ISCP INTERCOLLEGIATE SURGICAL CURRICULUM PROGRAMME

Trauma & Orthopaedic Surgery Curriculum

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THE INTERCOLLEGIATE
SURGICAL CURRICULUM PROGRAMME

Educating the surgeons of the future

Acknowledgements

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1 Introduction

The Trauma and Orthopaedic Surgery (T&O) curriculum provides the approved United Kingdom (UK) framework for the training of doctors to the level of independent consultant practice in T&O, addressing the requirements of patients, the population and the strategic health services. The curriculum will also be followed for training in T&O 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 T&O curriculum is to produce, at certification, competent doctors, able to deliver excellent outcomes for patients as consultant surgeons in the UK and Ireland. The curriculum will provide consultant T&O surgeons able to manage patients presenting with the full range of emergency T&O conditions and elective orthopaedic conditions in the generality of the specialty. Trainees will also be expected to develop a special interest within T&O in keeping with service requirements. They will be entrusted to undertake the role of the T&O Specialty Registrar (StR) during training and will be qualified to apply for consultant posts in T&O in the UK or Republic of Ireland after successful completion of training.

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, we expect trainees to be able to work safely and competently in the defined areas 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 pace.

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

In September 2006 the first T&O competence-based curriculum was approved by PMETB. In 2010 the early core surgical training years were included. The 2015 iteration refined the product of the vast amount of work undertaken to write the 2006, 2010, 2013 and 2014 iterations and reflected changes in T&O, as well as training in postgraduate medicine in general. The 2018 iteration added minor changes to reflect the development of major trauma centres.

Through all of these previous curricula, T&O has managed to resist a division of the specialty, so a fundamental principle of this curriculum is that all trainees will be trained in the generality of T&O, with an opportunity to develop special interests in the later years of training. Training in trauma is equally as important as training in elective orthopaedics, having the single aim of ensuring that all new certifying trainees are able to manage trauma from the day they are appointed as a consultant.

The key focus behind this new curriculum has been to maintain the above with an emphasis of the following:

- exposure to the full breadth of the specialty
- emergency safe for the acute unselected take
- focus on principles of orthopaedic surgery applicable in all areas.

The Shape of Training (SoT) review[1] and *Excellence by Design*: *standards for postgraduate curricula*[2] provided opportunities to reform postgraduate training. The T&O curriculum will produce a workforce fit for the needs of patients, producing doctors who are more patient-focused, more general in scope 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[3] (GPCs), interdependent essential capabilities that underpin professional medical practice and are common to all who practice medicine. GPCs are in keeping with *Good Medical Practice (*GMP)[4]. 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. In addition, core knowledge and skills gained in any surgical specialty training programme are transferable for entry into T&O. Trainees who choose to move from a different specialty training programme having previously gained skills transferable to T&O, therefore, 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 T&O, some limited areas of the syllabus may be transferable e.g. critical care skills. 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 The training pathway and duration of training

T&O training is divided into two phases and will take an indicative time of six years (four years in phase 2 and two years in phase 3).

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.

There will be options for those trainees who demonstrate exceptionally swift development and acquisition of capabilities to complete training more rapidly than the indicative time. There may also be a small number of trainees who develop more slowly and will require an extension of training, in line with *A Reference Guide for Postgraduate Foundation and Specialty Training in the UK (The Gold Guide)*[5]. Trainees who choose less than full time training (LTFT) will have the indicative training time

[1] Shape of training: Securing the future of excellent patient care
[2] Excellence by design: standards for postgraduate curricula
[3] Generic professional capabilities framework
[4] Good Medical Practice
[5] Gold Guide 10th edition

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.

Phase 2

Phase 2 will take an indicative time of four years to complete, during which trainees will acquire knowledge, skills and principles in the full breadth of the specialty, defined as the clinical exposure to the eight main general areas of the specialty. These comprise six anatomical areas; (Hand and Wrist, Shoulder and Elbow, Spine, Hip, Knee, Foot and Ankle) and two non-anatomical areas; (Paediatric Orthopaedics and Major Trauma). Whilst most clinical attachments will be six months, we have defined a minimum of three months allowing two areas to be combined in six months to allow for programme flexibility in delivery. These skills are central to the practice in the generality of the full breadth of the specialty, including being emergency-safe for unselected emergency on-call take, and as a foundation for any of the later chosen special interests. In addition, provided all eight areas have been covered, in consultation with the Training Programme Director (TPD), trainees may spend more than six months in one area, or special interest area, during phase 2 in preparation for phase 3. At the end of phase 2 there is a critical progression point, where trainees will demonstrate competencies in knowledge, clinical skills and professional behaviours, and become eligible to sit the Intercollegiate Specialty Board (ISB) examination in T&O.

Phase 3

Phase 3 will take an indicative time of two years to complete. Trainees will further develop their knowledge, clinical and technical skills in emergency general orthopaedic trauma surgery, but also develop more specific specialist area trauma assessment and technical skills. Current service demands require most consultants to be competent in general trauma and one, or two, special interest elective areas and the more specialist trauma related to these areas. For example, a consultant T&O surgeon with special interest in the upper limb (which may be defined as whole limb or part of the limb such as shoulder and elbow). So, to meet current service demands, and in order to maintain flexibility for employers, trainees will complete two special interest placements, usually for a minimum of six months, during phase 3. These may be any of the main eight areas described above or, in discussion with the TPD, a less common special interest area, such as tumour management or specialised peripheral nerve repair. Major trauma orthopaedics, such as that undertaken in major trauma centres, is considered a special interest area and may be chosen as a special interest in this phase.

This flexibility and the combination of modules allow development of a surgeon with the skills appropriate and relevant to the needs of patients and the modern service. Options allow for differences in scope of practice between nations and for special interests to be appropriate for smaller and larger hospitals. The knowledge, clinical and technical skills required for each module are defined in the syllabus.

At the end of Phase 3 trainees will be eligible for certification and for recommendation to enter the specialist register.

Selection of optional and special interest modules

The selection of optional and special interest modules will be determined in discussion between the trainee and TPD, and will be based on trainee needs, aptitude, service and workforce requirements. It is anticipated that this might be informed by an exploration of workforce requirements with statutory education authorities across the four nations via the Lead Dean for T&O.
By completion of training, all surgeons with certification in T&O will have:

- acquired the knowledge, clinical and technical skills in general emergency trauma and orthopaedic surgery as defined by the syllabus
- acquired the knowledge and clinical skills to independently manage an unselected emergency T&O on-call take
- completed two special interest modules in phase 3 and will have acquired the knowledge, clinical and technical skills as defined by the syllabus relevant to these special interests.

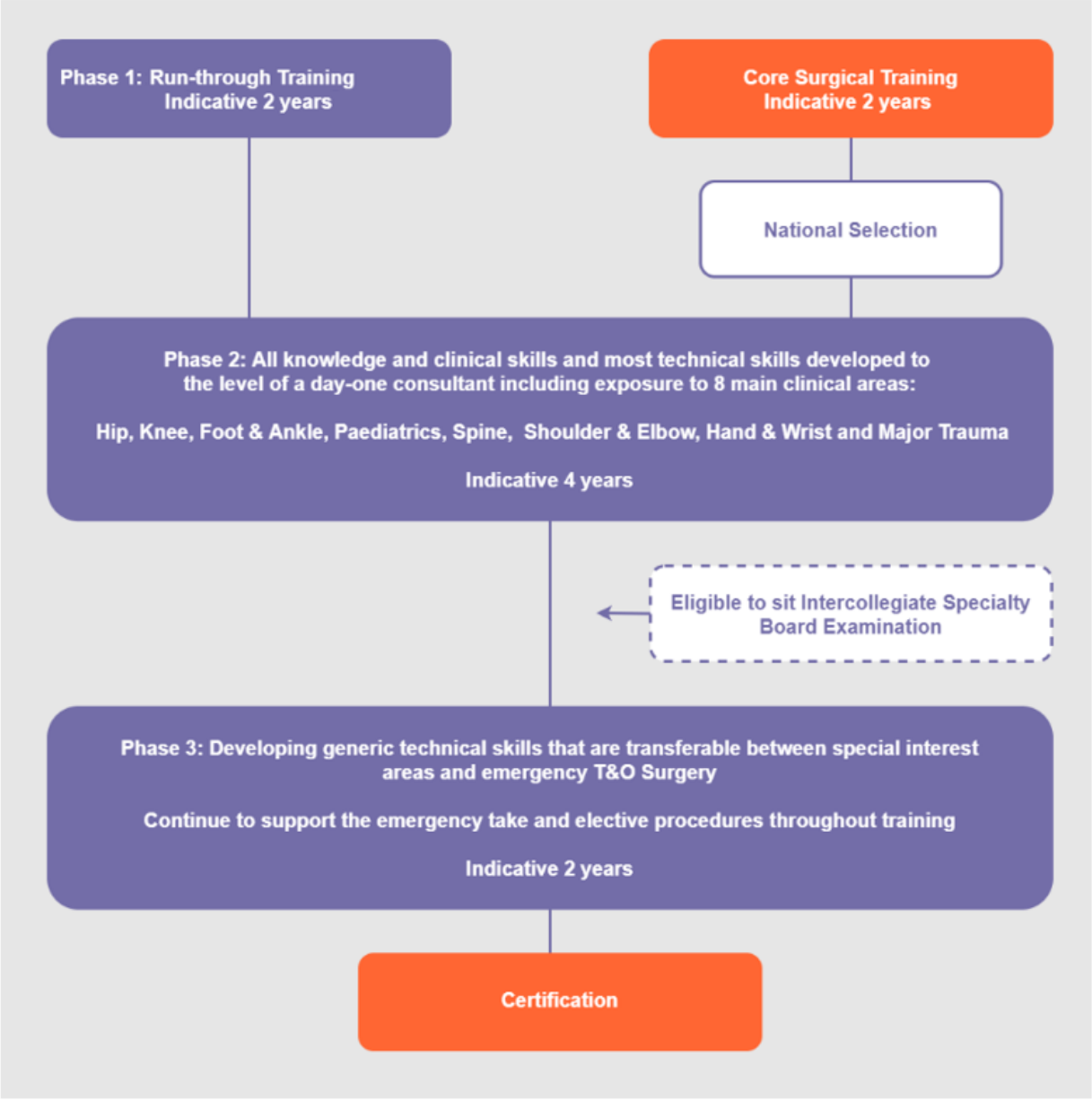

Figure 1: Overview of training pathway in Trauma and Orthopaedics

Output from the curriculum

The modular structure of the curriculum will permit flexibility to respond to changing service demands. Underpinning this is a commonality of training in phase 2 and emergency T&O surgery for all trainees in phase 3. On completion of training all trainees will have the surgical competencies in general trauma orthopaedic surgery and the principles of orthopaedics across the full breadth of the specialty and more specialist skills in two areas both elective and trauma.

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 T&O curriculum

The practice of T&O requires the generic and specialty knowledge, clinical and technical skills and behaviours to manage patients presenting with a wide range of emergency T&O conditions, and elective conditions in the generality of T&O. 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 and to the level described 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 T&O, 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 surgeon requires trainees to be able to integrate areas 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 T&O surgeon. 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 to be recommended to the GMC for certification and entry on 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 in the syllabus, 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.

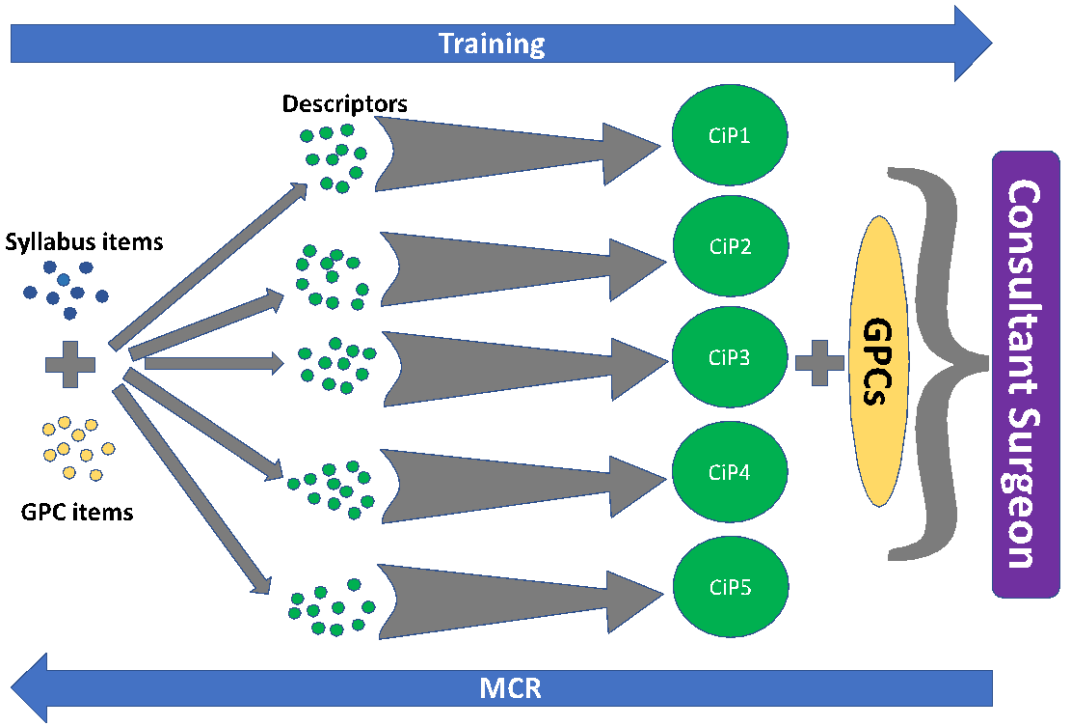

Figure 2 - The interrelationship of the GPCs, the syllabus, the CiPs and their descriptors to the role of a consultant surgeon. Items from the syllabus are combined with items taken from the GPC framework to form the small tasks which are the CiP descriptors. When the small tasks of the descriptors are 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 T&O surgeon, 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, 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

At the end of phase 2 there is a critical progression point for phase 3 entry, assessed at the ARCP, where trainees will demonstrate competencies in knowledge, clinical skills and professional behaviours commensurate with the CiPs and defined syllabus. 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 T&O. Table 1 shows indicative levels of supervision to be achieved to complete phase 2 and the supervision levels required by the end of phase 3. At the end of phase 3 trainees are required to reach level IV in all the shared CiPs as well as acquiring all the skills described in the GPC framework (in addition to the other certification requirements shown in section 5.4) as confirmed by and ARCP panel.

Excellence will be recognised by:

a. Achievement of level 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.

Capability in practice (shared)	Indicative Supervision Level (end of phase 2)	Supervision Level (end of phase 3 and certification)
Manages an out-patient clinic	Level III	Level IV
Manages the unselected emergency take	Level III	Level IV
Manages ward rounds and the on-going care of in-patients	Level III	Level IV
Manages an operating list	Level IIb	Level IV
Manages multi-disciplinary working	Level III	Level 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 T&O

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 T&O is described in the syllabus. In addition, there are certain skills and conditions within the syllabus that are of such fundamental importance to the safe practice of a T&O surgeon that they are highlighted as critical conditions and index procedures.

3.5.1 The syllabus

The syllabus, shown in appendix 2, provides a description of the high-level specialty-specific topics for which knowledge and clinical skills are required and details of the technical skills required for each phase of training and for certification in T&O. The syllabus is organised into modules with topics covering the presenting conditions of patients in relation to the specialty. All trainees will be expected to complete modules in elective and emergency T&O. These provide the bedrock for managing T&O patients both before and after surgery. In addition, trainees will complete modules in special interest areas to meet service demand in all parts of the UK.

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. [6] [7] [8]

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. [9] [10] [11]

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. 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. [12]

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

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

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

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

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

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

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

3.5.2 Critical conditions

From the syllabus, a list of critical conditions has been identified which 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 assessments of the Assigned Educational Supervisor (AES) and ARCP. A list of critical conditions for T&O is given in appendix 3. These critical conditions were decided following wide consultation with clinicians and trainers in the specialty.

3.5.3 Index procedures (See appendix 4 for list)

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 vital 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. A list of index procedures is given in appendix 4 and includes 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 and from logbook analysis.

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

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4 Teaching and Learning

4.1 How the 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 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*[13] (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.

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

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), Health Education and Improvement Wales (HEIW), the Northern Ireland Medical and Dental Training Agency (NIMDTA) and the Health Service Executive (HSE) in the Republic of Ireland to ensure compliance with these standards. 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 will be used by education providers 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 members 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[14]. 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.

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

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 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.

Trainees in the workplace are supervised in their clinical practice. This primarily takes place in a hospital environment in wards, clinics or theatre. There are strong links to practitioners working in primary 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. The 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, GPCs and the T&O 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. Some knowledge and capabilities are best gained in the formal setting of a taught course. A list of mandated courses for trainees and their learning outcomes is given in 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 multidisciplinary team (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[15] 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 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[7] 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 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

[15] GMC recognition and approval of trainers

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. 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 programme of assessment 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.

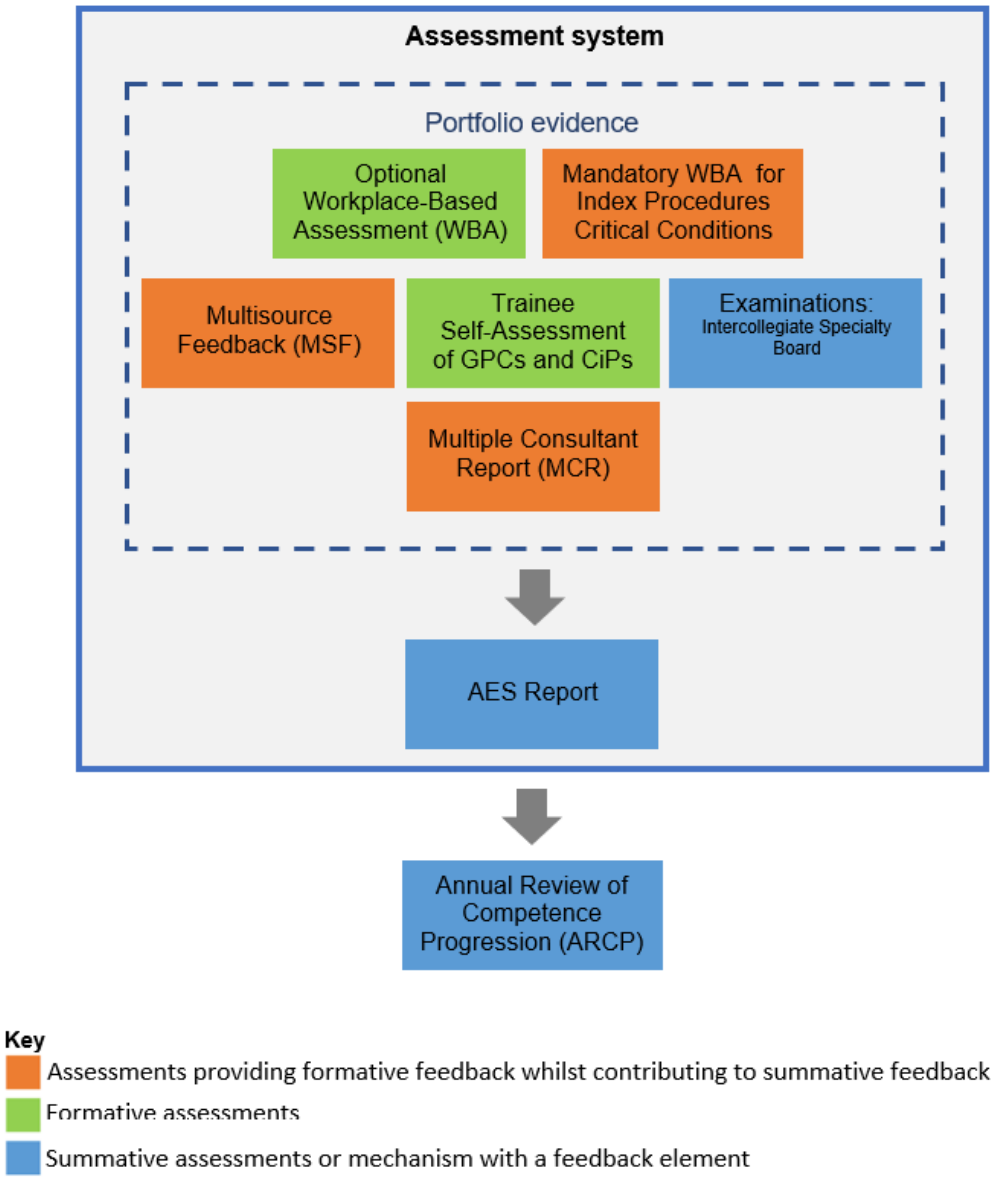


Figure 3: Assessment framework

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 an 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[16]. 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 is described below.

5.3.1 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.

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

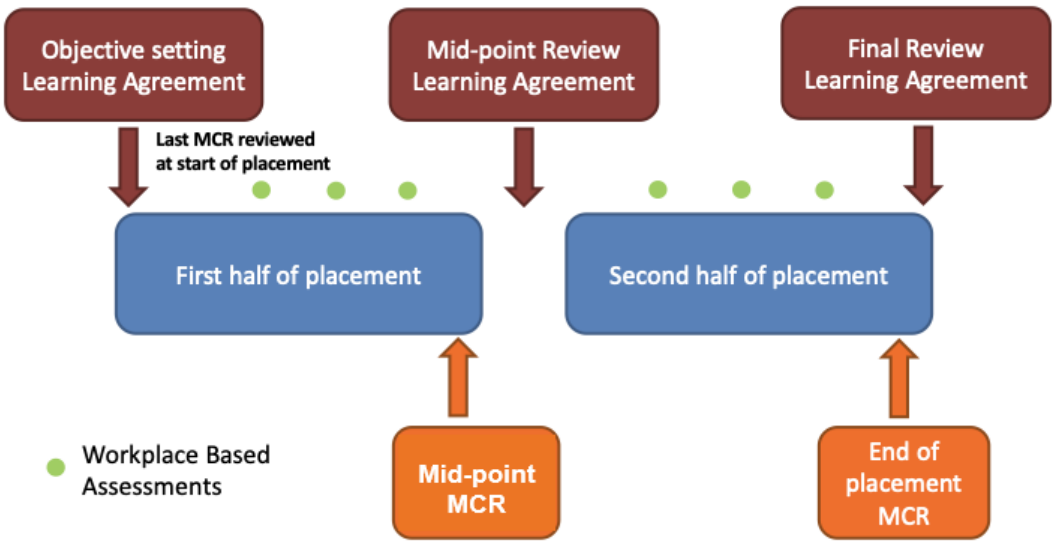


Figure 4: The sequence of assessment through a placement.

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 final 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 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 best 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 areas 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 can trigger any appropriate modifications for the focus of training as required. The MCR with indicative supervision level decisions 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	throughout	n/a

Supervision Level IIb:	Able and trusted to act with direct supervision: The supervisor will need to be physically present for part of the activity The supervisor needs to guide all aspects of the activity. This guidance may partly be given from another setting.	yes	all aspects	will be necessary for part	n/a
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

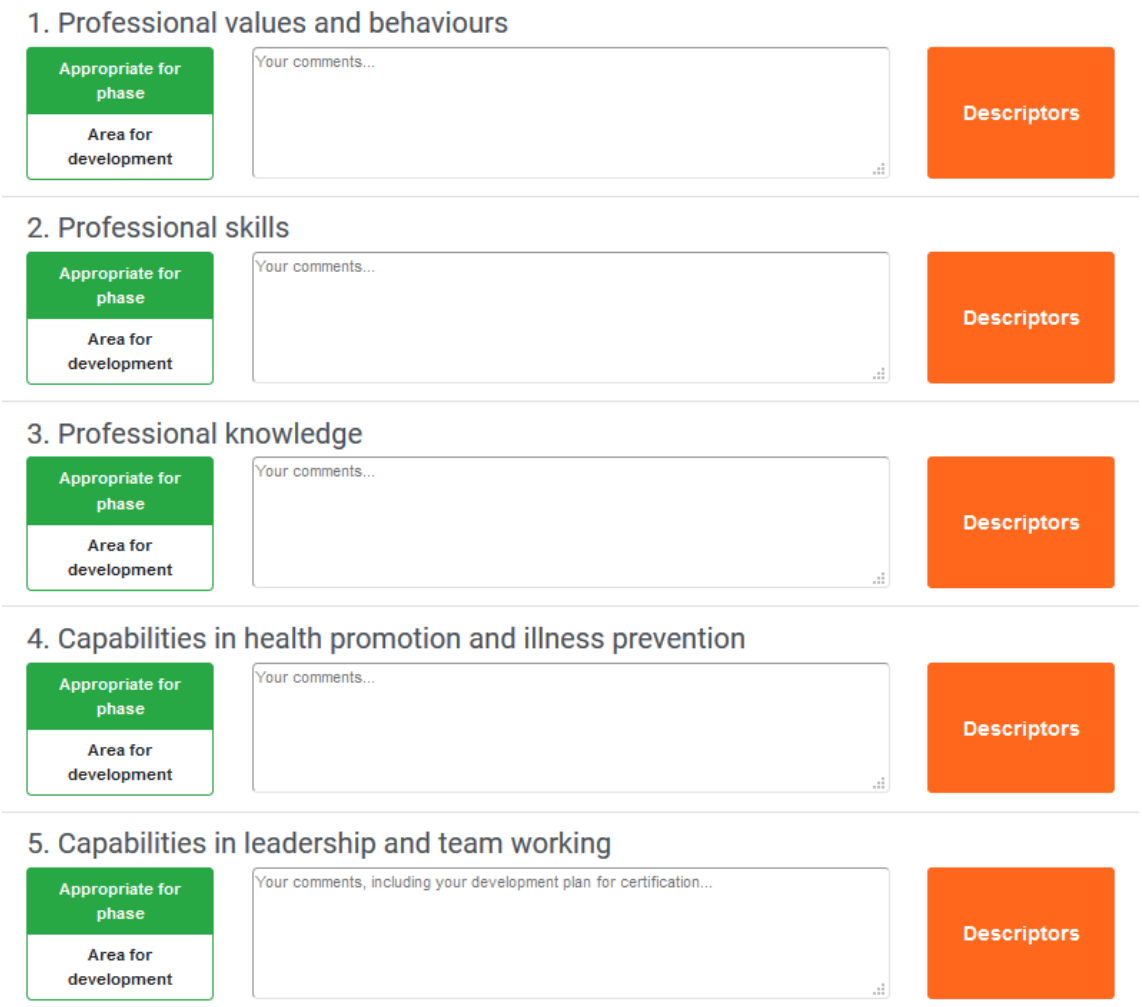
Table 2: MCR anchor statements and guide to recommendation of appropriate supervision level in each CiP.

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



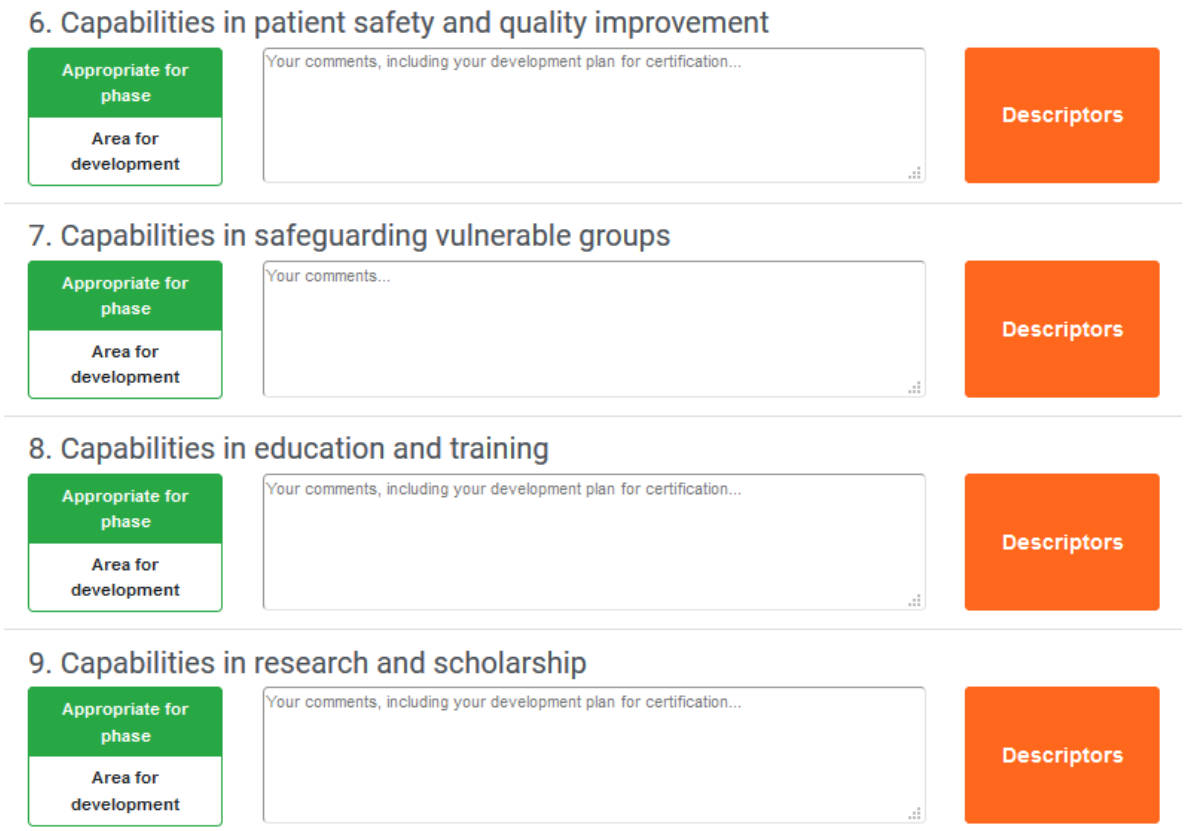


Figure 5: An example of how the GPCs are assessed through the MCR. CSs would consider whether there are areas for development in any of the nine GPC domains. If not, then nothing further need be recorded. If there are areas for development identified, then CSs are obliged to provide feedback through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

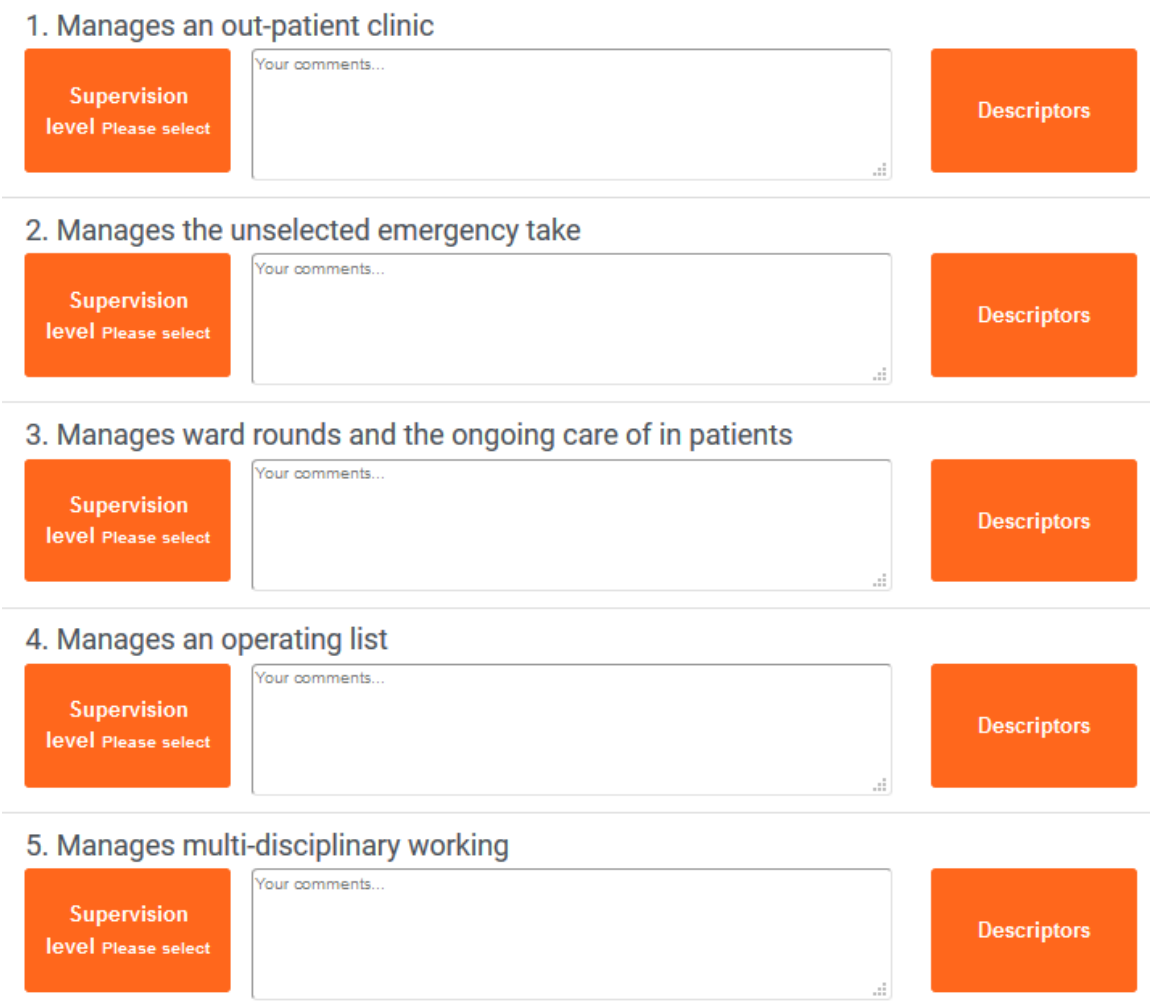


Figure 6: An example of how the CiPs are assessed through the MCR. The CSs would decide what supervision level to recommend for each of the CiPs and record this for each through the Supervison Level box. If the level recommended is IV or V then no further comment need be recorded, unless the CSs wished to capture areas of particular excellence for feedback. If levels I to III are recommended, then trainers 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 and the recommendation by CSs in the MCR allows identification of over or under confidence and for support to given accordingly.

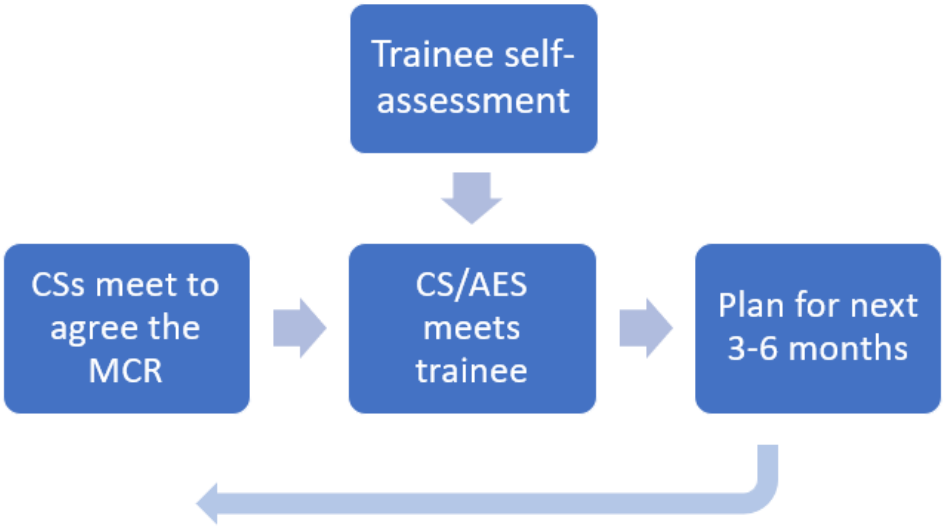


Figure 7: The iterative process of the MCR, showing the involvement of CSs, self-assessment by trainees, face to face meetings between trainees and supervisors and the development of an action plan focused on identified learning needs over the next three to six months of training. Progress against these 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 (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 underperformance. 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 to evidence 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 for feedback to and assess of 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, out-patient 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 (appendix 4). 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 in the WBA handbook.

5.3.6 Intercollegiate Specialty Board Examination

The ISB examination In T&O 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 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 T&O 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 T&O

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 T&O 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:

Certification Requirements for T&O Surgery

a) Generic requirements shared between surgical specialties

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 Specialty

Additional courses / qualifications – evidence of an understanding of, and participation in, medical education and training 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.
Educational conferences - evidence of having attended appropriate educational conferences and meetings as defined in the curriculum	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. Completion of clinical placement (minimum three months) in the eight main clinical areas as defined by the curriculum in phase 2. Completion of two special interest modules at phase 3 as defined by the curriculum.
Critical Conditions - To ensure that trainees have the necessary skills to manage the defined critical conditions.	By certification there should be documented evidence of performance at the level of a day-one consultant via completion of CBDs/CEXs in all the critical conditions to level 4 (appendix 3).
Operative experience - consolidated logbook evidence of the breadth of operative experience as defined in the curriculum	See appendix 4.

Index Procedures Index procedures are of significant importance for patient safety and to demonstrate a safe breadth of practice.	Indicative numbers of index procedures are listed in appendix 4. 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 as shown in appendix 4).

Table 3: Requirements for completion of training in T&O: a) generic requirements shared between all surgical specialties and b) requirements specific to T&O. 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.
- AESs can complete trainee appraisal through the learning agreement, monitor trainee portfolios and provide end of placement AES reports.
- CSs can 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 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 should have at least the breadth of operative experience described under Index Procedures (appendix 4 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 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: None

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 Trauma and Orthopaedic Surgery Syllabus

The syllabus provides a description of the knowledge and clinical skills required for the specialty-specific topics in each module and details of the technical skills required for each phase of training.

Formative WBAs may be used to assess and provide feedback on any areas of clinical activity. However, other than for the critical conditions, index procedures or where they have been identified to address a concern, WBAs are optional and trainees, therefore, do not need to use WBAs to evidence their learning against each syllabus topic.

APPLIED CLINICAL KNOWLEDGE

Standards for knowledge

Each topic for a level or phase of training has a competence level ascribed to it for knowledge ranging from 1 to 4 which indicates the depth of knowledge required:

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

Applied Clinical Knowledge

All T&O surgeons need to understand the scope of their discipline and, ultimately, to varying degrees of depth depending on their specialty interest in future practice. The emphasis here is on knowledge pertaining to acute work whilst acknowledging that most surgeons will also undertake elective work with or without a special interest. Training programmes should aim to deliver education in the generality of T&O.

It is crucial to realise that knowledge changes. This syllabus acknowledges that all T&O surgeons cannot know everything about all aspects of their chosen discipline. With this in mind, trainees (like consultants) must reflect on the need to update and change their knowledge base throughout their career. Trainees must not only acknowledge gaps in their knowledge but must fill them using appropriate means alongside self-awareness, humility and commitment.

This component contains that which underpins training in T&O and is essential both to contextualize skills and attitudes acquired in training and in order to practice as a T&O surgeon.

These are difficult terms to define precisely but it will be expected that a practicing surgeon (level 4) will not only be able to apply specific, detailed knowledge of a given condition or technique but also utilise a broad knowledge of orthopaedics and medicine to view any patient's situation holistically. Most crucially, trainees must demonstrate an appreciation that knowledge changes as research progresses, and so they must also possess and apply the relevant skills to keep themselves up to date.

A trainee must be able to apply the knowledge defined below in the relevant clinical situations. They should demonstrate their competency through the ability to verbalise the knowledge and justify any action or decision.

We have defined the levels for core surgical training /ST1-2 (phase 1), ST3-8 (phases 2 and 3) for all and special interest ST7-8 (phase 3) chosen module.

Competence Levels				
1 = Knows of	**3 = Knows generally**			
2 = Knows basic concepts	**4 = Knows specifically and broadly**			
Topic		**CORE**	**ST3-ST8**	**SPECIALTY INTEREST**
APPLIED CLINICAL (BASIC) SCIENCE				
Anatomy				
Clinical and functional anatomy with pathological and operative relevance		3	4	4
Surgical approaches to the limbs and axial skeleton		2	4	4
Embryology of musculoskeletal system		1	3	4
Structure and function of connective tissue				
Bone		3	4	4
Cartilage - articular, meniscal		3	4	4
Muscle and tendon		3	4	4
Synovium		3	4	4
Ligament		3	4	4
Nerve		3	4	4
Intervertebral disc		3	4	4
Pathology				
Thromboembolism and prophylaxis		3	4	4
Principles of fracture healing		3	4	4
Biology of wound healing		3	4	4
Tendon and ligament injury and healing		2	4	4
Nerve injury and regeneration		2	4	4
Shock - types, physiology, recognition and treatment		4	4	4
Physiological response to trauma		3	4	4
Blood loss in trauma/surgery, fluid balance and blood transfusion		3	4	4
Osteoarthritis		2	4	4
Osteoporosis		2	4	4
Metabolic bone disease		2	4	4
Rheumatoid arthritis and other arthropathies (inflammatory, crystal, etc.)		2	4	4
Haemophilia		2	4	4
Inherited musculoskeletal disorders		1	3	4
Neuromuscular disorders - inherited and acquired		1	3	4
Mechanisms and classification of failure of joint replacement and of periprosthetic fractures:		1	4	4
Osteonecrosis		2	4	4

Osteochondritis	1	4	4
Heterotopic ossification	1	4	4
Bone, joint and soft tissue infections, including prosthetic joint infection and fracture-related infection	2	4	4
Risk management for surgery in patients with significant co-morbidities	3	4	4
Prostheses and Orthoses			
Principles of design	1	4	4
Prescription and fitting of standard orthoses	1	4	4
Principles of orthotic bracing for control of disease, deformity and instability	1	4	4
Pain			
Anaesthesia - principles and practice of local and regional anaesthesia and principles of general anaesthesia	2	3	3
Pain management programmes and management of complex regional pain syndrome:	2	3	3
Management of pain and pain-related behaviour	2	4	4
Musculoskeletal oncology			
Presentation, radiological features, pathological features, treatment and outcome for common benign and malignant tumours	1	3	4
Principles of management of patients with metastatic bone disease in terms of investigation, prophylactic and definitive fixation of pathological fractures and oncological management	1	4	4
Presenting features, management and outcome of soft tissue swellings, including primary músculo-skeletal malignancy	2	4	4
Biomechanics & Biomaterials			
Bone grafts, bone banking and tissue transplantation	1	4	4
Biomechanics of musculoskeletal tissues	1	4	4
Biomechanics of fracture fixation	2	4	4
Tribology of natural and artificial joints	1	4	4
Design of implants and factors associated with implant failure (wear, loosening)	1	4	4
Biomaterials	1	4	4
Genetics and cell biology			
Application/relevance of modern genomics to orthopaedic disease and treatment	1	4	4
Molecular genomics and molecular biology in T&O	2	3	4
Cell biology in T&O	2	3	4
Cellular and molecular basis of wound healing	2	4	4

Diagnostics			
Musculoskeletal imaging: x-ray, contrast studies, CT, MR, ultrasound, radioisotope studies	2	4	4
Assessment of bone mass and fracture risk	3	4	4
Effects of radiation	3	4	4
Blood tests	4	4	4
Kinematics and gait analysis	1	3	4
Electrophysiological investigations	2	4	4

Clinical Environment			
Theatre Design			
Design of theatres	2	4	4
Equipment Design and Use			
Tourniquets	3	4	4
Sterilisation	3	4	4
Infection prevention and control	4	4	4
Patient warming methods and rationale	3	3	3
Skin preparation	4	4	4
Safe use of radiation in theatre	4	4	4
Medical Ethics			
Duty of care	4	4	4
Safeguarding	4	4	4
Informed consent	4	4	4
Non-technical skills			
Situational awareness	2	4	4
Decision-making	2	4	4
Teamwork & communication	2	4	4
Leadership	2	4	4
Evidence Management			
Data Analysis			
Data analysis and statistics - principles and applications	2	4	4
Principles of epidemiology	2	4	4
Clinical Trials			
Design and conduct of clinical trials	2	4	4
Quality improvement			
Quality improvement projects including principles, methods and reporting	3	4	4
Audit and quality improvement	3	4	4
Clinical governance	2	4	4

FOOT AND ANKLE			
Basic Science (Regional)			
Anatomy			
Anatomy of the foot and ankle and related structures	3	4	4
Surgical approaches: ankle, subtalar joint, mid-tarsal joint and forefoot and arthroscopic access	2	4	4
Surgical approach to ankle fractures	3	4	4
Physiology			
Physiology of nerve function around the foot and ankle	2	4	4
Pathology			
Inflammatory, degenerative and infective conditions of the foot and ankle	2	4	4
Instability of the foot and ankle	1	4	4
The neuropathic foot	2	4	4
Deformity			
Acquired and developmental deformities of the foot and ankle	2	4	4
Pain			
Causes of foot pain	2	4	4
Biomechanics & Biomaterials			
Biomechanics of the foot and ankle	2	4	4
Biomechanics of tendon transfer techniques	2	4	4
Biomechanics of the various types of ankle and first ray prostheses including the factors influencing design, wear and loosening	1	3	4
The functional role of orthotic devices	2	4	4
Investigations			
Radiological investigations to assess foot and ankle conditions	2	4	4
Role of diagnostic and guided injections of the foot and ankle	2	4	4
Role of examination under anaesthetic and diagnostic arthroscopy	1	4	4
Neurophysiology in foot and ankle disorders	1	4	4
Critical Conditions			
Compartment syndrome	3	4	4
Diabetic Foot	3	4	4
Necrotising fasciitis	2	4	4
Assessments			
History and examination of the foot and ankle including special clinical tests	3	4	4

Treatments			
Operative			
Prosthetic replacement in the foot and ankle	1	3	4
Arthroscopy of the foot and ankle	1	4	4
Amputations in the foot and ankle	2	4	4
Arthrodesis in the foot and ankle	1	4	4
Excision arthroplasty	1	4	4
First ray surgery	1	4	4
Lesser toe surgery	1	4	4
Ligament reconstruction in the foot and ankle	1	4	4
The rheumatoid foot and ankle	1	4	4
The neuropathic foot	1	4	4
Management of tendon, ligament and nerve injuries	1	4	4
Non operative			
Footwear modifications, orthoses and total contact casting	1	4	4
Rehabilitation of the foot and ankle	2	3	4
Complications			
Management of failed arthroplasty and management of failed soft tissue surgery	1	3	4

KNEE			
Basic Science (Regional)			
Anatomy			
Anatomy of the knee joint and related structures	3	4	4
Surgical approaches to the knee and arthroscopic access	2	4	4
Physiology			
Physiology of nerve function around the knee.	2	4	4
Pathology			
Inflammatory, degenerative and infective conditions of the knee	3	4	4
Instability of the knee, including the patellofemoral joint	2	4	4
Deformity			
Acquired and developmental deformities of the knee	2	4	4
Pain			
Causes of the painful knee	3	4	4
Neoplasia			
Benign and malignant conditions in the knee and surrounding structures	2	4	4
Biomechanics & Biomaterials			
Biomechanics of the knee	1	4	4

Biomechanics of knee arthroplasty	1	4	4
Investigations			
Radiological investigation to assess the knee	3	4	4
Diagnostic aspiration	3	4	4
Therapeutic injection	3	4	4
Examination under anaesthetic and arthroscopy	2	4	4
Neurophysiology in knee disorders	1	4	4
Critical Conditions			
Neurovascular injuries	3	4	4
Primary and secondary musculo-skeletal malignancy around the knee	2	4	4
Assessments			
History and examination of the knee joint including special clinical tests	3	4	4
Treatments			
Operative			
Arthroplasty of the knee	2	4	4
Arthroscopy of the knee	2	4	4
Ligamentous instability of the knee	2	4	4
Patello-femoral disorders	1	4	4
Meniscal pathology	2	4	4
Degenerative and inflammatory arthritis	2	4	4
Principles of revision surgery for failed arthroplasty	1	4	4
Therapeutic injection of the knee	3	4	4
Techniques available to repair and replace articular cartilage	1	4	4
Management of tendon, ligament and nerve injuries	1	4	4
Non operative			
Orthoses	1	4	4
Rehabilitation of the knee	1	3	4
Complications			
Failed arthroplasty and soft tissue surgery	1	3	4

HIP			
Basic Science (Regional)			
Anatomy			
Anatomy of the hip and pelvic region and related structures	3	4	4
Surgical approaches to the hip including arthroscopic access	2	4	4

HIP			
Physiology			
Physiology of nerve function affecting the hip	2	4	4
Pathology			
Inflammatory, degenerative and infective conditions of the hip	3	4	4
Impingement disorders	1	4	4
Primary and Secondary Tumours around the Hip			
Deformity			
Acquired and developmental deformity around the hip	1	4	4
Pain			
The painful hip	3	4	4
Biomechanics & Biomaterials			
Biomechanics of the hip	1	4	4
Biomechanics of hip arthroplasty	1	4	4
Investigations			
Radiological investigations to assess the hip	3	4	4
Diagnostic and guided injections	2	4	4
Hip arthroscopy	1	4	4
Neurophysiology in hip disorders	2	4	4
Assessments			
History and examination of hip including special clinical tests	3	4	4
Treatments			
Operative			
Arthroplasty of the hip	2	4	4
Arthroscopy of the hip	1	4	4
Soft tissue surgery, osteotomy and arthrodesis of the hip	1	3	4
Management of tendon, ligament and nerve injuries	1	4	4
Non-operative			
Orthoses	1	4	4
Complications			
Failed arthroplasty and soft tissue surgery	1	3	4

SPINE			
Basic Science (Regional)			
Anatomy			
Development of the spine, spinal cord and nerve roots	2	3	4
Anatomy and principles of surgical approaches: anterior and posterior at each level and endoscopic access	2	3	4
Physiology			
Physiology of nerve function affecting the spinal cord and emerging nerves	2	4	4
Spinal shock and it's physiological consequences	2	4	4
Pathology			
The aging spine and degenerative disease	2	4	4
Acute and chronic infections of the spine	2	4	4
Metabolic conditions affecting the spine	2	4	4
Neuromuscular conditions affecting the spine	1	4	4
Deformity			
Deformities of the spine, paediatric and adult, including coronal and sagittal plane deformities	1	3	4
Pain			
Causes of the acutely painful back, including referred pain e.g. acute prolapsed disc	1	4	4
Neoplasia			
Primary and secondary tumours of the spine	1	4	4
Biomechanics & Biomaterials			
Biomechanics of the spine	1	3	4
Spinal instability as applied to trauma, tumour, infection and spondylolysis/listhesis	1	4	4
Sagittal balance and the aging spine	1	3	4
Spinal instrumentation and internal fixation devices	1	3	4
Investigations			
Radiological investigations (and their interpretation) used to assess common spine conditions	2	4	4
Role of diagnostic and therapeutic injections	1	4	4
Role of biopsy including routes and complications	1	4	4
Blood tests	2	4	4
Electrophysiological studies (including cord monitoring)	1	3	4

SPINE			
Critical Conditions			
Cauda equina syndrome	3	4	4
Spinal trauma - assessment, immediate care and appropriate referral	2	4	4
Infections e.g. tuberculosis	1	4	4
Important complications of inflammatory spinal conditions - rheumatoid instability and ankylosing spondylitis	1	4	4
Metastatic spinal cord compression	2	4	4
The painful spine in the child	1	4	4
Assessments			
History and examination of the painful and injured spine including special clinical tests	3	4	4
Assessment for non-spinal conditions presenting as back pain (e.g. renal colic or vascular)	3	4	4
Recognition of somatisation, non-organic drivers of back pain and barriers to recovery (including yellow flags)	2	4	4
Treatments			
Operative			
Indications, options and complications for compressive conditions including radicular, stenotic and myelopathic	1	4	4
Indications, options and complications of instability of the spine	1	4	4
Principles of management of tumours around the spine	1	4	4
Principles of management of deformity of the spine	1	4	4
Principles of the application of spinal bracing	1	4	4
Scoliosis and Kyphosis deformity, Idiopathic & congenital	1	4	4
Painful spine conditions, including kyphosis**,** spondylolysis and spondylolisthesis	1	4	4
Non operative			
Non-operative treatment of disorders, such as low back pain, sciatica	1	4	4
Management of spinal fractures including osteoporotic fractures	1	4	4
Principles of interventional radiology in the management of spinal problems e.g. vertebroplasty	1	4	4
Care of the spinal cord injury patient from initial assessment to principles of rehabilitation	2	4	4
Complications			
Assessment and management of complications of spinal surgery (e.g. haematoma, neurological deterioration, failed biomechanics)	2	4	4

HAND			
Basic Science (Regional)			
Anatomy			
Anatomy of the wrist and hand and related structures including forearm rotation	3	4	4
Surgical approaches in the hand and wrist and arthroscopic access	2	4	4
Physiology			
Physiology of nerve function around the hand	2	4	4
Pathology			
Inflammatory, degenerative and infective conditions of the hand and wrist	2	4	4
Dupuytren's disease	2	4	4
High pressure injection injury	2	4	4
Infection	2	4	4
Deformity			
Acquired and developmental deformity around the hand and wrist	1	3	4
Pain			
Complex Regional Pain Syndrome	2	4	4
Neurectomy	2	4	4
Biomechanics & Biomaterials			
Biomechanics of the hand and wrist	1	3	4
Biomechanics of hand and wrist arthroplasty	1	3	4
Investigations			
Radiological investigations to assess the hand and wrist	3	4	4
Neurophysiology of the hand and wrist	2	4	4
Diagnostic and guided injections	2	4	4
Examination under anaesthetic and arthroscopy	2	4	4
Critical Conditions			
Compartment syndrome	3	4	4
Assessments			
History and examination of the hand and wrist including special clinical tests	3	4	4
Common clinical hand function tests	2	4	4
Treatments			
Operative			
Prosthetic replacement in the hand and wrist	1	3	4

Excision arthroplasty in the hand and wrist	1	4	4
Arthroscopy of the hand and wrist	1	3	4
Arthrodesis in hand and wrist	1	4	4
Biomechanics of tendon transfer techniques	2	4	4
Entrapment neuropathies	3	4	4
The rheumatoid hand and wrist	2	3	4
The congenital hand	1	3	4
Dupuytren's disease	1	4	4
Non-operative			
Rehabilitation of the hand and wrist	2	3	4
Orthoses	1	4	4
Use of splints	2	4	4
Complications			
Failed arthroplasty and soft tissue surgery	1	3	4
Infection	2	4	4

ELBOW			
Basic Science (Regional)			
Anatomy			
Anatomy of the elbow region and related structures	3	4	4
Surgical approaches to the elbow and arthroscopic access	2	4	4
Physiology			
Physiology of nerve function around the elbow	2	4	4
Pathology			
Compressive neurological problems around the elbow	2	4	4
Instability around the elbow	1	3	4
Inflammatory, degenerative and infective conditions of the elbow	2	4	4
Causes of elbow stiffness	1	3	4
Deformity			
Acquired and developmental deformity around the elbow	1	3	4
Pain			
The painful elbow	2	4	4
Biomechanics & Biomaterials			
Biomechanics of the elbow	1	3	4
Biomechanics of elbow arthroplasty	1	3	4

Investigations			
Radiological investigations to assess the elbow	3	4	4
Diagnostic and guided injections	2	4	4
Examination under anaesthetic and arthroscopy	2	4	4
Neurophysiology in elbow disorders	1	4	4
Assessments			
History and examination of the elbow including special clinical tests	2	4	4
Treatments			
Operative			
Arthroplasty of the elbow	1	3	4
Arthroscopy of the elbow	1	3	4
Ligamentous instability	1	3	4
Entrapment neuropathy	2	4	4
Degenerative and inflammatory arthritis	1	3	4
Soft tissue conditions	2	4	4
The rheumatoid elbow	1	3	4
Amputation	1	2	4
Non-operative			
Rehabilitation of the elbow	1	3	4
Orthoses	1	4	4
Complications			
Management of the failed arthroplasty and soft tissue surgery	1	3	4

SHOULDER			
Basic Science (Regional)			
Anatomy			
Anatomy of the shoulder girdle and related structures	3	4	4
Surgical approaches to the shoulder girdle including arthroscopic access	2	4	4
Physiology			
Physiology of nerve function around the shoulder	2	4	4
Pathology			
Impingement and rotator cuff disorders	1	4	4
Instability and labral pathology of the shoulder	2	4	4
Inflammatory, degenerative and infective conditions of the shoulder girdle	3	4	4
Shoulder stiffness	1	4	4
Deformity			
Acquired and developmental deformity around the shoulder	1	3	4
Pain			
The painful shoulder	3	4	4
Biomechanics & Biomaterials			
Biomechanics of the shoulder girdle	1	4	4
Biomechanics of shoulder arthroplasty	1	3	4
Investigations			
Radiological investigations to assess the shoulder	3	4	4
Diagnostic and guided injections	2	4	4
Examination under anaesthetic and arthroscopy	1	4	4
Neurophysiology in shoulder and brachial plexus disorders	1	3	4
Assessments			
History and examination of the shoulder girdle, including special clinical tests	3	4	4
Examination of the brachial plexus	2	4	4
Treatments			
Operative			
Arthroplasty of the shoulder	1	3	4
Arthroscopy of the shoulder	1	4	4
Soft tissue disorders of the shoulder girdle	2	4	4
Arthrodesis, osteotomy and excision arthroplasty	1	3	4
Reconstructive surgery for brachial plexus and other neurological disorders	1	3	4
Amputation	1	2	4

Non-operative			
Rehabilitation of the shoulder	1	3	4
Orthoses	1	3	4
Complications			
Management of failed arthroplasty and soft tissue surgery	1	3	4

TRAUMA			
Basic Science (Regional)			
Anatomy			
Regional anatomy for trauma	3	4	4
Surgical approaches for bone and soft tissue injuries	2	4	4
Physiology			
Physiological response to trauma	3	4	4
Pathology			
Delayed and non-union	2	4	4
Fractures in abnormal bone	3	4	4
Deformity			
Mal-union of fractures	2	4	4
Pain			
Pain relief in trauma patients	3	4	4
Biomechanics & Biomaterials			
Principles of open reduction and internal fixation/external fixation of fractures	2	4	4
Splintage and traction	2	4	4
Principles of casting	3	4	4
Investigations			
Radiological investigations to assess the injured patient	3	4	4
Critical Conditions			
Compartment syndrome	3	4	4
Neurovascular injuries	3	4	4
Physiological response to trauma	2	4	4
Necrotising fasciitis	3	4	4
Assessments			

TRAUMA			
Initial clinical assessment of the polytrauma patient	4	4	4
Priorities of treatment and identification of life/limb-threatening injuries	2	4	4
Ongoing management of polytrauma patient in first week, including prioritisation of treatment and multi-disciplinary care	2	4	4
Assessment of the limb at risk, including decision re limb salvage vs. amputation	2	3	3
Treatments			
The trauma team & multidisciplinary collaboration	3	4	4
Operative			
Management of closed/open diaphyseal fractures	3	4	4
Management of closed/open peri-articular fractures	2	4	4
Management of complex open fractures requiring bone/soft tissue reconstruction	2	4	4
Management of multiple injuries in a polytrauma patient	2	4	4
Management of peri-prosthetic fractures	2	4	4
Amputation	2	4	4
Management of isolated soft tissue injuries	3	4	4
Non-operative			
Non-operative management of fractures	3	4	4
Rehabilitation of the injured patient	3	4	4
Management of psychosocial aspects of are	3	4	4
Complications			
Principles of limb reconstruction in non-unions/mal-unions/bone infection	2	3	4
Specific fracture areas			
Spine			
The acute fracture and dislocation	2	4	4
Spinal shock and cord syndromes	3	4	4
Pelvis			
Pelvic/acetabular fracture stabilisation	2	3	3
Recognition of visceral/neurovascular damage	3	4	4
Shoulder			
Clavicle fractures	2	4	4
Proximal humeral fractures	2	4	4
The dislocated shoulder	3	4	4
Brachial plexus and other nerve injuries	1	3	3

TRAUMA			
Humeral shaft fractures	2	4	4
Elbow			
Proximal ulnar fractures	2	4	4
Distal humeral fractures	2	4	4
Proximal radial injuries	2	4	4
Radius and ulnar shaft fractures	2	4	4
Wrist			
Distal radius fractures	3	4	4
Scaphoid fractures	2	4	4
Carpal injuries	2	4	4
Hand			
Metacarpal & phalangeal fractures	2	4	4
The mangled hand	2	3	4
Fingertip injuries	2	4	4
Nerve injuries	2	4	4
Flexor tendon injuries	2	4	4
Extensor tendon injuries	2	4	4
Proximal femur			
Proximal femoral fractures	3	4	4
Femoral shaft fractures	2	4	4
Knee and lower leg			
Periarticular fractures around the knee	2	4	4
Tibial shaft fractures	2	4	4
Ankle			
Periarticular fractures around the ankle	2	4	4
All ankle fractures	3	4	4
Foot			
Hindfoot injuries	2	4	4
Midfoot injuries	2	4	4
Forefoot injuries	2	4	4
The crushed foot	2	3	4
Peri-prosthetic fractures			
Management of fractures around prostheses and implants	2	3	4

PAEDIATRIC ORTHOPAEDIC SURGERY			
Basic Science			
Anatomy			
Embroyology growth of bones, physeal anatomy and its application to fracture types/pathological processes and infection in particular	2	4	4
Anatomy of bones and joints in the growing child and its application to growth and deformity	2	4	4
Cerebral palsy	1	4	4
Other childhood conditions resulting in deformity, such as spina bifida, neural tube defects and muscular dystrophy	1	3	4
Genetic aspects of orthopaedic conditions	1	3	4
Normal variants in paediatric orthopaedics	1	4	4
Diseases affecting bones in childhood, including infection	1	4	4
Clinical Assessment			
History and examination of the child	2	4	4
Involving the parents in the assessment	2	4	4
Assessing the child with a disability	1	4	4
Assessing the child with possible non-accidental injury	2	4	4
Investigations			
Indications for and interpretation of plain x-ray, arthrogram, CT, MRI in children	2	4	4
Indications for the use of ultrasound, isotope and nuclear imaging	2	4	4
Critical Conditions			
The painful hip in a child	2	4	4
Painful spine in a child	2	4	4
Compartment syndrome	2	4	4
Neurovascular injury	2	4	4
Primary musculo-skeletal malignancy	2	4	4
Treatment			
Fractures (including non-accidental injury), growth plate injuries and sequelae	2	4	4
Bone and joint infection in a growing skeleton	2	4	4
Common childhood orthopaedic conditions, e.g. irritable hip, anterior knee pain	2	4	4
Slipped upper femoral epiphysis	1	4	4
Legg-Calve-Perthes' disease	1	3	4
Developmental dysplasia of the hip	1	4	4
Congenital Talipes Equino- Varus (CTEV)	1	4	4
Scoliosis and Kyphosis deformity, Idiopathic & congenital	1	4	4

Painful spine conditions, including kyphosis**,** spondylolysis and spondylolisthesis	1	4	4
Forefoot deformities	1	4	4
Congenital hand abnormalities	1	3	4
Osteogenesis imperfecta	2	3	4
Skeletal dysplasias	1	3	4
Tarsal coalitions	1	3	4
Torticollis	1	3	4
Leg length discrepancy	1	4	4
Metabolic and endocrine abnormalities	1	4	4
Localised disorder of the skin & soft tissue in paediatric orthopaedics	1	4	4
Diseases of the haematopoetic system in paediatric orthopaedics	1	4	4
Juvenile idiopathic arthritis	1	3	4
Musculoskeletal infections	1	4	4
Bone & soft tissue tumours	1	4	4
Cerebral palsy	1	4	4
Spina bifida, neural tube defects including myelomeningocele	1	3	4
Non-operatively Treated Orthopaedic Conditions in Childhood			
The treatment of normal variants such as knock knees, flat feet, femoral anteversion	1	4	4
Orthoses	1	3	4
Rehabilitation of the child	1	3	4
Musculoskeletal assessment of child with cerebral palsy	1	4	4
Determining physical disability	1	3	4
Screening for DDH	1	4	4
Screening for congenital abnormalities (other)	1	3	4
Sports medicine in the growing child	1	3	4

Applied Clinical Skills

The Applied Clinical Skills syllabus is a reflection of the procedures that have been recorded in trainee logbooks and, therefore, encountered in routine T&O practice. In all training programmes trainees should have the opportunity to be exposed to a large selection of the procedures.

Recording a surgical skill such as suturing or taking consent in isolation does not tell us sufficiently well how a professional deals with problems in the round. Neither do we want to simply credential individuals to carry out a particular hip replacement or fix a certain type of fracture. We, therefore, want to train and assess the ability of the trainee in the context of the whole patient problem and extrapolate that to dealing with problems in general.

Core competencies
The skills syllabus is not simply a list of procedures with their defined levels of competency, but considers each procedure as a whole from the first encounter with the patient pre-operatively to their management afterwards and onwards to discharge. Skills are captured as a list in the core domains of consent etc. listed below. They are then broken down further within each core domain to explore different elements, some of which may be verbal, involve interpretation or judgment as well as manual ability etc.

Procedures
The required skills remain broadly the same as in previous editions of the curriculum. The Curriculum Development Group recognised a consistent and constant expansion of procedure descriptions in the eLogbook, including some repetition. Therefore, it was decided to group similar procedures into more generic categories which does not detract from the mapping of the syllabus to the eLogbook. It attempts to future-proof it by allowing more flexibility in the detailed description of a procedure.

T&O is a surgical specialty covering a massive spectrum of treatment options. No consultant T&O surgeon can be an expert in all areas of T&O. Similarly, trainees cannot be expected to attain the highest levels of competence for all the procedures covered in the applied clinical skills syllabus. Therefore, this curriculum aims to outline what skills a trainee will need to act as a day-one consultant in the generality of T&O with an emphasis on managing an unselected take. It also defines skills trainees need to acquire in an area of specialty interest.
Level 4 is defined as the ability to manage a complete a procedure, including the most common complications without needing assistance.

Each topic within a stage has a competence level ascribed to it in the areas of clinical and technical skills ranging from 1 to 4:

Standards for clinical and technical skills

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

1. Has observed

Exit descriptor; at this level the trainee:

- has adequate knowledge of the steps through direct observation
- can handle instruments relevant to the procedure appropriately and safely
- can perform some parts of the procedure with reasonable fluency.

2. Can do with assistance

Exit descriptor; at this level the trainee:

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

3. Can do whole but may need assistance

Exit descriptor; at this level the trainee:

- can adapt to well-known variations in the procedure encountered, without direct input from the trainer
- recognises and makes a correct assessment of common problems that are encountered
- is able to deal with most of the common problems
- knows when help is needed
- requires advice rather than help that requires the trainer to scrub.

4. Competent to do without assistance, including complications

Exit descriptor, at this level the trainee:

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

We have defined the levels for core /ST1-2 (phase 1), ST3-8 (phases 2 and 3) for all and special interest ST7-8 (phase 3) chosen module.

Applied Clinical Skills: Spine

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	3 = Can manage whole but may need assistance
1= Has observed or knows of	4= Able to manage without assistance including potential common complications
2= Can manage with assistance	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Spine			
Cervical Spine			
Anterior column reconstruction cervical spine	0	1	4
Anterior fixation fracture / dislocation cervical spine	0	1	4
Application halo / tong traction cervical spine	0	2	4
MUA fracture / dislocation cervical spine	0	1	4
Non-classifiable cervical spine trauma procedure	0	1	4
Posterior column reconstruction cervical spine	0	1	4
Posterior fixation fracture / dislocation cervical spine	0	1	4
Thoracic Spine			
Anterior column reconstruction thoracic spine	0	1	4
Anterior decompression / fixation thoracic spine	0	1	4
Anterior decompression thoracic spine	0	1	4
Posterior column reconstruction thoracic spine	0	1	4
Posterior decompression / fixation thoracic spine	0	1	4
Posterior decompression thoracic spine	0	1	4
Lumbar Spine			
Anterior column reconstruction lumbar spine	0	1	4
Anterior decompression / fixation lumbar spine	0	1	4
Anterior decompression lumbar spine	0	1	4
Posterior column reconstruction lumbar spine	0	1	4
Posterior decompression / fixation lumbar spine	0	1	4
Posterior decompression lumbar spine	0	1	4

Elective Spine			
Cervical Spine			
Cervical disc replacement	0	1	3
Cervical laminectomy	0	1	4
Cervical laminoplasty	0	1	4
Cervical vertebrectomy for myelopathy	0	1	4
Anterior Cervical Discectomy +/-Fusion	0	1	4
C0 to C2 fusion (including the various specific instrumentation techniques	0	1	4
Posterior decompression +/- fixation / fusion (C2 - C7)	0	1	4
Excision cervical / 1st rib	0	1	3
Thoracic outlet release (not excision cervical / 1st rib)	0	1	3
Thoracic Spine			
Anterior column reconstruction thoracic spine e.g. for fracture or tumour	0	1	4
Costoplasty	0	1	4
Excision hemivertebra	0	1	4
Anterior thoracic decompression e.g. thoracic disc, tumour or fracture	0	1	4
Posterior thoracic decompression +/- fixation / fusion	0	1	4
Biopsy thoracic spine	0	1	4
Deformity			
Kyphosis correction - anterior and posterior	0	1	3
Scoliosis correction - anterior release & fusion	0	1	3
Scoliosis correction - posterior fusion	0	1	3
Scoliosis correction – combined anterior release and posterior spinal fusion	0	1	3
Growing rods for scoliosis	0	1	3
Lengthening of growing rods for scoliosis including magnetic rods	0	1	3
Casting for early onset scoliosis	0	1	3
Vertebroplasty/balloon kyphoplasty	0	1	3
Thoracoscopic spinal procedures +/- instrumentation (including vertebral body tethering)	0	1	3
Lumbar Spine			
Anterior column reconstruction lumbar spine	0	1	4
Decompression lumbar spine without fusion (not discectomy alone)	0	2	4
Discectomy open / micro /endoscopic	0	2	4
Excision hemivertebra	0	1	4
Anterior Lumbar Interbody Fusion +/- instrumentation (ALIF)	0	1	4
Decompression lumbar spine with fusion +/- fixation	0	1	4
Posterior Lumbar Interbody Fusion (PLIF) +/- Instrumentation	0	1	4
Transforaminal Lumbar Interbody Fusion (TLIF)	0	1	4
Direct Lateral Interbody Fusion (DLIF)	0	1	4
Less Invasive techniques for lumbar spine fusions	0	1	4

Investigations and injections			
Biopsy cervical spine	0	1	4
Cervical epidural	0	1	4
Nerve root / facet joint injection cervical spine	0	1	4
Revision cervical discectomy	0	1	4
Caudal epidural injection	0	3	4
Discogram	0	1	4
Lumbar epidural	1	1	4
Facet joint injection lumbar spine	0	1	4
Nerve root injection lumbar spine	0	2	4
Lumbar disc replacement	0	1	1
Osteotomy for spine sagittal plane imbalance	0	1	3
Posterior column reconstruction lumbar spine	0	1	4
Revision lumbar discectomy	0	1	4
Vertebroplasty/balloon kyphoplasty	0	1	4
Sacrococcygeal joint injection / MUA	0	3	4
Sacro-iliac joint injection	0	3	4

Applied Clinical Skills: Shoulder

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	3 = Can manage whole but may need assistance
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Shoulder			
Clavicle			
ORIF clavicle fracture	0	4	4
ORIF non-union clavicle fracture	0	3	4
SC joint dislocation closed / open reduction	0	2	4
SC joint instability/open stabilisation	0	2	4
Shoulder			
Acromioclavicular joint dislocation acute ORIF	0	3	4
Anterior dislocation shoulder			
Anterior dislocation shoulder closed reduction	2	4	4
Anterior dislocation shoulder open reduction +/- fixation	0	3	4
Fracture proximal humerus			
Fracture proximal humerus hemiarthroplasty	0	3	4
Fracture proximal humerus interlocking IM nail	0	3	4
Fracture proximal humerus ORIF	0	3	4
Glenoid fracture ORIF	0	2	3
Irrigation and debridement native joint for infection - shoulder	0	4	4
Posterior dislocation shoulder			
Posterior dislocation shoulder closed reduction	0	4	4
Posterior dislocation shoulder open reduction +/- fixation	0	3	4
Scapula fracture ORIF	0	2	3
Humerus			
Fracture diaphysis humerus			
Fracture diaphysis humerus non-operative	1	4	4
Non-union ORIF +/- bone grafting	0	3	4
Fracture diaphyseal humerus application of external fixator	0	3	4
Fracture diaphyseal humerus non-union - ORIF +/- bone grafting	0	3	4
Fracture diaphysis humerus IM nailing	0	4	4
Fracture diaphysis humerus ORIF plating	0	4	4

Elective Shoulder			
Clavicle			
Osteotomy and internal fixation of clavicle malunion	0	2	4
Shoulder			
Arthroscopic arthrolysis for capsulitis of shoulder	0	3	4
Arthroscopic biceps tenodesis	0	2	4
Arthroscopic subacromial decompression	0	3	4
Arthroscopic washout of shoulder joint	0	3	4
Capsular / rotator cuff repair			
Anterior repair for instability arthroscopic	0	2	4
Anterior repair for instability open including capsular shift	0	2	4
Posterior repair for instability including capsular shift	0	2	4
Rotator cuff repair (arthroscopic) +/- acromioplasty	0	2	4
Rotator cuff repair (open) +/- acromioplasty	0	3	4
MUA shoulder	0	4	4
Shoulder arthrodesis	0	1	4
Shoulder arthroplasty			
Hemiarthroplasty shoulder (elective)	0	2	4
Resurfacing hemiarthroplasty of shoulder	0	2	4
Reverse polarity (inverse) shoulder replacement	0	2	4
Shoulder replacement revision	0	1	4
Total shoulder replacement	0	2	4
Shoulder girdle procedures			
Acromioclavicular joint excision - arthroscopic / open / lateral clavicle	0	2	4
Acromioclavicular joint reconstruction (e.g. Weaver Dunn)	0	2	4
Acromioplasty open	0	3	4
Latarjet procedure	0	2	4
Levator scapulae transfer for trapezius palsy	0	1	2
Scapulothoracic fusion	0	1	4
Humerus			
Endoprosthetic replacement for malignant bone tumour - humerus	0	1	4

Applied Clinical Skills: Elbow

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	= Can manage whole but may need assistance
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Elbow			
Elbow			
Application of spanning external fixator	0	3	4
Capitellum ORIF	0	3	4
Coronoid fractures			
Coronoid fracture ORIF	0	3	4
Dislocated elbow +/- fracture:			
Dislocated elbow +/- fracture closed reduction	0	4	4
Dislocated elbow +/- fracture open reduction +/- fixation	0	3	4
Intraarticular distal humerus fracture ORIF	0	4	4
Irrigation and debridement native joint for infection – elbow	0	4	4
Lateral condyle fracture ORIF	0	4	4
Medial condyle / epicondyle fracture MUA / percutaneous wire / ORIF	0	4	4
Olecranon fracture ORIF	0	4	4
Radial head / neck fracture			
Radial head / neck fracture ORIF	0	3	4
Radial head excision	0	4	4
Radial head replacement for fracture	0	3	4
Supracondylar elbow fracture			
Supracondylar elbow fracture MUA +/- percutaneous wires	0	4	4
Supracondylar elbow fracture open reduction	0	4	4
Tendon repairs			
Repair of distal biceps tendon rupture	0	2	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Forearm			
Fasciotomy for compartment syndrome	1	4	4
Fracture shaft radius / ulna:			
Fracture shaft radius / ulna IM nailing	0	3	4
Fracture shaft radius / ulna MUA & POP	0	4	4
Fracture shaft radius / ulna ORIF	0	4	4
Galeazzi fracture ORIF	0	4	4
Monteggia fracture ORIF	0	4	4
Elective Elbow			
Elbow			
Arthrolysis elbow (open/arthroscopic)	0	2	4
Arthroscopy elbow diagnostic	0	2	4
Arthoscopy elbow therapeutic	0	2	4
Arthrotomy elbow	0	4	4
Excision radial head +/- synovectomy	0	2	4
OK procedure	0	2	4
Tennis / golfer elbow release	0	4	4
Total elbow replacement			
Total elbow replacement	0	2	4
Total elbow replacement - aseptic revision	0	1	4
Total elbow replacement for trauma	0	1	4
Total elbow replacement revision 1st stage	0	1	3
Total elbow replacement revision 2nd stage	0	1	3
Ulnar nerve decompression / transposition	0	4	4
Forearm			
Forearm malunion correction or other deformity	0	1	4

Applied Clinical Skills: Hand

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	3 = Can manage whole but may need assistance
1 = Has observed or knows of	4 = Able to manage without assistance including potential common complications
2 = Can manage with assistance	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Hand			
Wrist			
Fracture distal radius – closed non-op	3	4	4
Fracture distal radius external fixation	1	4	4
Fracture distal radius MUA & percutaneous wires	3	4	4
Fracture distal radius ORIF	1	4	4
Application of spanning external fixator	1	4	4
Arterial repair - wrist	0	1	2
Vein repair – wrist	0	1	2
Carpal fracture / dislocation:			
Carpal fracture / dislocation MUA & percutaneous wires	0	3	4
Carpal fracture / dislocation MUA & POP	0	3	4
Carpal fracture / dislocation non-op	0	3	4
Carpal fracture / dislocation ORIF	0	3	4
Irrigation and debridement prosthesis for infection – wrist	0	2	4
Nerve repair - wrist	0	3	4
Replantation of hand	0	0	1
Revascularisation of hand	0	0	1
Scapho-lunate ligament reconstruction	0	2	4
Scaphoid fracture:			
Scaphoid fracture non-operative	2	4	4
Scaphoid fracture MUA & percutaneous wires	0	2	4
Scaphoid fracture non-union ORIF +/- graft (excluding vascularised graft)	0	2	4
Scaphoid fracture non-union using vascularised graft	0	2	3
Scaphoid fracture ORIF	0	2	4
Hand			
1st ray fracture / dislocation			
1st ray fracture / dislocation external fixation	0	2	4
1st ray fracture / dislocation MUA & percutaneous wires	0	4	4
1st ray fracture / dislocation MUA & POP	2	4	4
1st ray fracture / dislocation ORIF	0	2	4
5th Ray fracture / dislocation			
5th ray fracture / dislocation external fixation	0	2	4
5th ray fracture / dislocation MUA & percutaneous wires	0	4	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
5th ray fracture / dislocation MUA & POP	2	4	4
5th ray fracture / dislocation ORIF	0	2	4
Fingertip reconstruction			
Fingertip reconstruction - advancement flap	0	2	3
Fingertip reconstruction - cross finger flap	0	2	3
Fingertip reconstruction - homodigital neurovascular island flap	0	2	3
Fingertip terminalisation	2	4	4
Nail bed repair	2	4	4
Hand compartment syndrome decompression	2	4	4
Excision / ablation of ingrowing nail	2	4	4
Infection			
High pressure injection injuries	0	3	4
Infection hand drainage (not tendon sheath)	1	4	4
Infection tendon sheath drainage	1	4	4
IPJ fracture / dislocation (PIPJ and DIPJ):	0	2	4
IPJ fracture / dislocation external fixator	1	2	4
IPJ fracture / dislocation MUA & percutaneous wires	1	4	4
IPJ fracture / dislocation MUA +/- POP	2	4	4
IPJ fracture / dislocation ORIF	0	2	4
IPJ fracture/dislocation MUA and splints	2	4	4
Ligament repair			
Ligament repair hand excluding thumb MCPJ ulnar collateral ligament	0	2	4
Thumb MCPJ ulnar collateral repair	1	4	4
MCPJ fracture / dislocation			
MCPJ fracture / dislocation external fixator	0	2	4
MCPJ fracture / dislocation MUA & percutaneous wires	1	4	4
MCPJ fracture / dislocation MUA +/- POP	1	4	4
MCPJ fracture / dislocation ORIF	0	3	4
Metacarpal fracture (not 1st or 5th) non-op	2	4	4
Metacarpal fracture (not 1st or 5th) MUA & percutaneous wires	1	4	4
Metacarpal fracture (not 1st or 5th) MUA +/- POP	2	4	4
Metacarpal fracture (not 1st or 5th) ORIF	0	3	4
Metacarpal fracture (not 1st or 5th) external fixation	0	3	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Neurovascular injuries			
Arterial repair +/- graft hand / digit	0	1	2
Nerve repair hand / digit	1	4	4
Revascularisation finger	0	1	2
Vein repair +/- graft hand / digit	0	1	2
Brachial Plexus			
Exploration / repair / grafting brachial plexus	0	1	2
Exploration of brachial plexus	0	1	2
Repair +/- grafting brachial plexus	0	1	2
Phalangeal Fractures			
Phalangeal fracture non-op	2	4	4
Phalangeal fracture MUA & percutaneous wires	1	4	4
Phalangeal fracture MUA +/- POP	2	4	4
Phalangeal fracture ORIF	0	2	4
Removal foreign body from skin / subcutaneous tissue	3	4	4
Replantation finger	0	1	2
Skin graft			
Free flap	0	1	1
Full thickness skin graft	2	2	3
Pedicle flap	0	2	3
Reversed radial forearm flap	0	2	2
Split skin graft	2	3	4
Transposition flap	0	2	4
Tangential excision of hand burns	0	1	1
Tendon repair			
Spaghetti wrist	0	2	4
Tendon repair extensor	2	4	4
Tendon repair flexor zone 1	0	2	4
Tendon repair flexor zone 2	0	2	4
Tendon repair flexor zone 3-5	0	4	4
Wound closure			
Delayed primary or secondary	1	4	4
Wound debridement	1	4	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Elective Hand			
Wrist			
Arthrodesis wrist (includes partial arthrodesis)	0	3	4
Arthroscopy wrist	0	2	4
Carpal tunnel decompression	3	4	4
De Quervain's decompression	1	4	4
Decompression / synovectomy tendons	0	3	4
Denervation wrist	0	2	4
Excision distal ulna	0	4	4
Ganglion excision at wrist	2	4	4
Proximal row carpectomy	0	2	4
Radial shortening	0	2	4
Surgery for chronic carpal instability	0	2	4
TFCC			
Repair TFCC - arthroscopic	0	2	4
Repair TFCC - open	0	2	4
Ulna shortening	0	3	4
Ulnar nerve decompression at wrist	0	3	4
Wrist arthroplasty	0	2	3
Congenital hand operation			
Congenital hand operation - clinodactyly	0	1	3
Congenital hand operation - complex reconstruction of congenital hand deformity	0	1	3
Congenital hand operation - camptodactyly	0	1	3
Congenital hand operation - correction of radial club hand	0	1	3
Congenital hand operation - lengthening procedures	0	1	3
Congenital hand operation - removal supernumerary digits	0	1	4
Congenital hand operation - separation of syndactyly	0	1	3
Dupuytren's contracture operation			
Dupuytrens contracture operation - dermofasciectomy	0	2	4
Dupuytren's contracture operation - primary multiple digits	0	3	4
Dupuytren's contracture operation - primary single digit	0	3	4
Dupuytren's contracture operation - recurrent multiple digits	0	2	4
Dupuytren's contracture operation - recurrent single digit	0	2	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Excision synovial cyst	0	3	4
Finger malunion correction or other deformity	0	2	4
Fusion of MCPJ or IPJ	0	3	4
MCPJ replacement	0	2	4
PIPJ replacement	0	2	4
Soft tissue reconstruction hand	0	2	4
Synovectomy	0	3	4
Tendon procedures			
Tendon graft hand	0	2	4
Tendon transfer hand	0	2	4
Tenolysis hand tendon	0	2	4
Tenosynovectomy	0	2	4
Trapezium excision	0	4	4
Trapezium replacement	0	3	3
Trigger finger release	2	4	4
Trigger thumb release	1	4	4

Applied Clinical Skills: Hip

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Hip			
Pelvis			
Acetabular fracture ORIF	0	1	3
Pelvic fracture:			
Pelvic fracture external fixator application	1	3	4
Pelvic fracture ORIF	0	1	3
Sacroiliac joint percutaneous screw fixation	0	1	3
Sacrum ORIF	0	1	3
Hip			
Dislocated hip			
Dislocated hip (no prosthesis) - closed reduction	1	4	4
Dislocated hip (no prosthesis) - open reduction +/- fixation	0	3	4
Dislocated hip hemiarthroplasty - closed reduction	2	4	4
Dislocated hip hemiarthroplasty - open reduction	0	4	4
Dislocated total hip replacement - closed reduction	2	4	4
Dislocated total hip replacement - open reduction	0	4	4
Extracapsular fracture			
Extracapsular fracture CHS / DHS	3	4	4
Extracapsular fracture intramedullary fixation	0	4	4
Extracapsular fracture other fixation	0	4	4
Intracapsular fracture			
Intracapsular fracture bipolar hemiarthroplasty	0	4	4
Intracapsular fracture hemiarthroplasty excluding bipolar	2	4	4
Intracapsular fracture internal fixation	1	4	4
Intracapsular fracture THR	1	4	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Irrigation and debridement native joint for infection - hip	0	4	4
Irrigation and debridement prosthesis for infection - hip	0	4	4
Periprosthetic fracture of hip			
Open reduction and fixation of periprosthetic fracture - hip	0	3	4
Revision THR for periprosthetic fracture of hip	0	2	4
Femur			
Diaphyseal femur fracture application of external fixator	0	4	4
Diaphyseal femur fracture intramedullary nailing	0	4	4
Diaphyseal femur fracture plate/screw fixation	0	4	4
Diaphyseal femur fracture spica cast application	0	3	4
Fasciotomy for compartment syndrome	1	4	4
Femoral non-union			
Femoral non-union (application of frame) +/- bone grafting	0	2	4
Femoral non-union (without frame) +/- bone grafting	0	2	4
Reconstruction of avulsed proximal hamstrings	0	1	3
Subtrochanteric fracture			
Subtrochanteric fracture intramedullary fixation	0	4	4
Subtrochanteric fracture plate/screw fixation	0	4	4
Elective Hip			
Hip			
Adductor tenotomy - hip	0	3	4
Arthrodesis hip	0	2	4
Arthroscopy hip - diagnostic	0	1	2
Arthroscopy hip - therapeutic	0	1	2
Arthrotomy hip	0	2	4
Aspiration / injection hip joint	0	3	4
Excision arthroplasty hip (e.g. Girdlestone)	0	4	4
Femoral head AVN			
Core decompression of femoral head for AVN	0	3	4
Vascular graft femoral head for AVN	0	1	2

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Femeroacetabular impingement			
Open hip debridement for femeroacetabular impingement syndrome	0	1	4
Iliopsoas release / lengthening	0	1	4
Osteotomy pelvis - not for DDH	0	1	3
Arthroscopic hip debridement for femeroacetabular impingement syndrome	0	1	2
Revision THR			
1 stg of 2 stg rev infected THR - removal of prosthesis/Girdlestones +/- insertion of cement spacer / antibiotic beads	0	1	4
2 stg of 2 stg rev infected THR - removal of spacer/beads	0	2	4
Single stage revision THR acetabular component	0	2	4
Single stage revision THR both components	0	2	4
Single stage revision THR femoral component	0	2	4
Total Hip Replacement			
THR cemented	1	4	4
THR hybrid	1	4	4
THR surface replacement arthroplasty	1	2	4
THR uncemented	1	4	4
Femur			
Endoprosthesisosthetic replacement for malignant bone tumour - femur	1	2	4
Femoral malunion correction or other deformity	0	2	4
Osteotomy corrective (not for DDH)	0	2	4

Applied Clinical Skills: Knee

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Knee			
Knee			
Acute arthroscopy for knee trauma	0	3	4
Application of spanning external fixator	0	4	4
Intraarticular fracture distal femur ORIF	0	3	4
Irrigation and debridement native joint for infection (open or arthroscopic) - knee	1	4	4
Irrigation and debridement prosthesis for infection - knee	1	4	4
Knee MUA +/- POP	2	4	4
Patella fracture			
Patella dislocation closed reduction +/- open repair	1	4	4
Patella fracture ORIF	0	4	4
Patellectomy	0	4	4
Periprosthetic fracture of knee			
Open reduction and fixation of periprosthetic fracture - knee	0	2	4
Revision TKR for periprosthetic fracture of knee	0	2	4
Soft tissue repair			
Acute ligament repair	0	3	4
Patella tendon repair	0	4	4
Quadriceps tendon repair	0	4	4
Supracondylar fracture (not intraarticular)			
Supracondylar fracture (not intraarticular) DCS / blade plate etc.	0	4	4
Supracondylar femur fracture (not intraarticular) external fixation	0	4	4
Supracondylar femur fracture (not intraarticular) Intramedullary fixation	0	4	4
Supracondylar femur fracture (not intraarticular) MUA & POP	0	4	4
Tibial plateau fracture			
Repair of tibial spine	0	3	4
Tibial plateau fracture arthroscopically assisted fixation	0	2	4
Tibial plateau fracture ORIF with plates & screws	0	4	4
Tibial plateau fracture treatment with circular frame	0	2	4
Tibia & Fibula			
Diaphyseal tibial fracture external fixation excluding ring fixation	1	4	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Diaphyseal tibial fracture intramedullary nailing	1	4	4
Diaphyseal tibial fracture MUA & POP	1	4	4
Tibial shaft plating	0	3	4
Fasciotomy for compartment syndrome	2	4	4
Tibial non-union			
Tibial non-union circular frame management	0	2	3
Tibial non-union intramedullary nailing +/- bone grafting	0	2	4
Tibial non-union ORIF +/- bone grafting	0	2	4
Elective Knee			
Knee			
Arthroscopic partial meniscectomy	1	4	4
Arthroscopic procedures	1	4	4
Arthroscopic excision of Hoffa's fat pad	0	4	4
Arthroscopic lateral release	0	4	4
Arthroscopic menisectomy	0	4	4
Arthroscopic removal loose bodies knee	0	4	4
Arthroscopic synovectomy	0	3	4
Arthroscopy knee diagnostic	1	4	4
Meniscal repair (arthroscopic)	0	2	4
Aspiration / injection knee joint	2	4	4
Cartilage regeneration procedures			
Abrasion arthroplasty / microfracture - knee	0	2	4
Mosaicplasty - knee	0	2	4
Osteochondral allografting - knee	0	2	4
Autologous chondrocyte implantation	0	2	4
Knee arthroplasty			
Patella resurfacing alone	0	1	4
Patello-femoral joint replacement	0	1	4
TKR	1	4	4
Unicompartmental knee arthroplasty	0	3	4
MUA knee	2	4	4
Osteotomy distal femoral	0	2	4
Osteotomy proximal tibial	0	2	4
Patella realignment	0	3	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Patella tendon decompression (open / arthroscopic)	0	3	4
Release contracture knee	0	2	4
Revision TKR			
1 stg of 2 stg rev infected TKR - removal of prosthesis +/- insertion of cement spacer / antibiotic beads	0	2	4
2 stg of 2 stg rev infected TKR - removal of spacer/beads	0	2	4
Revision TKR for periprosthetic fracture of knee	0	2	4
Single stage revision TKR	0	2	4
Soft tissue reconstruction			
ACL reconstruction - arthroscopic	0	2	4
ACL reconstruction - open	0	2	4
Reconstruction of posterolateral corner of knee	0	2	4
PCL reconstruction	0	2	4
Revision ACL reconstruction	0	1	4
Tibia & Fibula			
Endoprosthetic replacement for malignant bone tumour - tibia	1	2	3
Tibia or fibula malunion correction or other deformity	0	2	4
Tibial lengthening	0	1	3

Applied Clinical Skills: Foot and Ankle

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Trauma Foot and Ankle			
Ankle			
Ankle fracture / dislocation:			
Ankle fracture / dislocation MUA & POP	3	4	4
Ankle fracture / dislocation ORIF	2	4	4
Application of spanning external fixator	1	4	4
Irrigation and debridement native joint for infection - ankle	1	4	4
Irrigation and debridement prosthesis for infection - ankle	0	2	4
Pilon fracture			
Pilon fracture ex-fix	1	4	4
Pilon fracture ORIF	0	2	4
Pilon fracture treatment with circular frame	0	2	4
Foot			
Amputation toe / ray for trauma	0	3	4
Calcaneal fracture	0	2	4
Calcaneal fracture ex-fix	0	2	4
Calcaneal fracture ORIF	0	2	4
Metatarsal fracture ORIF	0	3	4
Phalangeal fracture MUA +/- K wire +/- ORIF	1	3	4
Removal foreign body from skin / subcutaneous tissue	2	4	4
Talar subtalar or midtarsal fracture / dislocation			
Lisfranc fracture ORIF	1	3	4
Midtarsal fracture / dislocation ORIF	0	3	4
Subtalar fracture / dislocation ORIF	0	3	4
Talar fracture / dislocation ORIF	0	3	4
Tarsometatarsal arthrodesis	0	2	4
Achilles tendon repair	1	4	4
Tendon repair in foot	0	4	4

Elective Foot and Ankle			
Ankle			
Arthrodesis ankle (open /arthroscopic)	0	2	4
Arthroplasty ankle	0	2	4
Arthrotomy ankle	0	4	4
Aspiration / injection ankle joint	0	4	4
Arthroscopic procedures			
Arthroscopy ankle diagnostic	0	3	4
Arthroscopy ankle therapeutic	0	2	4
Ligament repair / reconstruction			
Ankle - lateral ligament reconstruction	0	2	4
Ankle - medial ligament repair	0	2	4
Tendon procedures			
Decompression tendons at ankle	0	3	4
Gastrocnemius lengthening	0	3	4
Tendo-achilles reconstruction for neglected rupture	0	2	4
Tendo-achilles lengthening	0	2	4
Foot			
Akin osteotomy of proximal phalanx great toe	0	3	4
Amputation toe/ray	0	3	4
Ankle chielectomy	0	2	4
Aspiration / injection foot joint	0	3	4
Arthrodesis procedures			
Ankle	0	2	4
Hindfoot	0	2	4
Midtarsal	0	2	4
OSTEOTOMY			
Calcaneal osteotomy	0	2	4
Excision Haglund's deformity	0	2	4
Excision of accessory navicular	0	2	4
Excision of tarsal coalition	0	2	4
Pantalar arthrodesis	0	2	4
First metatarsal osteotomy			
First metatarsal osteotomy - basal	0	4	4
First metatarsal osteotomy – distal	0	4	4
First metatarsal osteotomy – scarf	0	4	4
First MTPJ procedures			
First MTPJ arthrodesis	0	4	4
First MTPJ cheilectomy	0	4	4

First MTPJ excision arthroplasty	0	3	4
First MTPJ replacement arthroplasty (silastic or other)	0	1	4
First MTPJ soft tissue correction	0	4	4
Forefoot reconstruction	0	2	4
Ingrowing toenail operation	2	4	4
Lesser metatarsal osteotomy	0	2	4
Correction of interphalangeal joint deformity of lesser toes	0	3	4
Soft tissue procedures			
Excision of Morton's neuroma	0	3	4
Correction of over-riding 5th toe'	0	2	4
Lesser toe tenotomy	0	3	4
Plantar fascia release	0	2	4
Tendon transfer foot	0	2	4
Tibialis posterior reconstruction	0	2	4

Topic	**CORE**	**ST3-ST8**	**SPECIALTY INTEREST**
Paediatric Orthopaedics			
The Upper Extremity			
Elective			
Repair of congenital pseudarthrosis of the clavicle	0	1	4
Release of congenital constriction band	0	1	2
Release of simple syndactyly	0	1	2
Release of congenital trigger thumb	1	3	4
Excision of duplicate thumb	0	1	2
Transfer of tendon for wrist flexion deformity	0	1	2
Supracondylar humeral osteotomy for correction of cubitus varus	0	1	2
Correction of thumb-in-palm deformity in cerebral palsy	0	1	2
Trauma			
Closed reduction and intramedullary fixation of humeral shaft fracture	1	3	4
Closed reduction and percutaneous pinning of supracondylar fracture of the humerus	1	4	4
Open reduction of supracondylar fracture of the humerus	1	4	4
Open reduction and internal fixation of displaced lateral condyle fracture of the humerus	1	3	4
Open reduction and internal fixation of fractures of the medical epicondyle	1	3	4
Closed, percutaneous, and open reduction of radial head and neck fractures	1	2	4
Intramedullary fixation of forearm fractures	1	3	4
The Pelvis and Hip			
Anterior drainage of the septic hip	1	4	4
Anterior approach to a developmentally dislocated hip	1	2	4

Topic	CORE	ST3-ST8	SPECIALTY INTEREST
Anteromedial approach to a developmentally dislocated hip	1	2	4
Innominate osteotomy of Salter	0	1	4
Pericapsular iliac osteotomy of Pemberton	0	1	4
The pericapsular pelvic osteotomy of Dega	0	1	4
Shelf arthroplasty	0	1	4
Triple innominate osteotomy	0	1	4
Ganz periacetabular osteotomy	0	1	4
Anterior osteotomy for bladder exstrophy	0	1	2
Staheli shelf procedure	0	1	4
Arthrodesis of the hip joint	0	1	4
Percutaneous in situ cannulated screw fixation of slipped capital femoral epiphysis	1	4	4
Adductor and iliopsoas lengthening	0	1	4
Hamstring tenotomy	0	1	4
The Femur			
Planning an intertrochanteric osteotomy	0	2	4
Proximal femoral varus osteotomy in children	0	1	4
Valgus osteotomy for developmental coxa vara	0	1	4
Valgus osteotomy for hinged abduction in Perthes' disease	0	1	4
Proximal femoral rotational osteotomy	0	1	4
Southwick biplane intertrochanteric osteotomy for slipped capital femoral epiphysis	0	1	4
Osteotomy at the base of the femoral neck for slipped capital femoral epiphysis	0	1	4
Transfer of greater trochanter	0	1	4
Closed intramedullary shortening of the femur	0	1	4
Intramedullary fixation for femoral deformity in osteogenesis imperfecta	0	1	4
Closed reduction and spica cast application for the treatment of femoral shaft fracture	1	4	4
Flexible intramedullary nailing of femoral shaft fractures	1	4	4
Closed reduction and external fixation of femoral shaft fracture	1	4	4
Lengthening of the femur with rotational and angular correction with an external fixator	0	2	4
Distal angular femoral osteotomy	0	1	4
Percutaneous distal femoral epiphysiodesis	1	2	4
Hemiepiphysiodesis using plates and screws or staples	1	2	4
Surgical resection of partial growth plate arrest	0	1	4
Distal hamstring lengthening and posterior capsulotomy	0	1	4
Rectus femoris transfer	0	1	4

The Knee			
Proximal patellar realignment (Insall technique)	0	1	4
Semitendinosus tenodesis of patella for recurrent dislocation	0	1	4
Surgical repair of irreducible congenital dislocation of the knee	0	1	4
The Tibia			
Angular osteotomy of proximal tibia	0	1	4
Double osteotomy with elevation of the tibial plateau for Blount disease	0	1	4
Realignment, and intramedullary fixation for tibial deformity in osteogenesis imperfecta	0	1	4
Tibial lengthening with an external fixator	0	1	4
Management of congenital pseudoarthrosis of the tibia	0	1	4
Proximal tibial and fibular epiphysiodesis	0	1	4
Percutaneous epiphysiodesis of the proximal tibia	0	1	4
Hemiepiphysiodesis of the proximal tibia to angular deformity	0	2	4
Supramalleolar rotation osteotomy of the distal tibia and fibula	0	1	4
Wedge osteotomy for angular deformities of long bones	0	1	4
Screw epiphysiodesis for ankle valgus	0	1	4
The Foot			
Cast treatment of congenital clubfoot: the Ponseti method	1	2	4
Achilles tenotomy as part of Ponseti	1	2	4
Surgical correction of clubfoot	0	1	4
Resection of calcaneonavicular coalition	0	1	4
Excision of talocalcaneal coalition	0	1	4
Osteotomy of calcaneus for valgus	0	1	4
Calcaneal lengthening osteotomy for the treatment of hindfoot valgus deformity	0	1	4
Triple arthrodesis	0	1	4
Grice extraarticular subtalar arthrodesis	0	1	4
Proximal metatarsal osteotomy and bunionectomy	0	1	4
Open lengthening of achilles tendon	0	1	4
Percutaneous lengthening of Achilles tendon	0	1	4
Split posterior tibial tendon transfer	0	1	4
Transfer of the posterior tibial tendon to the dorsum of the foot	0	1	4
Anterior tibialis transfer	0	1	4
Butler procedure for overlapping fifth toe	0	1	4
Flexor tenotomy for curly toe deformity	1	2	4
Symes amputation	0	1	4
Boyd amputation with osteotomy of the tibia for fibular deficiency	0	1	4

Appendix 3: Trauma and Orthopaedic Surgery Critical Conditions

The list of critical conditions covers a range of conditions where misdiagnosis or mismanagement can result in devastating consequences for life or limb. These critical conditions can be 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.

Trainees are expected to complete CBDs or CEX in each of the critical conditions to level 4 by certification.

CBD/CEX Level 4: Appropriate for certification (see CBDE/CEX forms for the full list of levels)

Compartment syndrome (any site)
Neurovascular injuries (any site)
Cauda equina syndrome
Immediate assessment, care and referral of spinal trauma
Complications of inflammatory spinal conditions
Metastatic spinal compression
Physiological response to trauma
Necrotising fasciitis
Diabetic foot
Primary and secondary musculo-skeletal malignancy
Major trauma resuscitation (CEX)
Spinal infections (adult or child)
The acute painful hip in the child (not infection)
Primary bone or joint infection in a child (septic arthritis or osteomyelitis)

Appendix 4: Index procedures / Indicative numbers / Waypoint checklist

Certification (end of phase 3) All trainees

Breadth and depth of experience is essential in operative surgery to ensure trainees have a range of strategies available to manage the variations in operative pathology they will be presented with as consultants.

a. Indicative number of total operations [P, T, S-TU, S-TS or A] expected as a requirement for certification = 1800
b. Indicative number of cases performed as first surgeon (P, T, S-TU, S-TS) = 1260
c. Indicative number of specific operation groups expected as a requirement for certification (usually over 72 months of training). These procedures must be supported by evidence from PBAs over a range of trainers and periods of time i.e. what is not acceptable is bunching of PBAs immediately prior to ARCPs.
d. PBAs - 3 x Level 4 PBAs in each specific operation group listed above by two or more trainers except for supracondylar fracture and fixation of long bone fractures in children (excluding K-wires).
e. For supracondylar fracture and fixation of long bone fractures in children (excluding K-wires) an indicative number of 1 x PBA level 4 in a non-simulated setting is acceptable.
f. For external fixation a maximum of two cases in a simulated setting are acceptable. An indicative number of 3 x Level 4 PBAs is required for this procedure, one of which may be assessed in simulation with agreement of AES or TPD.
g. For the category of osteotomy and arthrodesis, trainees are expected to have EITHER 3 x level 4 PBA for osteotomy OR 1 x level 4 PBA for osteotomy + 1 x level 4 PBA for arthrodesis + 1 x level 4 PBA for osteotomy or arthrodesis.
h. Injections in any site do not count as part of the indicative numbers.

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

Competency	Indicative Number	Notes
Elective		
Major Joint Arthroplasty	80	Total elbow, hip, knee, shoulder, ankle replacements
Osteotomy - by either - Osteotomy (20) OR Osteotomy (10 or more) + arthrodesis (10 or fewer) to make up a total of 20 cases	20	1st metatarsal, proximal tibia, distal femur, hip, humerus, wrist, hand, paediatric, spinal NOT allowed are Akin, lesser toe, and MT 2-5 osteotomies
Nerve Compression	20	Carpal tunnel, cupital tunnel, tarsal tunnel, spinal decompression, discectomy
Arthroscopy	50	Knee, shoulder, ankle, hip, wrist, elbow
Emergency Trauma		

Internal fixation of fractured neck of femur	40	
Hemiarthroplasty for Intracapsular Fracture Neck of Femur	40	
Application of Limb External fixator	10	
Tendon Repair for trauma	10	Any tendon for traumatic injury (includes quadriceps and patella tendon)
Intramedullary nailing for fracture of arthrodesis	30	Femur shaft, long CMN for subtrochanteric fracture, tibia shaft, humerus, hind foot nail, arthrodesis e.g. knee
Fixation of long bone fractures in children (excluding K-wires)	5	Any long bone, radius OR ulna OR both counts as one case
Plate fixation for fracture or arthrodesis	40	Ankle, wrist, hand, femur, tibia, humerus, forearm, clavicle, arthrodesis e.g. wrist
Cerclage compression technique	5	Patella, olecranon, ankle, wrist, hand
K wire fixation for fracture or arthrodesis	20	Wrist, hand, foot, paediatric
Children's displaced supracondylar fracture	5	Displaced fracture treated by internal fixation or application of formal traction
TOTAL NUMBER	375	

Principles of counting cases

Unbundling of cases, i.e. splitting up standard operations into two or more parts, in order to count operations as multiple cases on one patient is forbidden. As a principle, one patient counts as one operation. Exceptions include the following:

- Bilateral cases may count as two operations.
- Two or more operations on the same patient in different anatomical sites may count as multiple operations e.g. wrist and ankle
- Two large operations on one patient may count as two operations e.g. pelvic and femoral osteotomy for DDH.OR calcaneal osteotomy and soft tissue reconstruction for flat foot.
- In cases where there is uncertainty, it is expected that the decision to count multiple operations or not will decided by agreement of the TPD and SAC liaison member.

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

Some knowledge and capabilities are best gained in the formal setting of a taught course. In T&O there is one mandated course.

Trauma learning outcomes	**Rationale for learning by attendance at a course**	**Phase of training**	**GPC**	**CiP**	**Examples of ways to meet trauma learning outcomes**
Initial clinical assessment of the polytrauma patient Priorities of treatment and identification of life/limb-threatening injuries Management of multiple injuries in a polytrauma patient	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	The Advanced Trauma Life Support® (ATLS®), European Trauma Course, Definitive Surgical Trauma Skills course or equivalent and APLS 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.

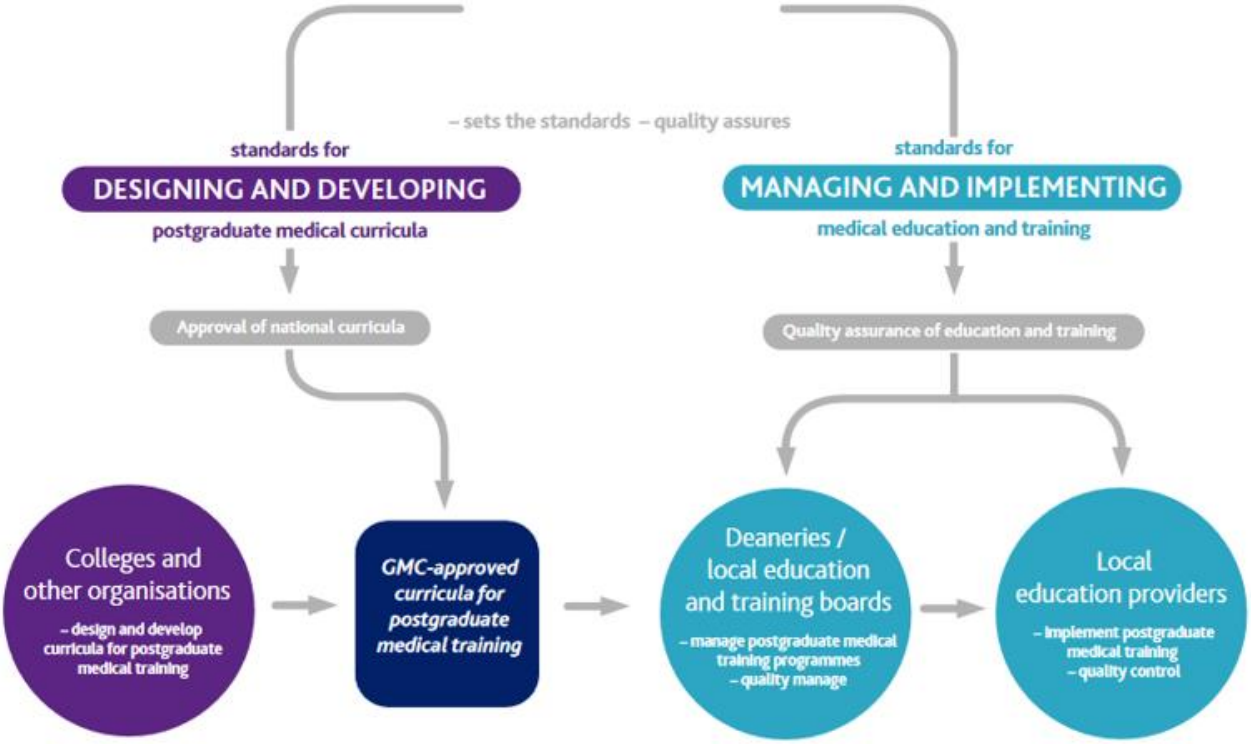

Figure 8: The quality assurance structure of the curriculum (adapted from Excellence by Design, GMC, 2017)

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)	*	*				*	*				