ultrasound guided access to the femoral artery and jugular vein.	*	*
To be able to undertake surgical AV fistula at radio-cephalic and brachiocephalic levels in real terms or simulation.	*	*
To be able to undertake Basilic vein transposition AV fistula in real terms or simulation.	*	*
To understand how to technically undertake complex AV fistula and be able to undertake these as part of a regional renal-access service, including creation of; a forearm loop graft, a thigh loop graft and a Saphenous vein transposition AV fistula.	*	*
To be able to undertake graft salvage and revision surgery including: Graft thrombectomy, revision, ligation or excision in real terms or simulation.	*	*
To have understanding of DRIL and more complex Fistula salvage and revision procedures.	*	*
To have an understanding of and be able to insert dialysis access inclusive of central venous dialysis catheters and peritoneal dialysis catheters.	*	*
RENOVASCULAR DISEASE AND TRANSPLANTATION		
OBJECTIVES		
To have knowledge of and be able to manage vascular problems related to renal disease and vascular surgical problems in patients with renal disease and renal transplantation.	*	*
To understand renal & reno-vascular anatomy, the role of kidney in control of blood pressure and calcium haemostasis.	*	*
To understand the pathophysiology of acute kidney injury and chronic kidney disease.	*	*
To understand the aetiology of renal disease; pre-renal (shock, trauma, sepsis and atherosclerosis), renal; intrinsic disease and toxins, and post renal (obstruction, stone or tumour).	*	*
To understand the pre-operative assessment and the indications for all the investigation options inclusive of indications for biopsy.	*	*
To understand the role of renal artery angioplasty and embolisation in managing renovascular disease. To be aware of the technical requirements for radiological access of the renal arteries.	*	*
To be able to undertake the open surgical approaches to the kidney and/ or exposure of the renal vessels.	*	*

MESENTERIC VASCULAR DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of patients with acute and chronic mesenteric ischaemia.	*	*
To understand the anatomy of the mesenteric arterial and venous system and the physiology of this.	*	*
To understand the roles, indications, and restrictions of endovascular interventions in mesenteric vascular disease (lysis, angioplasty, stenting).	*	*
To understand the pathophysiology of mesenteric ischaemia and how that presents in acute and chronic cases. To know how to investigate with mesenteric angiography/ CTA and the treatment options (medical, surgical or endovascular).	*	*
To be able to manage the complications of mesenteric ischaemia and of any surgical intervention.	*	*
To be able to undertake mesenteric thrombo-embolectomy and mesenteric bypass, likely with dual consultant operating.	*	*
SUPERFICIAL VENOUS DISEASE		
OBJECTIVES		
To be able to undertake the assessment and management of varicose veins, including recurrent veins and complications.	*	*
To understand the anatomy of the superficial venous system, the physiology of venous dynamics and the pathology of superficial venous incompetence.	*	*
To understand the process of neovascularisation and recanalisation, the presentation and effect of pelvis venous reflux and the complications of venous hypertension.	*	*
To understand the presentation and management of oedema, lipodermatosclerosis, ulceration, bleeding and recurrence. To know how to examine varicosities and venous incompetence.	*	*
To be able to interpret the investigation findings of venous duplex, venography (including CTV and MRV) and where necessary plethysmography.	*	*
To understand and be able to undertake all the management options (conservative, sclerotherapy, endovenous ablation and surgery).	*	*
To be able to dress an ulcer and undertake compression bandaging therapy.	*	*
To appreciate and where required undertake open surgical management of lower limb superficial venous disease (multiple phlebectomies, sapheno-femoral junction ligation, sapheno-popliteal junction ligation, long saphenous vein strip).	*	*
To be able to cannulate the long and short saphenous veins under ultrasound control and treat by endovenous thermal ablation.	*	*
To be able to undertake both ultrasound guided foam sclerotherapy of truncal veins and injection sclerotherapy.	*	*
To be able to undertake recurrent varicose vein surgery.	*	*

DEEP VENOUS THROMBOSIS		
OBJECTIVES		
To be able to undertake the assessment and management of patient with deep venous thrombosis, inclusive of the knowledge of the deep venous anatomy and the pathophysiology of thrombosis. Recognise the early/ late complications of DVT.	*	*
To understand the indications for intervention (caval filters, thrombolysis, surgical thrombectomy / Venous Stents).	*	*
To understand the role of thrombophilia within DVT and the options of thromboprophylaxis.	*	*
To understand the options for investigation with Ultrasound, Duplex, MRV, CTPA and V/Q scans.	*	*
To be able to utilise the management pathway of endovenous therapy (thrombolysis) and the subsequent or associated insertion of a venous stent.	*	*
To be aware of the technical components of insertion and withdrawal of a caval filter.	*	*
To understand the principles and procedures of venous thrombectomy and recognise any complications.	*	*
DEEP VENOUS INSUFFICIENCY		
OBJECTIVES		
The assessment and management of patient with deep venous insufficiency.	*	*
To understand the pathology of deep venous insufficiency (DVT, valvular dysfunction, valvular agenesis), to know the history of presentation and the risk factors.	*	*
To understand the examination findings of DVI, how to diagnose the complications and then how to investigate (duplex, venography, plethysmography, cross-sectional imaging, IVUS).	*	*
To understand the management options (compression systems, valvuloplasty, valve transplant, bypass, amputation).	*	*
To understand the indications and methods of deep venous stenting, working collaboratively with interventional radiology.	*	*
To be able to undertake leg ulcer biopsies.	*	*
To be able to undertake perforator ligation procedures.	*	*
To be able to understand the principles and procedures of deep venous reconstruction or venous bypass and perform such with appropriate mentoring.	*	*
LYMPHOEDEMA		
OBJECTIVES		
To be able to assess and manage patients with lymphoedema, with an awareness of the classification of lymphoedema (primary and secondary, Lipoedema).	*	*
To understand the anatomy, physiology, and pathophysiology of the lymphatic system. To be able to describe and recognise the clinical features of lymphoedema and the chronic effects.	*	*

To understand the investigation (lymphoscintigraphy, lymphangiogram, CT/ MRI) and management options (manual compression, compression bandaging, compression hosiery, surgical options).	*	*
To be able to undertake the surgical treatment of lymphoceles and lymphatic leaks.	*	*
VASCULAR SURGERY ABDOMINAL AND GENERAL SURGERY TOPICS		
	Phase 2	Phase 3
SUPERFICIAL SEPSIS INCLUDING NECROTISING INFECTIONS		
OBJECTIVES		
To be able to undertake the diagnosis and basic management of gas gangrene and other necrotising infections.	*	*
To understand the aetiology, bacteriology and treatment options of superficial abscesses, cellulitis, gas gangrene, and necrotising infections.	*	*
To understand the mechanisms of septic shock and the appropriate antibiotic regimens.	*	*
To be able to manage superficial abscesses either through surgical drainage or aspiration under ultrasound control.	*	*
To be able to surgically manage Necrotising Fasciitis through debridement or radical excisional surgery.	*	*
ABDOMINAL WALL		
OBJECTIVES		
To understand the management of abnormalities of the abdominal wall, excluding hernia, through knowledge of the abdominal wall anatomy and the pathology of acute and chronic conditions (haematoma, sarcoma, desmoid tumour).	*	*
To be able to determine where a swelling is within the abdominal wall and where this may be vascular in origin.	*	*
To understand how to investigate these (when to use ultrasound / biopsy) and know what management to advise.	*	*
To be able to conservatively manage abdominal wall haematomas.	*	*
LAPAROSCOPIC SURGERY		
OBJECTIVES		
To understand the principles of laparoscopic surgery including technical aspects and common complications.	*	*
To understand the physiology of pneumoperitoneum and the anaesthetic issues of laparoscopic surgery.	*	*
To understand the technology of video imaging, cameras and insufflator, the instruments used (clips, staplers and port types). To be aware of how equipment failure would be managed and to understand the use of diathermy with its associated risks.	*	*
To be able to recognise and manage laparoscopic complications, in particular those of a vascular nature. To be able to provide informed consent for laparoscopic procedures.	*	*

ELECTIVE HERNIA		
OBJECTIVES		
To be able to undertake the diagnosis and management, including operative management, of primary and most recurrent abdominal wall hernia.	*	*
To understand the anatomy of inguinal region including inguinal canal, femoral canal, abdominal wall and related structures e.g. adjacent retroperitoneum and soft tissues. To understand the relationship of structure to the function of the anatomical structures and as such understand the natural history of abdominal wall hernias including presentation, course, possible complications and where this may relate to a vascular presentation.	*	*
To understand the current operative repair options and where this may relate to vascular conditions or where they may need to be utilised in a vascular patient. (i.e. use of mesh, both open and laparoscopic and posterior wall plication).	*	*
To be able to diagnose and assess vascular patients presenting with common abdominal wall hernias (such as incisional, inguinal, femoral, epigastric, umbilical and paraumbilical).	*	*
ACUTE ABDOMEN		
OBJECTIVES		
To be able to undertake the assessment, resuscitation and management of patients with acute abdomen.	*	*
To understand the abdominal anatomy and hence how the pathology presents, such that understand the causes of the acute abdomen.	*	*
To understand the pathophysiology of peritonitis, sepsis and shock, how to resuscitate the patient, and to understand the optimal investigations to arrange and the indications for surgery.	*	*
To be able to identify the non-vascular cause of acute abdominal pain.	*	*
To be able to operate on the acute abdomen and undertake a diagnostic laparotomy and abdominal lavage.	*	*
ACUTE INTESTINAL OBSTRUCTION		
OBJECTIVES		
To be able to recognise and manage most cases of postoperative intestinal obstruction in conjunction with abdominal surgeons.	*	*
To understand the aetiology of intestinal obstruction, the differential diagnosis and the treatment options.	*	*
To understand how to investigate intestinal obstruction and provide nutritional support.	*	*
To be able undertake a laparotomy and division of adhesions in isolation or as the access to a vascular procedure.	*	*
	*	*
GASTROINTESTINAL BLEEDING		
OBJECTIVES		
To be able to undertake assessment of all cases of gastrointestinal bleeding, management and referral to subspecialists as needed. Inclusive of a knowledge of coagulopathy. To have the knowledge to resuscitate the hypotensive patient.	*	*

To be able to recognise all causes of GI bleeding, understand the role of endoscopy and CT angiography.	*	*
To understand the indications for operation and /or endoscopic or endovascular therapeutic procedures. To be able to recognise re bleeding and post-operative problems, to know how these are managed along with the postoperative care and fluid balance.	*	*
To be able to undertake a laparotomy for bleeding and develop the ability to mobilise the colon to expose the iliac vessels.	*	*
ABDOMINAL INJURIES		
OBJECTIVES		
To be able to identify and manage the majority of abdominal injuries, inclusive of the interpretation of imaging from a vascular perspective.	*	*
To understand the principles of management of severely injured patients, the differences of this in children and the importance of the mechanism of injury.	*	*
To understand coagulopathy and the indications for un-cross matched blood.	*	*
To understand the principles of damage control surgery, the management of hollow organ injury and recognise where injuries require input from other specialities.	*	*
To understand the appropriate use of imaging for abdominal injuries (CTA and FAST scanning).	*	*
To be able to undertake a trauma laparotomy, mobilise the colon to expose the major vessels, control the bleeding and manage liver trauma by packing. To be able to undertake a Splenectomy in collaboration with Trauma surgeons.	*	*
GASTRIC STASIS, PARALYTIC ILEUS AND CONSTIPATION		
OBJECTIVES		
To be able to undertake the management of postoperative gastric stasis, pseudo-obstruction and constipation. To be able to take the appropriate history, undertake the physical examination and initiate appropriate investigations / management.	*	*
To understand normal gastric, small bowel and colonic physiology (including gut hormones and peptides) and the process of defaecation.	*	*
To know the classification of types and causes of postoperative gastric stasis, pseudo-obstruction and constipation, along with the use of prokinetic and anti-emetic agents.	*	*
To know the different types of laxatives and describe the indications, contraindications, modes of action, and complications of each: stimulant, osmotic, bulk-forming, lubricant.	*	*
ISCHAEMIC AND INFECTIOUS COLITIS		
OBJECTIVES		
To be able to undertake the management of ischaemic colitis and clostridium difficile colitis.	*	*
To understand the vascular anatomy of the colon and the epidemiology, aetiology, pathogenesis, investigation, medical management and indications for surgery of both ischaemic colitis and clostridium difficile colitis.	*	*

To be able to manage ischaemic colitis and recognise and manage after abdominal aortic aneurysms repair.	*	*
To be able to manage infective colitis, including clostridium difficile.	*	*
RETICULO-ENDOTHELIAL SYSTEM		
OBJECTIVES		
To be able to undertake the management of conditions affecting the reticulo-endothelial and haemopoietic systems.	*	*
To understand the causes of lymphadenopathy.	*	*
To understand the indications for elective splenectomy-haemolytic anaemia, ITP, thrombocytopaenia, myeloproliferative disorders.	*	*
To know the indications for emergency splenectomy, the role of splenic preservation, the role of splenic embolisation and the post procedure sequelae of these.	*	*
To be able to plan appropriate diagnostic tests for lymphatic conditions and to work in consultation with haematology to plan the appropriate treatment schedule in splenic conditions.	*	*
To be able to undertake a lymph node FNA and biopsy a node within the groin or axilla.	*	*
To be able to undertake a lymph node block dissection in collaboration or be mentored by a colleague.	*	*

Appendix 3: Critical Conditions and Key Topics

Critical Conditions and Key Topics – Vascular Surgery

Vascular Surgery manages a large number of individual conditions as described in the syllabus. Assessment of a trainee's ability to manage these is through the supervision level decisions made when assessing the shared CiPs. Vascular Surgery also has a list of critical conditions and key topics which are felt to be of significant importance for patient safety and to demonstrate a safe breadth of practice. These critical conditions will be assessed individually by means of the Case Based Assessment (CBD) and Clinical Evaluation Exercise (CEX) which will both provide formative feedback to the trainee and feed into the summative assessment of the AES.

To ensure that trainees have the necessary skills in the critical conditions, by certification (the end of phase 3) there should be documented evidence in the portfolio of performance at the level of a day-one consultant by means of the CBD or CEX as appropriate (at level 4: *Appropriate for certification*. See CBD/CEX forms for the full list of levels).

The critical conditions are:

1) Acute Limb Ischaemia
2) Abdominal Aortic Aneurysms
3) Fulminant Diabetic Foot Sepsis
4) Femoral false aneurysms

The key topics are:

- 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.
- Recognise and know the principles of treatment of patients with ruptured abdominal aortic aneurysms.
- Diagnosis and management, including operative management of abdominal and peripheral aortic aneurysms. Have knowledge of both open and endovascular repair of aortic aneurysms.
- Ability to diagnose and manage patients with femoral false aneurysms, and the application of this to plan management of all false aneurysms.
- Recognition and management of severe vascular infections, involving native vessels and synthetic grafts
- Recognition and management of patients presenting with diabetic foot tissue loss/ Infection and sepsis.
- Safely assess the multiply injured patient (ATLS course or equivalent)
- Identify and manage traumatic and iatrogenic vascular injuries
- Diagnosis and management of carotid artery disease including knowledge of when to use endovascular techniques.
- A basic knowledge of vascular access techniques and the treatment of arterio-venous

malformations.

- Have knowledge of the techniques involved in renovascular surgical intervention.
- Recognition and management of patients with vasospastic and arteritic conditions of their upper and lower limbs.
- Have knowledge of both open and endovenous treatments for varicose veins and treat patients with varicose veins from start to finish
- 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
- Ability to assess published evidence in relational to clinical practice and ability to teach others

Appendix 4: Index Procedures

Index Procedures – Vascular Surgery

Vascular Surgery requires technical skills to be undertaken across a wide range of operative procedures as described in the syllabus. These are generally groups of procedures which are common and/or are seen as representing important areas of technical expertise. The assessment of a trainee's ability to carry out this full range of procedures is covered by the supervision level decisions made when assessing the CiPs. These assess not only the necessary technical skills but the totality of capabilities required to carry them out. Vascular Surgery also has a list of index procedures, which are felt to be of significant importance for patient safety and to demonstrate a safe breadth of practice.

The index procedures will be assessed individually by means of the PBA which will both provide formative feedback to the trainee and feed into the summative assessment of the AES and ARCP. The competency in these procedures should be developed through both Phase 2 and 3 of training.

By certification (the end of phase 3) there should be documented evidence of performance at the level of a day-one consultant for the index procedures to competence level 4 in the PBA.

PBA Level 4:
a: Procedure performed fluently without guidance or intervention
b: As 4a and was able to anticipate, avoid and/or deal with common problems/complications (see PBA form for the full list of levels).

The PBA numbers are an indicative guide for both trainees and trainers as to the case numbers that give an indication of competence as trainees would not normally be expected to have achieved sufficient experience to be able to manage the range of pathology they encounter unless these numbers were met. It is recognised that competence could be achieved with fewer cases, if supported by evidence from other assessments. Meeting the numbers does not, in itself, imply competence.

The index procedures and indicative numbers are:

Aortic aneurysm

- Open Aortic Procedures – 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

(To include Open repair of Elective AAA at level 4 and Ruptured AAA at level 3)

- Collaborative Endovascular Aortic Procedures -10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

(To include Endovascular repair of Elective AAA at level 4 and Ruptured AAA at level 3)

Carotid endarterectomy – 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

<u>Common Femoral Arterial Surgery</u> - 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

- Common Femoral artery exposure, endarterectomy and patch / graft anastomosis –to level 4
- Redo – Groin Surgery
- Combined Open with Endovascular Revascularisation (COWER)- to level 4 as part of Collaborative delivery

<u>Infra Inguinal bypass surgery</u> – 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

o Above Knee popliteal exposure and anastomosis
o Below knee popliteal exposure and anastomosis
o Calf vessel run exposure and anastomosis
o Pedal vessel exposure and anastomosis
o Popliteal artery exclusion bypass

<u>Endovascular –</u> 10 PBAs that show progression to competence. To include four at level 4 by at least twp trainers

Inclusive of:

- Perioperative Endovascular (DSA) imaging interpretation and management
- Angioplasty / Stenting of a luminal SFA/ Iliac stenosis.
- Over the wire balloon thrombectomy cases

<u>Emergency Vascular Surgery –</u> 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

o Femoral and Brachial Embolectomy
o 4 compartment fasciotomy
o Control and repair false femoral artery aneurysm

<u>Amputation and Debridement</u> 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

- Digital amputation and or – Drainage of Diabetic Foot Sepsis at level 4
- Major amputation (Inclusive of Above/ Through and Below Knee) at level 4

<u>Varicose vein surgery-</u> 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

o Sapheno-femoral and sapheno-popliteal ligation.
o Endovenous LSV and SSV ablation
o Foam injection sclerotherapy

<u>Vascular access –</u> 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

- Primary AV fistula at wrist/upper arm
- Revision of failed AV fistula

<u>General Surgery–</u> 10 PBAs that show progression to competence. To include four at level 4 by at least two trainers

Inclusive of:

- Open and Close Laparotomy – at level 4
- Emergency Control (packing) of intra-abdominal haemorrhage
- Division of Adhesions
- Colonic mobilisation to allow Vascular Control

Appendix 5: Courses and other learning opportunities away from the workplace

Learning outcomes relating to trauma which can be achieved by attendance at a formal trauma course, such as ATLS or equivalent where the specialty treats patients with traumatic injury, or a locally provided course meeting the outcomes described.

Trauma learning outcomes	**Rationale for learning by attendance at a course**	**Phase of training**	**GPC**	**CiP**	**Examples of ways to meet trauma learning outcomes**
To undertake the identification, assessment and management of injuries to blood vessels (penetrating, blunt and iatrogenic) and associated injuries relative to fractures, nerves and associated structures	Cannot be learned in the workplace to the level required for patient safety Allows a systematic process of teaching a safe and reliable method of immediate management of severely injured patients and comprises a range of comprehensive and adaptable trauma management skills relevant to all specialties	Current throughout training	Domain 2: Professional skills Domain 3: Professional knowledge Domain 5: Capabilities in leadership and team working	2) Manages the unselected emergency take	ATLS, European Trauma Course, definitive Surgical Trauma Skills course or equivalent locally provided course(s) meeting the outcomes described

Appendix 6: Roles and responsibilities for supervision

The role of the Training Programme Director (TPD)

TPDs are responsible for managing the specialty training programmes, ensuring they deliver the specialty curriculum.

TPDs are responsible for:

- Organising, managing and directing the training programmes, ensuring that the programmes meet curriculum requirements
- Identifying, appointing and supporting local faculty i.e. Assigned Educational Supervisors (AESs) and Clinical Supervisors (CSs), providing training as necessary, including training in equality and diversity and providing feedback to AESs and CSs on the quality of their performance
- Ensuring a policy for career management and advice covering the needs of trainees in their placements and programmes
- Overseeing progress of individual trainees through the levels of the curriculum, ensuring learning objectives are set, appropriate assessments are being undertaken and that appropriate levels of supervision 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 administrative support are knowledgeable about curriculum delivery and are able to work with NHS Employers, SACs, trainees and trainers
- Providing induction for trainees entering specialty programmes
- Administering and chairing the Annual Review of Competence Progression (ARCP) meetings
- Monitoring the quality of the training programme and producing quality reports (including the quality of trainer assessments and feedback) for the Postgraduate Dean
- Ensuring access to trainee data is kept confidential.

The role of the Assigned Educational Supervisor (AES)

AESs are consultant surgeons responsible for the management and educational progress of one or more specified trainee(s) in a training placement or series of placements. AESs must be appropriately trained for the role, familiar with the curriculum and have demonstrated an interest and ability in teaching, training, assessing and appraising. They should have gained skills equivalent to courses such as Training the Trainer offered by an appropriate educational institution and must keep up-to-date with developments in training. They must have appropriate access to teaching resources and time for training allocated to their job plan (approx. 0.25 PA per trainee). 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.

AESs are responsible for:

- Providing induction to the unit (where appropriate)
- Ensuring that trainees are familiar with the curriculum and assessment system relevant to the level/phase of training and undertake it according to requirements
- Ensuring that trainees have appropriate day-to-day supervision appropriate to their phase of training

- Helping trainees with both professional and personal development
- Completing a learning agreement with trainees and undertaking appraisal meetings (typically one at the beginning, middle and end of a placement)
- Ensuring the MCR is completed by CSs, ensuring all the CiPs are addressed, any differences in supervision level are explained and final sign off of the MCR
- Ensuring a record is kept in the portfolio of any serious incidents or concerns and how they have been resolved
- Regularly inspecting trainee learning portfolios and ensuring trainees are making the necessary clinical and educational progress
- Informing trainees of their progress and encouraging trainees to discuss any deficiencies in the training programme, ensuring that records of such discussions are kept
- Ensuring access to trainee data is kept confidential
- Ensuring patient safety in relation to trainee performance by the early recognition and management of those doctors in distress or difficulty
- Keeping the TPD informed of any significant problems that may affect training
- Discussing trainees' progress with each trainer with whom trainees spend a period of training and involving them in the formal reporting process
- Providing an end of placement AES report for the ARCP.

The role of the Clinical Supervisor (CS)

CSs are consultant surgeons responsible for delivering teaching and training under the delegated authority of the AES. The training of CSs should be similar to that of the AES.

CSs are responsible for:

- Ensuring patient safety in relation to trainee performance
- Carrying out WBAs on trainees and providing verbal and written feedback
- Liaising closely with other colleagues, with whom the trainee is working, regarding the progress and performance of trainees
- Keeping the AES informed of any significant problems that may affect training
- Ensuring access to trainee data is kept confidential
- Contributing to the MCR as part of the faculty of CSs and providing constructive feedback to the trainee.

The roles of AES and CS come under the umbrella of the Professionalised Trainer outlined in section 3.2.2. The JSCT is supportive of the GMC's moves towards greater recognition and accreditation for clinicians undertaking the roles of AES and CS, and other responsibilities supporting education and training.

The role of the Assessor

Assessors carry out a range of WBAs and provide verbal and written feedback trainees. Assessments during training are usually be carried out by CSs, who will be responsible for the MCR, recommending the supervision level and providing detailed formative feedback to trainees with reference to the CiPs. Other members of the surgical team including senior trainees, senior nurses and doctors from other medical disciplines may assess trainees in areas where they have particular expertise (e.g. with the use of the DOPS). Those who are not medically qualified may also act as assessors for the trainee's Multi-source Feedback (MSF). Assessors must be appropriately qualified in the relevant professional discipline and trained in the methodology of WBA. This does not apply to MSF raters.

Assessors are responsible for:

- Carrying out WBA, including the MCR, according to their area of expertise and training
- Providing constructive verbal feedback to trainees, including an action plan, immediately after the event
- Ensuring access to trainee data is kept confidential
- Providing written feedback and/or validating WBAs in a timely manner.

The role of the Trainee

Trainees are the learners who have been selected into a specialty training programme. Other surgeons who have registered to use the curriculum and learning portfolio as learners have the same responsibilities. All trainees/learners have a responsibility to recognise and work within the limits of their professional competence and to consult with colleagues as appropriate. 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. Trainees/learners must place the well-being and safety of patients above all other considerations. They are required to take responsibility for their own learning and to be proactive in initiating appointments to plan, undertake and receive feedback on learning opportunities.

Trainees/learners are responsible for:

- Engaging with opportunities for learning
- Creating a learning agreement and initiating meetings with the AES
- Raising concerns with the AES and/or TPD about any problems that might affect training
- Initiating regular WBAs with assessors in advance of observations
- Undertaking self and peer assessment
- Undertaking regular reflective practice
- Maintaining an up to date learning portfolio
- Working as part of the surgical and wider multi-professional team.

Appendix 7: Quality Management of the Curriculum

The Joint Committee on Surgical Training (JCST) works as an advisory body to the four surgical Royal Colleges of the UK and Ireland for all matters related to surgical training. It is the parent body of the Specialty Advisory Committees (SACs) and the Training Interface Groups (TIGs) and works closely with the Surgical Specialty Associations in Great Britain and Ireland. The JCST sets out a curriculum quality framework directed at evaluating and monitoring curriculum delivery against curriculum standards whereby a range of qualitative and quantitative measures inform continuous improvement. The JCST is also the umbrella organisation for the Intercollegiate Surgical Curriculum Programme (ISCP), the curriculum training management system. Through the variety of mechanisms outlined below, the JCST complies, and ensures compliance, with the requirements of equality and diversity legislation set out in the Equality Act 2010.

The quality system includes the following components:

- Quality assurance (QA): the development and maintenance of the curriculum links with the GMC's role in providing standards for training and for curricula.
- Quality management (QM): the implementation of training and curriculum standards by Deaneries through training programmes and post locations approved by the GMC. The system includes processes for recruitment and selection and mechanisms to address concerns. SAC Liaison Members provide externality and support for local quality management.
- Quality control (QC): the implementation of training standards by local education providers (LEPs). The local delivery of curriculum is through the trainers recognised by the GMC.

Internal Quality Review

The following mechanisms provide sources of information that, together, provide complementary information which informs quality management and quality improvement.

Specialty Advisory Committees (SACs)

There is one SAC for each GMC recognised surgical specialty and a Core Surgical Training Advisory Committee (CSTAC) which oversees core surgical training. Each SAC will comprise appointed Liaison Members to cover all training regions in the UK, the Lead Dean for the specialty, a trainee representative, the Chair of the Intercollegiate Specialty Board (ex officio), the President of the Specialty Association or deputy, a representative of Royal College of Surgeons in Ireland and additional members may be co-opted for a time-limited period to provide specific expertise as necessary. The skill set and experience of SAC members will reflect the breadth of the specialty. The Liaison Members act on behalf of the SAC by overseeing training in a particular region(s) other than their own. Duties include contributing to the local quality management systems, the ARCP and to the regular reporting through first-hand independent knowledge of training programmes.

Curriculum development

The SACs, working with their Specialty Associations, are responsible for curriculum development and maintenance. They monitor innovations in clinical practice and, when these become established components of service delivery, they can be incorporated into an approximately three yearly review of the specialty curriculum. Similarly, the JCST, ISCP Management Committee, JCST Quality Assurance Group and the SACs monitor developments in training delivery and incorporate these into formal curriculum reviews. Curriculum updates are made in consultation with all stakeholders, including trainees, trainers, speciality organisations, deans, employers, patient and lay representatives and the GMC including specific trials and pilots when required.

Equality and diversity implications are considered throughout the development of curricula in association with trainees and trainers through specific development events, which feed into impact assessments, noting any potential adverse effects on learners with protected characteristics as defined by the Equality Act 2010. Curricula are also developed through regular meetings with the GMC, helping to refine the curriculum approach and ensuring that the standards for curricula are met and identify future developments.

GMC Survey

The GMC undertakes a national training survey of trainee views on their training. The findings of the survey are available by country, postgraduate body, LEP, training level and graduating medical school. The GMC also conducts a survey of educational and clinical supervisors in the UK, which aims to collect evidence on whether trainers are able to undertake their duties as trainers effectively; have support for training including trainer development and the formal recognition of their duties in job plans; are implementing curricula and assessments appropriately.

The JCST analyses the GMC's published reports on these surveys, drawing out the key messages for surgery to feed into each SAC and QA Group meeting. SAC Liaison Members are responsible for consulting on the outcomes of these discussions with those responsible for curriculum delivery in their regions including TPDs and Specialty Training Committees (STCs). They also report key learning points through their Liaison Member Reports. The JCST uses the initial analysis and feedback from these processes to help address ad hoc queries and inform projects, pilots, monitoring and evaluation work. The outcomes of these processes are to report the specialty and national view of postgraduate surgical training through a continuous model of reporting to the GMC at regional and national level.

The GMC also provides a progression data portal, which colleges and faculties can use to consider data on the progression of trainees by specialties and regions. The JCST uses these data to help identify system or policy changes that might need review in order to ensure equality, diversity and fairness. See also below – External Quality Review (the GMC and postgraduate bodies use the GMC survey findings in external quality review).

Quality Indicators

The JCST Quality Indicators are the JCST and SACs' guidance on the attributes of good quality training posts. They are not an assessment for measuring the achievements of individual trainee. They are a tool to monitor the quality of training posts and drive quality improvement.

JCST Survey

The JCST trainee survey measures training post compliance with the JCST Quality Indicators across all UK training programmes. The anonymised survey responses are pivotal to the JCST's quality processes. Trainees complete one survey for each training placement prior to their ARCP. As part of its five-year strategy, the JCST shares this information in the form of annual reports. The JCST also conducts a biennial survey of surgical Assigned Educational Supervisors to gather information on issues particularly relevant to surgical trainers, such as use of the web-based ISCP, time and support available to undertake training and other related activities. Analysis of the findings from these surveys are key to the work of the SACs and QA Group. This informs their meetings and the consultations SAC Liaison Members have with those responsible for curriculum delivery within their regions including TPDs and STCs. The learning points drawn from the analysis and feedback

inform all JCST work including projects, pilots and evaluation and help report the specialty and national view of postgraduate surgical training.

JCST and ISCP data

Training data collected through the JCST and ISCP are used to review quality. These include curriculum delivery, adherence to quality indicators and equality and diversity issues. The ISCP is used to monitor curriculum delivery, trainee progression and WBA performance. The ISCP Management Committee undertakes and supports qualitative and quantitative research and recruits external Research Fellows to conduct specific studies to support curriculum and assessment change.

Trainee views

Representatives of trainee associations are members of the JCST committees and have specific sections of meetings to report on training issues and raise concerns. Trainee representatives are involved in working groups, curriculum review and the development of the ISCP training management system, including, where necessary, cascading training, testing and piloting.

External Quality Review

Postgraduate Deans

The responsibility for the quality management of specialty training programmes rests with the Deans. They ensure posts and programmes are approved by the GMC, oversee the appointment of trainees and of TPDs. They ensure that training in the regions is implemented in accordance with GMC-approved curricula. Deans work through STCs and Boards, seeking advice from the JCST, the surgical Royal Colleges and SACs on curriculum delivery, the local content of programmes, assessment of trainees, remedial training and the recognition and training of trainers. The Deans contract LEPs through Service Level Agreements to deliver training to agreed standards. Working alongside Postgraduate Deans, education providers must take responsibility for ensuring that clinical governance and health and safety standards are met. This includes the provision of a system of training including in equality and diversity, a process of revalidation and annual appraisals of trainers by employers set against the professional standards for Good Medical Practice.

Schools of Surgery

The co-ordination of surgical training is through Schools and their devolved nation equivalents, which are accountable to the Deaneries. They bring together networks of lead providers of postgraduate medical education in a particular specialty or group of specialties to decide how educational initiatives are best delivered and ensure consistency of approach. Each School is led by the Head of School who acts as a workforce adviser to the education commissioners, leads on quality management of surgery, supports and develops lead providers, provides regional representation in national fora and an interface with other disciplines. The Head of School or their devolved nation equivalent also oversees the quality of training posts provided locally. The national Heads of School and their devolved nation equivalents meet through their Confederation of Postgraduate Schools of Surgery (CoPSS), which is also attended by the Chair of the JCST and ISCP Surgical Director.

Training Programme Directors

Training programmes are led by TPDs or their designated equivalent. TPDs have responsibility for managing individual specialty training programmes. Their responsibilities include allocating trainees to training placements and rotations, providing systems for career management, flexible training, academic training and remedial training as well as organising the recognition and training of trainers and co-ordinating the ARCP. TPDs, working alongside Heads of School, are also introducing a standardised form for the evaluation of AES reports in order to offer feedback to AESs about the quality of their feedback to trainees, along with mechanisms for development.

Statutory Education Bodies

Co-ordination and alignment of policy on medical education is devolved from health ministers to bodies governing the health services in the four nations of the UK (NHS England, NHS Education for Scotland (NES), the Northern Ireland Medical and Dental Training Agency (NIMDTA) and Health Education and Improvement Wales (HEIW)) and Ireland (the Health Service Executive (HSE)). These organisations are responsible for healthcare, education, training and workforce development. They take advice from the JCST and the surgical Royal Colleges in order to ensure consistent regional delivery. These organisations can undertake visits to LEPs and visits can be triggered by specific concerns. They highlight any areas for improvement, agree the timetable for any appropriate action and identify areas of notable practice. SAC Liaison Members may be involved in the visits to provide both specialty-specific input and externality.

UK Medical Education Reference Group (UKMERG)

The UKMERG is a forum for discussion, co-ordination and alignment of matters relating to medical education across the UK. It includes representation from the four UK health departments and the four statutory postgraduate medical education bodies.

General Medical Council

The GMC is responsible for setting the standards for curricula and approving curricula as well as approval of training programmes and training post locations. The Deanery submits an application for programme and post location approval. Support for an application is available from the relevant surgical SAC. There is regular reporting to the GMC as part of their quality framework. The GMC activities may include document requests, meetings, shadowing, observations, visits and document reviews. The GMC uses the GMC survey results in quality assurance by monitoring that training meets the required standards. It will escalate issues through other QA activity such as an enhanced monitoring process. Triggered visits investigate possible serious educational failures or risks to patient safety as part of the GMC's enhanced monitoring process. The GMC’s QA process includes the ability to impose a sanction in response to a failure to meet its standards including imposing conditions which limit the time or scope of approval, refusing approval, and withdrawing recognition for training.

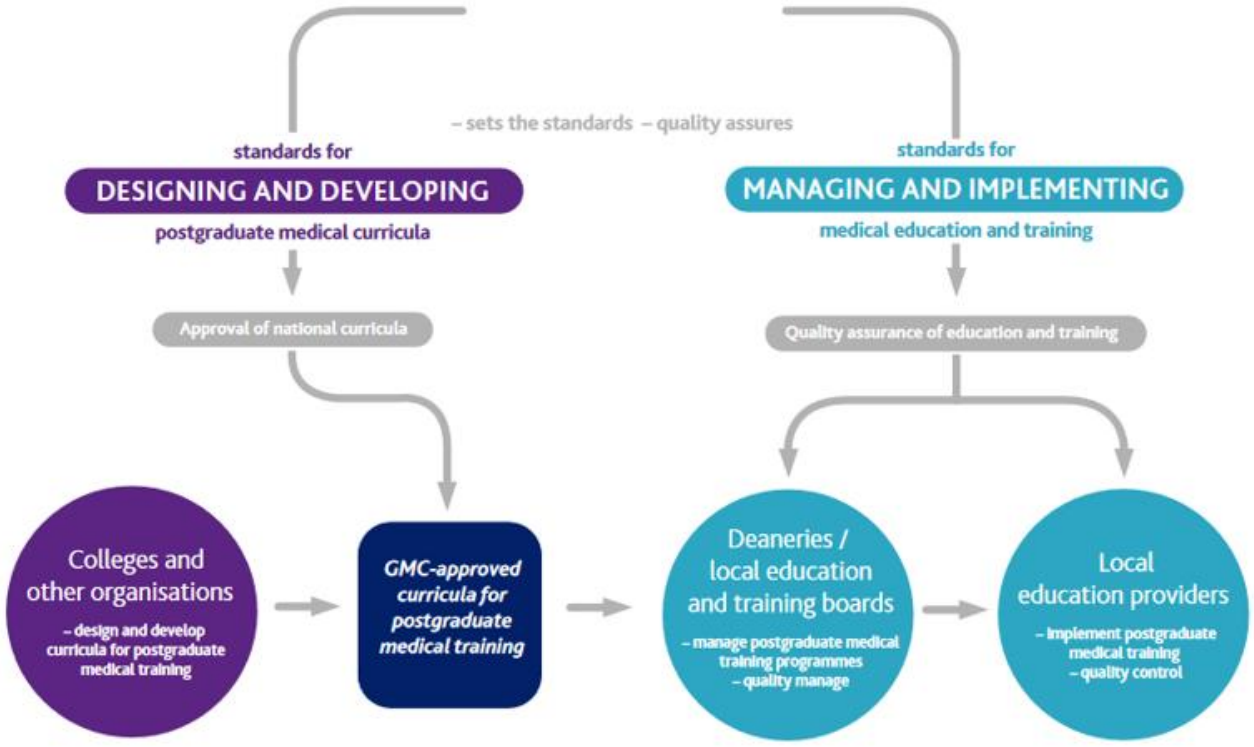

Figure 8: The quality assurance structure of the curriculum (adapted from Excellence by Design, GMC, 2017)

Appendix 8: Glossary

Term	Definition
AES Report	An end of placement report by the trainee's Assigned Educational Supervisor, providing key evidence for the trainee's ARCP.
ARCP / ARCP 6	The Annual Review of Competence Progression (ARCP) panel will recommend one of 8 outcomes to trainees. Outcome 6 sets out that a trainee has gained all required competencies and will be recommended as having completed the training programme. (For further information, please see the Gold Guide[7]).
Capability	The ability to be able to perform an activity in a competent way.
Capabilities in Practice (CiP)	The high-level learning outcomes of the curriculum. Learning outcomes operationalise groups of competencies by describing them in terms of holistic professional activities. In surgery they are aligned to what a day-one consultant will need to be able to know and do. Rather than learning 'inputs' ('what is learned', they set out what the learner must be able to do as a result of the learning at the end of the training programme – a practical skill) and clarify the extent to which trainees should successfully perform to reach certification.
Critical Condition	Any condition where a misdiagnosis can be associated with devastating consequences for life or limb.
Critical Progression Points	Key points during the curriculum where trainees will transition to a higher level of responsibility or enter a new area of practice. These points are frequently associated with increased risk, and so robust assessment is required. These points are at the end of phase 2 (transition to phase 3), and the end of phase 3 to achieve certification.
Core Surgical Training	The early years of surgical training for all ten surgical specialties.
Generic	Applicable to *all* trainees regardless of specialty, discipline and level of training, e.g. Generic Professional Capabilities.
Generic Professional Capabilities (GPCs)	A framework of educational outcomes that underpin medical professional practice for all doctors in the United Kingdom.
Good Medical Practice (GMP)	The core ethical guidance that the General Medical Council (GMC) provides for doctors.
High-Level Outcome	See Capability in Practice.

Index Procedure	Operative 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.
Manage	Throughout the curriculum the term 'manage' indicates competence in clinical assessment, diagnosis, investigation and treatment (both operative and non-operative), recognising when referral to more specialised or experienced surgeons is required for definitive treatment.
Multiple Consultant Report (MCR)	An assessment by Clinical Supervisors that assesses trainees on the high-level outcomes of the curriculum. The MCR provides a supervision level for each of the five Capabilities in Practice (CiPs) as well as giving outcomes for the nine domains of the Generic Professional Capabilities. The assessment will be at the mid-point and end of a placement. The MCR is a formative assessment, providing trainees with formative feedback. However, the final MCR also contributes to the summative AES report.
Phase	An indicative period of training encompassing a number of indicative training levels. Phases are divided by critical progression points to ensure safe transitioning where patient or training risk may increase. Phases have replaced 'stages' of training in previous versions of the curriculum.
Placement	A surgical unit in which trainees work in order to gain experiential training and assessment under named supervisors.
Run-through training	The route which allows trainees, after a single competitive selection process at ST1 and satisfactory progress, to progress through to specialty training at ST3 onwards (unlike uncoupled training).
Specialty Advisory Committee (SAC)	The committee which oversees training in a particular specialty, reporting to the JCST. SAC responsibilities include trainee enrolment and support, certification, out of programme and LTFT training, curriculum development, logbook development, simulation training, quality assurance (including processes for externality via the provision of regional liaison members), national recruitment also credentialing (if appropriate).
Shared	Applicable to all specialties i.e. the five shared CiPs are identical to all ten surgical specialties. In some specialties some additional CiPs may be specialty-specific.
Special Interest	Advanced areas of training in the specialty.
Supervision level	The level of supervision required by a trainee to undertake an activity, task or group of tasks, ranging from the ability to observe only through direct and indirect supervision to the ability to perform unsupervised.

Trainees	Doctors in training programmes.
Training programme	A rotation of placements in which training is provided under a Training Programme Director and named supervisors.
Uncoupled programme	The route where core surgical training (CT1 and CT2) and specialty training (ST3 onwards) are separated by a national recruitment process (unlike run-through training).

Appendix 9: Assessment Blueprint

All aspects of the curriculum are assessed using one or more of the described components of the assessment system. Some curriculum content can be assessed in more than one component but the emphasis will differ between assessments so that testing is not excessive in any one area. The key assessment is the MCR through which trainees are assessed on the high-level outcomes of the curriculum; the CiPs and GPCs.

High-level outcomes	Assessment Framework										
		CiP/GPC self-assessment	MCR	MSF	CEX	CBD	PBA	DOPS	AoA	OoT	ISB Exam Section 1	ISB Exam Section 2
	Capabilities in Practice											
	1. Manages an out-patient clinic	*	*	*	*	*						*
	2. Manages the unselected emergency take	*	*	*	*	*	*	*				*
	3. Manages ward rounds and the on-going care of in-patients	*	*	*	*	*						*
	4. Managing an operating list	*	*	*			*	*				
	5. Managing multi-disciplinary working	*	*	*		*						

High-level outcomes	Generic Professional Capabilities											
		CiP/GPC self-assessment	MCR	MSF	CEX	CBD	PBA	DOPS	AoA	OoT	ISB Exam Section 1	ISB Exam Section 2
	Domain 1: Professional values and behaviours	*	*	*	*	*	*	*	*	*		*
	Domain 2: Professional skills	*	*	*	*	*	*	*		*		*
	Domain 3: Professional knowledge	*	*	*	*	*	*	*	*	*	*	*
	Domain 4: Capabilities in health promotion and illness prevention	*	*		*	*					*	
	Domain 5: Capabilities in leadership and team working	*	*	*		*	*	*	*	*	*	
	Domain 6: Capabilities in patient safety and quality improvement	*	*			*			*		*	
	Domain 7: Capabilities in safeguarding vulnerable groups	*	*		*	*	*	*			*	
	Domain 8: Capabilities in education and training	*	*							*		
	Domain 9: Capabilities in research and scholarship	*	*									

Syllabus			CiP/GPC self-assessment	MCR	MSF	CEX	CBD	PBA	DOPS	AoA	OoT	ISB Exam Section 1	ISB Exam Section 2
	Knowledge		*	*	*	*	*	*	*	*	*	*	*
	Clinical skills	Clinical skills (general)	*	*	*	*	*						*
		Critical conditions (mandated CEX/CBD)	*	*	*	*	*						*
	Technical skills	Technical skills (general)	*	*				*	*				
		Index procedures (mandated PBA/DOPS)	*	*				*	*				