Specialist Training in Trauma and Orthopaedics

Curriculum August 2014

Editors:

Simon Frostick (Chair)

Emily Baird, Steve Bale, Tony Banks, Bhaskar Bhowal, Catherine Kellett, Andy Cole, Mark Goodwin, Lisa Hadfield-Law, Phil Hopgood, David Pitts, Phil Turner, Mike Reed, Lester Sher, Francois Tudor

Curriculum Development Group 2013:

Simon Frostick	Chair of BOA Training Standards Committee Professor of Orthopaedics, University of Liverpool
Steve Bale	Consultant Trauma and Orthopaedic Surgeon, Preston
Tony Banks	Chair of Orthopaedic SAC 2003-2006
Emily Baird	British Orthopaedic Trainees Association, Glasgow
Bhaskar Bhowal	Consultant Trauma and Orthopaedic Surgeon, Leicester
Mark Goodwin	Chairman of the SAC in Trauma and Orthopaedics
Lester Sher	Consultant Trauma and Orthopaedic Surgeon, Northumbria
Catherine Kellett	Consultant Trauma and Orthopaedic Surgeon, Glasgow
Andy Cole	Consultant Trauma and Orthopaedic Surgeon , Southampton
Lisa Hadfield-Law	BOA Educational Advisor
Phil Hopgood	Consultant Trauma and Orthopaedic Surgeon, Norwich
David Pitts	Formerly: Associate Director, Orthopaedic Curriculum and Assessment Programme Formerly: BOA Education Advisor Senior Education Adviser, RCSEd Director, Creative Learning Associates
Mike Reed	Consultant Trauma and Orthopaedic Surgeon , Northumbria
Francois Tudor	British Orthopaedic Trainees Association, Stanmore
Phil Turner	Consultant Trauma and Orthopaedic Surgeon , Manchester

Authors 2010 curriculum

David Pitts	Project Coordinator OCAP, Associate Director Leadership & Professional Development, RCSEd
W. Angus Wallace	SAC Chair, Professor of Orthopaedic & Accident Surgery, University of Nottingham
Nick Clarke	SAC Deputy Chair, Professor of Orthopaedics & Trauma, Southampton
Lester Sher	Head of School of Surgery Northern, T & O Surgeon, Ashington
Mike Reed	SAC Adviser Early Years, T & O Surgeon, Ashington

Authors 2006 curriculum
David Pitts, David I Rowley, Clare Marx, Lester Sher, Tony Banks, Alastair Murray

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The 2012 T&O Curriculum is the result of the endeavour a large number of people over more than a decade of work. Particular thanks must go to David Pitts who has been involved with the process from the outset and major a significant contribution to this version. A curriculum is an evolving entity and this iteration is a refinement of previous versions. Others will follow and change what has been achieved so far. All are sincerely thanked for their hard work.

Questions, Comments, Updates:

Questions and feedback are welcomed.

They should be addressed in the first instance to:

The Chairman of the BOA Training Standards Committee

Email the Policy & Programmes team - secretary@boa.ac.uk

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Preface to the 2012 curriculum

In September 2006 the first Trauma and Orthopaedic (T&O) competence based curriculum was approved by PMETB. In 2010 the present version was completed and approved by PMETB. The main change from the 2006 version was the inclusion of an early years curriculum for CORE training.

The 2012 edition is an attempt to refine the vast amount of work undertaken to write the 2006 and 2010 versions and to reflect changes in T&O as well as training in postgraduate medicine in general.

In its regulatory role, the General Medical Council (GMC) has published a number of documents defining various areas of postgraduate training. The Trainee Doctor (GMC, 2011) and Recognising and Approving Trainers: the implementation plan (GMC 2012) in effect form part of the T&O curriculum as they define foundations of training in the UK.

The main change for T&O since the 2010 curriculum has been the merging into ISCP. Although much of the content of the 2012 curriculum is similar to the previous versions there are several areas that are generic to the training of surgeons in general. However, having said that, T&O maintains its identity as one of the largest surgical specialties, and the authors of this curriculum version regard the curriculum as being owned by T&O trainees and trainers.

Trauma and orthopaedics has managed to resist a division of the specialty and so the principle of this curriculum is that all trainees will be trained in the generality of T&O, with an opportunity to develop a specialty interest in the later years of training and indeed post-CCT. Training in trauma is equally as important as training in elective orthopaedics, with the single aim of ensuring that all new CCT holders are able to manage trauma from the day they are appointed as consultants.

Much of the work in this version of the curriculum is a refinement of previous versions but we have focused on the requirement for trainees to extend the range of workplace based assessments (WBAs) that are used for formative assessment and placed a greater emphasis on feedback and reflection in the assessments. There is also a curriculum defined level of involvement in quality improvement projects. Simulation is highlighted as an important aspect of training that will increase in significance over the next 5 years. The evolving relationship between T&O and Plastic Surgery in the training for hand surgeons is specifically identified by the inclusion of the hand interface syllabus.

Introduction

Foreword

What do we expect of the trained trauma and orthopaedic surgeon?

The Specialist Advisory Committee (SAC) in Trauma and Orthopaedic Surgery has already defined the standard which a surgeon would be assessed as having completed their training and at which they might be deemed ready for the award of the Certificate of Completion of Training (CCT).

A surgeon with a CCT will have been trained in the generality of Trauma and Orthopaedics (T&O). They will have been assessed in the competencies laid out in the T&O curriculum. The syllabuses are for the generality of T&O and knowledge and skills will be assessed by the Intercollegiate Specialty Board Examination which trainees are required to successfully complete before the award of a CCT. Trainees will maintain a portfolio which includes evidence of training: learning agreements, workplace based assessments (WBAs), evidence of completion of audits and research and evidence showing attendance at relevant specialty courses and meetings. The portfolio will be assessed at a yearly ARCP (Annual Review of Competence Progression) and in its entirety at the final ARCP in ST8, prior to the recommendation of the award of CCT.

Towards the end of training in T&O, it is expected that the majority of trainees will have begun to develop a specialist interest. Training in the specialist area will continue after the award of CCT and will be assessed as part of the revalidation process. Therefore, maintenance of the portfolio and logbook after the completion of training is essential, to provide evidence for the revalidation process.

An individual receiving CCT will be able to join and lead a multidisciplinary team which will receive, assess and definitively manage the majority of patients who need emergency care. They will also provide a service for a range of common orthopaedic conditions. In both T&O services the CCT holder will be able to recognise and refer patients for more specialised definitive management. Further, the CCT holder will be committed to lifelong learning to ensure that patient safety is maintained and the quality of treatment provided is the best possible.

Scope & Purpose

Purpose

This curriculum is produced to guide T&O training in the UK by providing accessible information for trainees trainers and other stakeholders. It aims to make links between the surgical education process as a whole and assessment processes in particular, absolutely clear. It is written bearing in mind that all of its proposals must be feasible in the present workplace, not just in an aspirational future. The curriculum is a technical document written primarily for a professional orthopaedic audience, but it also seeks to provide guidance for all, in particular the general public and patients.

Target Audience

The curriculum is written for all those in training in T&O from ST3 - ST8 and for all those providing training in T&O. In addition the curriculum also provides the guidance for individuals applying for entry on to the Specialist Register via the CESR route.

There are a number of stakeholders for whom this document has been created:

- NHS employers in England, Scotland, Wales and Northern Ireland.
- COPMeD
- JCST and ISCP Management Committee
- CoPPS
- Training Programme Directors in Trauma and Orthopaedics
- BOA Executive and Education Board
- British Orthopaedic Trainees Association (BOTA)
- Joint Committee for the Intercollegiate Examination (JCIE)
- Patient Representatives
- The education committee for the Royal College of General Practitioners.
- Other healthcare professionals groups

Guiding Principles

A radical alternative

The surgical training environment of the last decade has seen major changes that radically affect the amount of time and resources available. Designing a curriculum that merely revised the existing processes was never an option. It was clearly necessary from the beginning to provide a clear structure to what, in many cases, was an unstructured activity.

Engagement with the previous versions of the curriculum has been an issue. Most people are resistant to change, and often to innovation, especially if they have the perception that it may increase their workload. Effective training of postgraduate surgical trainees can only occur in an environment where both trainees and trainers understand what is required and the reasons for imposing a structure where traditionally, surgical training occurred in an unstructured fashion.

Competency focused

The acquisition of operative experience is an important factor in surgical training and so any curriculum to be used "in the workplace" should be competency focused.

Competence may be defined simply as:

"… an individual's ability to perform in the workplace to the required standard … competencies are the descriptions of the constituent parts of performance which answer the question 'what do people have to do to be effective in various parts of their job?'"[1]

There are debates about the nature or meaning of the word competency. One conceptual standpoint states that a competency is simply a demonstrable ability to do something, using directly observable performance as evidence. Another understands competence as being an: 'holistic integration of understandings, abilities and professional judgments, where 'competence' is not necessarily directly observable, rather it is inferred from performance.[2,]

The integration of these two views acknowledges a much greater level of complexity within surgical competencies and avoids the problem that individuals may well be able to demonstrate that they can 'do' something, but that does not necessarily mean that they understand what they are doing or why, until they provide evidence for it.

Within our particular competency model we must look not only for the three key domains i.e. knowledge, skills and attitudes, but also for the unique combination of those domains in areas such as judgement and professionalism. The development of judgement and professionalism are key outcomes of surgical training, and allowance must be made to maintain the dynamic tension between the separate aspects of competence in an attempt to allow a clear assessment of whether a trainee possesses sufficient competencies in individual skill areas to prove competence in professional judgement.[3]

Flexible and easy (intuitive) to use

Day to day delivery of training in T&O will vary between programmes and between trainers. It is intended that the curriculum design will be able to recognise this, whilst providing a consistency of standard and outcome.

Able to adapt to new developments (open architecture)

The curriculum should not be such a 'finished product' that it cannot benefit from work that will not reach maturity before it is already in use. Many innovations, especially in social technology settings, have a lengthy gestation period. From the beginning, every effort has been made to ensure that the curriculum's architecture is sufficiently open to allow synergy with new developments. For example, although T&O has used simulation for many years, this version of the curriculum will embed a requirement for wider use and assessment of simulation within the document.

Adaptable to a variety of contexts

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[1] Standards in Competence Framework, UK Cabinet publication
[2] Michael Eraut. Developing Professional Knowledge and Competence. Falmer. 1994:172-181
[3] these notes on competence are adapted from work originally written by D. Pitts for the ISCP in consultation with Danae Goodsman

Each programme delivers its T&O service (and training) in an entirely different "geography". If trainees are to learn in the work place, the curriculum tools must in some way take into account this difference between the contexts in which they are being assessed. Workplaces differ not only in the facilities for education but also in the length of posts, frequency of supervised sessions and attitudes to training and teaching. ISCP serves as the delivery system for the T&O curriculum, facilitating access to all the components.

One element of the trainee's portfolio

Much surgical training happens in the midst of service delivery and is therefore secondary to the needs of the patient. This may severely limit the window of opportunity during which skills may be observed, discussed, evaluated and reflected upon. The hospital environment may be hostile to finding time and space to meet and talk with trainees. Most surgeons join the profession to perform surgery. They acknowledge the need to train but consider the evaluation of training to be part and parcel of service delivery.

With these considerations in mind we have tried (within the curriculum) to keep materials and systems straightforward and sympathetic to the paucity of time in rapidly changing settings within which to learn complex concepts and skills.

Driven by the trainee

The T&O curriculum requires (and enables) the trainee to take the initiative and responsibility for their own training. The trainer is still the senior partner in the enterprise but the curriculum provides tools to guide the trainee in getting the best from their trainer in a mutually supportive and mature relationship. The trainer must be receptive and sensitive the needs of the trainee.

Useable, valid and reliable

The curriculum is a waste of time unless these three criteria are fulfilled. All are thorny issues made more complex in a setting where service, which quite rightly has the patient as its focus, is the primary learning environment.

> ***Usability***
> The circumstances in which the curriculum will be used dictate that this area is of primary concern. "It might be valid and reliable but can you use it in a practical situation?" Efforts have been made to ensure that the curriculum can be used in real life contexts, within the constraints of time, user skills and attitudes.
> ***Validity***
> Questions of validity (truth) may be addressed in several different ways. Does the implementation of the whole process make a valid improvement in the outcomes of training? Are the primary procedures selected for assessments a valid choice? Is the internal structure of each assessment valid in terms of the measures of performance it proposes?
> A major problem in this area is the lack of previous measures of training effectiveness. It is impossible to make comparison with anything other than examination results, which only measure a limited area of intellectual competence. Validity remains the key however, and extensive efforts have been made to find answers in this area, not only by detailed validation of primary procedures and Procedure Based Assessments (PBAs) but also by keeping the curriculum in such close proximity to the workplace that face validity is maximised.
> ***Reliability***
> The curriculum should be understood by all (or most) in the same way. Efforts have been made to base the curriculum in accepted practice, so that a firm foundation of agreement can be laid for the future. Trainers will have to demonstrate competence in the use of the curriculum in the near future with the formal recognition of trainers by the GMC.

Holistic in approach

Communication skills and teamwork are often areas of concern when assessing a trainee. The early identification of these potential problem areas is essential. The tools and materials included in the curriculum are aimed at reducing this problem. However, awareness by training programme directors and individual trainers is also required to ensure that these issues are identified and remedial action taken.

Formative and summative

A fundamental issue in a competency based curriculum is that we have the means to assess trainees that shows progressive improvement in competencies.

Development Process for the Orthopaedic Curriculum

The 2012 version of the curriculum is the next stage of evolution of a document that will continue to change as it has since its inception.

Pre 2001

At this point the T&O curriculum documents were in the form of the BOA's "blue book", syllabus of Clinical Knowledge which has formed the foundation for the current Applied Clinical Knowledge syllabus. This was agreed after extensive consultations by the Education Committee of the BOA in partnership with the Specialist Associations. At this point, a number of experiments were already underway on the use of learning outcomes and development of learning agreements although very little had been produced in a coordinated form. Experimental developments in competence assessment had been undertaken as early as 1994 (Pitts, Ross 1994) and in the latter part of this period, following on from the Bristol enquiry, the JCST formed a Competence Working Party under the chairmanship of Professor Galasko.

2001 – 2006

The JCHST Competence Assessment Working Party met for a three year period under the chairmanship of Prof Galasko. Its recommendations were accepted in 2002.

The recommendations were that surgical competencies should include the following:

a) Generic or transferable

- Communication skills
- Teaching / learning skills
- Personal effectiveness
- Management skills

b) Clinical

- Knowledge of basic sciences
- Knowledge of theoretical clinical sciences
- Knowledge of clinical skills
- Decision-making
- Surgical skills
- Post-operative management
- Research

That all trainees should be assessed by means of a portfolio containing the following elements:

- Learning agreements, which should be drawn up by trainers and trainees, paying due deference to the experience of trainees and the facilities available from the training.
- A research portfolio which should follow the current JCST guidelines dealing with personal research, assessment of the research of others and evidence of audit.

- An operative log book, which should demonstrate learning through reflection on complications experienced.
- An accumulation of performance-based assessments derived from ward, clinic and operative exposure concentrating on the most common operations performed.
- A reflective diary of meetings attended and locally delivered educational events.
- A competency map linking the methods of delivery, assessment and curriculum content, to ensure no serious gaps.
- That a number of experiments should be encouraged in order to develop materials to support the portfolio process.

The Orthopaedic Competence Assessment Project (OCAP) was established in December 2002 through industrial sponsorship with the aim to "Improve the quality of Higher Surgical Training in orthopaedics through the introduction of a competency based portfolio of coaching and assessment tools". The project brought together materials (and expertise) already in various stages of development and implementation, assembling them as a coherent whole in order to further develop both the materials and the skills needed to use them effectively. The project team, working together with the British Orthopaedic Association and the T & O Specialist Advisory Committee, produced a competency based portfolio of educational tools which were then piloted and validated. This body of work has formed the basis of T&O higher surgical training from August 2005.

2006

An editorial group was convened by the Chair of the T&O SAC to draw together the work that had been done through both OCAP and the BOA to create a fit for purpose orthopaedic curriculum to be submitted for PMETB approval. This working group drew together material from a number of sources to create the 2006 document which formed a focus for considerable discussion, debate and refinement following its approval by PMETB.

2006-2010

The 2010 curriculum was produced in the light of practical experience and requirements, such as including an early years curriculum.

2011-2012

The T&O curriculum has been merged with ISCP so that all trainees are registered with ISCP and are expected to use the tools available.

Early years training and interaction with other specialties

Progression into higher specialist training in T&O requires trainees to complete Core Training in surgery and demonstrate acquisition of the competencies defined in the Core Training Curriculum. As with many specialties, there are several routes through core training – CT1/2 themed and generic programmes; run through ST1/2 (especially in Scotland) and academic clinical fellows (ACF). The clinical competencies for entry in ST3 are common to all routes. It must be emphasised that it is implicit that trainees in run through programmes (ST1/2 and ACF posts) must demonstrate their clinical competencies at a properly convened ARCP before they can progress to ST3 level.

The list below are examples of clinical problems that can be experienced by core trainees in a number of surgical specialties. Core trainees must use these opportunities to undertake and record appropriate WBAs to demonstrate competency.

- Trauma & Orthopaedics
- Trauma resuscitation
- Approach to multiple injury
- Approach to back pain
- Thromboprophylaxis in T & O
- Approach to the painful joint
- Assessment of the injured joint (knee/shoulder/wrist/hand/ankle)
- Management of open fracture
- Management of painful joint
- Management of painful back
- Cast for wrist fracture / below knee for ankle injury
- Removal of K wire
- Debridement traumatic/infected wound
- Closed reduction +/- k-wiring of a wrist fracture
- Reducing a trochanteric fracture on traction table
- Approach for application of a DHS.
- Approach to distal fibula for fracture.
- Application of a plate to distal fibula
- Application of DHS for inter-trochanteric fracture
- Simple fractures and dislocations
- Soft tissue injuries
- Ankle fractures
- Proximal femoral fractures in the elderly

Plastic Surgery

- The multidisciplinary assessment of management of tibial fractures involving skin loss
- Management of patients developing pressure ulcers

General Surgery

- Superficial sepsis, including necrotising infections
- Venous disease and ulceration
- Nutrition
- Assessment of the acute abdomen

Neurosurgery

- Breaking bad news
- Management of spinal cord compression or cauda equina syndrome
- Neurological assessment and initial resuscitation of patient with coma or impaired consciousness
- History and examination of a patient with spinal claudication
- Application of skull traction / burr hole / Insertion of intracranial pressure monitor

- Assessment and non-operative management of the burns patient
- Examination of the injured hand
- V-Y advancement / SSG / FTSG / excision & local flap / digital nerve block / primary repair of extensor tendon
- hand / primary repair of flexor tendon of hand / wound exploration & debridement

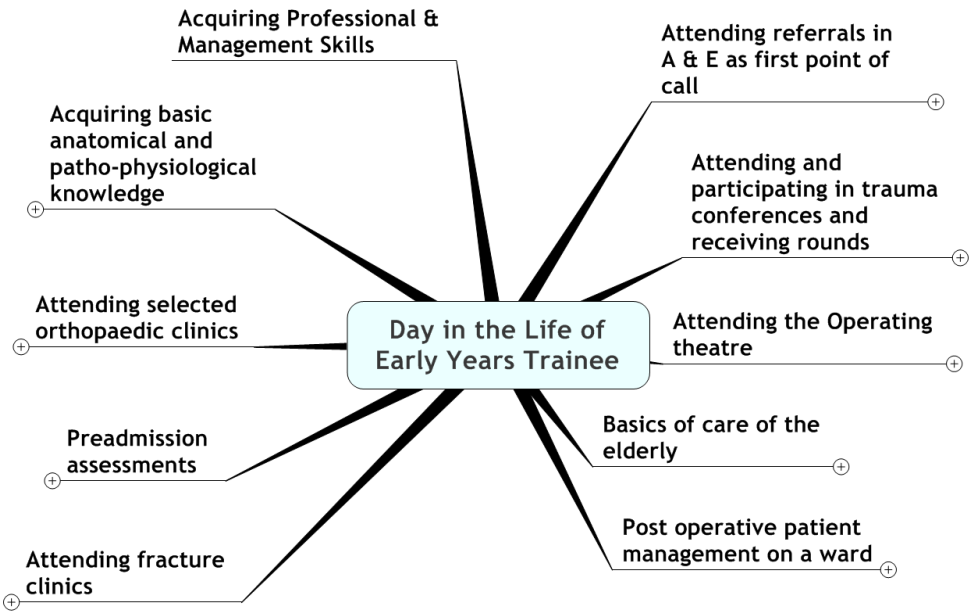
history, examination or resuscitation
- Assessment of patients with possible intra-abdominal injuries
- Treatment of benign lesions of skin and subcutaneous tissues
- Acute arterial insufficiency

T&O Entry requirements to ST3

Entry into core training is defined within the Core Training Curriculum. The person specification for application for ST3 posts in T&O specify a minimum of 10 months training in the specialty and define specific competencies for clinical skills. Core trainees who wish to enter T&O higher training should use the appropriate WBA tools found in this document to record competency in the operative skills required for ST3 entry.

This section of the curriculum also contains checklists for the trainee wishing to enter higher training in T&O. These checklists utilise information listed elsewhere in this curriculum in a format to help the trainee reflect on their actual experience in the various formats of early years training.

Features of jobs and experience to prepare for entry



Job Features	
Summary: A day in the life of an early years trainee	Care of the injured patient Orthopaedic emergencies Managing patients in an orthopaedic unit An introduction to elective orthopaedics
Attending referrals in ED as first point of call	Will be first on to take calls from ED Will be supported by a Consultant
Attending and participating in trauma conferences and receiving rounds	Presenting cases at trauma meetings and MDTs Contributing to the overall management of the patient Treating patients holistically and with dignity Using direct clinical contact to gain experience and competency
Attending the operating theatre	Organising a trauma list Liaising with theatre staff Liaising with radiographers Liaising with anaesthetists Assisting a senior in theatre Carrying out a range of procedures under supervision to include: Fixed angle screw plate for neck of femur fractures (required for ST3 entry) Fixing a simple ankle fracture (required for ST3 entry) Undertaking an Hemiarthroplasty for an intracapsular hip fracture (required for ST3 entry) Treating a distal radial fracture (required for ST3 entry) Other procedures deemed appropriate by the supervising consultant
Care of the elderly	Dehydration Electrolyte imbalance Common medical problems Arranging for ongoing care Rehabilitation team awareness
Post operative patient management on a ward	Fluid balance Post-operative pain management Surgical and medical complications DVT and pulmonary embolism
Attending fracture clinics	Management of closed fractures Managing complications Requesting appropriate help and advice Communication skills (verbal and written)
Preadmission assessments	Ensuring that patients are prepared for surgery Following hospital care pathways where defined Working with others in the MDT to ensure a successful patient journey
Attending selected orthopaedic clinics	Undertaking a full clinical assessment of orthopaedic conditions presenting to the clinic. Having the opportunity to present the cases to a consultant and discuss the management Complete WBAs that will demonstrate progression in the required competencies.
Acquiring basic science knowledge	Developing a knowledge of anatomy, physiology and pathology relevant to the treatment of T&O patients

Specific knowledge/skill requirements

This section defines in detail the knowledge and experience expected at ST3. It does not seek to define in any way the content of the selection process. It is possible to enter ST3 with gaps in knowledge or experience, this section tries to help trainees to define those gaps which will need to be filled in the early stages of ST3.

The knowledge level expected is indicated on the following four point scale:

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

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 T&O and medicine to view any patient's situation holistically. 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.

This is an example of what might be expected at different levels of training:

1. **Knows of?**

   What are the clinical features of a posterior dislocation of the shoulder and what investigations would you undertake?

2. **Knows basic concepts?**

   Describe the different types of posterior dislocation of the shoulder and comment in general terms about the treatment modalities.

3. **Knows generally?**

   Posterior instability and acute and chronic posterior dislocations are a spectrum of disease. Rehabilitation and surgical options may need to be used in the treatment; discuss the options in detail and derive an algorithm that is appropriate to follow.

4. **Knows specifically and broadly?**

   Arthroscopic and open surgical procedures may be appropriate in the treatment of patients with posterior instability and dislocations; discuss the evidence base for the treatment options. In a traumatic posterior dislocation of the shoulder different treatments are required dependent upon the lapse between the episode and when the patient presents for treatment; discuss the options and the likely outcome of the treatments.

The Applied Clinical Knowledge syllabus found on page 33 of this document defines the expected level of knowledge for each stage of training for T&O conditions.

The skills and procedures have 6 defined levels:

0 No experience expected

1 Has observed or knows of

2 Can manage with assistance

3 Can manage whole but may need assistance

4 Able to manage without assistance including potential common complications

5 Able to manage complex cases and their associated potential complications

This scale has been changed from previous versions of the curriculum. The required skills remain broadly the same as in previous versions of the curriculum. The Curriculum Development Group recognised a consistent and constant expansion of procedure descriptions in the eLogbook. Therefore, it was decided to omit a final level of detail 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 orthopaedic surgeon can be an expert in all areas of T&O. Similarly, trainees cannot be expected to attain the highest levels of competency for all the procedures covered in the Applied Clinical Skills syllabus. Therefore, the curriculum group has removed the "s" addition to level 4 as it appeared in the 2010 curriculum, but added a level 5 and modified the definitions for levels 4 and 5 to reflect that which is required for a trainee in the generality of T&O, as against that which will be required for training in an area of specialty interest.

Level 4 is defined as being able to manage without assistance including potential common complications. Level 5 defines a level where the surgeon can manage all levels of complexity of the procedure. The Applied Clinical Skills syllabus shows the levels expected at each stage of training.

OVERVIEW AND PRIORITIES FOR ENTRY INTO ST3

The detailed elements required in knowledge and application of knowledge should be reviewed in three areas which may be summarised as follows:-

Core training

In the first two years, trainees will focus on the competencies defined in the Core Training Curriculum. Each post approved for core training must be capable of facilitating the acquisition of the core competencies. It is essential that all trainees demonstrate their acquisition of knowledge and its application, by acquiring the Intercollegiate MRCS examination. Progression to ST3 is dependent on the completion of all requirements as defined in the person specification for entry into ST3 in T&O.

Basic trauma

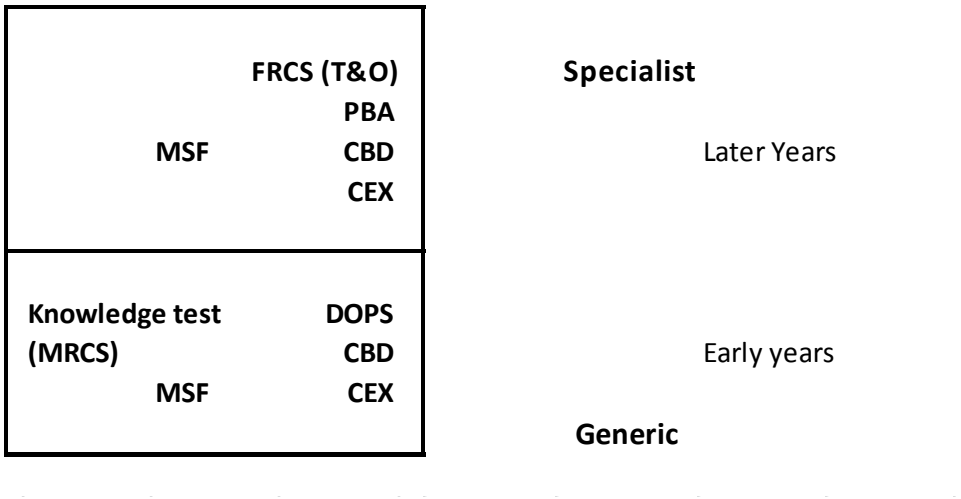
The main objective for T&O training at core level is the development of skills in the management of trauma. By the end of core training, trainees wishing to enter ST3 in T & O must show competence in the overall management of simple and common trauma episodes. They should also be part of the trauma team involved in the management of major and complex trauma. Specifically, they must be able to manage a limited range of techniques involved in treating fractures around the hip and simple internal fixations around the ankle or wrist. In terms of operative fixation, this small selection contains common technical problems. The techniques utilised to resolve them are representative of the types and levels of skills which give an indication of a trainee's fitness to proceed to ST3.

Broader trauma and elective experience

It is likely that core trainees will also encounter a wide range of elective and trauma experience over and above the basic requirements. It is important that such experience is used when available, reflected upon in the portfolio and supported by appropriate reading across the range of topics indicated in the curriculum.

ASSESSMENT EVIDENCE REQUIRED

The assessment strategy is illustrated below



Trainees at all levels should use a variety of assessment tools. There may be a different emphasis on the type and number of each at different levels of training. However, trainees must utilise a relevant tool to demonstrate competency across all aspects of their professional performance. In addition to those shown in the figure, all trainees must also initiate multi-source feedback at the points in their training defined by the GMC.

LEARNING AGREEMENTS

ISCP requires that all trainees complete learning agreements for each period of training and that the discussions are recorded in the portfolio. Trainees must be prepared to provide evidence of reflective practice.

WORKPLACE BASED ASSESSMENTS

Core trainees are expected to demonstrate their knowledge and clinical skills by the completion of workplace based assessments (WBA). Specific requirements are defined in the Core Training Curriculum. In order to be eligible for entry into higher training, core trainees must achieve the levels in specific clinical skills as defined in

the person specification for entry into ST3 in T&O. Core trainees should use the relevant WBA (PBA) for these competencies.

FORMAL KNOWLEDGE ASSESSMENT

Before the end of core training we will expect a trainee to demonstrate knowledge in the basic sciences relevant to surgery in general, anatomical knowledge of sufficient depth to facilitate training in T & O and specific pathophysiological and biomechanical knowledge relevant to musculoskeletal surgery.

Successful completion of the intercollegiate MRCS is **obligatory** for entry into ST3.

Overview of Curriculum

T&O surgery is a specialty, which encompasses the management of acute injuries and conditions and elective practice covering both congenital and acquired disorders of the bones, joints and their associated soft tissues, including ligaments, nerves and muscles.

Most consultants contribute to an emergency trauma service. The vast majority of surgeons also have a specialist elective interest in orthopaedic conditions often based on an anatomical region of the body including the following:

- Hip surgery
- Knee surgery (bony and soft tissue)
- Ankle and foot
- Upper limb (shoulder and elbow)
- Upper limb (hands)
- Spine
- Bone tumour surgery
- The surgery of childhood
- Rheumatoid surgery
- Complex trauma surgery

A minority of surgeons have very highly specialised practices in one of these areas and an increasing proportion do not take part in general trauma surgery.

The award of a Certificate of Completion of Training (CCT) occurs at the completion of training once the trainee has demonstrated a range of generic medical skills including team working and communication as well as evidence of competency in the generality of T&O surgery. All trainees are required to have successfully completed the intercollegiate specialty examination before they are awarded their CCT. By the time they acquire the CCT they may already have developed a special interest in one of the above areas.

RECRUITMENT INTO TRAUMA AND ORTHOPAEDICS

The recruitment process into ST3 is determined by the Lead Postgraduate Dean for T&O in consultation with the SAC in T&O. Variations in the process occur across the UK.

PROGRAMME OF TRAINING

Progress from core training to higher training in T&O is defined in the Core Training Curriculum. All trainees wishing to pursue higher training must have completed a minimum of 10 months of posts in T&O before completion of core training. ACF trainees will have 3 years of core training and must fulfil competencies for clinical training as well as research.

ASSESSMENT

Training progression is assessed by the ARCP process, based upon the evidence presented in the portfolio and mapped against the competencies defined in the curriculum. Successful completion of the summative assessments, the intercollegiate MRCS and FRCS (T&O), are required at the appropriate level in training.

A Certificate of Completion of Training (CCT) is awarded at the completion of training once the trainee has demonstrated their competency in the entire range of skills, knowledge and attitudes described in the curriculum and mapped to Good Medical Practice, including competence in the generality of T&O surgery. By

the time they acquire the CCT they may already have developed a specialty interest. Specialty interest training may occur either in the later years of the training period, usually ST8, or post-CCT. Specialty interest areas such as spinal surgery are increasingly expecting trainees to have completed a significant amount of post-CCT fellowship training before entering the consultant grade.

CURRICULUM PHASES

The curriculum for T&O training is modular, with the trainee rotating through a series of posts aimed at providing a comprehensive appreciation of the range of disorders likely to present in later professional life.

THE INITIAL PHASE (CORE TRAINING)

Core training consists of 2 years (3 years for ACF trainees) with an emphasis on training in surgery in general but with a significant amount of specific training in T&O (minimum 10 months with a recommendation that this be increased to a 12 months in 2014). Core trainees wishing to pursue a career in T&O are also encouraged to secure posts in other surgical specialties relevant to T&O, such as plastic surgery and neurosurgery. Further, core trainees wishing to enter T&O at ST3 level are encouraged to be involved in audit and research relevant to T&O.

ST3-6 TRAINING

This phase of training provides the fundamental basis to training in the generality of T&O. During this phase trainees will develop knowledge, skills, judgement and professionalism in all areas of T&O with an equal weighting being given to trauma and orthopaedics. Trainees must be allocated to posts in the major specialty interest areas – hand surgery, spinal surgery and children's T&O during this period. The trainees must gather evidence supporting their achievements, including WBAs, audit, research and attendance at courses and meetings. This phase represents 4 indicative years of training. An important outcome of this phase of training is the successful completion of the intercollegiate examination in T&O (FRCS (T&O)) which trainees are expected to sit early in ST7. Training Programme Directors should discourage trainees from undertaking the intercollegiate examination during ST3-6 as they are unlikely to be suitably prepared.

THE FINAL PHASE (ST7-8)

During this phase of training, trainees may have the opportunity of developing a specialty interest. However, in ST7-8 this will serve as an introduction to such an interest and the trainee must expect to continue developing their specialist skills in the initial post-CCT years, either by undertaking a specialist fellowship or by working closely with a senior colleague. For some trainees and indeed in some training programmes, specialty interest fellowship may not be possible until after acquisition of CCT.

The successful completion of the intercollegiate examination is required in this phase of training. A CCT will not be awarded without passing the examination.

Further, trainees must maintain their skills in the generality of trauma during ST7/8 so they can provide a general trauma service from day 1 on appointment as a consultant. The trainees must have an up-to-date ATLS provider certificate or an equivalent assessment.

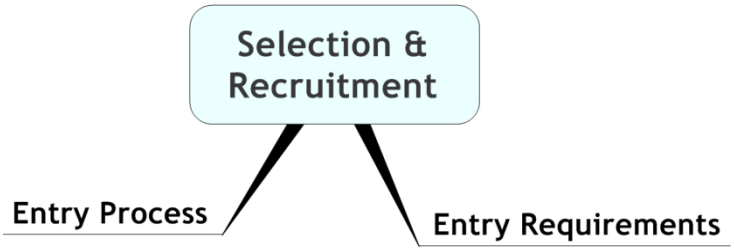
THE OUTCOME OF TRAINING

The acquisition of a CCT will define an individual who could work in a multi disciplinary team and an individual at this stage should seek active mentoring from a more experienced T&O surgeon.

A newly appointed consultant in T&O with CCT should be able to accept responsibility for the reception and initial management of the majority of unselected trauma cases and to be able to triage trauma admissions appropriately including the onward referral to more specialist trauma care. They will deal with the majority of these cases definitively. They may, in particular hospitals, be part of the trauma team dealing with the initial management of major and complex trauma, including the resuscitation of such patients using appropriate protocols.

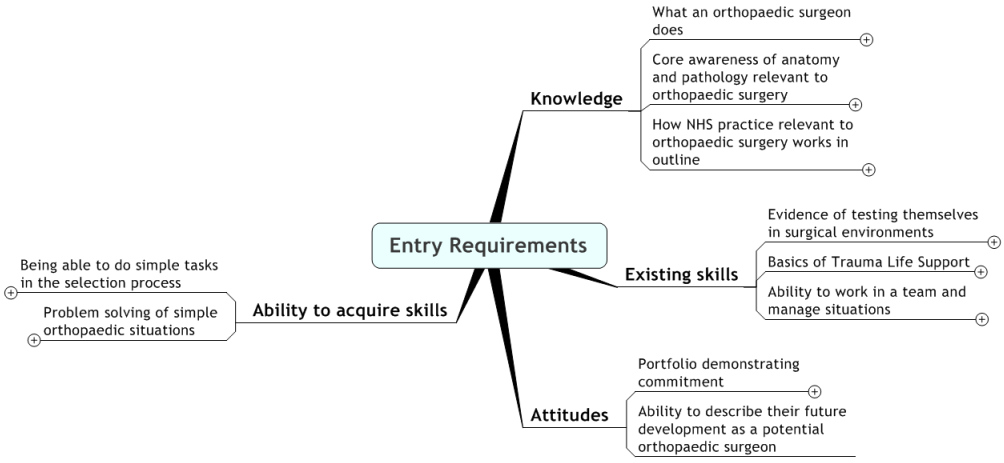
In the final phase of training, although the CCT holder may already have proven competencies in one or more of the specialty interest areas, further acquisition of knowledge, skills, judgement and professionalism in the area of interest will continue for the whole career. The CCT holder will continue to be assessed at consultant level through the revalidation process ensuring they are maintaining competency in all areas of patient care with which they are involved.

Selection and Recruitment



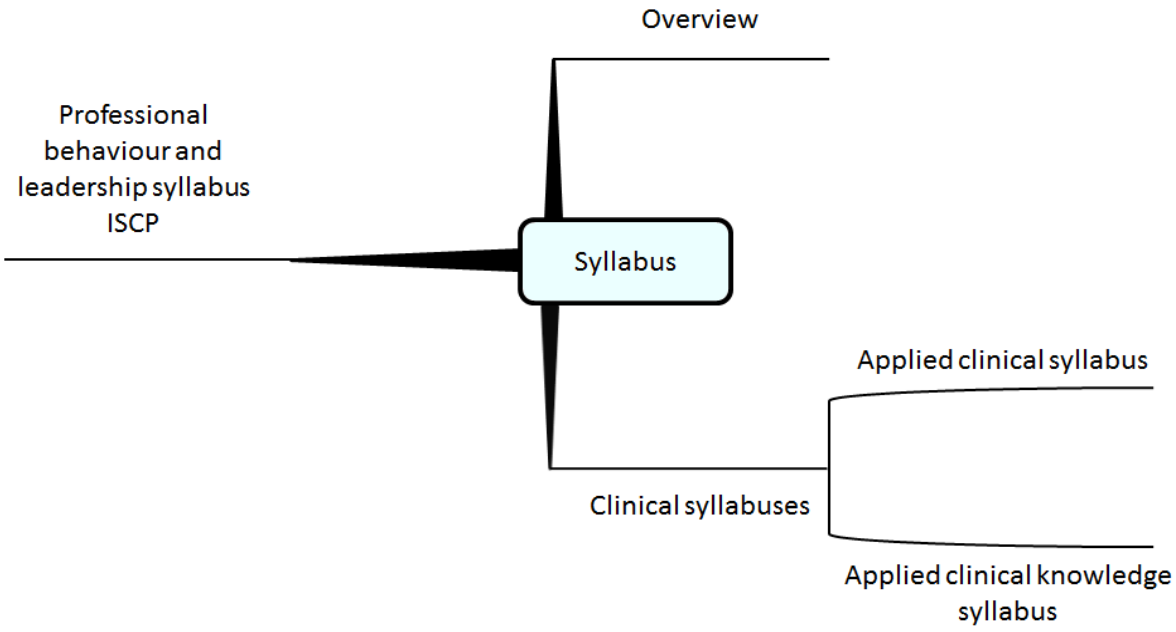
Selection into T&O is by a nationally agreed process under the management and organisation of the Lead Postgraduate Dean for T&O. There are variations in the process between the 4 home countries. In 2011 and 2012 recruitment was managed nationally but with local selection procedures based upon nationally agreed criteria. In 2013 both recruitment and selection will be national with trainees being ranked and given the opportunity to choose their Deanery of training based upon their ranking. Appropriate standard setting will be used to ensure that interviews are fairly undertaken.

ENTRY REQUIREMENTS FOR TRAINING AT ST3 LEVEL



It is important that the knowledge, skills, judgement and professionalism, acquired during core training, that are required to be able to train and then practice as an orthopaedic surgeon are identified and assessed as part of the selection process. The diagram above summarises desirable attributes in an individual wishing to train in T & O. The portfolio completed during core training will provide much of the evidence outlined in the diagram. It is also accepted that some individuals who wish to enter ST3 in T&O may have followed a route other than foundation and core training. Their applications are welcome and will be judged using the same criteria.

Syllabus

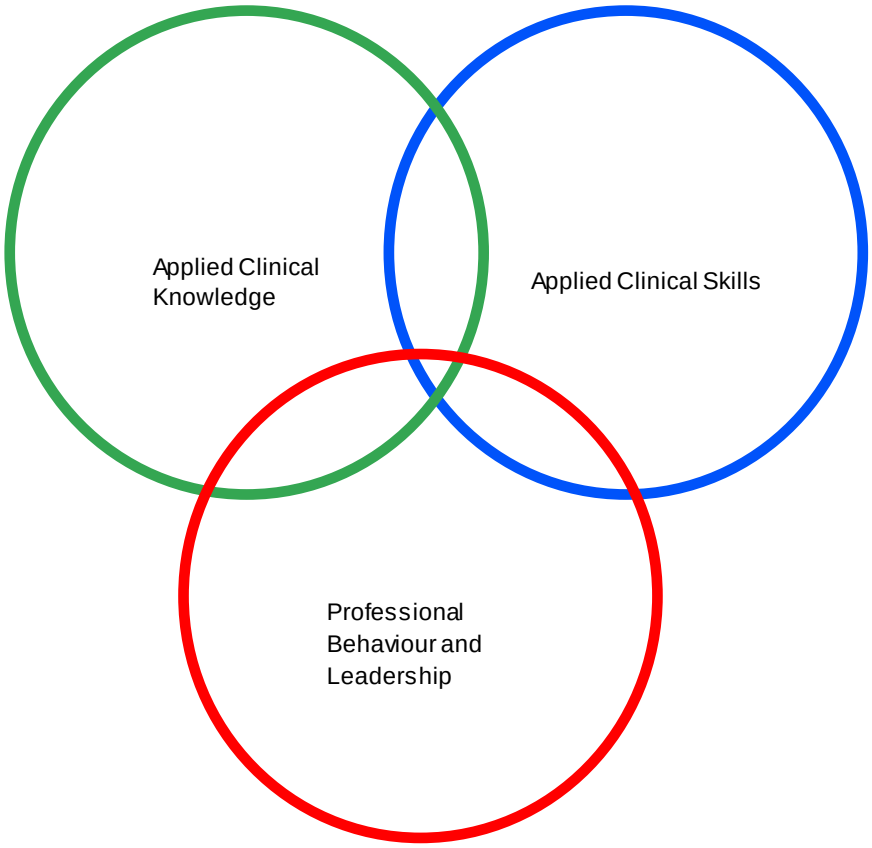


OVERVIEW

The syllabus specifically supporting T & O has three distinct elements which capture the skills, knowledge and attitudes (judgement and professionalism) required of a T & O surgeon practicing in a modern health service. All map back to Good Medical Practice, which then permits the whole content to be associated with assessment, making a complete curriculum which can be reviewed for scope and quality. The Professional Behaviour and Leadership Syllabus is part of ISCP and is common to all surgical specialties.

The three T & O components include:-

- Applied Clinical Knowledge: what the trainee needs to know at each level.
- Applied Clinical Skills, including core competencies which are applied in procedures which encompass the core of T & O surgical practice, and are tested in a selected group of key (or indicative) procedures.
- Professional Behaviour and Leadership.



These three elements are interdependent – for example being skilled manually but a poor communicator is no more acceptable than being indifferently skilled but a good communicator. All domains of the GMC Good Medical Practice are embodied in these elements.

APPLIED CLINICAL KNOWLEDGE

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.

The knowledge level expected is indicated on the following four point scale:

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

These are difficult terms to define precisely (see page 17 for an example of the levels of knowledge) 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. These skills are defined in the Professional Behaviour & Leadership Syllabus.

APPLIED CLINICAL SKILLS

In the early years of training trainees must acquire core technical skills expected of a surgeon in any discipline (e.g. suturing, soft tissue handling, sterile practice). Moreover, they must acquire the skills relevant to entering higher training in T&O as defined in the Core Training Curriculum and required in the person specification for selection into T&O.

A collection of core competencies have been identified through OCAP. These now form part of the Applied Clinical Skills syllabus (and form the basis for assessment through the primary WBAs).

The trainee must demonstrate the same competency and skill in all procedures they eventually perform as a consultant.

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

Assessment of competency in procedures is dealt with in depth on page 126 of this curriculum. In order to facilitate workplace based assessment (WBA) a number of key (indicative) procedures have been identified. These will be assessed in depth in the Procedure Based Assessment workplace assessment instrument described on page 129. It is essential to realise that these key procedures do not encompass the whole practice of the discipline but do indicate the whole range of skills to be acquired by a competent T & O surgeon. Assessment (PBA) in the key procedures gives evidence as to the quality of a trainee's performance, their overall competence is assessed from this evidence set in the context of their entire logbook (quantity) of procedures. Trainees must make every effort (with the support of their local programme) to experience the scope of the whole procedures list in as much depth as is practicably possible. Trainees and trainers should aspire to a level of mastery and not just core competence.

: The skills and procedures have 6 defined levels:

0 **No experience expected**

1 **Has observed or knows of**

2 **Can manage with assistance**

3 **Can manage whole but may need assistance**

4 **Able to manage without assistance including common potential complications**

5 **Able to manage complex cases and their associated potential complications**

The "0" level has been included as is applicable to core trainees only. All key procedures assessed by primary PBAs must be mastered to level 4 and the remainder at a level as indicated in the syllabus depending upon the level of training and specialisation.

PROFESSIONAL BEHAVIOUR & LEADERSHIP SYLLABUS

This syllabus can be found as a generic syllabus on ISCP for all surgical specialties.

This syllabus / section incorporates clinical skills alongside general aspects of behaviour as a high grade professional. The two are deliberately integrated to reflect their essential and inseparable nature in day to day practice. They map to Good Medical Practice and the Academy of Medical Royal Colleges' Leadership syllabus. It cannot be over emphasized how important it is for a T & O surgeon to behave in an all round manner which is nothing less than exemplary at all times.

THE SYLLABUS AT CRITICAL WAYPOINTS

Although training and education in the full scope of the curriculum are progressive and seamless there are convenient waypoints within key stages. At these waypoints the trainee's progress through the syllabus may be helpfully reviewed.

The first waypoint occurs after what is termed "core training". Here, trainees and trainers must be certain that career choice is correct and ability matches aspiration. The generality of surgical knowledge must be mastered and basic skills acquired. Once a higher training post has been secured at the end of this period, the trainee must be comfortable that they have both the motivation and the ability to succeed.

The second waypoint is towards the end of training, after the middle years period, when the generality of the discipline will have been covered and competencies demonstrated. The nature of training in the middle years will be modular and vary in style depending on the nature of local training programmes, which are bound together by the standards set out in this curriculum. Towards the end of this period, or at the start of the next, a public demonstration of the acquisition of the skills, knowledge and attitudes expected of a T & O surgeon practicing in the generality of the discipline, at the level of an NHS consultant, must take place in the form of the intercollegiate fellowship examination T&O. Together with a portfolio of evidence of workplace based competency, this will permit the trainee to enter the final stages described below.

In the last part of training, the acquired competencies will be honed into capability through gaining broader experience in the discipline and specific experience in a developing specialist interest converting a competent trainee into a capable and flexible surgeon.

STANDARDS AND VALUES

Mastery

The standards in the three core elements we have described must not be set at the lowest common denominator as "competent". The culture of training programmes and aim of trainees must aspire to "mastery", especially as specialist interests are honed. Mastery requires a continuing self reflection and drive by trainer and trainee alike to achieve the most from assessment and feedback. Self and peer assessment by trainees, followed by constructive feedback from trainers who develop "adult – adult" learning relationships with their trainees will ensure that training programmes "aim high".

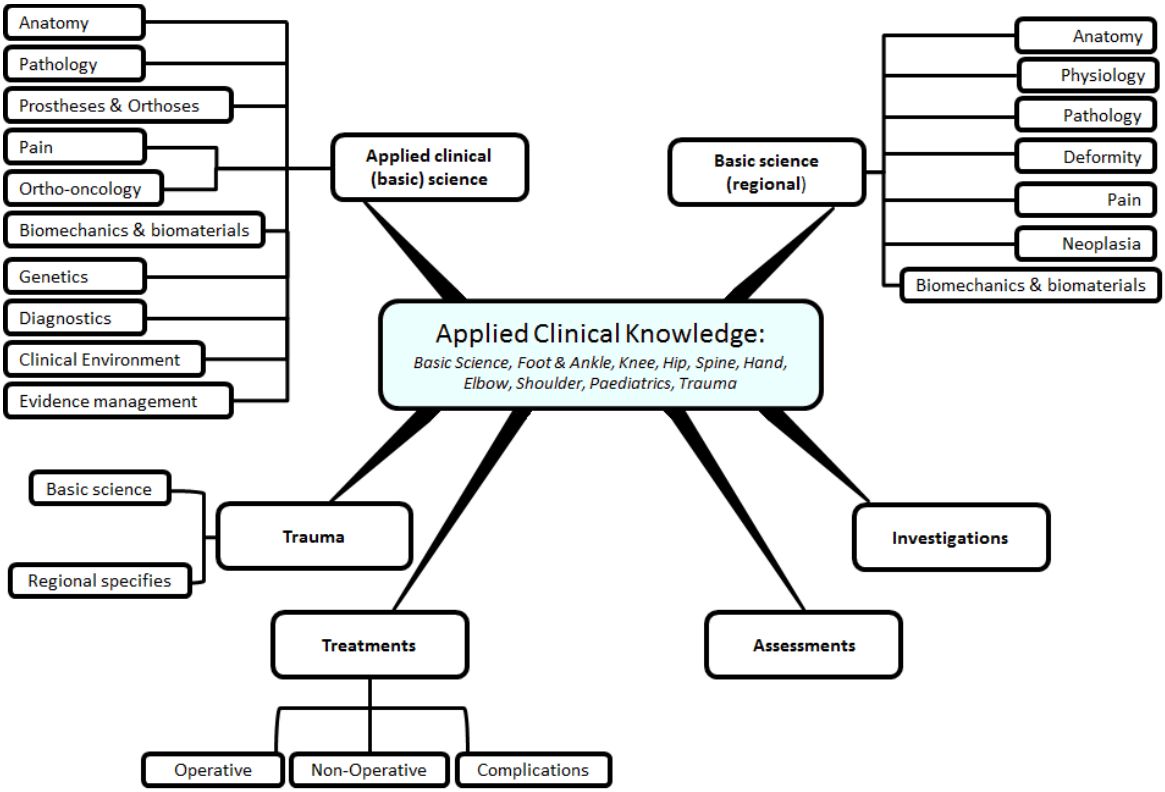
Transparency

This syllabus is available to all stakeholders and hopefully presents a clear narrative – there are no separate documents or agenda. To monitor progress, training programme directors will have more information about individual trainees but in general we wish to foster a culture of openness and transparency, whilst respecting personal privacy.

Partnership

The curriculum lays out relationships of the key stakeholders around the premise that the trainee is responsible for their own learning. A mature partnership with assigned trainers and training programme directors is expected and the record of achievement will be explicit.

APPLIED CLINICAL KNOWLEDGE SYLLABUS (TRAUMA & ORTHOPAEDICS)



The Applied Clinical Knowledge syllabus (ACK) in the 2006 and 2010 curricula was based on the original BOA syllabus produced in the 1990s. This syllabus had been written by a series of committees and, as a result the structure of each individual area varied slightly and contained substantial duplication. In the new syllabus we have brought all sections to a common structure and removed, as far as is possible, any duplications. Nothing has been removed from the 2010 syllabus, only reformatted. The process has been a careful and detailed one involving both expert individuals and an expert group. The content of the original syllabus was examined, closely following which a common structure was designed and thoroughly debated by the expert group. All items from the old syllabus were then migrated to the new structure to ensure that nothing was lost. This material was then edited to achieve a concise, uniform format of both content and expression. Each stage of this process was thoroughly debated by an expert group whose members are listed as the authors of this document. Where appropriate, advice was sought from others representing specialty interest groups to confirm the original group's decisions.

Note: The 2007 and 2010 editions of the T&O curriculum defined a level "4s": level of knowledge required for a specialty interest, over and above level 4 knowledge required for the generality of T&O. In this iteration all the levels have been re-mapped by an expert group and reflect the level of knowledge required for each level of training.

An addition for this version of the curriculum is the inclusion of a "critical conditions" section. A critical condition is defined as "any condition where a misdiagnosis can be associated with devastating consequences for life or limb".

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. There is some content that all T&O surgeons must know well and these are delineated in this (ACK) syllabus. 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.

A trainee must be able to apply the knowledge outlined in this syllabus in the relevant clinical situations. They must be able to demonstrate their competence and justify any action or decision. This syllabus defines the level of knowledge a trainee must achieve at the various stages of their training. These levels are illustrated below by a question that may be asked on a particular topic by an assessor:

1. Knows of?

What are the clinical features of a posterior dislocation of the shoulder and what investigations would you undertake?

2. Knows basic concepts?

Describe the different types of posterior dislocation of the shoulder and comment in general terms about the treatment modalities.

3. Knows generally?

Posterior instability and acute and chronic posterior dislocations are a spectrum of disease. Rehabilitation and surgical options may need to be used in the treatment; discuss the options in detail and derive an algorithm that is appropriate to follow.

4. Knows specifically and broadly?

Arthroscopic and open surgical procedures may be appropriate in the treatment of patients with posterior instability and dislocations; discuss the evidence base for the treatment options. In a traumatic posterior dislocation of the shoulder, different treatments are required, dependent upon the lapse between the episode and when the patient presents for treatment; discuss the options and the likely outcome of the treatments.

Applied Clinical Knowledge Syllabus (T&O)

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.

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	3	4	4
Metabolism and hormonal regulation	3	4	4
Metabolic and immunological response to trauma	3	4	4
Blood loss in trauma/surgery, fluid balance and blood transfusion	3	4	4
Osteoarthritis	3	4	4
Osteoporosis	3	4	4
Metabolic bone disease	3	4	4
Rheumatoid arthritis and other arthropathies (inflammatory, crystal, etc)	3	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
Osteochondritides	1	4	4

Heterotopic ossification	1	4	4
Infection of bone, joint, soft tissue, including tuberculosis , and their prophylaxis	2	4	4
Prosthetic infection	2	4	4
Surgery in high risk and immuno- compromised patients	3	4	4
Prostheses and Orthoses			
Principles of design	1	4	4
Prescription and fitting of standard prostheses	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:	2	3	3
Pain and pain relief	3	4	4
Behavioural dysfunction and somatization	1	3	3
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 sarcomas	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 genetics to orthopaedic disease and treatment	1	4	4
Molecular genetics 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	3	4
Diagnostics			
Musculoskeletal imaging: x-ray, contrast studies, CT, MR, ultrasound, radioisotope studies	3	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	3	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
Medical Ethics			
Duty of care	4	4	4
Informed consent	4	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	2	4	4
Audit	2	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 Weber B 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	3	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
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	3	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	3	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 and therapeutic injections	2	4	4
Examination under anaesthetic and arthroscopy	2	4	4
Neurophysiology in knee disorders	1	4	4
Critical Conditions			
Neurovascular injuries	3	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
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
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
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, osteoplasty 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	1	3	4
Physiology			
Physiology of nerve function affecting the spinal cord and emerging nerves	2	4	4
Spinal shock and associated secondary problems	2	4	4
Pathology			
The aging spine and degenerative disease	2	4	4
Acute and chronic infections of the spine	1	4	4
Metabolic conditions affecting the spine	2	4	4
Neurological conditions affecting the spine			
Deformity			
Congenital and acquired conditions causing deformity around the spine e.g. scoliosis and kyphosis	1	4	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 cervical and lumbar spine	1	3	4
Spinal instability as applied to trauma, tumour, infection and spondylolysis/listhesis	1	3	4
Spinal deformity	1	3	4
Spinal instrumentation and internal fixation devices	1	3	4
Use of spinal bracing	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
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	3	4
Metastatic spinal cord compression	2	4	4
The painful spine in the child	1	3	4
Assessments			

SPINE			
History and examination of the painful and injured spine including special clinical tests	3	4	4
Examinations of conditions causing referred symptoms to the spine (e.g. renal pain)	3	4	4
Recognition of somatisation	2	4	4
Assessment of patients after failed spinal surgery for deformity and reconstruction for non-degenerative disease	1	3	4
Treatments			
Operative			
Indications, options and complications for compressive conditions	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
Non operative			
Non-operative treatment of disorders ,such as low back pain, sciatica	1	4	4
Management of spinal fractures e.g. osteoporotic fractures	1	4	4
Principles of interventional radiology in the management of spinal problems	1	4	4
Initial and ward care of the paralysed patient	1	4	5
Complications			
Management of failed spinal surgery	1	3	4
Management of consequences of delayed surgery	2	4	4

HAND			
Basic Science (Regional)			
Anatomy			
Anatomy of the wrist and hand region and related structures	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
Deformity			
Acquired and developmental deformity around the hand and wrist	1	3	4
Pain			
The painful hand and wrist	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
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
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
Complications			
Failed arthroplasty and soft tissue surgery	1	3	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	3	4	4
Instability around the elbow	1	3	4
Inflammatory, degenerative and infective conditions of the elbow	3	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 orders	1	4	4
Assessments			
History and examination of the elbow including special clinical tests	3	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
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
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
Approaches for hip fractures	3	4	4
Approaches for Weber B ankle fractures	3	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
Assessments			
Initial clinical assessment of the injured patient	4	4	4
Priorities of treatment and identification of life/limb-threatening injuries	2	4	4
Treatments			
The trauma team	3	4	4

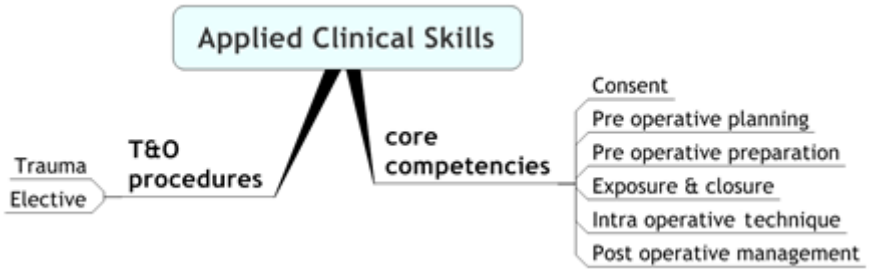
Operative			
Fracture management (closed, open and pathological)	3	4	4
Soft tissue management	3	4	4
Amputation	2	4	4
Non operative			
Non-operative management of fractures	3	4	4
Rehabilitation of the injured patient	3	4	4
Complications			

TRAUMA			
Reconstructive surgery in non-unions/mal-unions	2	4	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	4	4
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	4	4
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 and digital injuries	2	4	4
The mangled hand	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
Weber B ankle fractures	3	4	4
Foot			
Hindfoot injuries	2	4	4
Midfoot injuries	2	4	4
Forefoot injuries	2	4	4

TRAUMA			
The crushed foot	2	4	4
Peri-prosthetic fractures			
Management of fractures around prostheses and implants	2	4	4

PAEDIATRIC ORTHOPAEDIC SURGERY			
Basic Science			
Anatomy			
Growth of bones, physeal anatomy and its application to fracture types and 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
Neurological processes involved in the production of deformity e.g. spina bifida, cerebral palsy and muscular dystrophy	1	3	4
Clinical Assessment			
History and examination of the child	2	4	4
Involving the parents in the assessment	2	4	4
Assessing the disabled child	1	3	4
Investigations			
Indications for plain x-ray, arthrogram, CT, MRI and the how to interpret the images	2	4	4
Indications for the use of ultrasound and nuclear imaging	2	4	4
Limitations of investigations in paediatric practice	1	3	4
Critical Conditions			
The painful hip			
Treatment			
Operative			
Fractures (including non-accidental injury) and growth plate injuries and their sequelae	2	4	4
Bone and joint infection	2	4	4
Common childhood orthopaedic conditions, e.g. irritable hip, anterior knee pain	2	4	4
Slipped epiphysis	1	4	4
Perthes' disease	1	3	4
Developmental dysplasia of the hip	1	4	4
Talipes	1	4	4
Scoliosis	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
Non-operative			
The treatment of normal variants such knock knees, flat feet, femoral anteversion	1	3	4
Orthoses	1	3	4
Rehabilitation of the child	1	3	4
Determining physical disability	1	3	4
Screening for congenital abnormalities	1	3	4

Applied Clinical Skills



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 preoperatively 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.

The list of procedures correlates with the elogbook structure, which facilitate the electronic monitoring of the trainee's developing experience.

CORE COMPETENCIES – Domains of the Primary PBAs

I Consent

- Demonstrates sound knowledge of indications and contraindications including alternatives to surgery
- Demonstrates awareness of sequelae of operative or non operative management
- Demonstrates sound knowledge of complications of surgery
- Explains the perioperative process to the patient and/or relatives or carers and checks understanding
- Explains likely outcome and time to recovery and checks understanding

II Pre operative planning

- Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies/techniques to deal with these e.g. nutritional status
- Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays
- Checks materials, equipment and device requirements with operating room staff
- Ensures the operation site is marked where applicable
- Checks patient records, personally reviews investigations

III Pre operative preparation

- Checks in theatre that consent has been obtained
- Gives effective briefing to theatre team
- Ensures proper and safe positioning of the patient on the operating table
- Demonstrates careful skin preparation
- Demonstrates careful draping of the patient's operative field
- Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)
- Ensures appropriate drugs administered
- Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively

IV Exposure and closure

- Demonstrates knowledge of optimum skin incision / portal / access
- Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly
- Completes a sound wound repair where appropriate
- Protects the wound with dressings, splints and drains where appropriate

V Intra operative Technique

- Follows an agreed, logical sequence or protocol for the procedure
- Consistently handles tissue well with minimal damage
- Controls bleeding promptly by an appropriate method
- Demonstrates a sound technique of knots and sutures/staples
- Uses instruments appropriately and safely
- Proceeds at appropriate pace with economy of movement
- Anticipates and responds appropriately to variation e.g. anatomy
- Deals calmly and effectively with unexpected events/complications
- Uses assistant(s) to the best advantage at all times
- Communicates clearly and consistently with the scrub team
- Communicates clearly and consistently with the anaesthetist

VI Post operative management

- Ensures the patient is transferred safely from the operating table to bed
- Constructs a clear operation note
- Records clear and appropriate post operative instructions
- Deals with specimens. Labels and orientates specimens appropriately

VII Feedback and reflection

- The trainer will provide constructive feedback.
- The trainee will record his or her reflections on the procedure.

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.

Each change has been carefully examined and thoroughly debated by both the Curriculum Development Group and individual specialists in order to ensure that nothing has been lost in making this section of the curriculum fit for purpose. The new syllabus section is intended to replace the previous section found on pages 8-17 to 8-27 of the 2010 Curriculum and pages 4-25 to 4-32 of the 2007 Curriculum.

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, the curriculum group has removed the “s” addition to level 4 as it appeared in the 2010 curriculum but added a level 5 and modified the definitions for levels 4 and 5 to reflect that which is required for a trainee in the generality of T&O as against that which will be required for training 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. Level 5 (previously 4s) defines a level at which the surgeon can manage all levels of complexity of the procedure and associated complications.

Applied Clinical Skills Mapped to Simulation Options

To improve patient safety, many surgical/procedural, clinical and communication skills can be practiced in a simulated environment. This will also shorten the learning curve for trainees and allow them to focus their learning on their specific needs.

We aspire to provide equality of access to all trainees for opportunities in simulation, but recognise that cost and availability of some high tech facilities may limit access locally. There will be scope for a range of simulations from low to high fidelity and low to high technology. Many of these will be available locally but some will be provided at national or regional centres. This will help to provide uniformity of standards across Trauma & Orthopaedics (T&O) in the UK – deliverable and affordable for all trainees.

The mapping of particular types of simulation against the requirement of the curriculum is an on-going process and will evolve over the next three years. We have focused on integrating simulation into day to day training in surgical practice. Through our bespoke two day Training Orthopaedic Trainers (TOTs) programme we have started to teach T&O trainers simple and accessible simulation techniques to use with their trainees.

Simulation refers to any reproduction or approximation of a real event, process or set of conditions or problems for the purposes of learning or assessment. It allows trainees to focus on developing skills without the fear of making a mistake or harming a patient. Facilities of variable levels of sophistication are available, both permanently in “skills centres” and through regular course provision.

Trauma and orthopaedics has a long and established track record in the area of simulation and simulated tasks. Whilst the Training Standards Committee is ready to embrace technology enhanced learning, our priority must be the expert supervision of trainees and appropriate preparation of trainers. We have endeavoured to explore aspects of simulation, which can be easily and inexpensively accessed by T&O trainers and trainees throughout the country. Ideally, facilities should be available close to the clinical area, with expert supervision/feedback available, and accessed in a flexible way around patient workload.

The key for T&O is the preparation of both trainees and trainers. We have created a suite of courses including “Training Orthopaedic Trainers” (TOTs), “Training Orthopaedic Educational Supervisors” (TOES) and “Training Orthopaedic Clinical Supervisors” (TOCS), which have integrated concepts of simulation at various levels. Feedback and performance debriefing lie at the heart of simulation based training. T&O as a specialty is committed to getting this aspect of teaching and learning right.

BACKGROUND

Kneebone et al (2010) have developed the concept of Distributed Simulation (DS), with the underlying philosophy to provide simulation facilities that are "good enough" to engage participants and achieve learning goals, yet are low cost, accessible and can be set up in a variety of clinical or non-clinical locations.

The framework for technology enhanced learning (DOH 2011) identified six key principles recommending that technology integrated into the curriculum should:

1. Be patient centred and service driven

2. Be educationally coherent

3. Be innovative and evidence based

4. Deliver high quality educational outcomes

5. Deliver value for money

6. Ensure equity of access and quality of provision.

Technology refers to the use of "information technology" such as computers, handheld devices, simulators and simulation facilities for individual, group, multidisciplinary and interprofessional use.

Recognising the difficulties associated with mapping the entire curriculum to simulation and acknowledging the sparse evidence base for orthopaedic simulation, the TSC has developed some general recommendations targeting generic/transferable skills for trainees in the first few years of training. The early years probably derive the greatest benefit from simulation but we suggest use in later years for focused training. Once we gather data from on going educational research world wide, we will be in a better position to formulate a more detailed simulation curriculum.

Below you will find suggested opportunities for integration of simulation into every day surgical activity

SIMULATION OPPORTUNITIES

On Site Equipment Assembly (equ)

For rarer procedures where the trainee is expected to take a low level of

responsibility, they should be able to gather and assemble the appropriate equipment e.g. application of halo traction or application of a pelvic external fixator.

Low Tech/Cost Options

T&O trainees have to be able to practice surgical skills in a safe environment. Novel, accessible and cheap simulation models/trainers, using recycled and reusable items, will help trainees to fully integrate simulation into learning and achieve the deliberate practice and distributed simulation to accomplish automaticity.

Examples

Drainage of an abscess, bursa or removal of a ganglion or tumour and wound debridement.

Fill the end of a latex glove with 2 – 3 ml of toothpaste and tie off to create simulated pus. Insert to balloon underneath the skin of a chicken breast/thigh/wing. The trainee can then make an incision over the abscess, cyst or ganglion and must excise it without bursting. If it does burst, they must debride the wound.

Injecting mock purulent material under the chicken breast skin can replicate the classic palpable fluctuance and ultrasound findings of an actual abscess, and it can be surgically incised and drained in a similar fashion.

Removal of malignant tumour

Insert a balloon into the muscle mass of a chicken breast. The trainee must excise the balloon with appropriate margins. No part of the glove should be visible after excision.

To simulate a foreign body the balloon can be substituted with a pebble.

Scarf Osteotomy for Hallux Valgus

Take a peeled banana and plastic knife (available in the canteen) and make the scarf osteotomy cuts. Rotate the two pieces of banana to simulate straightening of the metatarsal. Use two cocktails sticks to pin the newly straightened banana in place and cut off protruding edges of the “bone” (banana).

Arterial and Nerve Repair

Place a cut piece of string under an operating microscope, and use fine suture to repair.

Tendon Repair, Decompression, Lengthening and Transfer

Pig's trotters offer realistic and good quality tendons on which to practice. They are readily and cheaply available.

Cementing Techniques

To be practiced using cement and a large barrelled syringe.

Debriding a Wound

A simulated wound covered with thick slough can be created on a pig trotter by excising an area of skin and then applying a layer of hydrocolloid paste (e.g. ADAPTTM, Hollister) on the denuded area. A layer of toothpaste may then be applied and covered with a piece of cling film to simulate the application of EMLA cream. A small curette is then used to debride the wound as in a human patient, after washing away the layer of toothpaste (=topical anaesthetic).

Use an orange to simulate debridement the trainee is required to remove the peel and the white fibres (representing slough) off the orange without puncturing the inner orange itself.

Peer/Simulated Patient Skills Practice (PSP)

Some institutions have invested in the selection and training of simulated patients (SP). Whilst the educational value of such encounters with SP has been reported, they can be expensive and of limited availability. However, getting real patients to teaching meetings is a popular method and simulates an out-patients appointment. It provides an excellent opportunity to refine history and examination skills, and teaches skills in the management of the patient.

When trainees practice skills on each other, they have the unique opportunity of accessing insights into the patient experience. Application of casts and subsequent removal will help trainees to truly understand how hot a POP can become during the setting process and how threatening an oscillating saw can appear. Careful health and safety measures must be considered.

Trainees below practicing reduction of a Colles fracture taking the roles of surgeon, nurse and patient.

Example of a patient with back pain

One trainee/trainer to play the part of a patient with a large set of notes and chronic back pain for which no cause can be found, the other to assume the role of the surgeon in clinic. To explore options for handling breaking bad news:

1. I am really sorry but you have a condition for which medical science has no answer at present.
2. Your symptoms may worsen or improve over time - and if you still have symptoms in 2 years time we may have some answers.
3. Is your condition bad enough to warrant an operation?
4. Are your symptoms the same as you had on the other side? (in bilateral problems)
5. Can you put a % figure on how much better you are after your surgery/treatment?
6. For CRPS patients (who have a diagnosis). You have a poorly understood problem for which there is little that we can do apart from physiotherapy. After any trauma you get swelling, pain and stiffness of your joints. CRPS patient suffer from those symptoms much more and for much longer but by 2 years most of them will abate .

These high impact simulations can be conducted whilst waiting for a delayed patient in theatre, during the lunch break in clinic or indeed any other variable period of downtime.

Bone Models (bon)

Bone models can range from expensive commercially produced synthetic bone to wooden blocks or cardboard tubes fashioned to represent bone. Some bone models would be classed as low tech/cost simulators, others are only available commercially.

Models are available but are more costly than taking two pieces of wood and gluing them together at angles to simulate a mal-union.

Cadaveric Surgery (cad)

Approach and bone fixation can be two elements of same procedure. Whilst models can simulate the bone element, fresh frozen or soft fix cadavers provide an excellent opportunity to teach soft tissue approaches. Sharing cadavers between multiple disciplines can help with cost containment.

Grouping Simulations

Some procedures comprise similar skills e.g. evacuation of haematoma, incision and drainage of abscess and excision of cyst, so simulation of each individual procedure may not be necessary. Also, many fracture fixations require similar skills, and simulation for every type may not be necessary.

Paediatrics

Obviously there are no appropriate cadaveric opportunities but the following are available:

1. Radius and ulna fracture – dry bones
2. Elbow fractures
    i. supracondylar fracture dry bones with foam covering
    ii. lateral condyle - dry bones
    iii. medial epicondyle - dry bones
3. Humeral shaft and shoulder - dry bones
4. Femoral neck shaft and distal femur – simulated periosteum covered dry bone and transparent for elastic nails
5. Tibia-dry bones for fracture fixation and osteotomy
6. Ankle for tri-plane and other complex fractures
7. Elective orthopaedics – there is a well-developed practical for corrective osteotomy in cerebral palsy and a suitable bone for pelvic osteotomy.

The surgical approaches are largely the same ones as in adult orthopaedics so trainees need to learn to do them carefully on small people. The unfamiliar approaches (mainly anterior to the hip) can be learned on an adult cadaver.

Generally the purpose of an attachment in paediatric orthopaedics is to develop knowledge, attitudes and experience in respect of children. Trainees always do less operating in paediatric orthopaedics because paediatric orthopaedic surgeons do less operating and more clinics, plastering and injections.

Courses

A number of courses are available which include several opportunities for practicing skills in the simulated environment e.g.

1) Basic fracture fixation
    i) Left: learning about theatre set up using modified Playmobil
    ii) Right: positioning the patient safely on the operating table using Action Man

2) Basic arthroplasty
3) Basic surgical skills
4) Specialist courses including spine, hand and wrist, shoulder and elbow, foot and ankle, pelvic and acetabular, paediatric, and fragility fractures.

Trainees and trainers should give priority to courses based on educationally sound principles rather than driven commercially. They might also consider some of the programmes which are higher risk and rarer in terms of operative opportunities e.g. spine and paediatrics. Some if these will provide the best return on investment.

Other Technology Enhanced Learning

Virtual Learning Environment (VLE)

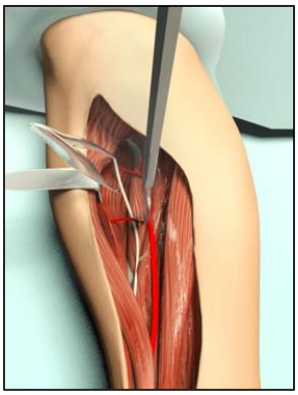
A wide variety of V L E or “Learning Management Systems” are

available. Regardless of which system is used, it should facilitate student registration, deliver course materials, communicate, test and track, as well as being relevant and logically organised.

The barriers and facilitators to the use of the V L E can be divided into two groups; issues that concern technical problems (including limited computer skills, limited access or lack of training) and issues around poor peer participation or lack of commitment. The most important facilitators to use of any VLE are flexibility, feedback and its perceived usefulness or relevance.

Touch Surgery

Touch Surgery is a mobile digital platform that outlines T&O procedures trainees to learn operative steps and be subsequently tested on the move, before and after surgery. It allows trainees to "carry out" operations step by step on their mobile touch screen device such as iPhones and iPads. It is accessible and completely free to the end user.



http://www.touch-surgery.com

Assessment

All these simulation techniques can be captured using the T&O workplace based assessment (WBA) tools in current use. We have successfully used DOPs, CbD and CEX to record formative assessments/supervised learning events in trainee portfolios. This has had the added value of reinforcing the use of WBAs and bridging the theory/practice divide.

See below trainers and trainees completing assessments on tablets and phones after fixing fractures on bone models.

AUDIT

The Training Standards Committee will plan an audit of access over the next three years. Accessibility to simulation opportunities for all trainees will be tracked, including appropriate time with trainers for exchange of feedback. Data will be sourced through:

- Questionnaires via the training programme director network.
- Analysis of WBA activity via ISCP.

Once data has been analysed, results will be used to inform the next review of the T&O curriculum and to develop aspirational aspects into essential elements.

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	**5 = Able to manage complex cases and their associated potential complications**

Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for years for focused training (from October 2013)

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma General				
Compartment syndrome				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Fasciotomy for compartment syndrome	1	4	5	
Measurement of compartment pressures	1	4	5	
Correction of malunion or other deformity	0	4	5	
Evacuation of haematoma	2	5	5	
Excision / ablation of ingrowing nail	1	5	5	
Iliac crest bone graft harvesting	2	5	5	
Infection				
Incision and drainage of abscess	3	5	5	
Irrigation and debridement native joint for infection	1	4	5	
Metalware and frames				
Application of external fixator (not spanning or Ilizarov)	0	4	5	
Application of Ilizarov frame	0	3	5	
Application of skeletal traction	1	5	5	
Application of spanning external fixator	0	4	5	
Removal external fixator or frame	2	5	5	
Removal K wires or skeletal traction	2	5	5	
Removal metal	2	4	5	
Neurovascular injuries				
Arterial repair +/- graft	0	1	5	
Nerve repair	0	3	5	
Open reduction and fixation of periprosthetic fracture	0	3	5	
ORIF osteochondral fragment in joint	0	3	5	
Removal foreign body from skin / subcutaneous tissue	2	5	5	
Tendon repair	1	4	5	
Wound management				
Free flap	0	1	1	
Full thickness skin graft	0	3	5	
Muscle flap	0	1	1	
Pedicle flap	0	1	1	
Split skin graft	0	3	5	
Transposition flap	0	1	1	
Wound closure	3	5	5	
Wound debridement	3	5	5	
Elective General (Site Non Specific)				
Aspirations / injections				

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Aspiration / injection ankle joint	0	4	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Aspiration / injection elbow joint	0	4	5	
Aspiration / injection foot joint	0	4	5	
Aspiration / injection hip joint	0	3	5	
Aspiration / injection hand and wrist	0	4	5	
Aspiration / injection knee joint	2	5	5	
Aspiration / injection shoulder joint	0	5	5	
Botulinum toxin injection - musculoskeletal	0	3	5	
Benign tumour excision (not exostosis)	0	3	5	
Biopsy bone - needle	0	3	5	
Biopsy bone - open	0	3	5	
Currettage pinsites	0	5	5	
Cyst bone curettage +/- bone graft	0	3	5	
Distraction lengthening of bone upper limb	0	2	5	
Endoprosthetic replacement for malignant bone tumour - not femur / humerus / tibia	0	1	5	
Epiphysiodesis	0	1	5	
Exostosis / osteochondroma excision	0	3	5	
Injection of bone cyst	0	1	5	
Malignant tumour excision	0	1	5	
Nerve decompression / neurolysis	2	4	5	
Osteomyelitis excision including sequestrectomy	0	3	5	
Soft tissue procedures				
Biopsy soft tissue	0	3	5	
Bursa excision	0	4	5	
Ganglion excision	0	4	5	
Muscle biopsy	0	4	5	
Release contracture joint	0	3	5	
Synovectomy	0	3	5	
Tendon decompression	0	4	5	
Tendon lengthening	0	3	5	
Tendon transfer	0	3	5	
Tenodesis	0	3	5	
Amputations				
Forequarter amputation	0	1	5	
Above elbow amputation	0	2	5	
Below elbow amputation	0	2	5	
Finger amputation	0	4	5	
Hindquarter amputation	1	1	5	
Above knee amputation	0	3	5	
Through knee amputation	0	1	5	
Below knee amputation	1	4	4	
Through ankle amputation	0	1	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
				Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)
Hindfoot amputation	0	2	5	
Midfoot amputation	0	1	5	
Toe amputation	0	4	5	

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	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	**Areas in which simulation should be used to develop relevant skills**
Trauma Spine				
Cervical Spine				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Anterior column reconstruction cervical spine	0	1	5	
Anterior fixation fracture / dislocation cervical spine	0	1	5	
Application halo / tong traction cervical spine	0	1	5	
MUA fracture / dislocation cervical spine	0	1	5	
Non-classifiable cervical spine trauma procedure	0	1	5	
Posterior column reconstruction cervical spine	0	1	5	
Posterior fixation fracture / dislocation cervical spine	0	1	5	
Brachial Plexus				
Exploration / repair / grafting brachial plexus	0	1	5	
Exploration of brachial plexus	0	1	5	
Repair +/- grafting brachial plexus	0	1	5	
Thoracic Spine				
Anterior column reconstruction thoracic spine	0	1	5	
Anterior decompression / fixation thoracic spine	0	1	5	
Anterior decompression thoracic spine	0	1	5	
Posterior column reconstruction thoracic spine	0	1	5	
Posterior decompression / fixation thoracic spine	0	1	5	
Posterior decompression thoracic spine	0	1	5	
Lumbar Spine				
Anterior column reconstruction lumbar spine	0	1	5	
Anterior decompression / fixation lumbar spine	0	1	5	
Anterior decompression lumbar spine	0	1	5	
Posterior column reconstruction lumbar spine	0	1	5	
Posterior decompression / fixation lumbar spine	0	1	5	
Posterior decompression lumbar spine	0	1	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Elective Spine				
Cervical Spine				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Anterior column reconstruction cervical spine	0	1	5	
Cervical disc replacement	0	1	5	
Cervical laminectomy	0	1	5	
Cervical laminoplasty	0	1	5	
Cervical vertebrectomy for myelopathy	0	1	5	
Excision hemivertebra	0	1	5	
Fixation and fusion procedures				
Anterior decompression +/- fixation / fusion (C2 - C7)	0	1	5	
Atlantoaxial fixation +/- fusion	0	1	5	
C1 pedicle screws and C2 fusion	0	1	5	
Occipital / cervical / thoracic fusion	0	1	5	
Occipital cervical fusion	0	1	5	
Occipito-cervical fusion +/- fixation	0	1	5	
Posterior decompression +/- fixation / fusion (C2 - C7)	0	1	5	
Transarticular screws C1/C2	0	1	5	
Investigations and injections				
Biopsy cervical spine	0	1	5	
Discogram	0	1	5	
Epidural	0	1	5	
Nerve root / facet joint injection cervical spine	0	1	5	
Osteotomy for spine sagittal plain imbalance	0	1	5	
Posterior column reconstruction cervical spine	0	1	5	
Revision cervical discectomy	0	1	5	
Thoracic outlet obstruction				
Excision cervical / 1st rib	0	1	5	
Thoracic outlet release (not excision cervical / 1st rib)	0	1	5	
Thoracic Spine				
Anterior column reconstruction thoracic spine	0	1	5	
Costoplasty	0	1	5	
Excision hemivertebra	0	1	5	
Fixation or fusion procedures				
Anterior decompression +/- fixation / fusion	0	1	5	
Posterior decompression +/- fixation / fusion	0	1	5	
Investigations and injections				
Biopsy thoracic spine	0	1	5	
Discogram	0	1	5	
Kyphosis correction				
Kyphoplasty corpectomy	0	1	5	
Kyphosis correction - anterior and posterior	0	1	5	
Kyphosis correction - anterior only	0	1	5	
Posterior column reconstruction thoracic spine	0	1	5	
Scoliosis correction - anterior release +/- instrumentation	0	1	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Scoliosis correction - posterior fusion +/- instrumentation	0	1	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Scoliosis correction				
Anterior release + posterior fusion and instrumentation for scoliosis	0	1	5	
Growing rods for scoliosis	0	1	5	
Lengthening of growing rods for scoliosis	0	1	5	
Localiser cast for scoliosis	0	1	5	
Scoliosis correction - anterior release +/- instrumentation	0	1	5	
Scoliosis correction - posterior fusion +/- instrumentation	0	1	5	
Thoracic disc replacement	0	1	5	
Vertebroplasty	0		5	
Thoracoscopic spinal procedures +/- instrumentation	0	1	5	
Lumbar Spine				
Anterior column reconstruction lumbar spine	0	1	5	
Decompression lumbar spine without fusion (not discectomy alone)	0	2	5	
Discectomy open / micro	0	2	5	
Excision hemivertebra	0	1	5	
Fixation and fusion procedures				
ALIF	0	1	5	
Decompression lumbar spine with fusion +/- fixation	0	1	5	
PLIF	0	1	5	
TLIF	0	1	5	
Investigations and injections				
Caudal epidural injection	0	3	5	
Discogram	0	1	5	
Epidural	1	3	5	
Facet joint injection lumbar spine	0	1	5	
Nerve root injection lumbar spine	0	1	5	
Lumbar disc replacement	0	1	5	
Lumbar spine - dynamic neutralisation system	0	1	5	
Osteotomy for spine sagittal plain imbalance	0	1	5	
Posterior column reconstruction lumbar spine	0	1	5	
Revision lumbar discectomy	0	1	5	
Vertebroplasty	0	1	5	

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**
1 = Has observed or knows of	**4 = Able to manage without assistance including potential common complications**
2 = Can manage with assistance	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma Shoulder				
Clavicle				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
ORIF clavicle fracture	0	4	5	
ORIF non-union clavicle fracture	0	3	5	
SC joint dislocation closed / open reduction	0	3	5	
SC joint instability/open stabilisation	0	2	5	
Shoulder				
Acromioclavicular joint dislocation acute ORIF	0	3	5	
Anterior dislocation shoulder				
Anterior dislocation shoulder closed reduction	2	5	5	
Anterior dislocation shoulder open reduction +/- fixation	0	3	5	
Fracture proximal humerus				
Fracture proximal humerus hemiarthroplasty	0	3	5	
Fracture proximal humerus interlocking IM nail	0	3	5	
Fracture proximal humerus ORIF	0	3	5	
Glenoid fracture ORIF	0	2	5	
Irrigation and debridement native joint for infection - shoulder	0	2	5	
Posterior dislocation shoulder				
Posterior dislocation shoulder closed reduction	0	3	5	
Posterior dislocation shoulder open reduction +/- fixation	0	3	5	
Scapula fracture ORIF	0	2	5	
Humerus				
Fracture diaphysis humerus				
Fracture diaphysis humerus non-operative	1	4	5	
Non-union ORIF +/- bone grafting	0	3	5	
Fracture diaphyseal humerus application of external fixator	0	3	5	
Fracture diaphyseal humerus non-union - ORIF +/- bone grafting	0	3	5	
Fracture diaphysis humerus IM nailing	0	4	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Fracture diaphysis humerus ORIF plating	0	4	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Elective Shoulder				
Clavicle				
Osteotomy and internal fixation of clavicle malunion	0	2	5	
Shoulder				
Arthroscopic procedures				
Arthroscopic arthrolysis for capsulitis of shoulder	0	4	5	
Arthroscopic biceps tenodesis	0	2	5	
Arthroscopic subacromial decompression	0	4	5	
Arthroscopic removal loose body - shoulder				
Arthroscopy diagnostic - shoulder	0	4	5	
Capsular / rotator cuff repair				
Anterior repair for instability arthroscopic	0	2	5	
Anterior repair for instability open including capsular shift	0	2	5	
Posterior repair for instability including capsular shift	0	2	5	
Rotator cuff repair (arthroscopic) +/- acromioplasty	0	2	5	
Rotator cuff repair (open) +/- acromioplasty	0	2	5	
MUA shoulder	0	4	5	
Shoulder arthrodesis	0	1	5	
Shoulder arthroplasty				
Hemiarthroplasty shoulder (elective)	0	2	5	
Resurfacing hemiarthroplasty of shoulder	0	2	5	
Reverse polarity (inverse) shoulder replacement	0	2	5	
Shoulder replacement revision	0	1	5	
Total shoulder replacement	0	2	5	
Shoulder girdle procedures				
Acromioclavicular joint excision - arthroscopic / open / lateral clavicle	0	2	5	
Acromioclavicular joint reconstruction (e.g. Weaver Dunn)	0	2	5	
Acromioplasty open	0	3	5	
Latarjet procedure	0	2	5	
Levator scapulae transfer for trapezius palsy	0	1	5	
Scapulothoracic fusion	0	1	5	
Humerus				
Endoprosthetic replacement for malignant bone tumour - humerus	0	1	5	

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.	
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0 = No experience expected	**3 = Can manage whole but may need assistance**
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	**Areas in which simulation should be used to develop relevant skills**
Trauma Elbow				
Elbow				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Application of spanning external fixator	0	2	5	
Capitellum ORIF	0	3	5	
Coronoid fractures				
Coronoid fracture ORIF	0	2	5	
Dislocated elbow +/- fracture:				
Dislocated elbow +/- fracture closed reduction	0	4	5	
Dislocated elbow +/- fracture open reduction +/- fixation	0	3	5	
Intraarticular distal humerus fracture ORIF	0	4	5	
Irrigation and debridement native joint for infection – elbow	0	3		
Lateral condyle fracture ORIF	0	4	5	
Medial condyle / epicondyle fracture MUA / percutaneous wire / ORIF	0	4	5	
Olecranon fracture ORIF	0	4	5	
Radial head / neck fracture				
Radial head / neck fracture ORIF	0	3	5	
Radial head excision	0	4	5	
Radial head replacement for fracture	0	4	5	
Supracondylar elbow fracture				
Supracondylar elbow fracture MUA +/- percutaneous wires	0	4	5	
Supracondylar elbow fracture open reduction	0	4	5	
Tendon repairs				

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Repair of distal biceps tendon rupture	0	3	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Forearm				
Fasciotomy for compartment syndrome	1	4	5	
Fracture shaft radius / ulna:				
Fracture shaft radius / ulna IM nailing	0	3	5	
Fracture shaft radius / ulna MUA & POP	0	4	5	
Fracture shaft radius / ulna ORIF	0	4	5	
Galeazzi fracture ORIF	0	4	5	
Monteggia fracture ORIF	0	4	5	
Elective Elbow				
Elbow				
Arthrolysis elbow (open/arthroscopic)	0	2	5	
Arthroscopy elbow diagnostic	0	2	5	
Arthoscopy elbow therapeutic	0	2	5	
Arthrotomy elbow	0	4	5	
Excision radial head +/- synovectomy	0	2	5	
OK procedure	0	2	5	
Tennis / golfer elbow release	0	4	5	
Total elbow replacement				
Total elbow replacement	0	2	5	
Total elbow replacement - aseptic revision	0	1	4	
Total elbow replacement for trauma	0	1	5	
Total elbow replacement revision 1st stage	0	1	4	
Total elbow replacement revision 2nd stage	0	1	4	
Ulnar nerve decompression / transposition	0	4	5	
Forearm				
Forearm malunion correction or other deformity	0	1	5	

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**
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop
Trauma Hand				
Wrist				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Fracture distal radius:				
Fracture distal radius – closed non-op	3	5	5	
Fracture distal radius external fixation	1	4	5	
Fracture distal radius MUA & percutaneous wires	3	5	5	
Fracture distal radius ORIF	1	4	5	
Application of spanning external fixator	1	4	5	
Arterial repair - wrist	0	1	5	
Vein repair – wrist	0	1	5	
Carpal fracture / dislocation:				
Carpal fracture / dislocation MUA & percutaneous wires	0	3	5	
Carpal fracture / dislocation MUA & POP	0	3	5	
Carpal fracture / dislocation ORIF	0	3	5	
Irrigation and debridement prosthesis for infection – wrist	0	2	5	
Nerve repair - wrist	0	3	5	
Replantation of hand	0	0	1	
Revascularisation of hand	0	0	1	
Scapho-lunate ligament reconstruction	0	2	5	
Scaphoid fracture:				
Scaphoid fracture non-operative	2	3	5	
Scaphoid fracture MUA & percutaneous wires	0	2	5	
Scaphoid fracture non-union ORIF +/- graft (excluding vascularised graft)	0	2	5	
Scaphoid fracture non-union using vascularised graft	0	2	5	
Scaphoid fracture ORIF	0	2	5	
Hand				
1st ray fracture / dislocation				**Strongly**
1st ray fracture / dislocation external fixation	0	2	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop
1st ray fracture / dislocation MUA & percutaneous wires	0	3	5	**recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
1st ray fracture / dislocation MUA & POP	2	4	5	
1st ray fracture / dislocation ORIF	0	2	5	
Carpal fracture / dislocation				
Carpal fracture / dislocation non-op	0	3	5	
Carpal fracture / dislocation MUA & percutaneous wires	0	3	5	
Carpal fracture / dislocation MUA & POP	0	3	5	
Carpal fracture / dislocation ORIF	0	2	5	
5th ray fracture / dislocation				
5th ray fracture / dislocation external fixation	0	2	5	
5th ray fracture / dislocation MUA & percutaneous wires	0	3	5	
5th ray fracture / dislocation MUA & POP	2	3	5	
5th ray fracture / dislocation ORIF	0	2	5	
Excision / ablation of ingrowing nail	2	5	5	
Finger tip reconstruction				
Finger tip reconstruction - advancement flap	0	3	5	
Finger tip reconstruction - cross finger flap	0	3	5	
Finger tip reconstruction - homodigital neurovascular island flap	0	2	5	
Finger tip terminalisation	2	5	5	
Nail bed repair	2	4	5	
Hand compartment syndrome decompression	2	4	5	
Infection				
High pressure injection injuries	0	2	5	
Infection hand drainage (not tendon sheath)	1	3	5	
Infection tendon sheath drainage	1	3	5	
IPJ fracture / dislocation (PIPJ and DIPJ):				
IPJ fracture / dislocation external fixator	1	2	5	
IPJ fracture / dislocation MUA & percutaneous wires	1	4	5	
IPJ fracture / dislocation MUA +/- POP	2	4	5	
IPJ fracture / dislocation ORIF	0	2	5	
Ligament repair				
Ligament repair hand excluding thumb MCPJ ulnar collateral ligament	0	2	5	
Thumb MCPJ ulnar collateral repair	1	5	5	
MCPJ fracture / dislocation				
MCPJ fracture / dislocation external fixator	0	2	5	
MCPJ fracture / dislocation MUA & percutaneous wires	1	4	5	
MCPJ fracture / dislocation MUA +/- POP	1	4	5	
MCPJ fracture / dislocation ORIF	0	3	5	**Strongly recommended for early years CT/ST1 – 4**
Metacarpal fracture (not 1st or 5th) non-op	2	4	5	
Metacarpal fracture (not 1st or 5th) MUA & percutaneous wires	1	4	5	
Metacarpal fracture (not 1st or 5th) MUA +/- POP	2	5	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop
Metacarpal fracture (not 1st or 5th) ORIF	0	3	5	**(from October 2013) Desirable for later years for focused training (from October 2013)**
Metacarpal fracture (not 1st or 5th) external fixation	0	3	5	
Neurovascular injuries				
Arterial repair +/- graft hand / digit	0	1	2	
Nerve repair hand / digit	1	4	5	
Revascularisation finger	0	1	2	
Vein repair +/- graft hand / digit	0	1	2	
Phalangeal fracture non-op	2	4	5	
Phalangeal fracture MUA & percutaneous wires	1	4	5	
Phalangeal fracture MUA +/- POP	2	4	5	
Phalangeal fracture ORIF	0	3	5	
Removal foreign body from skin / subcutaneous tissue	3	5	5	
Replantation finger	0	1	2	
Skin graft				
Free flap	0	1	5	
Full thickness skin graft	2	3	5	
Pedicle flap	0	2	5	
Reversed radial forearm flap	0	2	3	
Split skin graft	2	4	5	
Transposition flap	0	2	3	
Tangential excision of hand burns	0	1	2	
Tendon repair				
Spaghetti wrist	0	2	5	
Tendon repair extensor	2	5	5	
Tendon repair flexor zone 1	0	2	5	
Tendon repair flexor zone 2	0	2	5	
Tendon repair flexor zone 3-5	0	4	5	
Wound closure				
Delayed primary or secondary	1	4	5	
Wound debridement	1	4	5	
Elective Hand				
Wrist				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for**
Arthrodesis wrist (includes partial arthrodesis)	0	3	5	
Arthroscopy wrist	0	2	5	
Carpal tunnel decompression	3	5	5	
De Quervain's decompression	1	5	5	
Decompression / synovectomy tendons	0	3	5	
Denervation wrist	0	3	5	
Excision distal ulna	0	4	5	
Ganglion excision at wrist	2	5	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop
Proximal row carpectomy	0	2	5	**later years for focused training (from October 2013)**
Radial shortening	0	2	5	
Surgery for chronic carpal instability	0	2	5	
TFCC				
Repair TFCC - arthroscopic	0	2	5	
Repair TFCC - open	0	2	5	
Ulna shortening	0	3	5	
Ulnar nerve decompression at wrist	0	3	5	
Wrist arthroplasty	0	2	5	
Hand				
Carpal tunnel decompression	3	5	5	
Congenital hand operation				
Congenital hand operation - clinodactyly	0	1	4	
Congenital hand operation - complex reconstruction of congenital hand deformity	0	1	2	
Congenital hand operation - camptodactyly	0	1	2	
Congenital hand operation - correction of radial club hand	0	1	2	
Congenital hand operation - lengthening procedures	0	1	2	
Congenital hand operation - removal supernumerary digits	0	1	3	
Congenital hand operation - separation of syndactyly	0	1	3	
Dupuytren's contracture operation				
Dupuytrens contracture operation - dermofasciectomy	0	2	5	
Dupuytren's contracture operation - primary multiple digits	0	3	5	
Dupuytren's contracture operation - primary single digit	0	3	5	
Dupuytren's contracture operation - recurrent multiple digits	0	2	5	
Dupuytren's contracture operation - recurrent single digit	0	2	5	
Excision synovial cyst	0	3	5	
Finger malunion correction or other deformity	0	2	5	
Fusion of MCPJ or IPJ	0	3	5	
MCPJ replacement	0	2	5	
PIPJ replacement - hand (other)	0	2	5	
PIPJ replacement - hand (silastic)	0	2	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for**
Soft tissue reconstruction hand	0	2	5	
Synovectomy	0	3	5	
Tendon procedures				
Tendon graft hand	0	2	5	
Tendon transfer hand	0	2	5	
Tenolysis hand tendon	0	2	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop
Tenosynovectomy	0	2	5	**focused training (from October 2013)**
Trapezium excision or replacement	0	3	5	
Trigger finger release	2	5	5	
Trigger thumb release	1	5	5	

Applied Clinical Skills: Hip

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma Hip				
Pelvis				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Acetabular fracture ORIF	0	2	4	
Pelvic fracture:				
Pelvic fracture external fixator application	1	3	5	
Pelvic fracture ORIF	0	2	5	
Sacroiliac joint percutaneous screw fixation	0	1	5	
Sacrum ORIF	0	1	4	
Hip				
Dislocated hip				
Dislocated hip (no prosthesis) - closed reduction	1	4	5	
Dislocated hip (no prosthesis) - open reduction +/- fixation	0	3	5	
Dislocated hip hemiarthroplasty - closed reduction	2	4	5	
Dislocated hip hemiarthroplasty - open reduction	0	4	5	
Dislocated total hip replacement - closed reduction	2	4	5	
Dislocated total hip replacement - open reduction	0	4	5	
Extracapsular fracture				
Extracapsular fracture CHS / DHS	3	5	5	
Extracapsular fracture intramedullary fixation	0	5	5	
Extracapsular fracture other fixation	0	4	5	
Intracapsular fracture				
Intracapsular fracture bipolar hemiarthroplasty	0	5	5	
Intracapsular fracture hemiarthroplasty excluding bipolar	2	5	5	
Intracapsular fracture internal fixation	1	5	5	
Intracapsular fracture THR	1	4	5	
Irrigation and debridement native joint for infection - hip	0	4	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Irrigation and debridement prosthesis for infection - hip	0	4	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Periprosthetic fracture of hip				
Open reduction and fixation of periprosthetic fracture - hip	0	3	5	
Revision THR for periprosthetic fracture of hip	0	2	5	
Femur				
Diaphyseal fracture				
Diaphyseal femur fracture application of external fixator	0	3	5	
Diaphyseal femur fracture intramedullary nailing	0	5	5	
Diaphyseal femur fracture plate/screw fixation	0	4	5	
Diaphyseal femur fracture spica cast application	0	3	3	
Fasciotomy for compartment syndrome	1	4	5	
Femoral non-union				
Femoral non-union (application of frame) +/- bone grafting	0	2	5	
Femoral non-union (without frame) +/- bone grafting	0	2	5	
Reconstruction of avulsed proximal hamstrings	0	1	5	
Subtrochanteric fracture				
Subtrochanteric fracture intramedullary fixation	0	4	5	
Subtrochanteric fracture plate/screw fixation	0	3	5	
Elective Hip				
Pelvis				
Sacrococcygeal joint injection / MUA	0	3	5	
Sacro-iliac joint injection	0	3	5	
Hip				
Adductor tenotomy - hip	0	3	5	
Arthrodesis hip	0	2	5	
Arthroscopy hip - diagnostic	0	1	5	
Arthroscopy hip - therapeutic	0	1	5	
Arthrotomy hip	0	3	5	
Aspiration / injection hip joint	0	3	5	
Excision arthroplasty hip (e.g. Girdlestone)	0	3	5	
Femoral head AVN				
Core decompression of femoral head for AVN	0	3	5	
Vascular graft femoral head for AVN	0	2	3	
Femeroacetabular impingement				
Open hip debridement for femeroacetabular impingement	0	1	4	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Syndrome				
Iliopsoas release / lengthening	0	2	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Osteotomy pelvis - not for DDH	0	1	3	
Revision THR				
1 stg of 2 stg rev infected THR - removal of prosthesis +/- insertion of cement spacer / antibiotic beads	0	2	5	
2 stg of 2 stg rev infected THR - removal of spacer/beads	0	2	5	
Single stage revision THR acetabular component	0	2	5	
Single stage revision THR both components	0	2	5	
Single stage revision THR femoral component	0	2	5	
Total Hip Replacement				
THR cemented	1	4	5	
THR hybrid	1	4	5	
THR surface replacement	1	2	5	
THR uncemented	1	4	5	
Femur				
Endoprosthetic 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

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	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma Knee				
Knee				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Acute arthroscopy for knee trauma	0	3	5	
Application of spanning external fixator	0	2	5	
Intraarticular fracture distal femur ORIF	0	3	5	
Irrigation and debridement native joint for infection (open or arthroscopic) - knee	1	4	5	
Irrigation and debridement prosthesis for infection - knee	1	4	5	
Knee MUA +/- POP	2	5	5	
Patella fracture				
Patella dislocation closed reduction +/- open repair	1	4	5	
Patella fracture ORIF	0	4	5	
Patellectomy	0	4	5	
Periprosthetic fracture of knee				
Open reduction and fixation of periprosthetic fracture - knee	0	2	5	
Revision TKR for periprosthetic fracture of knee	0	3	5	
Soft tissue repair				
Acute ligament repair	0	3	5	
Patella tendon repair	0	4	5	
Quadriceps tendon repair	0	4	5	
Supracondylar fracture (not intraarticular)				
Supracondylar fracture (not intraarticular) DCS / blade plate etc	0	4	5	
Supracondylar femur fracture (not intraarticular) external fixation	0	4	5	
Supracondylar femur fracture (not intraarticular) Intramedullary fixation	0	4	5	
Supracondylar femur fracture (not intraarticular) MUA & POP	0	4	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Tibial plateau fracture				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Repair of tibial spine	0	3	5	
Tibial plateau fracture arthroscopically assisted fixation	0	2	5	
Tibial plateau fracture ORIF with plates & screws	0	4	5	
Tibial plateau fracture treatment with circular frame	0	2	4	
Tibia & Fibula				
Diaphyseal tibial fracture				
Diaphyseal tibial fracture external fixation (including frame)	1	3	5	
Diaphyseal tibial fracture intramedullary nailing	1	4	5	
Diaphyseal tibial fracture MUA & POP	1	5	5	
Tibial shaft plating	0	3	5	
Fasciotomy for compartment syndrome	2	5	5	
Tibial non-union				
Tibial non-union circular frame management	0	2	3	
Tibial non-union intramedullary nailing +/- bone grafting	0	2	3	
Tibial non-union ORIF +/- bone grafting	0	2	3	
Elective Knee				
Knee				
Arthroscopic partial meniscectomy	1	5	5	
Arthroscopic procedures				
Arthroscopic excision of Hoffa's fat pad	0	4	5	
Arthroscopic lateral release	0	4	5	
Arthroscopic menisectomy	0	5	5	
Arthroscopic removal loose bodies knee	0	4	5	
Arthroscopic synovectomy	0	3	5	
Arthroscopy knee diagnostic	1	5	5	
Meniscal repair (arthroscopic)	0	3	5	
Aspiration / injection knee joint	2	5	5	
Below knee amputation	1	4	5	
Cartilage regeneration procedures				
Abrasion arthroplasty / microfracture - knee	0	2	5	
Mosaicplasty - knee	0	2	4	
Osteochondral allografting - knee	0	2	4	
Autologous chondrocyte implantation	0	2	5	
Knee arthroplasty				
Patella resurfacing alone	0	1	3	
Patello-femoral joint replacement	0	1	3	
TKR	1	4	5	
Unicompartmental knee replacement	0	3	5	
MUA knee	2	4	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
				Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)
Osteotomy distal femoral	0	2	4	
Osteotomy proximal tibial	0	2	5	
Patella realignment	0	3	5	
Patella tendon decompression (open / arthroscopic)	0	3	5	
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	5	
2 stg of 2 stg rev infected TKR - removal of spacer/beads	0	2	5	
Revision TKR for periprosthetic fracture of knee	0	2	5	
Single stage revision TKR	0	2	5	
Soft tissue reconstruction				
ACL reconstruction - arthroscopic	0	2	5	
ACL reconstruction - open	0	2	5	
Reconstruction of posterolateral corner of knee	0	2	5	
PCL reconstruction	0	2	5	
Revision ACL reconstruction	0	1	5	
TKR	1	4	5	
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	2	

Applied Clinical Skills: Foot and Ankle

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	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma Foot and Ankle				
Ankle				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Ankle fracture / dislocation:				
Ankle fracture / dislocation MUA & POP	3	5	5	
Ankle fracture / dislocation ORIF	3	5	5	
Application of spanning external fixator	0	2	5	
Irrigation and debridement native joint for infection - ankle	1	3	5	
Irrigation and debridement prosthesis for infection - ankle	0	2	5	
Pilon fracture				
Pilon fracture ex-fix	0	2	5	
Pilon fracture ORIF	0	2	5	
Pilon fracture treatment with circular frame	0	2	5	
Foot				
Amputation toe / ray for trauma	0	3	5	
Calcaneal fracture				
Calcaneal fracture ex-fix	0	2	5	
Calcaneal fracture ORIF	0	2	5	
Metatarsal fracture ORIF	0	2	5	
Phalangeal fracture MUA +/- K wire +/- ORIF	1	3	5	
Removal foreign body from skin / subcutaneous tissue	2	5	5	
Talar subtalar or midtarsal fracture / dislocation				
Lisfranc fracture ORIF	0	3	5	
Midtarsal fracture / dislocation ORIF	0	3	5	
Subtalar fracture / dislocation ORIF	0	3	5	
Talar fracture / dislocation ORIF	0	3	5	
Talectomy	0	3	5	
Tarsometatarsal arthrodesis	0	2	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Achilles tendon repair	1	4	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Tendon repair in foot	0	3	5	
Elective Foot and Ankle				
Ankle				
Arthrodesis ankle (open /arthroscopic)	0	2	5	
Arthroplasty ankle	0	2	4	
Arthroscopic procedures				
Arthrodesis ankle - arthroscopic	0	1	4	
Arthroscopy ankle diagnostic	0	2	5	
Arthroscopy ankle therapeutic	0	2	4	
Arthrotomy ankle	0	2	5	
Aspiration / injection ankle joint	0	3	5	
Ligament repair / reconstruction				
Ankle - lateral ligament reconstruction	0	2	5	
Ankle - lateral ligament repair	0	2	5	
Ankle - medial ligament repair	0	2	5	
Pantalar arthrodesis	0	2	5	
Tendon procedures				
Decompression tendons at ankle	0	2	5	
Gastrocnemius lengthening	0	2	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	2	5	
Amputation toe / ray	0	3	5	
Ankle chielectomy	0	2	5	
Arthrodesis procedures				
Ankle	0	2	5	
Hindfoot	0	2	5	
Midtarsal	0	2	5	
Forefoot and toes	0	2	5	
Aspiration / injection foot joint	0	3	5	
Calcaneal osteotomy	0	2	5	
Excision Haglund's deformity	0	2	5	
Excision of accessory navicular	0	2	5	
Excision of tarsal coalition	0	2	5	
First metatarsal osteotomy				
First metatarsal osteotomy - basal	0	2	5	

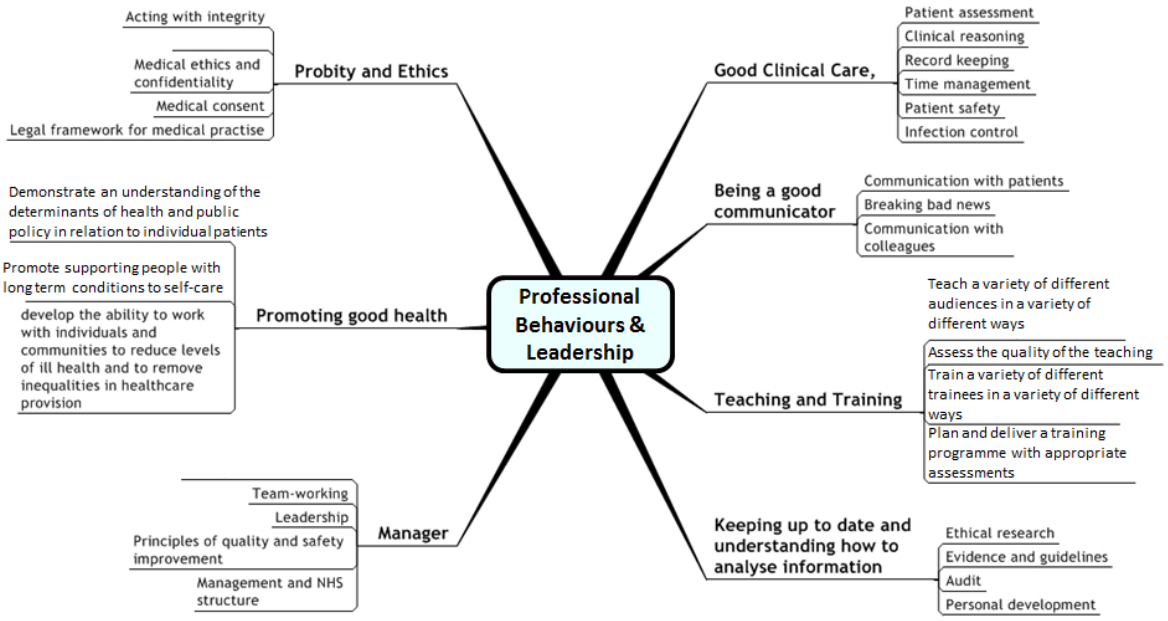
Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
First metatarsal osteotomy - distal	0	3	5	**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
First metatarsal osteotomy – other	0	3	5	
First metatarsal osteotomy - Scarf	0	3	5	
First MTPJ procedures				
First MTPJ arthrodesis	0	3	5	
First MTPJ cheilectomy	0	3	5	
First MTPJ excision arthroplasty	0	3	5	
First MTPJ replacement arthroplasty (silastic or other)	0	2	4	
First MTPJ soft tissue correction	0	3	5	
Foot malunion correction or other deformity	0	2	4	
Forefoot arthroplasty (Mann Thompson / Stainsby / Other	0	2	5	
Ingrowing toenail operation	2	5	5	
Lesser metatarsal osteotomy	0	2	5	
Lesser toe excision part/all phalanx	0	3	5	
MTPJ cheilectomy - not 1st	0	3	5	
Soft tissue procedures				
Excision of Morton's neuroma	0	3	5	
Fifth toe soft tissue correction	0	3	5	
Lesser toe tenotomy	0	3	5	
Plantar fascia release	0	3	5	
Tendon decompression or repair	0	3	5	
Tendon transfer foot	0	3	5	
Tibialis posterior reconstruction	0	3	5	
Talectomy	0	2	5	
Wedge tarsectomy	0	2	5	

Applied Clinical Skills: Children's Trauma and Orthopaedics

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	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
Trauma Paediatrics				
Supracondylar elbow fracture				**Strongly recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Supracondylar elbow fracture MUA +/- percutaneous wires	1	4	5	
Supracondylar elbow fracture open reduction	0	3	5	
Forearm fractures				
Manipulation and POP forearm	1	5	5	
Manipulation and K wire forearm	0	4	5	
Titanium elastic nailing paediatric long bone	0	2	5	
Slipped upper femoral epiphysis				
Dunn procedure for slipped upper femoral epiphysis	0	2	5	
Slipped upper femoral epiphysis percutaneous cannulated screw fixation	0	2	5	
Drainage of septic arthritis of the hip	0	2	5	
Repair of avulsion of tibial eminence	0	2	5	
ORIF paediatric ankle fracture	0	4	5	
Obstetric brachial plexus injury: exploration / repair / grafting	0	1	2	
Elective Paediatrics				
Cerebral Palsy				
Adductor tenotomy - hip	0	2	5	
Botulinum toxin injection - musculoskeletal	0	2	5	
Hamstring lengthening	0	2	5	
Iliopsoas release / lengthening	0	2	5	
MTPJ arthrodesis	0	2	5	
Patella realignment	0	2	5	
Steindler's release	0	1	5	
Tendo-achilles lengthening	0	2	5	
Tendon transfer foot	0	1	5	**Strongly**
Tendon transfer not hand / foot	0	1	5	

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	Areas in which simulation should be used to develop relevant skills
CTEV correction				**recommended for early years CT/ST1 – 4 (from October 2013) Desirable for later years for focused training (from October 2013)**
Arthrodesis for recurrence for CTEV	0	1	5	
Bony release for recurrence for CTEV	0	1	5	
CTEV correction	0	1	5	
Ilizarov correction for CTEV	0	1	5	
Percutaneous tendo-achilles release for CTEV	0	2	5	
Posterior release for CTEV	0	1	5	
Postero-medial release for CTEV	0	1	5	
Soft tissue release for recurrence for CTEV	0	1	5	
Tibilialis anterior transfer for CTEV	0	1	5	
DDH				
Application of hip spica	0	2	5	
Hip MUA	0	2	5	
Open reduction for DDH	0	1	5	
Osteotomy hip - pelvic for DDH	0	1	5	
Osteotomy hip - proximal femoral for DDH	0	1	5	
Distraction lengthening of bone upper limb	0	1	5	
Excision of physeal bar (Langenskjold procedure)	0	1	5	
Femoral lengthening	0	1	5	
GA change of POP	0	3	5	
Repair of avulsion of tibial eminence (child)	0	2	5	
Sternomastoid release (torticollis)	0	1	5	
Tibial lengthening	0	1	5	



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PROFESSIONAL BEHAVIOUR AND LEADERSHIP SYLLABUS

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

Overview

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

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

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

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

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

Covered ✔✔	Partly covered ✔	Not covered

Click on Workplace Based Assessments to view the assessment forms.

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Category	**Good Clinical Care**, to include: • History taking (GMP Domains: 1, 3, 4) • Physical examination (GMP Domains: 1, 2,4) • Time management and decision making (GMP Domains: 1,2,3) • Clinical reasoning (GMP Domains: 1,2, 3, 4) • Therapeutics and safe prescribing (GMP Domains: 1, 2, 3) • Patient as a focus of clinical care (GMP Domains: 1, 3, 4) • Patient safety (GMP Domains: 1, 2, 3) • Infection control (GMP Domains: 1, 2, 3)	**Area 4.1**		
Objective	To achieve an excellent level of care for the individual patient • To elicit a relevant focused history (See modules 2, 3, 4,5) • To perform focused, relevant and accurate clinical examination (See modules 2,3,4,5) • To formulate a diagnostic and therapeutic plan for a patient based upon the clinic findings (See modules 2,3,4,5) • To prioritise the diagnostic and therapeutic		Mini CEX, CBD, Mini PAT, MRCS and Specialty FRCS	Strongly recommended Patient safety Desirable: Human factors

	plan (See modules 2,3,4,5) • To communicate a diagnostic and therapeutic plan appropriately (See modules 2,3,4,5) To produce timely, complete and legible clinical records to include case-note records, handover notes, and operation notes To prescribe, review and monitor appropriate therapeutic interventions relevant to clinical practice including non – medication based therapeutic and preventative indications (See module 1,2,3,4,5) To prioritise and organise clinical and clerical duties in order to optimise patient care To make appropriate clinical and clerical decisions in order to optimise the effectiveness of the clinical team resource. To prioritise the patient's agenda encompassing their beliefs, concerns expectations and needs To prioritise and maximise patient safety:			

	• To understand that patient safety depends on
	  ○ The effective and efficient organisation of care
	  ○ Health care staff working well together
	  ○ Safe systems, individual competency and safe practice
	• To understand the risks of treatments and to discuss these honestly and openly with patients
	• To systematic ways of assessing and minimising risk
	• To ensure that all staff are aware of risks and work together to minimise risk
	
	To manage and control infection in patients, including:
	
	• Controlling the risk of cross-infection
	• Appropriately managing infection in individual patients
	• Working appropriately within the wider community to manage the risk posed by communicable diseases
		Area 4.1		

Knowledge	**Patient assessment** • Knows likely causes and risk factors for conditions relevant to mode of presentation • Understands the basis for clinical signs and the relevance of positive and negative physical signs • Recognises constraints and limitations of physical examination • Recognises the role of a			

	chaperone is appropriate or required • Understand health needs of particular populations e.g. ethnic minorities • Recognises the impact of health beliefs, culture and ethnicity in presentations of physical and psychological conditions **Clinical reasoning** • Interpret history and clinical signs to generate hypothesis within context of clinical likelihood • Understands the psychological component of disease and illness presentation • Test, refine and verify hypotheses • Develop problem list and action plan • Recognise how to use expert advice, clinical guidelines and algorithms • Recognise and appropriately respond to sources of information accessed by patients • Recognises the need to determine the best value and most effective treatment both for the individual patient and for a patient cohort **Record keeping** • Understands local and national guidelines for the standards of clinical record keeping in all circumstances, including handover • Understanding of the importance of high	**Area 4.1**		

	quality and adequate clinical record keeping and relevance to patient safety and to litigation • Understand the primacy for confidentiality **Time management** • Understand that effective organisation is key to time management • Understand that some tasks are more urgent and/or more important than others • Understand the need to prioritise work according to urgency and importance • Maintains focus on individual patient needs whilst balancing multiple competing pressures • Outline techniques for improving time management **Patient safety** • Outline the features of a safe working environment • Outline the hazards of medical equipment in common use • Understand principles of risk assessment and management • Understanding the components of safe working practice in the personal, clinical and organisational settings • Outline local procedures and protocols for optimal practice e.g. GI bleed protocol, safe prescribing • Understands the investigation of			

	significant events, serious untoward incidents and near misses **Infection control** • Understand the principles of infection control • Understands the principles of preventing infection in high risk groups • Understand the role of Notification of diseases within the UK • Understand the role of the Health Protection Agency and Consultants in Health Protection			
Skills	**Patient assessment** • Takes a history from a patient with appropriate use of standardised questionnaires and with appropriate input from other parties including family members, carers and other health professionals • Performs an examination relevant to the presentation and risk factors that is valid, targeted and time efficient and which actively elicits important clinical findings • Give adequate time for patients and carers to express their beliefs ideas, concerns and expectations • Respond to questions honestly and seek advice if unable to answer • Develop a self-			

	management plan with the patient • Encourage patients to voice their preferences and personal choices about their care **Clinical reasoning** • Interpret clinical features, their reliability and relevance to clinical scenarios including recognition of the breadth of presentation of common disorders • Incorporates an understanding of the psychological and social elements of clinical scenarios into decision making through a robust process of clinical reasoning • Recognise critical illness and respond with due urgency • Generate plausible hypothesis(es) following patient assessment • Construct a concise and applicable problem list using available information • Construct an appropriate management plan in conjunction with the patient, carers and other members of the clinical team and communicate this effectively to the patient, parents and carers where relevant **Record keeping** • Producing legible, timely and comprehensive clinical notes relevant to the setting • Formulating and implementing care plans			

	appropriate to the clinical situation, in collaboration with members of an interdisciplinary team, incorporating assessment, investigation, treatment and continuing care • Presenting well documented assessments and recommendations in written and/or verbal form **Time management** • Identifies clinical and clerical tasks requiring attention or predicted to arise • Group together tasks when this will be the most effective way of working • Organise, prioritise and manage both team-members and workload effectively and flexibly **Patient safety** • Recognise and practise within limits of own professional competence • Recognise when a patient is not responding to treatment, reassess the situation, and encourage others to do so • Ensure the correct and safe use of medical equipment • Improve patients' and colleagues' understanding of the side effects and contraindications of therapeutic intervention	**Area 4.1**		

	• Sensitively counsel a colleague following a significant untoward event, or near incident, to encourage improvement in practice of individual and unit • Recognise and respond to the manifestations of a patient's deterioration or lack of improvement (symptoms, signs, observations, and laboratory results) and support other members of the team to act similarly **Infection control** • Recognise the potential for infection within patients being cared for • Counsel patients on matters of infection risk, transmission and control • Actively engage in local infection control procedures • Prescribe antibiotics according to local guidelines and work with microbiological services where appropriate • Recognise potential for cross-infection in clinical settings • Practice aseptic technique whenever relevant			
Behaviour	• Shows respect and behaves in accordance with Good Medical Practice • Ensures that patient assessment, whilst clinically appropriate considers social, cultural and religious boundaries • Support patient self-management			

	• Recognise the duty of the medical professional to act as patient advocate • Ability to work flexibly and deal with tasks in an effective and efficient fashion • Remain calm in stressful or high pressure situations and adopt a timely, rational approach • Show willingness to discuss intelligibly with a patient the notion and difficulties of prediction of future events, and benefit/risk balance of therapeutic intervention • Show willingness to adapt and adjust approaches according to the beliefs and preferences of the patient and/or carers • Be willing to facilitate patient choice • Demonstrate ability to identify one's own biases and inconsistencies in clinical reasoning • Continue to maintain a high level of safety awareness and consciousness • Encourage feedback from all members of the team on safety issues • Reports serious untoward incidents and near misses and co-operates with the investigation of the same. • Show willingness to take action when concerns are raised about performance of members of the healthcare team, and act appropriately when these concerns are voiced to you by others • Continue to be aware of one's own limitations, and operate within them • Encourage all staff, patients and relatives to observe infection control			

	principles • Recognise the risk of personal ill-health as a risk to patients and colleagues in addition to its effect on performance			
Examples and descriptors **for Core Surgical Training**	**Patient assessment** • Obtains, records and presents accurate clinical history and physical examination relevant to the clinical presentation, including an indication of patient's views • Uses and interprets findings adjuncts to basic examination appropriately e.g. internal examination, blood pressure measurement, pulse oximetry, peak flow • Responds honestly and promptly to patient questions • Knows when to refer for senior help • Is respectful to patients by o Introducing self clearly to patients and indicates own place in team o Checks that patients comfortable and			

	willing to be seen ○ Informs patients about elements of examination and any procedures that the patient will undergo **Clinical reasoning** • In a straightforward clinical case develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes **Record keeping** • Is able to format notes in a logical way and writes legibly • Able to write timely, comprehensive, informative letters to patients and to GPs **Time management** • Works systematically through tasks and attempts to prioritise • Discusses the relative importance of tasks with more senior colleagues. • Understands importance of communicating progress with other team members **Patient safety** • Participates in clinical governance processes • Respects and follows local protocols and guidelines • Takes direction from the team members on patient safety	**Area 4.1**		

	• Discusses risks of treatments with patients and is able to help patients make decisions about their treatment • Ensures the safe use of equipment • Acts promptly when patient condition deteriorates • Always escalates concerns promptly **Infection control** • Performs simple clinical procedures whilst maintaining full aseptic precautions • Follows local infection control protocols • Explains infection control protocols to students and to patients and their relatives • Aware of the risks of nosocomial infections.			
Examples and descriptors for CCT	**Patient assessment** • Undertakes patient assessment (including history and examination) under difficult circumstances. Examples include: ○ Limited time available (Emergency situations, Outpatients, ward referral), ○ Severely ill patients ○ Angry or distressed patients or relatives • Uses and interprets findings adjuncts to basic examination appropriately e.g. electrocardiography, spirometry, ankle brachial pressure index, fundoscopy,			

	sigmoidoscopy • Recognises and deals with complex situations of communication, accommodates disparate needs and develops strategies to cope • Is sensitive to patients cultural concerns and norms • Is able to explain diagnoses and medical procedures in ways that enable patients understand and make decisions about their own health care. **Clinical reasoning** • In a complex case, develops a provisional diagnosis and a differential diagnosis on the basis of the clinical evidence, institutes an appropriate investigative and therapeutic plan, seeks appropriate support from others and takes account of the patients wishes **Record keeping** • Produces comprehensive, focused and informative records which summarise complex cases accurately **Time management** • Organises, prioritises and manages daily work efficiently and effectively • Works with, guides, supervises and supports junior colleagues • Starting to lead and direct the clinical team in effective fashion **Patient safety** • Leads team discussion on risk assessment, risk management, clinical	**Area 4.1**		

	incidents • Works to make organisational changes that will reduce risk and improve safety • Promotes patients safety to more junior colleagues • Recognises and reports untoward or significant events • Undertakes a root cause analysis • Shows support for junior colleagues who are involved in untoward events **Infection control** • Performs complex clinical procedures whilst maintaining full aseptic precautions • Manages complex cases effectively in collaboration with infection control specialists			

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Category	**Being a good communicator** To include: • Communication with patients (GMP Domains: 1, 3, 4) • Breaking bad news (GMP Domains: 1, 3, 4) • Communication with colleagues (GMP Domains: 1, 3)	N/A		
Objective	**Communication with**		PBA, DOPS, Mini	

	patients • To establish a doctor/patient relationship characterised by understanding, trust, respect, empathy and confidentiality • To communicate effectively by listening to patients, asking for and respecting their views about their health and responding to their concerns and preferences • To cooperate effectively with healthcare professionals involved in patient care • To provide appropriate and timely information to patients and their families **Breaking bad news** • To deliver bad news according to the needs of individual patients **Communication with Colleagues** • To recognise and accept the responsibilities and role of the doctor in relation to other healthcare professionals. • To communicate succinctly and effectively with other professionals as appropriate • To present a clinical case in a clear, succinct and systematic manner		CEX, Mini PAT and CBD	Desirable: Human factors
Knowledge	**Communication with patients** • Understands questioning and listening techniques • Understanding that poor communication is a cause of complaints/ litigation **Breaking bad news** • In delivering bad news understand that:			

	○ The delivery of bad news affects the relationship with the patient ○ Patient have different responses to bad news ○ Bad news is confidential but the patient may wish to be accompanied ○ Once the news is given, patients are unlikely to take in anything else ○ Breaking bad news can be extremely stressful for both parties ○ It is important to prepare for breaking bad news **Communication and working with colleagues** • Understand the importance of working with colleagues, in particular: ○ The roles played by all members of a multi-disciplinary team ○ The features of good team dynamics ○ The principles of effective inter-professional collaboration ○ The principles of confidentiality			
Skills	**Communication with patients** • Establish a rapport with the patient and any relevant others (e.g. carers) • Listen actively and question sensitively to guide the patient and to clarify information • Identify and manage communication barriers, tailoring language to the individual patient and others and using interpreters when indicated • Deliver information compassionately, being alert to and managing their and your emotional response (anxiety, antipathy etc.) • Use, and refer patients to appropriate written and other evidence based information sources • Check the patient's			

	understanding, ensuring that all their concerns/questions have been covered • Make accurate contemporaneous records of the discussion • Manage follow-up effectively and safely utilising a variety if methods (e.g. phone call, email, letter) • Provide brief advice on health and self care e.g. use of alcohol and drugs. • Ensure appropriate referral and communications with other healthcare professional resulting from the consultation are made accurately and in a timely manner **Breaking bad news** • Demonstrate to others good practice in breaking bad news • Recognises the impact of the bad news on the patient, carer, supporters, staff members and self • Act with empathy, honesty and sensitivity avoiding undue optimism or pessimism **Communication with colleagues** • Communicate with colleagues accurately, clearly and promptly • Utilise the expertise of the whole multi-disciplinary team • Participate in, and co-ordinate, an effective hospital at night or hospital out of hours team • Communicate effectively with administrative bodies and support organisations • Prevent and resolve conflict and enhance collaboration			

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

Examples and descriptors for CCT	• Shows mastery of patient communication in all situations, anticipating and managing any difficulties which may occur • Able to break bad news in both unexpected and planned settings • Fully recognises the role of, and communicates appropriately with, all relevant team members • Predicts and manages conflict between members of the healthcare team • Beginning to take leadership role as appropriate, fully respecting the skills, responsibilities and viewpoints of all team members			

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Category	**Teaching and Training** (GMP Domains: 1, 3)	N/A		
Objective	• To teach to a variety of different audiences in a variety of different ways • To assess the quality of the teaching • To train a variety of different trainees in a variety of different ways • To plan and deliver a training programme with appropriate assessments		Mini PAT, Portfolio assessment at ARCP	Strongly recommended Teaching and Assessment Desirable: Presentation skills Reflective practice
Knowledge	• Understand relevant educational theory and principles			

	relevant to medical education • Understand the structure of an effective appraisal interview • Understand the roles to the bodies involved in medical education • Understand learning methods and effective learning objectives and outcomes • Differentiate between appraisal, assessment and performance review • Differentiate between formative and summative assessment • Understand the role, types and use of workplace-based assessments • Understand the appropriate course of action to assist a trainee in difficulty			
Skills	• Critically evaluate relevant educational literature • Vary teaching format and stimulus, appropriate to situation and subject • Provide effective feedback and promote reflection • Conduct developmental conversations as appropriate eg: appraisal, supervision, mentoring			

	• Deliver effective lecture, presentation, small group and bed side teaching sessions • Participate in patient education • Lead departmental teaching programmes including journal clubs • Recognise the trainee in difficulty and take appropriate action • Be able to identify and plan learning activities in the workplace			
Behaviour	• In discharging educational duties respect the dignity and safety of patients at all times • Recognise the importance of the role of the physician as an educator • Balances the needs of service delivery with education • Demonstrate willingness to teach trainees and other health workers • Demonstrates consideration for learners • Acts to endure equality of opportunity for students, trainees, staff and professional colleagues • Encourage discussions with colleagues in			

	clinical settings to share understanding • Maintains honesty, empathy and objectivity during appraisal and assessment			
Examples and descriptors **for Core Surgical Training**	• Prepares appropriate materials to support teaching episodes • Seeks and interprets simple feedback following teaching • Supervises a medical student, nurse or colleague through a simple procedure • Plans, develops and delivers small group teaching to medical students, nurses or colleagues			
Examples and descriptors for CCT	• Performs a workplace based assessment including giving appropriate feedback • Devises a variety of different assessments (eg MCQs, WPBAs) • Appraises a medical student, nurse or colleague • Acts as a mentor to a medical student, nurses or colleague • Plans, develops and delivers educational			

	programmes with clear objectives and outcomes • Plans, develops and delivers an assessment programme to support educational activities			

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Category	**Keeping up to date and understanding how to analyse information** Including • *Ethical research* (GMP Domains: 1) • Evidence and guidelines (GMP Domains: 1) • Audit (GMP Domains: 1, 2) • Personal development	**Area 1.3**		
Objective	• To understand the results of research as they relate to medical practise • To participate in medical research • To use current best evidence in making decisions about the care of patients • To construct evidence based guidelines and protocols • To complete an audit of clinical practice • At actively seek opportunities for		Mini PAT, CBD, Portfolio assessment at ARCP, MRCS and specialty FRCS	

	personal development • To participate in continuous professional development activities	**Area 1.3** **Area 1.3**		
Knowledge	• Understands GMC guidance on good practice in research • Understands the principles of research governance • Understands research methodology including qualitative, quantitative, bio-statistical and epidemiological research methods • Understands of the application of statistics as applied to medical practise • Outline sources of research funding • Understands the principles of critical appraisal • Understands levels of evidence and quality of evidence • Understands guideline development together with their roles and limitations • Understands the different methods of obtaining data for audit • Understands the role of audit in improving patient care and risk management • Understands the audit cycle • Understands the working and uses of national and local databases used for audit such as specialty data collection systems, cancer registries etc • To demonstrate knowledge of the importance of best practice, transparency and consistency	**Area 1.3**		
Skills	• Develops critical appraisal skills and applies these when reading literature • Devises a simple plan to test a hypothesis • Demonstrates the ability to write a scientific paper			

	• Obtains appropriate ethical research approval • Uses literature databases • Contribute to the construction, review and updating of local (and national) guidelines of good practice using the principles of evidence based medicine • Designs, implements and completes audit cycles • Contribute to local and national audit projects as appropriate • To use a reflective approach to practice with an ability to learn from previous experience • To use assessment, appraisal, complaints and other feedback to discuss and develop an understanding of own development needs	**Area 1.3** **Area 1.3**		
Behaviour	• Follows guidelines on ethical conduct in research and consent for research • Keep up to date with national reviews and guidelines of practice (e.g. NICE) • Aims for best clinical practice at all times, responding to evidence based medicine while recognising the occasional need to practise outside clinical guidelines • Recognise the need for audit in clinical practice to promote standard setting and quality assurance • To be prepared to accept responsibility • Show commitment to continuing professional development	**Area 1.3** **Area 1.3**		
Examples and descriptors **for Core Surgical Training**	• Defines ethical research and demonstrates awareness of GMC guidelines • Differentiates audit and research and understands the different types of research approach e.g. qualitative and quantitative • Knows how to use literature databases • Demonstrates good presentation and writing skills • Participates in departmental or other local journal club • Critically reviews an article to	**Area 1.3**		

	identify the level of evidence • Attends departmental audit meetings • Contributes data to a local or national audit • Identifies a problem and develops standards for a local audit • Describes the audit cycle and take an audit through the first steps • Seeks feedback on performance from clinical supervisor/mentor/patients/carers/service users	**Area 1.3**		
Examples and descriptors **for CCT**	• Demonstrates critical appraisal skills in relation to the published literature • Demonstrates ability to apply for appropriate ethical research approval • Demonstrates knowledge of research organisation and funding sources • Demonstrates ability to write a scientific paper • Leads in a departmental or other local journal club • Contributes to the development of local or national clinical guidelines or protocols • Organise or lead a departmental audit meeting • Lead a complete clinical audit cycle including development of conclusions, the changes needed for improvement, implementation of findings and re-audit to assess the effectiveness of the changes • Seeks opportunity to visit other departments and learn from other professionals	**Area 1.3** **Area 1.3**		

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Sub-category:	**Manager** including • Self Awareness and self management (GMP Domains: 1) • Team-working (GMP Domains: 1, 3) • Leadership (GMP Domains: 1, 2, 3) • Principles of quality and safety improvement (GMP Domains: 1, 3, 4) • Management and NHS structure (GMP Domains: 1)	**Area 1.1 and 1.2** **Area 2** **Area 4.2, 4.3, 4.4** **Area 3**		
Objective	**Self awareness and self management** • To recognise and articulate one's own values and principles, appreciating how these may differ from those of others • To identify one's own strengths, limitations and the impact of their behaviour • To identify their own emotions and prejudices and understand how these can affect their judgement and behaviour • To obtain, value and act on feedback from a variety of sources • To manage the impact of emotions on behaviour and actions • To be reliable in fulfilling responsibilities and commitments to a consistently high standard • To ensure that plans and actions are flexible, and take into account the needs and requirements of others • To plan workload and activities to fulfil work requirements and commitments with regard to	**Area 1.1 and 1.2**	Mini PAT and CBD	Desirable: Patient safety Human factors

	their own personal health **Team working** • To identify opportunities where working with others can bring added benefits • To work well in a variety of different teams and team settings by listening to others, sharing information, seeking the views of others, empathising with others, communicating well, gaining trust, respecting roles and expertise of others, encouraging others, managing differences of opinion, adopting a team approach **Leadership** • To develop the leadership skills necessary to lead teams effectively. These include: • Identification of contexts for change • Application of knowledge and evidence to produce an evidence based challenge to systems and processes • Making decision by integrating values with evidence • Evaluating impact of change and taking corrective action where necessary **Principles of quality and safety improvement** • To recognise the desirability of monitoring performance, learning from mistakes and adopting no blame culture in order to ensure high standards of care and optimise patient safety • To critically evaluate services • To identify where services can be improved • To support and facilitate innovative service improvement **Management and NHS culture** • To organise a task where several competing priorities may be involved • To actively contribute to plans which achieve service goals • To manage resources effectively and safely • To manage people effectively and safely	**Area 2**	Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and	

	• To manage performance of themselves and others • To understand the structure of the NHS and the management of local healthcare systems in order to be able to participate fully in managing healthcare provision	**Area 5** **Area 4.2, 4.3 and 4.4** **Area 3**	Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP Mini PAT, CBD and Portfolio assessment during ARCP	
Knowledge	**Self awareness and self management** • Demonstrate knowledge of ways in which individual behaviours impact on others; • Demonstrate knowledge of personality types, group dynamics, learning styles, leadership styles	**Areas 1.1 and 1.2**		

	• Demonstrate knowledge of methods of obtaining feedback from others • Demonstrate knowledge of tools and techniques for managing stress • Demonstrate knowledge of the role and responsibility of occupational health and other support networks • Demonstrate knowledge of the limitations of self professional competence **Team working** • Outline the components of effective collaboration and team working • Demonstrate knowledge of specific techniques and methods that facilitate effective and empathetic communication • Demonstrate knowledge of techniques to facilitate and resolve conflict • Describe the roles and responsibilities of members of the multidisciplinary team • Outline factors adversely affecting a doctor's and team performance and methods to rectify these • Demonstrate knowledge of different leadership styles **Leadership** • Understand the responsibilities of the various Executive Board members and Clinical Directors or leaders • Understand the function and responsibilities of national bodies such as DH, HCC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations • Demonstrate knowledge of patient outcome reporting systems within surgery, and the organisation and how these relate to national programmes. • Understand how decisions are made by individuals, teams and the organisation • Understand effective communication strategies within organisations • Demonstrate knowledge of impact mapping of service change, barriers to change, qualitative methods to gather the experience of patients and carers	**Area 2** **Area 5** **Area 4.2, 4.3, 4.4**		

	Quality and safety improvement
	
	• Understand the elements of clinical governance and its relevance to clinical care
	• Understands significant event reporting systems relevant to surgery
	• Understands the importance of evidence-based practice in relation to clinical effectiveness
	• Understand risks associated with the surgery including mechanisms to reduce risk
	• Outline the use of patient early warning systems to detect clinical deterioration
	• Keep abreast of national patient safety initiatives including National Patient Safety Agency , NCEPOD reports, NICE guidelines etc
	• Understand quality improvement methodologies including feedback from patients, public and staff
	• Understand the role of audit, research, guidelines and standard setting in improving quality of care
	• Understand methodology of creating solutions for service improvement
	• Understand the implications of change
	
	Management and NHS Structure
	
	• Understand the guidance given on management and doctors by the GMC
	• Understand the structure of the NHS and its constituent organisation
	• Understand the structure and function of healthcare systems as they apply to surgery
	• Understand the principles of:
	  • Clinical coding
	  • Relevant legislation including Equality and Diversity, Health and Safety, Employment law, European Working Time Regulations
	  • National Service Frameworks
	  • Health regulatory agencies (e.g., NICE, Scottish Government)
	  • NHS Structure and relationships
	  • NHS finance and budgeting
	  • Consultant contract
	  • Commissioning, funding and contracting arrangements
	  • Resource allocation
	  • The role of the independent sector as providers of healthcare
	  • Patient and public involvement processes and role
		Area 3		

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

	delivery of health care relevant to surgery • Identify trends, future options and strategy relevant to surgery • Compare and benchmark healthcare services • Use a broad range of scientific and policy publications relating to delivering healthcare services • Prepare for meetings by reading agendas, understanding minutes, action points and background research on agenda items • Work collegiately and collaboratively with a wide range of people outside the immediate clinical setting • Evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities • Understand the wider impact of implementing change in healthcare provision and the potential for opportunity costs **Quality and safety improvement** • Adopt strategies to reduce risk e.g. Safe surgery • Contribute to quality improvement processes e.g. o Audit of personal and departmental performance o Errors / discrepancy meetings o Critical incident and near miss reporting o Unit morbidity and mortality meetings o Local and national databases • Maintenance of a personal portfolio of information and evidence • Creatively question existing practise in order to improve service and propose solutions **Management and NHS Structures** • Manage time and resources effectively • Utilise and implement protocols and guidelines • Participate in managerial meetings • Take an active role in promoting the best use of healthcare resources • Work with stakeholders to create and sustain a patient-centred service • Employ new technologies appropriately, including information technology • Conduct an assessment of the community needs for specific health improvement measures	**Area 4.2, 4.3, 4.4** **Area 3**		

Behaviour	**Self awareness and self management** • To adopt a patient-focused approach to decisions that acknowledges the right, values and strengths of patients and the public • To recognise and show respect for diversity and • differences in others • To be conscientious, able to manage time and delegate • To recognise personal health as an important issue	**Area 1.1 and 1.2**		
	Team working • Encourage an open environment to foster and explore concerns and issues about the functioning and safety of team working • Recognise limits of own professional competence and only practise within these. • Recognise and respect the skills and expertise of others • Recognise and respect the request for a second opinion • Recognise the importance of induction for new members of a team • Recognise the importance of prompt and accurate information sharing with Primary Care team following hospital discharge	**Area 2** **Area 5**		
	Leadership • Demonstrate compliance with national guidelines that influence healthcare provision • Articulate strategic ideas and use effective influencing skills • Understand issues and potential solutions before acting • Appreciate the importance of involving the public and communities in developing health services • Participate in decision making processes beyond the immediate clinical care setting • Demonstrate commitment to implementing proven improvements in clinical practice and services • Obtain the evidence base before declaring effectiveness of changes	**Area 4.2, 4.3, 4.4**		
	Quality and safety improvement • Participate in safety improvement strategies such as critical incident reporting • Develop reflection in order to achieve insight into own professional practice			

	• Demonstrates personal commitment to improve own performance in the light of feedback and assessment • Engage with an open no blame culture • Respond positively to outcomes of audit and quality improvement • Co-operate with changes necessary to improve service quality and safety **Management and NHS Structures** • Recognise the importance of equitable allocation of healthcare resources and of commissioning • Recognise the role of doctors as active participants in healthcare systems • Respond appropriately to health service objectives and targets and take part in the development of services • Recognise the role of patients and carers as active participants in healthcare systems and service planning • Show willingness to improve managerial skills (e.g. management courses) and engage in management of the service	**Area 3**		
Examples and descriptors **for Core Surgical Training**	**Self awareness and self management** • Obtains 360° feedback as part of an assessment • Participates in peer learning and explores leadership styles and preferences • Timely completion of written clinical notes • Through feedback discusses and reflects on how a personally emotional situation affected communication with another person • Learns from a session on time management **Team working** • Works well within the multidisciplinary team and recognises when assistance is required from the relevant team member • Invites and encourages feedback from patients • Demonstrates awareness of own contribution to patient safety within a team and is able to outline the roles of other team members. • Keeps records up-to-date and legible and relevant to the safe progress of the patient. • Hands over care in a precise, timely and effective manner • Supervises the process of finalising and submitting operating lists to the theatre suite **Leadership**	**Area 1.1 and 1.2** **Area 2** **Area 5**		

	• Complies with clinical governance requirements of organisation • Presents information to clinical and service managers (eg audit) • Contributes to discussions relating to relevant issues e.g. workload, cover arrangements using clear and concise evidence and information **Quality and safety improvement** • Understands that clinical governance is the over-arching framework that unites a range of quality improvement activities • Participates in local governance processes • Maintains personal portfolio • Engages in clinical audit • Questions current systems and processes **Management and NHS Structures** • Participates in audit to improve a clinical service • Works within corporate governance structures • Demonstrates ability to manage others by teaching and mentoring juniors, medical students and others, delegating work effectively, • Highlights areas of potential waste	**Area 4.2, 4.3, 4.4** **Area 3**		
Examples and descriptors **for CCT**	**Self awareness and self management** • Participates in case conferences as part of multidisciplinary and multi agency team • Responds to service pressures in a responsible and considered way • Liaises with colleagues in the planning and implementation of work rotas **Team working** • Discusses problems within a team and provides an analysis and plan for change • Works well in a variety of different teams • Shows the leadership skills necessary to lead the multidisciplinary team • Beginning to leads multidisciplinary team meetings o Promotes contribution from all team members o Fosters an atmosphere of collaboration o Ensures that team functioning is maintained at all times. o Recognises need for optimal team dynamics o Promotes conflict resolution	**Area 1.1 and 1.2** **Area 2**		

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

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	**Areas in which simulation should be used to develop relevant skills**
Sub-category:	**Promoting good health** (GMP Domains: 1, 2, 3)			
Objective	• To demonstrate an understanding of the determinants of health and public policy in relation to individual patients • To promote supporting people with long term conditions to self-care • To develop the ability to work with individuals and communities to reduce levels of ill health and to remove inequalities in healthcare provision • To promote self care	N/A	MRCS, specialty FRCS, CBD, Mini PAT	
Knowledge	• Understand guidance documents relevant to the support of self care • Recognises the agencies that can provide care and support out with the hospital • Understand the factors which influence the incidence and prevalence of common conditions including psychological, biological, social, cultural and economic factors • Understand the screening programmes currently available within the UK • Understand the possible positive and negative implications of health promotion activities • Demonstrate knowledge of the determinants of health worldwide and strategies to influence policy relating to health			

	issues • Outline the major causes of global morbidity and mortality and effective, affordable interventions to reduce these			
Skills	• Adapts assessment and management accordingly to the patients social circumstances • Assesses patient's ability to access various services in the health and social system and offers appropriate assistance • Ensures appropriate equipment and devices are discussed and where appropriate puts the patient in touch with the relevant agency • Facilitating access to appropriate training and skills to develop the patients' confidence and competence to self care • Identifies opportunities to promote change in lifestyle and to prevent ill health • Counsels patients appropriately on the benefits and risks of screening and health promotion activities			
Behaviour	• Recognises the impact of long term conditions on the patient, family and friends • Put patients in touch with the relevant agency including the voluntary sector from where they can access support or equipment relevant to their care • Show willingness to maintain a close working relationship with other members of the multi-disciplinary team, primary and community care			

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

	PROFESSIONAL BEHAVIOUR AND LEADERSHIP	MAPPING TO LEADERSHIP CURRICULUM	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Sub-category:	**Probity and Ethics** To include • Acting with integrity • Medical Error • Medical ethics and confidentiality (GMP Domains: 1, 2, 3, 4) • Medical consent (GMP Domains: 1, 3, 4) • Legal framework for medical practise (GMP Domains: 1, 2, 3)	Area 1.4		
Objective	• To uphold personal, professional ethics and values, taking into account the values of the organisation and the culture and beliefs of individuals • To communicate openly, honestly and inclusively • To act as a positive role model in all aspects of communication • To take appropriate action where ethics and values are compromised • To recognise and respond the causes of medical error • To respond appropriately to complaints • To know, understand and apply appropriately the principles, guidance and laws regarding medical ethics and confidentiality as they apply to surgery • To understand the necessity of obtaining valid consent from the patient and how to obtain • To understand the legal framework within which healthcare is provided in the UK • To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice, taking into account local and national regulations • Understand ethical obligations to patients and colleagues • To appreciate an obligation to be aware of	Area 1.4	Mini PAT and CBD, PBA, DOPS, MRCS, specialty FRCS	Desirable: Human factors

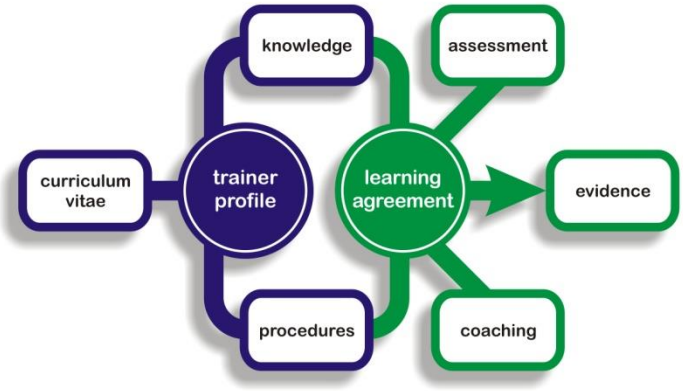
	personal good health			
Know ledge	• Understand local complaints procedure • Recognise factors likely to lead to complaints • Understands the differences between system and individual errors • Outline the principles of an effective apology • Knows and understand the professional, legal and ethical codes of the General Medical Council and any other codes to which the physician is bound • Understands of the principles of medical ethics • Understands the principles of confidentiality • Understands the Data Protection Act and Freedom of Information Act • Understands the principles of Information Governance and the role of the Caldicott Guardian • Understands the legal framework for patient consent in relation to medical practise • Recognises the factors influencing ethical decision making including religion, personal and moral beliefs, cultural practices • Understands the standards of practice defined by the GMC when deciding to withhold or withdraw life-prolonging treatment • Understands the UK legal framework and GMC guidelines for taking and using informed consent for invasive procedures including issues of patient incapacity	Area 1.4		
Skills	• To recognise, analyse and know how to deal with unprofessional behaviours in clinical practice taking into account local and national regulations • To create open and nondiscriminatory professional working relationships with colleagues awareness of the need to prevent bullying and harassment • Contribute to processes whereby complaints are reviewed and learned from • Explains comprehensibly to the patient the events leading up to a medical error or serious untoward incident, and sources of support for patients and their relatives • Deliver an appropriate apology and explanation relating to error • Use and share information with the highest regard for confidentiality both within the team and in relation to patients • Counsel patients, family, carers and advocates tactfully and effectively when making decisions about resuscitation status, and	Area 1.4 Area 1.4		

	withholding or withdrawing treatment • Present all information to patients (and carers) in a format they understand, checking understanding and allowing time for reflection on the decision to give consent • Provide a balanced view of all care options • Applies the relevant legislation that relates to the health care system in order to guide one's clinical practice including reporting to the Coroner's/Procurator Officer, the Police or the proper officer of the local authority in relevant circumstances • Ability to prepare appropriate medical legal statements for submission to the Coroner's Court, Procurator Fiscal, Fatal Accident Inquiry and other legal proceedings • Be prepared to present such material in Court			
Behaviour	• To demonstrate acceptance of professional regulation • To promote professional attitudes and values • To demonstrate probity and the willingness to be truthful and to admit errors • Adopt behaviour likely to prevent causes for complaints • Deals appropriately with concerned or dissatisfied patients or relatives • Recognise the impact of complaints and medical error on staff, patients, and the National Health Service • Contribute to a fair and transparent culture around complaints and errors • Recognise the rights of patients to make a complaint • Identify sources of help and support for patients and yourself when a complaint is made about yourself or a colleague • Show willingness to seek advice of peers, legal bodies, and the GMC in the event of ethical dilemmas over disclosure and confidentiality • Share patient information as appropriate, and taking into account the wishes of the patient • Show willingness to seek the opinion of others when making decisions about resuscitation status, and withholding or withdrawing treatment • Seeks and uses consent from patients for procedures that they are competent to perform while o Respecting the patient's autonomy o Respecting personal, moral or religious beliefs o Not exceeding the scope of authority	Area 1.4 Area 1.4 Area 1.4		

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

LEARNING AGREEMENT

The Learning Agreement between the trainer and the trainee forms the cement that binds together the T&O curriculum. The formulation of this agreement in the workplace environment is made as simple and straightforward as possible through the use of a series of templates and agendas, which form a protocol accessed through ISCP.



In order for the trainee to maximise the learning opportunities available, a number of points need to be considered:

The trainee and trainer need to discuss prior training experiences to establish an understanding of the overall level of competency that the trainee has.

The trainer needs to be able to present to the trainee what training opportunities are going to be on offer for that trainee at his or her level. ISCP has embedded within the system trainer profiles, which can be accessed by trainees.

The trainer must be flexible to ensure that the trainee has as many learning opportunities as possible given the limitations of NHS practice.

The trainee must accept that not all perceived learning opportunities will be available given the constraints of NHS practice.

Both trainee and trainer must be prepared to give and receive feedback and both must reflect upon the experiences.

Learning agreements:

The documents for the learning agreements are managed through ISCP. Essentially these are completed at the start of the attachment, near the mid-point and the end.

The learning agreements should establish in detail what is going to be achieved for the period of the attachment, including clinical skills, quality improvement projects, research and attendance at courses and meetings.

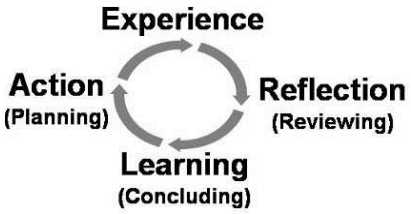
There should be an agreement about the opportunities to complete WBAs in the post.

MODELS OF LEARNING

Educational Models

There are numerous educational models, theories and papers relevant to this curriculum and to the activity of training in T & O. Of all of these, trainers and trainees should be familiar with four, listed below, that have underpinned the development of this curriculum.

How surgeons learn

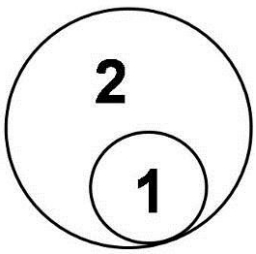


David Kolb's learning cycle illustrates the importance of reflection in the learning process. Without the key activities of reflecting and drawing conclusions, learning is reduced to a series of events with no connection to changes or improvements in behaviour or competence.

The T&O curriculum encourages reflective learning on the part of both trainer and trainee in the learning agreement. All trainers are required to reflect on their own practice in the production of a trainer profile which is shared with each trainee at the start of an attachment. The trainee in turn uses this profile to reflect on their own progress to date, sharing this with the trainer in the first learning agreement meeting where, together, they set goals for the attachment. As the attachment progresses workplace based assessments generate feedback for the trainee on which s/he reflects informally on a day to day basis and formally at two further learning agreement meetings, the last of which offers the opportunity to reflect on the attachment as a whole and draw conclusions to be actioned in the next post.

What surgeons learn

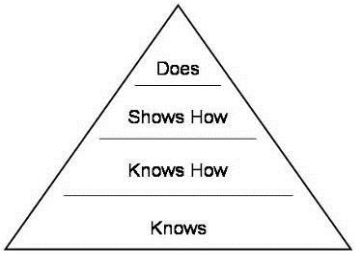
Argyris & Schön proposed that to be effective in the workplace, learning must cover multiple levels synergistically. It is not enough to move rapidly around loop 1 (detecting errors and fixing immediate problems). Without loop 2 (values, underlying principles, why the problems occur in the first place) learning is incomplete.



Similarly it is not enough for a surgical trainee to learn the specific details of clinical work (doing surgery) without simultaneously extending their competence in being a surgeon, a much wider activity.

In the T & O curriculum the content of the clinical syllabus represents the detail of surgery (including those skills relating to the generality of the discipline) whereas the Professional Behaviour and Leadership Skills syllabus represents the breadth of surgical activity beyond the solution of clinical problems (Good Medical Practice).

Assessment of learning



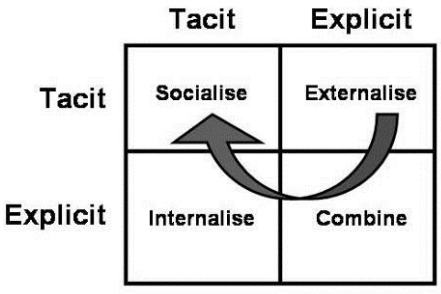
George Miller provided a framework for assessment in his pyramid model. In Miller's view a portfolio of assessments needs to be used to evaluate the trainee at different levels.

In the T& O curriculum the WBA including Procedure Based Assessments CEX, CBD and MSF target the highest levels of the pyramid. and the examination focuses largely at knowledge level.

Articulating Tacit Knowledge (& skills)

Most surgeons will find it difficult to articulate how or when they learned "professional judgement", "leadership" or many other meta-skills. This may be in part because such learning was through socialisation (rather than programmed) but fundamentally because such knowledge and skills are routinely held tacitly by consultants.

Tacit knowledge is the collection of things we don't know we know, even though we use them to do things. Explicit knowledge (skills) refers to the things we know that we know and are able to share with others through words or deliberate actions. Ikujiro Nonaka's work on knowledge management helps us to see that two people may share their tacit knowledge (through socialisation, unguided observation…). One or other may then externalise that knowledge, combine it with other knowledge and then re-internalise it through practice.



For example, a trainee assists the trainer in a difficult procedure during which an unexpected complication occurs. The trainee has seen and heard much during the procedure, including conversations between the surgeon, scrub nurse and anaesthetist. In commenting to the surgeon afterwards on what has (factually) been observed, the trainee makes the knowledge explicit and then combines this explicit knowledge with explanations from the surgeon or other knowledge. The trainee then "takes on board" or intern alises it as part of ongoing competence development in readiness to pursue the learning cycle further. The articulation of Tacit Knowledge is a frequently occurring element of reflection within the overall learning cycle.

There is much in this T&O curriculum that will be "newly explicit" to many trainers and trainees. There has been a clinical knowledge syllabus for many years (on which various examinations have been based) but the material now included in the professional behaviour and leadership skills syllabus covers competencies, which have, until now, been "picked up on the way". It is to be hoped that the curriculum will enable trainers and trainees to progress more easily by the externalisation of such skills.

LEARNING ENVIRONMENT

As surgery is a craft specialty, it is essential that trainees are able to acquire specialist surgical skills in the work place under supervision that is appropriate for the level of the trainee and the particular learning experience. They will be expected to use those skills to deliver clinical services and thus acquire experience based on the competencies they achieve. The delivery of training occurs alongside service delivery as a matter of necessity. Clarity is required on the nature of this partnership in order that the interests of all parties (trainee, trainer, trust and patient) are best served. It is the responsibility of the programme director, in partnership with the Postgraduate Dean and the individual training unit, to ensure that an adequate learning environm ent is provided.

INDIVIDUALS IN THE WORKPLACE

Trainees

Individual trainees must take ultimate responsibility for their own learning. It will be their duty to ensure that they cover the syllabus (as set out in this document) and supplement the other aspects of their training with planned learning, personal study, audit and research.

As part of the process of work based learning a trainee would be expected to:

- Attend supervised fracture and orthopaedic clinics.
- Attend supervised elective and trauma operating lists.
- Undertake emergency assessments of the acute presentations of trauma and orthopaedic problems in the Emergency Department.
- Participate in the presentation of trauma cases and trauma management discussions.
- Work as a member of a team that includes other health care professionals.
- Undertake the care of patients in the ward environment.
- Participate in the organisation and management of in and outpatient care.
- Attend teaching sessions within the work place.
- Participate in audit meetings.
- Participate in journal clubs.
- Undertake clinical reviews and research.
- The trainee is also required to take advantage of external learning opportunities.
- Attend programme based teaching sessions.
- Attend appropriately organised and instructed external courses and workshops as agreed in their learning agreements.

- Attend professional association instructional courses and conferences.
- Produce poster presentations, presentations and publications.
- Undertake guided reading.
- Undertake e- learning.

Trainers

One of the most valued resources of the current training system is the time, commitment and energy devoted by the trainers.

Currently trainers are expected to fulfil the requirements of the GMC as stated in "Recognising and Approving Trainers 2012". They must be able to demonstrate competencies as follows:

- Ensuring **safe and effective patient care** through training
- Establishing and maintaining an **environment for learning**
- **Teaching and facilitating** learning
- Enhancing learning through **assessment**
- Supporting and **monitoring educational progress**
- **Guiding** personal and professional **development**
- **Continuing** professional **development** as an educator

DEANERY/PROGRAMME

The training programme director (TPD) should produce an outline rotation for each stage of training to enable trainees to acquire the necessary knowledge, skills, judgement and professionalism to fulfil each stage of their educational requirements. The outline rotation may need to be adjusted subject to the outcomes of the ARCP process

The programme should provide a cohesive, progressive core curriculum programme, which should include opportunities for didactic tuition, clinical presentation, paper presentations and for journal discussion.

EXTERNAL RESOURCES

Courses

External organisations regularly promote and organise courses of study. Trainees (in discussion with their trainers) must choose courses appropriate to their stage of learning and identify them in their learning agreement. Full funding for these courses will rarely be available from training budgets and trainees should be aware of this when planning these external opportunities.

Resources

There is now a wealth of web based instructional materials and medical resources with which the trainee should become familiar.

Colleges

All the Royal Colleges produce publications and instructional material, sometimes on an intercollegiate basis.

British Orthopaedic Association (BOA)

The BOA hosts instructional courses for trainees and includes instructional sessions within its Annual Congress.

The BOA web site has a specific education section with information and hyperlinks.

Other Specialty Interest Associations

All areas of T&O specialty interests have associations that will provide a variety of learning opportunities.

STAGES OF LEARNING

Core Training

Core training enables surgical trainees to develop their basic knowledge and skills and provides the opportunity to be exposed to several different surgical specialties. Core trainees wishing to enter T&O for higher training should endeavour to choose a core training programme that enables them to build foundations for a future career in the specialty. There is a specified requirement of a minimum of 10 months training in T&O for core trainees wishing to become ST3 trainees in T&O. These posts must be able to deliver the competencies as defined in the Core Training Curriculum.

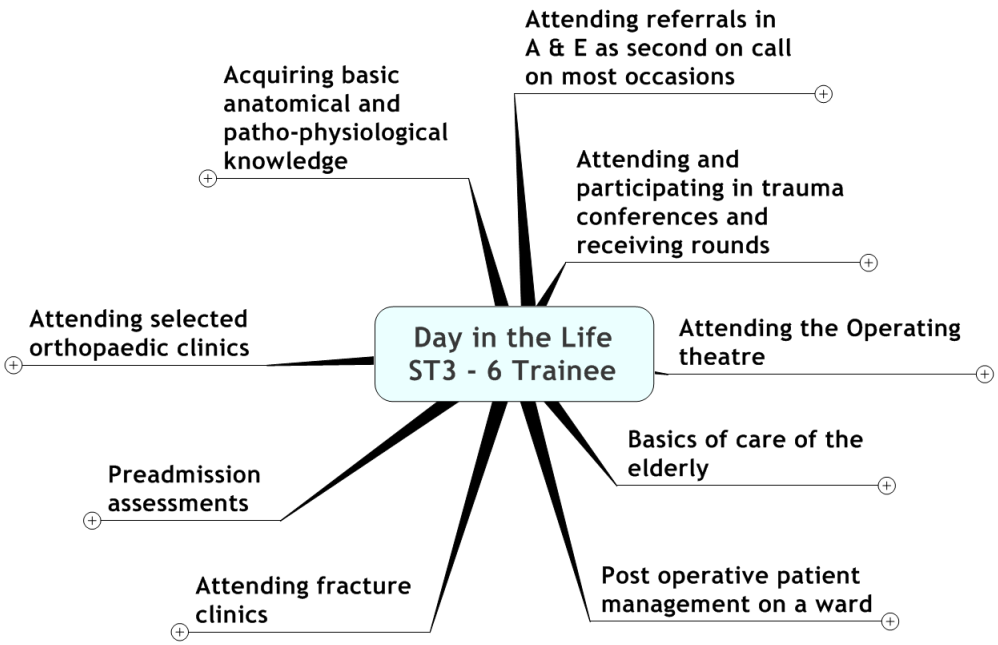
ST3 – 6 Overview

This is the stage when the trainee obtains many of the clinical competencies. They will also acquire both in and outpatient diagnostic and management skills and will supervise the day to day ward work of the foundation and core trainee doctors.

The intermediate phase includes further training in trauma and the introduction of specialty modules for example ankle and foot, hand, shoulder and elbow, hip, knee, spine and children's surgery. The precise shaping of the modules will differ in different training programmes. Most training posts will be attachments to one or at most two trainers. Trainees should not have to "compete" with others seeking training, such as fellows, when attached to a particular trainer. Training posts should have a job plan that maximises contact between the trainer and trainee, has combination of trauma and elective orthopaedics and must include time for personal study, attendance at regional training programme teaching and time for audit and research.

The majority of posts include trauma on call according to a rota which would normally be supervised by a number of different trainers during an attachment. This provides an opportunity to receive feedback from more than one source, during a training interval, which is to be encouraged. Occasionally posts will include no trauma commitment, but this is unusual. Overall, approximately 50% of training experience should be allocated to the specialist subjects and 50% to trauma.

Over the intermediate training interval the majority of the examples of modular training outlined above should be covered.



ST7 – 8 Overview

The final phase is assumed to occur in the last one to two indicative years of the programme, assuming that by then all the necessary competencies outlined in the curriculum have been acquired. During this period trainees have a number of choices.

The purpose of this phase is for the trainee to consolidate their skills in the generality of T&O surgery and practice and to extend their expertise in one or more of their areas of special interest. This period enables the trainee to further develop their decision making skills under guidance based on the solid grounding of knowledge, skills, judgement and professionalism obtained in the earlier phases. It prepares the trainee for entry onto the Specialist Register and for the role of team leader required as a consultant in the NHS.

The most likely choice training posts may be a combination of one of the following:-

- A reprise in one of the modular components revisiting existing training places on your rotation to study in more depth. For example, ankle and foot, hand, shoulder and elbow, hip, knee, spine and paediatric.
- Visits to another specialist in the trainee's declared field of interest in the existing programme. This is only likely to apply in larger programmes
- Fellowships within other UK programmes or in national training accredited posts for specialist training – these are well recognised in particular disciplines particularly hand surgery, children's orthopaedics and spinal surgery. Stand alone fellowships, either in the UK or overseas may also provide the training required by a trainee.
- All fellowships must have prospective approval from GMC prior to commencement. The SAC liaison member for training programme is required to consider a post for approval and will review the

experience once the post has been completed. Approval that the post will contribute to overall training will be given only if evidence is provided demonstrating the acquired competencies.

- A period in research. If a trainee has already spent a period in research and sought to have it approved for training, a second period is unlikely to be recognised unless it has a substantial clinical element. It is vital that the trainee checks with the SAC if such a proposal is to be considered. The SAC wishes to support academic development but within the context of training.
- The trainee is required to successfully complete the Intercollegiate Specialty Examination in Trauma and Orthopaedics during this last phase of training.

ACTING UP AS A CONSULTANT (AUC)

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

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

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

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

ACADEMIC T & O SURGERY AND RESEARCH

T&O actively supports research and the need for the training of academic clinicians. The programmes for such posts are governed through National Institute for Health Research (NIHR) initiatives and highly competitive. Academic trainees will have to demonstrate both clinical and academic competencies.

In general it is expected that all trainees will be involved in research. The type and direction of the research will depend upon the support that is on offer. Some trainers have a research background and so are able to develop and support research programmes that trainees can join. Academic departments can and will s upport research, both basic science and clinical.

It is essential that all trainees have knowledge of some aspects of research methodology, especially epidemiology and statistics. It is, however, also important that all T&O trainees are able to understand the language of modern scientific technologies as applied to the specialty. The ability to critically appraise scientific publications is an essential skill for all T&O surgeons.

Trainees may ask what acceptable research output is during their training. There is no easy answer to this. Being proscriptive about numbers of publications and presentations simply leads to wasted effort by the trainees who may not have sought or found the necessary support to successfully complete a piece of work. However, it is expected that all trainees provide evidence of involvement in research. Some guidance can be found on the JCST website.

Some points to be considered by trainees:

- Find a topic that you find personally interesting and stimulating.
- Spend some time finding out if you can make an original contribution to knowledge by following that topic.
- Discuss widely with others who are experienced in undertaking research. You will need a mentor.
- Get statistical support if appropriate.
- Be realistic about timescales. The necessary permissions such as ethics can take months to gain.
- Get other trainees involved so that you are not working on your own. Help is essential at various points, such as when you are preparing for the intercollegiate examination and cannot concentrate on the research.
- If you are wishing to undertake basic science research in a laboratory, remember that you are likely to be less experienced than anyone else in that environment, so respect other workers who will be willing to help.
- Discuss, at an early stage, whether a piece of work may be suitable for a research degree or as a thesis as part of a taught masters degree.

QUALITY IMPROVEMENT PROJECTS

There is a requirement that all doctors are involved in quality improvement projects. Traditionally this has been accepted as undertaking an audit that does not necessarily close the loop.

For this version of the curriculum it will be a requirement that all trainees are able to provide evidence of involvement in quality improvement projects. Success at ARCP will be dependent on providing such evidence.

Undertaking a full audit cycle (closing the loop) leading to a change in practice and improved quality of care has become part of the revalidation process for consultants. Trainees have been expected to take part in regular audit and demonstrate that activity in their portfolio. However, there has not been a curriculum requirement to undertake audit. In this revision of the curriculum there is a requirement for all trainees to undertake a minimum of one full audit per year. Within the 6 years of higher training, trainees must undertake at least 2 audits where the loop is closed. The completed audit cycle should be presented at a local, national or international meeting.

It is recognised that other methodologies can demonstrate quality improvement. Therefore, trainees should consider using root cause analysis or other quality improvement methodologies to demonstrate competency in this area.

ACUTE MANAGEMENT OF THE INJURED PATIENT

It is a requirement of all trainees that they have a current certificate (provider status) in Advanced Trauma Life Support (ATLS) or an equivalent course. Trainees must be able to assess and manage the acutely injured patients using a structured approach. Trainees will be part of the trauma team at various stages in their training and indeed as they become senior may have to take a leadership role. ATLS or similar provides a structure which is familiar to all who are involved in the acute management of the injured patient.

AT COMPLETION OF ST8

Trainees will be able to demonstrate the following evidence in support of their application for a CCT and entry into the Specialist Register:

- Completion of 8 indicative years of training – 2 at core level and 6 at higher level.
- Successful completion of the intercollegiate specialty examination in Trauma and Orthopaedics.
- A comprehensive portfolio showing training in the generality of T&O and evidence of specialty interest advanced training.
- Consolidation sheets from an e-logbook that demonstrate the breadth of exposure and performance of procedures progressing from supervised with the trainer scrubbed to more independent operating.
- Completion of all the primary PBAs to level 4; completion of the CBDs for critical conditions; completion of such additional PBAs to demonstrate wider competency in T &O surgery.
- Completion of quality improvement projects including the completion of 2 full audit loops in ST3 –ST8.
- Completion, presentation and publication of appropriate research work.
- Maintenance of ATLS provider status or an equivalent status in the acute management of the injured.
- Completion of an appropriate teaching course such Training the Trainers as a minimum requirement.
- Completion of a course on management in the NHS.
- Completion of training in equality and diversity and assessment and appraisal.

CESR applicants

It should be noted that some surgeons will enter the Specialist Register via the CESR route. Applicants for such entry must be able to demonstrate evidence as outlined for those receiving a CCT. CESR applicants are encouraged to seek mentorship from a senior consultant. CESR applicants will need to ensure that they are able to show recent (within 5 years) experience in all the specialty interest areas (hands, spines and children's trauma and orthopaedics).

Assessment & Feedback

INTRODUCTION

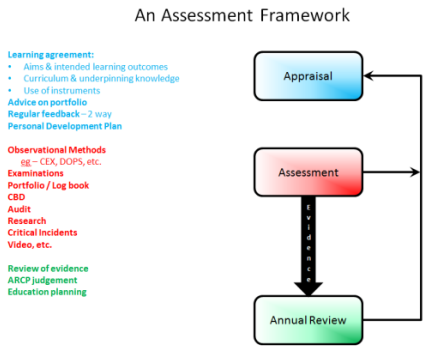
The curriculum is designed to provide clear outcomes at all stages. It includes elements germane to the whole of surgery in the early years and becoming increasingly specialised towards a competency model mapped back to "Good Medical Practice" in the context of T & O in later stages. The assessment and feedback mechanisms are fashioned to enable trainees to monitor their progress against these outcomes through a series of learning agreements which will be reviewed at regular intervals by the clinical supervisor and the trainee through a process of informal day to day encounters supported by formal and regular educational appraisals.

The assessment framework is constructed along the lines proposed by the GMC sub-committee on workplace based assessment (WBA) and illustrated below (GMC 2010).

The feedback process has three stages:

- Reaching a learning agreement and reviewing it – educational appraisal
- Structured assessment in the workplace
- An annual review which has two components:
    - A review of the evidence of progression achieved as a result of stages one and two described above. The annual review is a high stakes event and will include Deanery and SAC nominated external scrutiny – it is also likely to be a paper-based or virtual process for most trainees.
    - An educational review between trainee and designated members of the local training committee (ARCP) which will plan the next stage of training or any remedial action recommended as a result of the high stakes review. This second stage is entirely formative and designed to encourage progression.

This is summarised in the diagram below:



The only exception to the above process will be in CT1 when at least two high stakes educational reviews will be necessary to ensure the trainee remains comfortable with their chosen career and to permit both trainers and trainees to reflect on progress or suggestions for the need for counselling or career change in a minority of cases.

THE LEARNING AGREEMENT

Learning agreements are the central agenda setting tool for the trainer and trainee. They form a link between the short-term learning opportunities within a specific attachment and the curriculum as a whole.

The learning agreement enables the trainee (in consultation with the Clinical Supervisor) not only to monitor their learning continuously but also to review their progress against the overall curriculum. It is essential that both trainers and trainees utilise the learning agreement to maintain the overall progression in acquiring the generic skills and judgment required of a surgeon in addition to the specific skills and knowledge acquired in any particular post. The selection of assessment tools within the learning agreement (e.g. PBAs and CBDs) must be made with the intention of sampling the trainee's growing competence with a reliability and scope, which ensures learning overall is quality assured.

The Trainee, Assigned Educational and Clinical Supervisors should anticipate and integrate opportunities for simulation into the learning agreement to maximise every opportunity to prepare safely and effectively.

THE INSTRUMENTS OF ASSESSMENT

In general, assessment will take place in the workplace where possible, using an agenda set by the learning agreement and regular educational appraisal as described above. Where appropriate, knowledge and its application will be assessed by formal examinations. Progression will be determined by the series of reviews which will take into account all the evidence presented in a portfolio. The elements, which provide evidence of progression, will be looked at in an integrated manner, ensuring the outcome based curriculum has been addressed satisfactorily by a trainee in all aspects. All the components discussed in the curriculum must be achieved to the standards laid out in this curriculum.

T & O recognises the need to test knowledge, skills, judgement and professionalism relevant to the general practice of surgery in the early years of training.

The reasons for this are three fold:

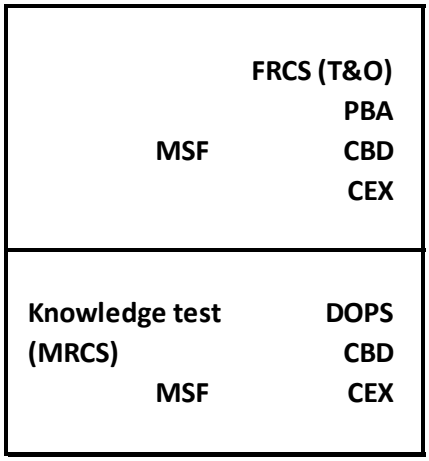
- Surgeons are primarily 'doctors who do surgery' and must acknowledge the knowledge, skills, judgement and professionalism (built on undergraduate and foundation training) which consolidate this principle.
- An individual's aspirations in relation to surgery may turn out to be unrealistic or they may wish to change their careers and need educational credit.
- To enable individuals to focus on the breadth of medicine as well as the depths of surgery to the benefit of their patients.

With this in mind, the early assessments (CEX, CBD, DOPS, MSF) consist largely of elements carried forward from the foundation programme, applied in the context of the generality of surgery; and set within the learning agreement for any attachment. .

As trainees progress, assessments will focus increasingly on the T & O context but still conceptualized in all aspects of Good Medical Practice. If a trainee is felt to be deficient in an element of GMP then any of the early years instruments may be reintroduced at any time during training.

The assessment strategy is illustrated below.

The foundation and core training instruments are common to all 10 disciplines of surgery with the exception of Procedure Based Assessment instruments specific to the T & O specialist components laid out in the curriculum. Early assessments will test transferable knowledge, skills, judgement and professionalism relevant to surgery in general. The early test of knowledge encompassed in a revised test similar to the basic sciences element of the current MRCS will be predominantly germane to the whole of surgery, but some elements may be specific to T & O, such as anatomy and surgical pathology.



CEX (Clinical Evaluation Exercise)

A direct observation of clinical skills on the ward, emergency department or in outpatients by a trainer of a trainee; e.g. history taking, physical examination, discharge work up. Usually the trainer and trainee will agree in advance (generally triggered by the trainee) that an opportunity will be found in an imminent event such as a clinic, to observe part of a patient interaction. The trainer becomes an observer and assessor and marks the trainee using the checklist shown in Appendix (a). These checklists are generic. Multiple encounters are needed by multiple assessors (four different ones) over time in order to provide a valid and reliable measure of clinical performance. The trainee is encouraged to self and peer assess using the instruments when opportunities arise.

DOPS (Direct Observation of Procedural Skills)

Initially these will build from Foundation skills outlined in the Foundation curriculum commonly agreed. For surgery in general a series of potential DOPS is described in ISCP including some specific to T & O.

The concept is simply that commonly performed straightforward procedures will be observed in the operating room and clinic or ward settings. This could include suturing, applying a cast, injecting a joint for example plus other techniques not encountered in foundation years but relevant to surgery.

CBD (Case Based Discussion)

A focused discussion on the trainee's recent entries in a patient's notes to explore clinical thinking and management. This will assess the trainee's judgement as well as knowledge.

Multi-source feedback

A type of Multi-Source Feedback or 360º appraisal, which measures performance across the domains of Good Medical Practice. Raters should include surgical staff of a variety of grades, plus nurses, anaesthetists and allied health professionals selected by the trainee. The aggregate ratings are compared with self-assessments and used to provide feedback on professionalism.

PBA (Procedure Based Assessments)

Procedure Based Assessments are direct observations of surgical skills in intermediate and advanced procedures such as total knee replacement or open reduction and internal fixation of fractures. Either a part or the whole of the procedure can be assessed, including obtaining consent and developing a management plan.

The design of the PBA has the following criteria:

- A PBA can be applied to many procedures, theoretically, but in order to ensure validity and high levels of reliability, each PBA has tightly controlled descriptors of good and bad practice in each of the domains of observation.
- Only behaviours are measured – it is not possible to second guess or interpret assumed intentions or beliefs.
- Procedures are selected as PBAs on the basis that they are indicative of a wide range of activity. The internal elements of PBAs are also selected on the basis that they are indicative of performance throughout the procedure.
- The range of primary (formerly called index) PBAs are descriptive of T & O activity in general and are not designed to accredit particular procedures, but rather to indicate an educational trajectory in the discipline as a whole. As indicated earlier this has been triangulated in terms of frequency with the T & O log book.
- Elements within specific PBAs are cross-referenced to all PBAs. This enables a variety of observers in a number of contexts to increase the validity of the assessments.
- Assessment is both global and domain specific with a view to providing triangulation with transferable skills, such as communication and also in order to provide precise feedback as to why a global rating overall has been given. This is described below.
- The PBA Summary Sheet (see Appendix (d)) shows the trainee's development at a glance. The cross-referencing function of PBAs reveals areas that may require attention e.g. a trainee who is good technically but a poor communicator.
- PBAs are designed to be conducted immediately after the procedure has been completed. ISCP has been set-up to facilitate on-line completion of the tool. The end of the procedure is an ideal time for the trainee to receive feedback and for reflection, both of which must be recorded in the electronic record for review at the ARCP.

Three rules for primary (index) PBAs:

- Assessable: it is possible to assess the procedure in all its domains and that the assessment is valid. Hence, all PBAs are subjected to a validation process in the form of a Delphic group determining positive and negative behaviours relevant to the procedure.
- Accessible: That a trainee has access to the procedures in sufficient numbers to allow them to demonstrate progression in competency.
- Indicative: That the primary PBAs demonstrate a wide range of skills applicable to the generality of T&O, i.e. indicative of a wide performance of surgical activity.

Rule 1 and 2 also apply to secondary and tertiary PBAs.

In the previous version of the curriculum there were 14 PBAs known as index PBAs which were designed as outlined above to assess a wide range of essentially generic T&O skills. Each individual PBA is formative; feedback and reflection are essential and progression in competency in a procedure should be demonstrated. Trainees must understand that being deemed to be at level 4 on a PBA on a specific day does not mean they are competent for all procedures of that type. On the other hand achieving a level 4 in all the primary PBAs shows that the trainee has gained most of the generic skills required to be able to enable them to learn new the majority of T&O procedures.

In this update of the curriculum we have introduced several changes:

- PBAs are only one of several workplace based assessment (WBA) tools that trainees will use for formative assessment of progress.
- The range of primary PBAs has been changed to reflect current practice but also a realistic view of the possible opportunities that trainees may have to complete the assessments.
- The index PBAs are now termed primary PBAs and are all to be completed at level 4 before gaining a CCT.
- Secondary PBAs are those to be completed by trainees going through the specialty interest areas of T&O and will form a record of progress.
- Tertiary PBAs are those to be completed during specialty interest training and are a record of progression in attaining specialty interest skills.
- At the time of submitting this curriculum revision PBAs have been generated and validated by 2 specialty interest groups: upper limb and children's orthopaedics. Hand surgery PBAs are being validated. Other PBAs have been identified by specialty groups but will need validation before their use.
- Secondary and tertiary PBAs will be validated by a Delphic group, but the form to be completed by the trainee and trainer is a "generic" form. The emphasis will be on feedback and trainee reflection.
- Critical conditions will be assessed using a case based discussion (CBD). It will be a requirement that the trainees complete the assessment prior to attempting the intercollegiate examination.
- CBDs are primarily designed to assess judgement but also DOPs where appropriate, should be used to assess knowledge and skills not assessed by the PBAs.

The **primary** PBAs for T & O are as follows:

1. Carpal tunnel decompression
2. Arthroscopy and simple arthroscopic procedures
3. Total knee replacement
4. Forefoot surgery
5. Total hip replacement
6. ORIF for proximal intertrochanteric facture neck of femur
7. Arthroplasty for intracapsular fracture neck of femur
8. Application of limb external fixator
9. Operative fixation of ankle fractures
10. Tension band wiring of a patellar or olecranon fracture
11. Intramedullary nailing for femoral or tibial shaft fractures
12. Tendon repair
13. ORIF long bone fracture (NB adaptation of clavicle fracture PBA)

14. Stabilisation of a growth plate injury

Secondary / tertiary PBAs:

Upper limb:

1. Arthroscopic subacromial decompression
2. Arthroscopic acromioclavicular joint excision
3. Arthroscopic rotator cuff repair
4. Arthroscopic shoulder stabilisation
5. Open rotator cuff repair
6. Open shoulder stabilisation
7. ORIF distal humerus fracture
8. ORIF humeral shaft fracture
9. ORIF proximal humerus fracture
10. Tennis elbow release
11. Total elbow replacement
12. Total shoulder replacement
13. Ulna nerve decompression
14. Shoulder hemiarthroplasty

Children's trauma and orthopaedics:

1. Arthrotomy for septic hip.
2. Application of a hip spica.
3. MUA distal radius fracture ±K wires.
4. Botulinum toxin injection.
5. MUA and K wire fixation of a supracondylar elbow fracture.
6. Ponseti cast application.
7. Proximal femoral corrective osteotomy.
8. Percutaneous cannulated screw fixation for slipped upper femoral epiphysis (SUFE).

Hand surgery:

1. Closed reduction of a hand fracture and K wire fixation.
2. Correction of simple syndactyly.
3. Flexor tendon repair.
4. ORIF metacarpal fracture.
5. ORIF phalangeal fracture.
6. Trapeziectomy.

Spinal Surgery:

1. Anterior cervical discectomy
2. Application of halo jacket
3. Cervical decompression
4. Lumbar decompression
5. Lumbar discectomy
6. Posterior spinal instrumentation

Knee Surgery:

1. Meniscus repair
2. ACL reconstruction
3. Revision ACL reconstruction
4. Complex ligament repair / reconstruction
5. Articular cartilage regenerative procedures
6. Osteotomy around the knee
7. Patellar re-alignment
8. Partial knee replacement
9. Revision total knee replacement - single stage
10. Revision total knee replacement - stage 1 of 2 stages
11. Revision total knee replacement - stage 2 of 2 stages

Foot and ankle:

1. Tendo-achilles repair
2. Ankle arthroscopy
3. Ankle fusion

It is anticipated that validated PBAs will be developed in the other areas of T&O.

Case Based Discussions (CBD):

CBDs are designed to assess judgement and decision making. In this curriculum revision it is a requirement that all critical conditions are assessed by a CBD.

A critical condition is defined as "***any condition where a misdiagnosis can be associated with devastating consequences for life or limb***".

The critical conditions list is:

1. Compartment syndrome (any site).
2. Neurovascular injuries (any site).
3. Cauda equina syndrome
4. Immediate assessment, care and referral of spinal trauma.
5. Spinal infections
6. Complications of inflammatory spinal conditions.
7. Metastatic spinal compression.
8. The painful spine in the child.

9. Physiological response to trauma.
10. The painful hip.

The WBAs to be used during any post will be agreed at the learning needs meeting, depending on a trainees needs and the realistic expectation of available opportunity within the context of an individual trainer's practice, as part of the learning agreement. The WBAs selected will be related to a particular post, however, all WBAs give indications of more generalized progression as indicated through the summary sheets. It cannot be over emphasized how important it is to view the WBAs holistically and not to see them as assessments of competence in a single procedure.

The WBA described above will be used for learning and feedback from simulated events as well as those involving real patients. By using familiar tools, users are more likely to use them flexibly and effectively.

In order to progress to CCT, the majority of the primary PBAs should be achieved to level 4 (that required at CCT level). We acknowledge that some procedures may be difficult to access frequently enough to achieve reliable measures in an individual procedure but sampling across the PBAs is to make an overall judgment feasible. Trainers and trainees need to make maximum use of learning opportunities. The utilization of such opportunities is and will continue to be monitored through triangulation with the log book.

LOGBOOK

The Functions of the Current eLogbook/ePortfolio

All trainees must maintain their portfolio through ISCP. An important component of ISCP is an e-Logbook, recording procedures in which the trainee has been involved and whether they assisted or were the primary surgeon. When recording logbook information, it is essential that when a trainee is the primary surgeon that the level of supervision is accurately recorded. In the more junior years of higher training there should be an expectation that the majority of surgical experience will be supervised by the consultant trainer scrubbed in theatre. As the trainee becomes more experienced, the level of supervision can and should diminish such that in ST7/8 there may be a number of procedures where the trainee is deemed competent to undertake the operation unsupervised.

The e-Logbook forms one part of the evidence to support progression in training. Simple numbers of operations alone are not sufficient to demonstrate competency. Experience in operations needs to be supported by WBAs (particularly PBAs in this regard) that are completed contemporaneously with the procedure.

The JCST, advised by the T&O SAC, has produced several quality indicators in regard to indicative numbers of procedures. Trainees are advised to consult those documents as the information may be used in the ARCP discussions. It must be emphasised that trainees must demonstrate competency using all forms of evidence.

What the eLogbook/ePortfolio offers to trainees in Trauma and Orthopaedics

The eLogbook allows the trainee user an opportunity to document all the operations which they attend and the extent of their involvement in the operation. This is coded using the JCST coding scheme which is as follows:-

A	=	Assisted at the operation
S-TS*	=	Supervised – trainer scrubbed
S-TU	=	Supervised – trainer unscrubbed but in theatre
P	=	Performed operation (not supervised in theatre)
T	=	Training a more junior trainee

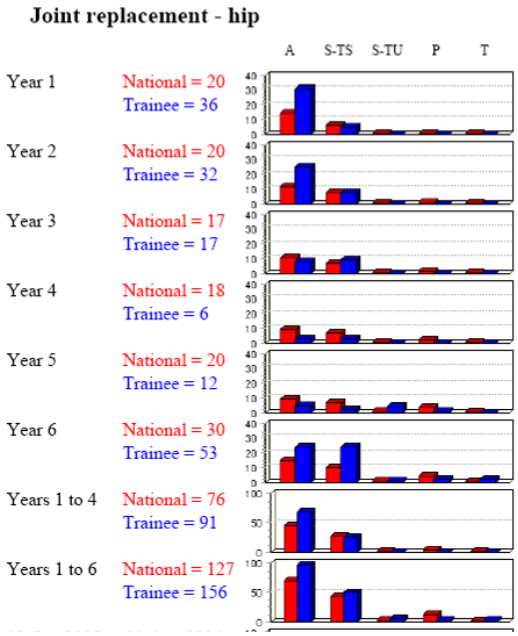
plus an added field of:-
O = Observed

(* in T&O the trainee must perform at least 70% of the operation to satisfy this code)

Consolidation reports are easily produced demonstrating the surgical experience of the user/trainee to date or during a particular attachment, or, for example highlighting key procedures such as “total hip replacement” or “total knee replacement”.

A unique technique has been developed to “normalise” the data as described below:-

The trainee’s uploaded information is interrogated and compared with the data uploaded by their peers in the same year of training, and at the same stage of training. This allows the trainee and the ARCP panel to compare each individual’s operative experience with a comparable deanery or their national (UK) peer group. Comparisons of numbers of operations attended, the extent of surgical exposure and the level of supervision can now be made and this is highlighted by bar charts such as the one shown below.



What the eLogbook/ePortfolio offers to Trainers in T&O

The eLogbook produces a mirror trainer “footprint” every time a trainee logs an operation. In this way a training profile of procedures undertaken and patterns of training soon emerge for individual trainers. This consolidated data can be accessed by both the trainer and by the TPD and the SAC.

What the eLogbook/ePortfolio offers to Training Programme Directors (TPDs) in T&O

The data available to the TPD allows scrutiny not only of an individual trainee’s experience but of training patterns by trainers for trainees at varying stages of their careers. This can be vital “hard data” in

understanding satisfactory and unsatisfactory progress on the part of a trainee or even demonstrating an unsatisfactory training environment and a problem trainer.

What the eLogbook offers to the SAC in T&O

The Chair of the SAC has the capacity to examine individual trainees, trainers, training programmes and even national trends in the practice of T&O surgery.

The data have demonstrated that training posts at the ST1 and ST2 level can be configured correctly and deliver more operative opportunity than the old SHO grade. It also demonstrated that poorly configured posts offer less operative training. (Jameson SS, Gupta S, Khan A, Lamb A, Sher L, Wallace WA, Reed MR Has MMC improved early years training in T&O? Glasgow Meeting of Orthopaedic Research, 2009).

Other data have suggested a significant drop in operative training cases per year with the introduction of shift patterns to support the European Working Time Regulations and further examination of this data in the coming years is seen as vital for quality assurance of the national training programme (Wraighte et al 2012))

Conclusions

The eLogbook has already proven to be a valuable tool in monitoring and influencing exposure of trainees to operative surgery in the specialty of T&O surgery.

SIMULATION

To improve patient safety, many surgical/procedural, clinical and communication skills will be practiced in the simulated environment. This will also help increase trainees confidence and competence before they practice in the clinical setting.

We aspire to provide opportunities for all trainees in simulation but recognise that cost and availability of facilities may limit access locally. There will be scope for a range of simulations from low to high fidelity and low to high technology. Many of these are available locally but some will be provided at national or regional centres. This will help to provide uniformity of standards across T&O in the UK.

The mapping of particular types of simulation against the requirement of the curriculum is an on-going process and will evolve over the next 5 years or so.

Simulation refers to any reproduction or approximation of a real event, process or set of conditions or problems for the purposes of learning or assessment. Wet and dry lab facilities are available around the country, both permanently in "skills centres" and through regular course provision e.g. AO and RCS courses.

Trauma and orthopaedics has a long and established track record in the area of simulation and simulated tasks. Whilst the Training Standards Committee are anxious to embrace technology enhanced learning, our priority must be the expert supervision of trainees and appropriate preparation of trainers. We have endeavoured to explore aspects of simulation, which can be easily and inexpensively accessed by T&O trainers and trainees throughout the country. Ideally, facilities should be available close to the clinical area, with expert supervision/ feedback available, and accessed in a flexible way around patient workload.

Kneebone et al (2010) have developed the concept of Distributed Simulation (DS), with the underlying philosophy to provide simulation facilities that are "good enough" to engage participants and achieve learning goals, yet are low cost, portable and can be set up in a variety of clinical or non clinical locations.

The key for T&O is the preparation of both trainees and trainers. A number of courses are available for such training and include "Training the trainers" and "Training Orthopaedic Educational Supervisors".

The framework for technology enhanced learning (DOH 2011) identified six key principles recommending that technology integrated into the curriculum should:

1. Be patient centred and service driven

2. Be educationally coherent
3. Be innovative and evidence based
4. Deliver high quality educational outcomes
5. Deliver value for money
6. Ensure equity of access and quality of provision.

Technology refers to the use of "information technology" such as computers, handheld devices, simulators and simulation facilities for individual, group, multidisciplinary and interprofessional use.

The TSC has mapped the new curriculum to simulation opportunities and in due course recommendations will be available. These are likely to be based on the following principles:
Bath and Lawrence (2012)

1. Target skills appropriate to the learner
2. Establish mandatory simulation sessions
3. Procure appropriate tools for the job along with adequate funding
4. Develop relevant teaching skills in trainers
5. A standardised approach to simulation
6. Establish experienced proctors (recognised proficiency in simulation and surgical skill)
7. Schedule rehearsal prior to simulation sessions
8. Monitor and report the outcomes of simulation training
9. Follow the 4 step approach to skills training
10. Use situational "stressors" to increase simulation learning
11. Integrate simulation learning within a clinical scenario
12. Integrate elements of assessment to maximise learning

The level of technology and fidelity of each simulation pathway may vary from region to region to allow for best use of available facilities and budgets. However, even low tech, low fidelity simulation can help to mind map a clinical skill. Some clinical skills e.g. ATLS, aspects of professionalism and communication skills may be learnt as part of a national, generic programme for all surgical specialties.

FORMAL TESTS OF KNOWLEDGE RELEVANT TO THE TRAINING OF A SURGEON

Entry into ST3 level training in T&O requires the successful completion of the intercollegiate MRCS examination.

A CCT will not be awarded unless a trainee has successfully completed the intercollegiate FRCS (T&O).

FEEDBACK

The learning agreements between trainee and trainer require regular meetings between the individuals and that a record is kept of those meetings and reviewed at the ARCP. The minimum formal meetings are at the beginning, middle and at the end of an attachment. These meetings, which should take place outside the clinical setting should enable both the trainee and trainer to discuss any and all aspects of progress. The regular Educational Appraisals will be primarily enabling processes, designed to encourage the trainee through feedback. There is no maximum limit to the amount of informal feedback and assessment that a trainee may receive during an attachment. Reasons for poor progress must be explored at these meetings and a remedial plan agreed. Full documentation of these meetings is obligatory.

Usually more formal WBA episodes will be triggered by trainees who feel ready to move on. Occasionally a trainer may trigger a WBA either to encourage confidence or occasionally to highlight concerns.

The educational appraisal – short loop feedback

Feedback should be ongoing between trainee and trainer through WBA as described above. A minimum of three distinct medium term reviews of progress will be made:-

At the beginning of a designated training attachment when the learning agreement will be finalised.

Half way through the attachment when progress against outcomes will be checked and the contract modified if necessary (goals should remain realistic).

Finally the evidence in the trainee's portfolio supporting the agreed achievements relative to the learning agreement will be reviewed between trainer and trainee. This will be presented as part of the ARCP.

Annual review- long loop feedback

- A more in-depth annual feedback meeting must take place as part of the ARCP process. Evidence is reviewed either with the trainee or virtually, in the absence of the individual. The ARCP, however, will discuss the outcome of that review with the trainee. Progression is likely to be confirmed in the majority of cases (an ARCP 1 outcome) but some trainees will be given targets to achieve within a specified time (an ARCP 2 outcome). In this situation, if the targets are achieved, an ARCP 1 outcome will be subsequently recorded. In a small number of cases progression is poor and it is decided that the trainee would benefit from an extra period of training where specified targets must be met (an ARCP 3 outcome). If the targets are satisfactorily completed, the trainee will be given an ARCP 1 outcome at the end of the period of extra training. Failure to achieve targets may mean that the training will be terminated through the approved processes.
- Fundamental to the ARCPs is that trainees are able to provide robust and complete evidence to demonstrate their competency and progression. Further, it is a requirement that trainers must record concerns about the progression of a trainee. A trainer must not submit information that has not been made available to the trainee.
- The evidence supporting an agreed position about progression will include:-
- The WBA as described above. Sufficient evidence should be provided to ensure the instruments provide valid and reliable assessments. Measures are in place to ensure this is underway. In summary we believe the instruments chosen are rational, have face validity and are reliable in the numbers which approximate in current evidence to those described by Norcini and Holcombe (personal communication).
- A log book of surgical experience. This is described in detail above. The key procedures on which PBAs are based are tracked to the log book.
- Evidence of achievement of summative exams.
- Evidence of reflective practice through a critical appraisal of study leave, courses etc.
- Evidence from previous ARCPs.
- The review process at deanery level must ensure transparency, clarity and feedback designed to inform progression wherever possible. It should not only facilitate setting a minimum standard, or recommend remediation but also permit strong candidates to demonstrate excellence and mastery.
- This review should ask three core questions about the conduct of the process before dealing with any specific elements of the learning agreement. These are:-
    - On reflection were the goals set in the learning agreement reasonable?
    - Have there been any unanticipated constraints such as illness, systems failures etc?
    - Has the relationship between trainer and trainee been conducive to achieving a realistic and objective appraisal of progress?

If these issues (which are rarely likely to be of concern) are dealt with, then the agreement goals can be compared to the evidence provided in the WBAs. It is the role of the first part of the annual review to ensure that the agreed position between a trainee and their trainers over the year is a reasonable one. If in doubt they may interview trainees and their trainers. If the position is accepted then the trainee will go to the second half of the process of educational planning with a designated member or member of the training panel agreed with the training programme director.

The second phase of the annual review will determine what needs to be achieved next according to the overall blueprint. The details of how this will be delivered must be discussed in a face to face interview with the trainee by representatives of the local training committee and ideally an external appraiser nominated by the SAC.

APPEALS

If a trainee is unhappy with the verdict of an ARCP panel they have the right to appeal.

THE END POINT OF TRAINING

Training will be deemed complete when the trainee has populated the curriculum knowledge and procedures maps/syllabus appropriately and to a standard defined in the levels of the individual domains of the syllabus. The outcomes must fulfil the requirements of Good Medical Practice.

KEY ROLES IN ASSESSMENT

The central stakeholder is the trainee who must be responsible for their own learning ,supported by the designated trainers and the TPD who is accountable to the School of Surgery which represents the Deanery. Those responsible for training and assessing the trainee are ultimately responsible to patients in ensuring newly trained surgeons comply with the best standards that ensure safety and indeed excellence in Good Medical Practice in the context of T&O surgery.

The trainee

The trainee will be responsible for the contents and probity of their portfolio. Failure to keep accurate and honest information will be regarded as a professional disciplinary matter, which could ultimately, in serious cases of fraud or plagiarism, result in reporting the individual to the fitness to practise committee of the GMC.

All WBAs triggered by trainee and / or trainer must be retained whatever their outcome. Where an assessment is unsatisfactory, repeated assessments will be required until a satisfactory standard is reached. Trainees must appreciate that a record of unsatisfactory assessments which ultimately show improvement and success can be a positive experience in reflective learning. Likewise trainees who reach a satisfactory standard early are encouraged to continue to trigger assessments in order to demonstrate continuing improvement and progress to mastery and excellence.

It is the responsibility of the trainee to ensure the TPD and the School of Surgery are fully appraised of contact details, address etc as well as personal health issues and any ongoing disciplinary matters involving the GMC.

The trainee will be responsible for completing and storing information and evidence in their portfolio with a view to informing the educational appraisal process and any examination board which represents compulsory testing of trainees.

The trainee will be solely responsible for the payment of fees and subscriptions deemed necessary to complete training.

The Clinical supervisor (CS)

The CS must complete learning agreements and reviews according to the set protocols. They will work in partnership with trainees to give timely feedback and ensure all appropriate documents are signed and validated. With the trainee they should ensure the evidence prepared for ARCP is appropriate, complete and meets all standards of probity. Difficulties with completing learning agreements for whatever reason must be made clear to the trainee and the TPD.

The clinical supervisor will also carry out assessments and must be clear when that is the role they are fulfilling and that a particular workplace event should be recorded. All trainers who carry out assessments must have been trained and be competent in the application of the tools described.

The Training Programme Director (TPD)

The training programme director is responsible for the whole programme and accountable locally to the School of Surgery and nationally to the SAC in T & O. The TPD is the first port of call should a trainee have difficulty – either personally or with their CS. They will be the first point of appeal should a trainer and trainee have any kind of difficulty or dispute. Their aim should be to resolve disputes as quickly and effectively as possible.

The Specialist Advisory Committee

The SAC will provide external quality assurance of the programme.

The Deanery and School of Surgery

The School of Surgery is expected to be the repository for T & O training programmes ultimately. In the meantime deaneries will deliver training programmes through local training committees in T & O chaired by TPDs appointed through SACs with Deanery support.

BLUEPRINTING AND SAMPLING OF ASSESSMENT TO THE CURRICULUM-ACHIEVING INTEGRATION

Outcome Medical Practice	Assessment Method				
	CBD	CEX	MSF	PBA	Knowledge Test
Good Clinical Care/Maintaining Good Medical Practice					
Relationships with Patients					
Working with Colleagues					
Teaching & Training, Appraising & Assessing					
Probity, Health					

The whole curriculum has been mapped back to GMP.

It is essential that the assessments be they workplace based or summative in the case of set examinations provide a fair spectrum of appraisal of all aspects of knowledge, skills, judgement and professionalism required of a T & O surgeon practising as leader of an on call team and delivering emergency and elective services.

The blueprint of assessment methodology mapped back to Good Medical Practice is shown above and relates back to the outcomes in terms of clinical, professional and management activities.

The challenge for the examination board is to provide an exam blueprint which reciprocates with the other assessment methodologies which themselves sample broadly across the curriculum, but by necessity will inevitably be less systematic and more opportunistic.

In terms of integration of assessment, the right amount of assessment overall must be achieved without leaving gaps in sampling across the blueprint. WBAs should map back to the procedure and knowledge syllabuses in ensuring that contextualised application of knowledge and testing at the peak of Miller's pyramid occurs. In terms of formal summative tests, a fair sampling of real clinical problems will be balanced with clinical scenarios, which test clinical situations commonly encountered. This will also provide triangulation with

WBAs. It will also generate an overall profile of a trainee's ability across the spectrum of the syllabus which is appropriately sampled.

TRANSITION TO LIFELONG CONTINUOUS PROFESSIONAL DEVELOPMENT AND RECORDING PRACTICE IN A PORTFOLIO

At the point of exit a trainee will be considered fit to practice as part of a team leading the receipt and management of trauma and emergencies etc. However we accept that the selected specialist interest will require further development.

We expect that the transition to lifelong learning will be a seamless and natural transition for someone steeped in the philosophy of our curriculum, which pivots around the values of professionalism and reflective practice.

The GMC has defined the requirements for revalidation. CPD is an important aspect of the revalidation process and enables surgeons to continually update knowledge, skills, judgement and professionalism

Exit Criteria

SPECIALTY ADVISORY COMMITTEE (SAC) STATEMENT OF OUTCOMES

At the end of training, a number of factors will be in place; a trainee will have a series of ARCP 1 outcomes, which will demonstrate to both professional colleagues and the public the level of training achieved to work as an independent consultant surgeon in T & O.

In order to satisfy the final ARCP process the trainee's portfolio must contain a number of mandatory elements:

- A complete set of mandatory learning agreements which have been satisfactorily discharged.
- Sufficient WBAs to make a reliable assessment that a satisfactory standard has been reached.
- Attendance certificates for professional development courses.
- Evidence of publications and presentations.
- Evidence of involvement in quality improvement projects.
- Legal documents.
- Evidence that during their training the trainee has satisfied the intercollegiate specialty examinations board.
- E-log book consolidation data.
- Maintenance of ATLS or equivalent provider status.
- Evidence that the programme director has scrutinised the e-log book and is satisfied that it contains a range and number of operations necessary in order to carry out the duties of the modern T&O surgeon.
- Evidence that the programme director has scrutinised the learning agreements and WBAs and has sought and received evidence of satisfactory progress and completion of training from those trainers who have been involved in those assessment processes.

After the completion of the ARCP process, the SAC will recommend to the JCST that a CCT be issued by GMC

CERTIFICATE OF COMPLETION OF TRAINING (CCT)

At the end of training, a CCT will be awarded when the trainee has satisfied the GMC that they have been trained in the generality of T&O, assessed as having completed the competencies laid out in the T &O curriculum and having the knowledge, skills, judgement and professionalism of a surgeon capable of independent practice.

The SAC recommendation to GMC for the award of the CCT will take into consideration that:

1. The syllabus is for the generality of T&O and this will have been assessed in the summative intercollegiate specialty board exam which trainees must have completed by the end of their training. This exam forms part of the trainee's portfolio which also includes WBAs , evidence of previous learning agreements and ARCP assessments. The portfolio will have been assessed in its entirety at the final ARCP assessment prior to the recommendation of the award of the CCT.

2. Towards the end of their training in the generality of the discipline the overwhelming majority of trainees will have developed a specialty interest which will have been assessed in the work place both pre and post CCT and is likely to be formally assessed in a subsequent peer review process.

3. Such an individual would then be able to join and lead a multidisciplinary team which would receive, assess and go on to definitively manage the majority of patients who needed emergency treatments. They would provide a similar service for a range of common orthopaedic conditions. In both T&O services they would recognise the need to refer rarer and specific conditions for more specialised definitive management.

JCST AND COPSS JOINT RECOMMENDATIONS ON EXTERNALITY FOR SURGICAL TRAINING PROGRAMMES.

Overview

The Schools of Surgery or their equivalent have had a close working relationship with JCST and the SACs and rely on the SAC Liaison Member (LM) to provide externality for several processes within the School / Deanery. The provision of externality has been the subject of advice and reports from the regulator and the Deans via COPMED and JACTAG.

All surgical specialties in the Schools of Surgery have an allocated SAC liaison member (SAC LM) from another region to act as a link between the local specialty trainers and the SAC. The SAC LM facilitates communication in both directions.

The JCST must ensure that all SAC LMs have the necessary knowledge and skills to fulfil their various roles.

This paper outlines a set of principles agreed between the Heads of Schools of Surgery and JCST that defines the roles of the SAC LM in the surgical specialties. The JCST has provided guidance on the role of the SAC LM within the Schools of Surgery and has stressed that the LM should actively participate in, but not necessarily attend several events.

STC meetings

It is recommended that –

1. SAC Liaison Members should attend, as a minimum, one STC meeting per year. SAC Liaison Members should aim to attend the meeting at which key issues are discussed, such as the Annual Specialty Report and ARCP outcomes.

2. SAC Liaison Members should explore videoconferencing options to allow them to participate in all STC meetings

3. SAC Liaison Members should receive and review the agenda papers and minutes of all STC meetings

Visits

Trusts and local education providers (LEPs) may be subjected to quality monitoring visits in various circumstances –

- A regular quality review visit from a Deanery or School team (usually the two are combined).
- A specific review where there are concerns over training or the response to a previous visit.

- A triggered visit where there are serious concerns. The concerns may relate to the global provision of education across all medical specialties, just the surgical specialties, one specific surgical specialty or core surgical training.

In addition, external advice may be required if a specialty or core training programme across a School is causing concerns.

- As part of a review of a programme arranged in agreement with the SAC LM, the TPD, the School and the Deanery

- As a triggered visit where there are serious concerns over the performance of a specialty programme.

Structure of resulting review visits.

1. SAC LM joins the PD and the Deanery team for targeted visits to units where the surgical sub-specialty training is a cause for concern

2. The SAC LM and PD visit units causing concern with School of Surgery representation – either the Associate Dean or the Head of School. These would be regarded as triggered visits.

3. The SAC LM and PD with STC and School representation arrange a series of visits to all training units if a major revision of the training programme is planned or required.

4. The SAC LM and PD meet with School of Surgery representation – either the Associate Dean or the Head of School - to conduct a whole programme review. The review would be conducted centrally and would not require visits to individual LEPs.

Underlying principles of arranged visits

Expenses will need to be paid by the Deanery to the SAC LM as well as travel and incidental expenses of other visitors. To keep service disruption to a minimum, only those trainers and trainees necessary to the process will be interviewed – all relevant information from the trainees must be gathered from the interim reviews, JCST and GMC surveys or a specific survey arranged by the Programme Director. Evidence from previous SAC visits and recent Deanery visits must be reviewed prior to any planned visit from the SAC LM and the areas for review should clearly require the expertise of the SAC LM.

The purpose of the visit must be stated to all parties before it is arranged. Any conflicts of interest should be declared by the SAC LM.

The format for any report should be agreed by the SAC LM, the TPD and the School /Deanery before the visit goes ahead and any necessary funding should also be agreed.

RITAs

As with STC meetings, some SAC LMs have attended RITAs. The role of the SAC LM is to ensure the process meets the requirements of the SAC and may be able to offer advice to trainers and trainees where there are difficulties. The main value of such input is externality that ensures a consistent standard of assessment and feedback across all Schools. In order to reduce the necessity for the SAC LM to attend the

School, it is recommended by some Schools that any problem issues and trainees who may require support and have specific training concerns are grouped into one session. It is in this environment that there may be some controversy over the role of the SAC LM in providing advice to trainees in difficulty where the responsibility for dealing with that trainee may rest with another system within the School or Deanery. It would be of value for the SAC LM to advise the panel and be part of the discussion, but advice to the trainee should come from the panel Chair or Deanery representative.

NB: This section will be redundant within 2 years as all Calman trainees finish their training.

Interim reviews

The interim review is a process adopted by several Schools to appraise the trainee and give feedback. This is a formative process and is outside the requirements of the Gold Guide and SAC. It is not envisaged that the SAC LM is required for these reviews. However, for those Schools that do conduct interim reviews, externality would be welcomed for those trainees who are identified as having problems that could result in an outcome 2 or 3 in the ARCP. There would need to be deanery agreement to fund travel expenses.

ARCP panels

The same comments apply as for RITA attendance. The Panel A ARCP should be a paper/electronic process alone. It may be appropriate for the SAC LM to attend as a member of one of the Panel B committees to fulfil the same role as in the RITA committee.

It is stated that 10% of ARCPs should be subjected to external review and the SAC LM is ideally placed to provide this, but in reality it would be of more value for the SAC LM to attend at least all Panel Bs.

It is recommended that –

1. SAC Liaison Members should, as a minimum, attend ARCPs for the following groups of trainees:

a. Those attending Panel Bs expected to receive outcome 2 or 3

b. New starters

c. Those in their penultimate year of training

2. Ideally, SAC Liaison Members should participate in all ARCPs to give an overview of process and also to gather information on training units that will help inform their annual specialty report.

Annual Specialty Reports

The SAC LM has a key role in providing information on the local scheme that will be incorporated into the specialty report and ultimately into the JCST report to the GMC. Similar information is provided by the TPD to the School for incorporation into the Annual Deanery Report that is also submitted to the GMC.

It is recommended that the TPD and SAC LM should collaborate closely on these reports so that good practice is shared and a consistent review of the programme is reflected to both the JCST and Deanery.

Reports

Each visit by an SAC LM should generate a report that will go to both the School of Surgery and the SAC. The report should concentrate on the processes observed during the visit and on the structure and quality management of the training programme.

The format of the report should be agreed as the School or Deanery may have a standardised report pro-forma for external visits that is not equivalent to the JCST report form.

As an overriding principle, individual trainees must not be identified in any recognisable way in these reports.

Funding for expenses and travel

The SAC and JCST do not pay for any SAC LM visits, so all expenses including travel to the School, travel between appointments during the visit, accommodation and subsistence will have to be met by the Deanery. Because of this, a process is required to ensure the visit is necessary and valuable. Within each Deanery or School there should be a mechanism to agree the purpose and structure of the visit.

Wherever possible full use should be made of the SAC LM's time by combining activities such as STCs and ARCP panels. Usually, expenses will only be met upon receipt of an independent report at the conclusion of the visit.

Trainers

The GMC document Recognising and Approving Trainers, 2012 applies to all clinical and educational supervisors involved in the training of T&O trainees.

All trainers should follow the requirements in that document together with the recommended time lines. Failure to follow guidance may result in a trainee being removed.

Trainers are expected to fulfil the requirements of the GMC as stated in "Recognising and Approving Trainers 2012". They must be able to demonstrate competencies as follows:

- Ensuring **safe and effective patient care** through training
- Establishing and maintaining an **environment for learning**
- **Teaching and facilitating** learning
- Enhancing learning through **assessment**
- Supporting and **monitoring educational progress**
- **Guiding** personal and professional **development**
- **Continuing** professional **development** as an educator

Further Work and Development

The 2012 curriculum is little different from its predecessors. It is hoped that many areas have been improved even though the fundamental principles in the training of T&O remain the same. An aim of this version of the curriculum has been to improve clarity. This will not be the last version and further changes will be needed in the light of discussions within T&O and as a result of external pressures, for example, the changing health education environment in England.

It is anticipated that the following will be changes in the future:

- Ongoing review and development of secondary and tertiary PBAs in the specialty interest areas.
- Further validation and reliability testing of the assessment tools.
- Further blueprinting such that WBA integrate with formal tests and examinations.
- Thorough embedding of recognised trainers.
- Assessment of professional skills competencies.
- Thorough mapping of the curriculum to possible simulation methodologies.

Ongoing review and development of the PBAs

A number of specialty interest groups have already produced secondary and tertiary PBAs. Other groups need to form Delphic groups to develop appropriate instruments such that we are able to support tools for all of T&O.

Further validation and reliability testing of the assessment instruments

Appropriate methodologies need to be used to determine the validity and reliability of the WBAs.

Further blueprinting such that WBA integrate with formal tests and examinations

We have illustrated a curriculum map, which can be linked to good clinical practice and can indicate where examinations can define the best methodologies for testing knowledge in particular. The challenge will be to consolidate the whole map onto a living blueprint, which can define the scope and depth of assessment by ensuring WBA appropriately triangulate with set piece examinations. The tension between undue overlap and assurance of sufficient assessment to indicate reliability is still a challenge to be met. We do not, however, feel alone in this deficiency and would welcome opportunities to share best practice and solutions with other medical disciplines.

Assessment of Professional Competencies

Clinical skills are assessed in the workplace and so must "professional" skills. The same constraints apply and so a similar assessment method must be developed.
It remains our intention to identify a series of "indicative activities", for example:

- Giving a presentation
- Writing a report
- Chairing a meeting
- Conducting a briefing session

Plus others to cover range of professional skills

Each activity will have an Activity Based Assessment (ABA) in a similar format to the existing WBA, with competence statements that can be mapped across a wide range of activities.

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FURTHER READING

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APPENDIX 1

Trauma & Orthopaedics PBA 4: Total Knee Replacement

Trainee:	**Assessor:**	Date:
Start time:	End time:	Duration:
Operation more difficult than usual? Yes / No (If yes, state reason)		

Score: N = Not observed or not appropriate U = Unsatisfactory S = Satisfactory

Competencies and Definitions		Score N / U / S	Comments
	Consent		
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
C3	Demonstrates sound knowledge of complications of surgery		
C4	Explains the perioperative process to the patient and/or relatives or carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
	Pre operative planning		
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies/techniques to deal with these e.g. nutritional status		
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays		
PL3	Checks materials, equipment and device requirements with operating room staff		
PL4	Ensures the operation site is marked where applicable		
PL5	Checks patient records, personally reviews investigations		
	Pre operative preparation		
PR1	Checks in theatre that consent has been obtained		
PR2	Gives effective briefing to theatre team		
PR3	Ensures proper and safe positioning of the patient on the operating table		
PR4	Demonstrates careful skin preparation		
PR5	Demonstrates careful draping of the patient's operative field		
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)		
PR7	Ensures appropriate drugs administered		

Competencies and Definitions		Score N / U / S	Comments
PR8	Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively		
	Exposure and closure		
E1	Demonstrates knowledge of optimum skin incision / portal / access		
E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly		
E3	Completes a sound wound repair where appropriate		
E4	Protects the wound with dressings, splints and drains where appropriate		
	Intra Operative Technique		
IT1	Follows an agreed, logical sequence or protocol for the procedure		
IT2	Consistently handles tissue well with minimal damage		
IT3	Controls bleeding promptly by an appropriate method		
IT4	Demonstrates a sound technique of knots and sutures/staples		
IT5	Uses instruments appropriately and safely		
IT6	Proceeds at appropriate pace with economy of movement		
IT7	Anticipates and responds appropriately to variation e.g. anatomy		
IT8	Deals calmly and effectively with untoward events/complications		
IT9	Uses assistant(s) to the best advantage at all times		
IT10	Communicates clearly and consistently with the scrub team		
IT11	Communicates clearly and consistently with the anaesthetist		
IT12	Demonstrates familiarity and understanding of the use of alignment jigs		
IT13	Understands tibial and femoral referencing		
IT14	Understands flexion and extension gap balance		
IT15	Demonstrates ability to achieve a balanced tibial femoral and patellofemoral implantation		
IT16	Demonstrates ability to cement the components into place		
	Post operative management		
PM1	Ensures the patient is transferred safely from the operating table to bed		
PM2	Constructs a clear operation note		
PM3	Records clear and appropriate post operative instructions		
PM4	Deals with specimens. Labels and orientates specimens appropriately		

Trainer feedback	
Trainee Reflection	

Global summary

Level at which completed elements of the PBA were performed		Tick as appropriate
Level 0	Insufficient evidence observed to support a judgment	
Level 1	Unable to perform the procedure under supervision	
Level 2	Able to perform the procedure under supervision	
Level 3	Able to perform the procedure with minimum supervision (would need occasional help)	
Level 4	Able to perform the procedure unsupervised (could deal with potential complications)	

Signatures:

Trainee:	**Assessor(s):**

Procedure Based Assessment Validation Worksheet

Procedure-Based Assessment Validation

Specialty: Trauma & Orthopaedics	Procedure: PBA 4: Total Knee Replacement

Competencies and Definitions		Positive Behaviours (doing what should be done)	Negative Behaviours (doing what shouldn't be done)	Negative – Passive Behaviours (not doing what should be done)
Consent				
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery	Explains using examples relevant to the patient: Principle benefit of operation Subsequent improvement of function Limitations of surgery Consequences of not having surgery	Expresses unrealistic views of the improvement in function expected following the procedure	Fails to point out the limitations of the operation
		Indicates pain relief as principle, aim of operation and improvement of function being subsidiary to that. Discusses limitations of activities relative patients age and specific requests	Glosses over potential difficulties related to activities such as kneeling or playing sport	Fails to point out limitations of a TKR in very active patients, particularly patients who require considerable bending

C2	Demonstrates awareness of sequelae of operative or non operative management	Describes consequences, agrees expectations and checks patient understanding	Is over confident in describing consequences, reinforces patient's unrealistic expectations	Fails to mention key inevitable consequences
		Show through discussion they can understand the long term issues around wear and loosening, risks of infection and specific limitations regarding movement and kneeling	Overrides legitimate concerns patient may have	Not discussed the risk of infection. The long term effects in terms of loosening
C3	Demonstrates sound knowledge of complications of surgery	Explains in priority order the complications likely to occur in terms of commonality and in terms of seriousness	Spends time explaining rare complications and fails to mention commoner ones	Misses out one or more major complications when explaining to trainer or patient
		Describes infection as the principle problem followed by the much more remote risk of dislocation and indicates the problems of the potential stiffness and the need for rehabilitation		
C4	Explains the perioperative process to the patient and/or relatives or carers and checks understanding	Describes what will happen throughout the management of the condition indicating clear post operative milestones giving a rough idea of time involved and specifying who will do what. Questions the patient to check that their expectations are realistic and they have understood fully	Uses technical terms, explains too quickly and does not check understanding	Misses out common events, particularly those likely to happen in the early post operative period
		Discusses the likely length of stay. The need for post operative physiotherapy and rehabilitation and that the knee replacement gradually shows dramatic improvement followed by a more gradual improvement		

C5	Explains likely outcome and time to recovery and checks understanding	Expresses sensible prognosis and clearly has knowledge of the current outcome data	Expresses over optimistic outcomes and glosses over realistic difficulties	Fails to check that the patient has understood by actively listening to the patients reiteration of what is being said to them
		Able to articulate realistic likelihood of longevity of the knee implant showing clear knowledge of the current outcome data	Expresses over optimistic outcomes in terms of high levels of function for example playing sport and kneeling and squatting	
	Pre operative planning			
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies/techniques to deal with these e.g. nutritional status	Articulates the realistic clinical findings against any investigative findings and achieves a balance between the two	Describes an operative plan without the full use of the clinical and investigative material	Fails to take into account specific medical conditions that might limit the technical choices
		Looks at the standing x-ray both AP and lateral and in discussion indicates the likely prosthesis to be used and is able to defend their position	Simply indicates they will use the routine prosthesis irrespective of whether that is appropriate or not	Having for example noted calcification on the artery still intends to use a tourniquet without being able to defend that position
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays	Draws, writes or iterates a pre operative plan	Does not take into account investigative findings when planning or selecting the equipment	Fails to check the notes for relevant or unexpected findings
		Takes standing x-rays AP and a standard lateral	Does not check that the AP film is a true standing film	Fails to check the lateral x-ray, in particular the patella position and makes all the decisions on an ill defined AP x-ray
PL3	Checks materials, equipment and device requirements with operating room staff	Either personally visits or rings up the operating theatre to check on equipment availability	Delegates the task to a more junior team member with no plans to check the instruction has been carried out	Fails to communicate with the theatre staff

PL4	Ensures the operation site is marked where applicable	Personally marks the site	Delegates the task of marking the site to a junior doctor or nurse	Fails to check that the site has been marked
PL5	Checks patient records, personally reviews investigations	Ensures that the relevant information such as investigative findings are present, checks wristband	During the procedure asks theatre staff to look something up in the notes	Fails to check notes to ensure all information is available that is needed
		Ensures that the x-rays are placed on the viewing box at the time of the operation		
	Pre operative preparation			
PR1	Checks in theatre that consent has been obtained	Checks the consent form in the notes	Leaves the consent checking to nurses or junior medical staff	Makes no effort to check the consent form in the notes
PR2	Gives effective briefing to theatre team	Checks with nurse that they have all equipment needed ready to hand and discusses planned actions	Complains when something not available during the procedure. Asks for something which results in theatre staff to go on a hunt for it	Makes no attempt to discuss operation with team
		Checks with the theatre that they anticipated range of implants in the pre operative plan are in fact available		
PR3	Ensures proper and safe positioning of the patient on the operating table	Prior to scrubbing supervises the positioning of the patient	Delegates the task to a theatre orderly and does not check	Concentrates on the process of scrubbing up while the patient is being transferred onto the operating table
		Arranges for the patient to be placed in a supine position with appropriate supports for the foot and protects the other leg. Personally supervises the process		
PR4	Demonstrates careful skin preparation	Personally paints the operative field and ensures the material covers the whole surface	Paints (or supervises) the operative field leaving gaps or inadequate coverage	Delegates painting to an unsupervised member of the team or fails to check that the area has been adequately painted

PR5	Demonstrates careful draping of the patient's operative field	Drapes (or supervises draping of) the operative field to adequately expose site ensuring only prepared site is exposed	Exposes an inadequate area for the incision/access	Fails to secure drapes adequately
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)	Checks with the anaesthetic nurse that the diathermy has been placed well away from any existing metal implants	Delegates the task unsupervised to the anaesthetic nurse or orderly	Fails to brief the team if metalware is in place in the other limb
		Ensures the tourniquet is sufficiently high to give proper access to the knee. Checks with the anaesthetic nurse that the diathermy has been placed well away from any existing metal implants	Does not check the tourniquet position ensuring access e.g. Delegates the task unsupervised to the anaesthetic nurse or orderly	e.g. makes team aware presence of metalware in the other limb or THR on same side
PR7	Ensures appropriate drugs administered	Checks notes, liaises with anaesthetic team to ensure prescribed drugs administered	Assumes drugs have been administered without checking	Fails to check with anaesthetic team that drugs have been administered
PR8	Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively	Briefs and discusses with the team where equipment is to be placed relative to the operative field	Takes no regard of where equipment is placed such as diathermy scabbard and/or places it in a position where the devices can't be used safely	Ignores the set up procedure in the immediate pre operative period and has a conversation with a third party
		Personally ensures that the stabilizers and sandbags are properly position so that a suitable degree of flexion can be satisfactorily obtained		
	Exposure and closure			
E1	Demonstrates knowledge of optimum skin incision / portal / access	Verbally states or marks with a pen the anatomical landmarks prior to making the incision	Makes an incision that is clearly too small or too large	Does not extend an incision when struggling for access

E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly	Gives a running commentary to the trainer of the structures encountered	Describes the structure encountered in the dissection in the wrong location	Tries to maintain the standard approach despite the fact that access is proving difficult
E3	Completes a sound wound repair where appropriate	Closes each layer without tension	Ties very tight sutures, clearly strangulating soft tissue	Leaves too large a gap between sutures so that structures are not properly opposed
		Ensures the knee flexes whilst sutures are in place		Fails to check that the knee can be flexed after the reconstruction
E4	Protects the wound with dressings, splints and drains where appropriate	Personally supervises the application of the wound dressing	Walks away from the operating table without briefing the assistant or the nurse what they require to cover the wound	Fails to specify required dressing
	Intra Operative Technique			
IT1	Follows an agreed, logical sequence or protocol for the procedure	Justifies actions at any point in procedure	Spends a lot of time removing superfluous tissue	When a difficulty is encountered fails to complete manoeuvre
IT2	Consistently handles tissue well with minimal damage	Personally places self retaining retractors and checks whether the skin is under tension	Pulls and tears tissue. Allows the wound edges to become dry	Fails to recognise tissue damage
IT3	Controls bleeding promptly by an appropriate method	Responds calmly by applying pressure initially. Briefs the team about what will need to be done – e.g. asks assistant to be ready for diathermy	Grabs in a non systematic manner at soft tissue and indiscriminately applies diathermy. Continues with a dissection despite welling up of blood in the field	Fails to act calmly. Fails to brief team. Fails to control blood flow.

IT4	Demonstrates a sound technique of knots and sutures/staples	Draws soft tissue together without tension and forms proper reef knots	Pulls tissues tight so that the tissues blanche. Lets a wound edge gape or pulls one layer of tissue under another	Fails to use the correct method or technique
IT5	Uses instruments appropriately and safely	Asks for instruments in a timely manner anticipating what is needed	Uses an instrument for a purpose it is not intended. Takes whatever is given to them then complains	Fails to ask for correct instruments at the correct time
IT6	Proceeds at appropriate pace with economy of movement	Lets the nurse know what is to be done or needed next	Stops and starts, picking things up and then putting them down without using them. Spends a long time on a task not appropriate to the pace	
IT7	Anticipates and responds appropriately to variation e.g. anatomy	When encountering something unexpected stops and verbalizes concerns with the team	Persists in a task that is proving difficult and has to be stopped	Fails to recognize anatomical variation and has to be stopped
IT8	Deals calmly and effectively with unexpected events/complications	Verbalises that there is a problem and briefs the team what needs to happen next	Verbalises negative concerns and issues conflicting instructions. Tries to continue inappropriately (has to be stopped)	Fails to brief the assistant adequately
IT9	Uses assistant(s) to the best advantage at all times	Briefs assistants and places them and the instruments where they are needed	Accepts whatever assistant does irrespective of whether or not appropriate	Fails to brief assistant and expresses irritation when positions are not what are required
IT10	Communicates clearly and consistently with the scrub team	Sets positive tone with appropriate greeting. Asks for instruments clearly. Informs as to next steps. Asks for instruments by correct name	Uses rough or inappropriate tone of voice or words. Uses slang or 'local' descriptions of instruments	Gives no greeting, does not ask for anything (but expects to be given it)
IT11	Communicates clearly and consistently	Sets positive tone with appropriate	Proceeds with next step of procedure	Fails to inform anaesthetist of key

	with the anaesthetist	greeting. Sets clear goals and expectations	without anaesthetic advice (where required)	phase requiring anaesthetic cooperation
IT12	Demonstrates familiarity and understanding of the use of alignment jigs	Clearly indicates to the nurse what instrument is required next in the sequence of jigs. In particular indicates whether they will proceed down a femoral or tibial route first	Responds aggressively to being offered the wrong jig because it is not that which they asked for.	Does not ask positively for exactly what they require in terms of jig in the appropriate sequence
IT13	Understands tibial and femoral referencing	Iterates clearly that they are using anterior posterior or transcondylar referencing principles in the use of the jigs	Enable to iterate a firm conclusion as to what referencing system they are using	Places the jig with no obvious regard to femoral rotation
IT14	Understands flexion and extension gap balance	Uses the blocks to indicate they are balancing the flexion and extension gap and uses associated rods	Fails to use alignment devises to demonstrate balance	Fails to check the position of the anatomical axis
IT15	Demonstrates ability to achieve a balanced tibial femoral and patellofemoral implantation	Places trial components and patella component included if appropriate. Carries out a thumbs off test	Makes no attempt to use the trial implants to check position and flexion extension.	Goes straight from blocks to final implants without using appropriate range of provisionals
IT16	Demonstrates ability to cement the components into place	Briefs the nurse when ready to insert cement. Places the cement on the bone and/or the implant without using too much or too little. Pushes the components into place with the appropriate devices. Removes excess cement and ensures the cement is retained under compression until it is demonstrably set at the implant interface	Continues to flex and extend the knee before the cement is set.	Fails to ensure that the articulating surfaces are free of cement before it goes hard and does not retain compression on the implant until the cement is demonstrably set
	Post operative management			

PM1	Ensures the patient is transferred safely from the operating table to bed	Personally takes part in the transfer of the patient from the operating table to the bed.	Leaves the operating room prior to the transfer	Fails to check patient once they are in bed
		Checks the patients leg is lying comfortably and that there are palpable distal pulses and capillary filling		
PM2	Constructs a clear operation note	Makes a legibly written or clearly dictated note	Writes illegibly, mumbles on dictaphone	Fails to write or dictate anything at all
PM3	Records clear and appropriate post operative instructions	Writes in clear text a list of post operative instructions in the notes	Gives verbal instructions to a passing nurse	Fails to write anything in the notes at all
PM4	Deals with specimens. Labels and orientates specimens appropriately	Personally arranges specimens for pathologist	Delegates checking labels to junior	Does not label specimens

Generic PBA tool

[Specialty] PBA: [Procedure] APPROVED SURGICAL

Trainee:	**Assessor:**	**Date:**
Start time:	End time:	Duration:
Operation more difficult than usual? Yes / No (If yes, state reason)		

Score: N = Not observed or not appropriate U = Unsatisfactory S = Satisfactory

Competencies and Definitions		**Score N / U / S**	**Comments**
	Consent		
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
C3	Demonstrates sound knowledge of complications of surgery		
C4	Explains the perioperative process to the patient and/or relatives or carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
	Pre operative planning		
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies/techniques to deal with these e.g. nutritional status		
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays		
PL3	Checks materials, equipment and device requirements with operating room staff		
PL4	Ensures the operation site is marked where applicable		
PL5	Checks patient records, personally reviews investigations		

	Pre operative preparation		
PR1	Checks in theatre that consent has been obtained		
PR2	Gives effective briefing to theatre team		
PR3	Ensures proper and safe positioning of the patient on the operating table		
PR4	Demonstrates careful skin preparation		
PR5	Demonstrates careful draping of the patient's operative field		
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)		
PR7	Ensures appropriate drugs administered		
PR8	Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively		
	Exposure and closure		
E1	Demonstrates knowledge of optimum skin incision / portal / access		
E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly		
E3	Completes a sound wound repair where appropriate		
E4	Protects the wound with dressings, splints and drains where appropriate		

Competencies and Definitions		Score N / U / S	Comments
	Intra operative Technique		
IT1	Follows an agreed, logical sequence or protocol for the procedure		
IT2	Consistently handles tissue well with minimal damage		
IT3	Controls bleeding promptly by an appropriate method		
IT4	Demonstrates a sound technique of knots and sutures/staples		
IT5	Uses instruments appropriately and safely		
IT6	Proceeds at appropriate pace with economy of movement		
IT7	Anticipates and responds appropriately to variation e.g. anatomy		
IT8	Deals calmly and effectively with unexpected events/complications		
IT9	Uses assistant(s) to the best advantage at all times		
IT10	Communicates clearly and consistently with the scrub team		
IT11	Communicates clearly and consistently with the anaesthetist		
	Post operative management		
PM1	Ensures the patient is transferred safely from the operating table to bed		
PM2	Constructs a clear operation note		
PM3	Records clear and appropriate post operative instructions		
PM4	Deals with specimens. Labels and orientates specimens appropriately		

Trainer feedback	
Trainee Reflection	

Global summary

Level at which completed elements of the PBA were performed		Tick as appropriate
Level 0	Insufficient evidence observed to support a judgment	
Level 1	Unable to perform the procedure under supervision	
Level 2	Able to perform the procedure under supervision	
Level 3	Able to perform the procedure with minimum supervision (would need occasional help)	
Level 4	Able to perform the procedure unsupervised (could deal with complications)	

Signatures:

Trainee:	**Assessor(s):**

Appendix 2

Hand interface syllabus

VIVIEN LEES, DAVID SHEWRING IAN EARDLEY, DAVID PITTS

(on behalf of the Hand Surgery Interface Group)

Nationally recognised specialist hand surgery posts require training in aspects of both T&O and plastic surgery. The following syllabus, approved by GMC for plastic surgery, is the syllabus to be used by interface trainees. Trainees

Syllabus Structure

This syllabus is structured on a modular basis. The modules are based on those originally used by FESSH, the BSSH Instructional Courses and the BSSH Postgraduate Diploma in Hand Surgery (BSSH/UoM).

The modules are as follows:

- Skin and soft tissue (including microsurgery and Dupuytren's disease)
- Fractures and joint injuries (including wrist instability)
- Osteoarthritis and inflammatory arthritis
- Tendon
- Nerve
- The child's hand, vascular anomalies and tumours of the hand

Within each module, there are three levels of topics, reflecting progressive complexity. These levels are entitled Basic, Intermediate and Advanced.

It is envisaged that trainees in the Interface Hand Fellowships will achieve:

- Level 4 competence in all basic topics in every module
- Level 4 competence in all intermediate topics in every module
- Level 4 competence of all advanced topics in 3 modules

These individuals will be capable of working as interface consultants e.g. plastic surgeon working in an orthopaedic department etc.

Final Years trainees who train in a mono-specialty and who wish to specialise in hand surgery will be expected to achieve:

- Level 4 competence in all basic topics in every module
- Level 4 competence in all intermediate topics in 3 modules
- Level 4 competence of all advanced topics in 2 modules

MODULES

Topic	HAND
Category	ST7/8 Final Years and TIG Fellows
Module 1	Skin / Soft tissue / Microsurgery / Dupuytren's Disease
Objective	Acquire competence in the diagnosis and management of soft tissue problems around the hand and upper limb including traumatic loss. Acquire competence in all aspects of care of Dupuytren's disease.
Knowledge	**BASIC** Should demonstrate knowledge of: • anatomy, embryology, physiology of skin, blood supply and blood flow, • models of skin blood supply • mechanism of action of pharmacology on the microcirculation, • elements of wound healing, • organisms causing soft tissue infection including, microbiology of infecting organisms, surgical pathology and spread of infection, • surgical and pathological anatomy of Dupuytren's disease in the palm and digits. **INTERMEDIATE** Should demonstrate knowledge of: • range, indications and principles of operations to treat conditions listed in this module, • post-operative complications and their management, • hand therapy interventions for wound & scar management, reduction of swelling and management of stiffness, • levels of amputation for the upper limb, • principles of microvascular surgery, • principles of replantation including macroreplantation. • sciences of pathogenesis of Dupuytren's disease. **ADVANCED** Should demonstrate knowledge of: • recent advances in wound healing including wound healing technology such as vacuum-assisted closure, • ancillary investigations including those pertinent to vascular compromise of limb, life or limb-threatening infections, • techniques to raise vascularised free tissue transfers including lateral

	arm flap, latissimus dorsi flap, gracilis flap, toe transfer, • management of the mutilating hand injury including rollover injury, gunshot injury, • management of extravasation and high-pressure injection injury to the hand. • management of thermal injury to the hand including local treatment of scald, flame, chemical & electrical burns and frostbite,
Clinical Skills	**BASIC** Should perform: • assessment and non-operative management of the acute surgical patient including targeted hand-related history and hand examination. **INTERMEDIATE** Should demonstrate ability to: • devise management algorithms for the conditions covered in this section including investigations. **ADVANCED** Should demonstrate abilities of • analysis and diagnostic synthesis, judgement, surgical planning.
Technical Skills and Procedures	**BASIC** Should be able to perform: • nail bed repair, • different types of skin grafts including split skin/full thickness skin graft, • palmar fasciectomy for Dupuytren's disease, • fasciocutaneous flaps around the forearm. • variety of flap reconstructions, • local flap (transposition, rotation, island), • microsurgical techniques including simulation-based exercises • arterial and venous repair – small and medium vessels **INTERMEDIATE** Should be able to perform: • fingertip reconstruction : heterodigital flap reconstruction including cross-finger flap, thenar flap, Foucher flap, and homodigital neurovascular island flaps • application of mechanical vacuum suction device for appropriate

	wounds,
	• debridement of complex wounds,
	• fasciectomy for MCPJ contracture (Dupuytren's disease),
	• fasciectomy with correction of PIPJ contracture.
	
	ADVANCED
	
	Should be able to perform:
	
	• planning and execution of flap reconstruction
	  ○ distant flap e.g. groin, posterior interosseous artery flap, radial forearm flap
	• free tissue transfer – flap elevation
	  ○ elevation of variety of free tissue transfers e.g. lateral arm flap, latissimus dorsi muscle flap, second toe transfer etc., includes cadaver based flap elevation as part of simulation exercises
	• microsurgical techniques
	  ○ microsurgical free tissue transfer
	  ○ revascularisation digit or upper limb part
	  ○ replantation of digit or upper limb segment
	• fasciectomy for recurrence of Dupuytren's disease,
	• dermofasciectomy for Dupuytren's disease.

Topic	HAND
Category	ST7/8 Final Years and TIG Fellows
Module 2	Fractures and Joint Injuries including Wrist Instability
Objective	Acquire competence in the diagnosis and management of all types of fractures of the phalanges, metacarpals, carpus and distal radius. Acquire competence in the diagnosis and management of the unstable wrist including distal radioulnar joint.

Knowledge	**BASIC**
	
	Should be able to demonstrate knowledge of:
	
	• pathophysiology of fracture healing including non-union and malunion,
	• principles of operative and non-operative management of hand and wrist fractures,
	• detailed anatomy of:
	  ○ radio-carpal/DRUJ/MCP/PIP/DIP joints and CMC joint of the thumb
	  ○ ligamentous anatomy of these joints and how it influences treatment
	• available imaging techniques and their interpretation:
	  ○ plain and stress radiographs of the wrist and hand.
	  ○ other specific views relevant to particular situations
	  ○ role of: MRI/bone scan / ultrasound / arthrography / arthroscopy for investigating the hand and wrist
	
	INTERMEDIATE
	
	Should be able to demonstrate knowledge of
	
	• detailed management of fractures and dislocations of bones and joints of hand and wrist including carpus and distal radioulnar joint,
	• normal biomechanics of the osseoligamentous structures of the hand and wrist.
	
	ADVANCED
	
	Should be able to demonstrate knowledge of
	
	• detailed wrist anatomy,
	• pathophysiology of wrist instability / recognised patterns of instability and their clinical presentation,
	• investigations for complex joint disorders and wrist instability,

	• appropriate interventions for wrist instability through knowledge of indications, • indications for diagnostic and therapeutic wrist arthroscopy.
Clinical skills	**BASIC** Should demonstrate ability to • clinically assess fractures, dislocations and ligamentous injuries of the hand and wrist, • assess the unstable wrist, • manage common fractures of the hand and wrist, • apply a range of plaster splints. **INTERMEDIATE** Should demonstrate ability to • manage more complex fractures of the hand and wrist, • manage distal radius and scaphoid fractures by standard techniques. **ADVANCED** Should demonstrate ability to • clinically assess and manage complex fractures of the distal radius and scaphoid, • manage ligamentous injury of the carpus and distal radioulnar joint, • manage malunion and non-union of fractures of the phalanges, carpus and distal radius.

Technical Skills and Procedures	**BASIC**
	
	Should be able to perform
	
	• simulation-based exercises of the techniques for fracture fixation: closed reduction with application splint or cast, K-wiring and interosseous wiring, plate and screws, and lag screw.
	
	INTERMEDIATE
	
	Should be able to perform
	
	• closed K-wiring for:
	  ○ CMC/PIP joint dislocations
	  ○ phalangeal/metacarpal fractures
	  ○ distal radius fractures (pins & plaster)
	• open fixation of metacarpal fractures,
	• open fixation of uncomplicated distal radius fractures,

	• repair of ulnar collateral ligament of MCPJ of thumb (Gamekeeper's thumb), • application of external fixator to upper limb. **ADVANCED** Should be able to perform • open fixation of phalangeal fractures, • operative treatment of intra-articular fractures of the PIP joint, • open fixation of complex distal radius fractures, • scaphoid fracture fixation (acute and for non-union), • vascularised bone grafting for scaphoid non-union, • Operative stabilisation of acute carpal disruptions, • ligament stabilisation procedures for chronic problems of the, scapholunate, lunotriquetral CMC joints and midcarpal instability, • bone transport, and • Should be able to use bone substitutes.

Topic	HAND
Category	ST7/8 Final Years and TIG Fellows
Module 3	Osteoarthritis and Inflammatory Arthritis
Objective	Acquire competence in the diagnosis and management of all aspects of management of osteoarthritic joints of the hand and wrist. Acquire competence in the diagnosis and management of all aspects of management of inflammatory arthritis of the hand and wrist.

Knowledge	**BASIC**
	
	Should be able to demonstrate knowledge of:
	
	• pathophysiology of osteoarthritis, inflammatory arthritis and septic arthritis including appreciation of patterns of disease.
	• imbalances and deformities associated with inflammatory arthritis
	• pathomechanics of common rheumatoid hand deformities including:
	  ○ distal radioulnar joint subluxation and carpal translocation
	  ○ MCPJ subluxation and ulnar drift
	  ○ digital boutonnière and swan neck
	• thumb deformity and CMC disease
	• principles of arthroplasty.
	
	INTERMEDIATE
	
	Should be able to demonstrate knowledge of:
	
	• principles and detailed management of the common osteoarthritic disorders of the hand and wrist including the basal joint of the thumb,
	• principles and detailed management of rheumatoid arthritis in the hand and wrist,
	• aetiology, pathomechanics of deformity in inflammatory arthritides including understanding disease patterns,
	• biomechanics of small joint replacement,
	• place of soft tissue reconstruction, joint fusion,
	• replacement, interposition and excision arthroplasty in the treatment of the rheumatoid hand and wrist,
	• planning and prioritising treatment within an MDT setting.
	
	ADVANCED
	
	Should be able to demonstrate knowledge of:
	
	• principles and detailed management of more complex and osteoarthritic disorders of the hand including secondary osteoarthritis,
	• surgical and non-surgical management of the wrist, tendons, small

	joints and imbalance disorders (swan neck and boutonnière) occurring in rheumatoid arthritis, • pathology, mechanisms of deformity and management of other inflammatory conditions (non-rheumatoid) affecting the hand and wrist, • management of Kienbőch's disease and Madelung's deformity.
Clinical Skills	**BASIC** Should demonstrate ability to: • clinically assess the arthritic patient and recognise the typical patterns of disease, • demonstrate conservative management techniques including splinting, exercises and understanding of occupational therapy assessment and provision of aids to daily living, • undertake external K-wire removal. **INTERMEDIATE** Should demonstrate ability to • undertake detailed examination of the patient with inflammatory arthritis to demonstrate the features of: o distal radioulnar joint subluxation and carpal translocation o MCPJ subluxation and ulnar drift o digital boutonnière and swan neck o thumb deformity and CMCJ disease • diagnose pathology through local anaesthetic joint injection techniques, • undertake treatment by joint injection, • includes simulation-based exercises for joint injection techniques **ADVANCED** • Should demonstrate knowledge of detailed management algorithms for the conditions covered in this module including complex conditions.
Technical Skills and Procedures	**BASIC** Should be able to perform: • harvesting of iliac bone graft / radius bone graft, • simulation-based exercises of wrist arthroscopy **INTERMEDIATE** Should be able to perform:

	• arthrodesis of DIPJ / PIPJ/ MCPJ, • trapeziectomy plus/minus soft tissue ligamentous reconstruction, • total wrist arthrodesis • Darrach's procedure • Suave-Kapandje procedure • diagnostic wrist arthroscopy **ADVANCED** Should be able to perform • therapeutic wrist arthroscopy e.g. TFCC debridement • limited arthrodesis including STT, 4-corner, radiolunate • variety of procedures for rheumatoid arthritis including MCPJ arthroplasty e.g. Swanson silicone spacer replacement, surface replacement arthroplasty, soft tissue arthroplasty with ligament reconstruction for instability, soft tissue correction for swan neck/boutonnière deformities • joint replacement arthroplasty: PIP / CMCJ / Wrist / DRUJ

Topic	**HAND**
Category	**ST7/8 Final Years and TIG Fellows**
Module 4	**Tendon and tendon-related disorders**
Objective	Acquire competence in the diagnosis and management of all aspects of flexor and extensor tendon injuries and associated reconstruction. Detailed knowledge of the hand therapy and rehabilitation regimens for the same.
Knowledge	**BASIC** Should be able to demonstrate knowledge of: • mechanisms of tendon injury and healing, • pathophysiology of related tendon disorders. **INTERMEDIAT**E Should be able to demonstrate knowledge of: • principles of tendon transfer, • biomechanics of the tendons and tendon sheath / pulleys, • available suture techniques for repair of the divided tendon including multistrand repair, • rehabilitation regimens for flexor and extensor tendon repair. **ADVANCED** • Should be able to demonstrate knowledge of: • recent advances in basic sciences of tendon injury and repair, • basic science and evidence base informing use of different techniques of tendon repair and rehabilitation regimens, • the role of the intrinsic muscles in facilitating co-ordinated tendon function.
Clinical Skills	**BASIC** Should demonstrate ability to: • clinically assess the injured tendon and other tendon disorders, • select use of relevant specialist imaging techniques such as ultrasound. **INTERMEDIATE** Should demonstrate ability to • clinically assess and manage algorithms for the conditions covered in this module, • examine the stiff finger and distinguish flexor/extensor adhesions / primary or

	secondary joint stiffness. **ADVANCED** Should demonstrate ability to • undertake detailed assessment of and advise on complex tendon problems including reconstruction and reanimation of the hand in cases of tendon loss and nerve palsy using individualised tendon transfers, • analyse and advise on modifications needed to standard therapy regimens to correct specific problems such as joint contracture.
Technical Skills and Procedures	**BASIC** • Should be able to perform: • extensor tendon repair • flexor tendon repair (Zones III-V) • tendon graft harvest • extensor / flexor synovectomy • trigger digit release **Includes simulation-based exercises related to tendon surgery** **INTERMEDIATE** Should be able to perform: • De Quervain's release • flexor tendon repair (multistrand)(Zones I & II) • flexor or extensor tenolysis • tendon transfer (EI-EPL) • tenodesis (EDC replacement in partial EDC rupture) **ADVANCED** Should be able to perform: late reconstruction of flexor and extensor tendons: • tendon grafting 1 and 2-stage • tendon transfer • radial nerve set • opponensplasty for opposition • intrinsic replacement for claw hand • adductorplasty for key pinch

Topic	**HAND**
Category	**ST7/8 Final Years and TIG Fellows**
Module 5	**Nerve and nerve-related disorders**
Objective	Acquires competence in the diagnosis and management of all aspects of nerve related disorders including nerve compression, nerve palsy and nerve injuries along with associated reconstructive techniques. Acquires detailed knowledge of the rehabilitation regimens for the same.
Knowledge	**BASIC** Should demonstrate knowledge of: • topographic anatomy of peripheral nerve including brachial plexus, • response of peripheral nerve to injury and repair, • pathophysiology of nerve compressive disorders. • appropriate outcome assessment instruments. **INTERMEDIATE** Should demonstrate knowledge of: • techniques of nerve repair, • mechanisms of brachial plexus injury, the patterns of injury and outline treatment options, • pathophysiology and classification of CRPS and neuropathic pain problems. **ADVANCED** Should demonstrate knowledge of: • appropriate use of nerve grafts and other conduits, • techniques of nerve reconstruction, neurotisation, and muscle transfers for reanimation of the upper limb, • principles of management and classification systems pertinent to cerebral palsy and tetraplegia, • pharmacological and non-pharmacological methods for the relief of nerve-related pain problems.
Clinical Skills	**BASIC** Should demonstrate ability to: • clinically assess nerve-related disorders including brachial plexus, • apply relevant specialist imaging techniques such as electrophysiological

	investigation and ultrasound, • prevent iatrogenic nerve injury. **INTERMEDIATE** Should demonstrate ability to: • clinically assess and manage algorithms for the conditions covered in this module. • assessment of nerve function using specific equipment used in rehabilitation and assessment (such as Semmes Weinstein filaments). **ADVANCED** Should demonstrate ability to: • clinically assess brachial plexus and obstetrical brachial plexus injury including acute and interval treatment, • clinically assess the spastic and tetraplegic upper limb. • define the management algorithm of the iatrogenic nerve injury.

Technical Skills and Procedures	**BASIC**
	
	Should be able to perform:
	
	• peripheral nerve repair including digital nerve including simulation-based exercises for microsurgical peripheral nerve repair
	• nerve graft harvest
	• carpal tunnel release
	• cubital tunnel release (simple decompression)
	
	INTERMEDIATE
	
	Should be able to perform:
	
	• nerve decompression:
	  ○ cubital tunnel release (transposition / medial epicondylectomy)
	  ○ revision carpal tunnel release
	• nerve grafting for segmental nerve defect
	
	ADVANCED
	
	Should be able to perform:
	
	• nerve decompression
	  ○ ulna nerve in Guyon's canal
	  ○ submuscular transposition of ulna nerve (cubital tunnel)
	  ○ radial nerve in radial tunnel

	○ median nerve in pronator tunnel • transposition of neuroma • wrist denervation • brachial plexus exploration (including OBP) ○ nerve grafting ○ neurotisation ○ intercostal nerve grafting ○ muscle transfer for reanimation

Topic	**HAND**
Category	**ST7/8 Final Years and TIG Fellows**
Module 6	**The Child's Hand, Vascular Disorders and Tumours**
Objective	Acquire overall competence in the diagnosis and management of children's hand problems with emphasis on congenital hand conditions. Acquire competence in the management of vascular disorders and neoplastic conditions of the upper limb in both children and adults. Demonstrate knowledge of the aetiology, classification, risk factors and surgical management of these conditions.

Knowledge	**BASIC**
	
	Should demonstrate knowledge of:
	
	• principles of management of children's hand disorders including classification, reconstructive principles and timing of operations for congenital difference,
	• embryology of the upper limb and the mechanisms of malformation,
	• patterns of normal growth and development
	• management of vascular injury including compartment syndrome
	• principles of management of soft tissue and bony tumours particularly the more common swellings found around the hand
	• management of upper limb tumours with reference to surgical oncology including biopsy techniques, excision margins, management of regional lymph nodes, formal amputations.
	
	INTERMEDIATE
	
	Should demonstrate knowledge of:
	
	• the following conditions of the Child's Hand: trigger digits, polydactyly including thumb duplication, simple syndactyly, epiphyseal injury (Salter Harris)
	• management of vascular insufficiency syndromes, - haemangiomas and vascular malformations,
	• management of soft tissue and bony tumours including formal amputations, reconstructions,
	• principles of management of skin cancer occurring in the upper limb and management of the regional lymph nodes.
	
	ADVANCED
	
	Should demonstrate knowledge of:
	
	• the following conditions of the Child's Hand:
	  ○ complex syndactyly (e.g. Apert's hand)
	  ○ radial dysplasia (radial club hand), ulnar dysplasia
	  ○ thumb hypoplasia
	  ○ upper limb malformations in arthrogryposis

	○ Madelung's deformity ○ Constriction band syndrome ○ cerebral palsy, spasticity ○ use of prosthetics • vascular lesions including vascular malformations, • management of acute and chronic vascular insufficiency syndromes including compartment syndrome / Volkmann's ischaemic contracture. • classification systems and histopathology relevant to neoplasms of the upper limb including skin cancer, sarcoma and bone tumours, • modalities of treatment including non-surgical and surgical options, • surgical margins for the commoner tumours, • options for reconstruction of the surgically excised defect, • adjuvant treatments used in combination with surgery for malignant neoplasms.
Clinical Skills	**BASIC** Should demonstrate ability to: • clinically assess and deliver non-operative management of the Child's Hand disorder, • in respect of cancer diagnoses demonstrates the skill set necessary to advise a patient of such diagnosis. • work and communicate within the relevant multidisciplinary team (MDT) **INTERMEDIATE** • Should demonstrate ability to apply a working knowledge of the management algorithms to the conditions covered in this module. **ADVANCED** Should demonstrate: • skills of analysis and diagnostic synthesis, judgement, and surgical planning. • in respect of the Child's Hand, the ability to advise regarding timing of reconstruction and effect of growth on reconstructive surgery previously performed, • in respect of vascular disorders shows the ability to advise regarding conservative, non-surgical and surgical treatment options, • in respect of neoplastic conditions of the upper limb the shows the ability to provide detailed advice on the treatment pathway, including interpretation of specialist imaging, within the context of the relevant MDT.

Technical Skills and Procedures	**BASIC** Should be able to perform: • surgery for uncomplicated traumatic conditions of the Child's Hand, • excision of small superficial vascular malformations, • ganglion excision (dorsal wrist, volar wrist, DIPJ) • safe biopsy for suspected tumours of the upper limb **INTERMEDIATE** Should be able to perform: • trigger thumb/finger release • simple syndactyly separation • correction of duplicate thumb • correction of polydactyly • reconstruction of vascular defects by vein grafting, • excision of vascular malformations involving multiple tissue layers, • fasciotomies for compartment syndrome, • excision of giant cell tumour of tendon sheath, • excision/curettage enchondroma, • removal of swellings from nerves e.g. Schwannoma • excision of other benign tumours of bone and soft tissue. **ADVANCED** Should be able to perform: • complex syndactyly correction • radialisation radial club hand • application external distraction devices for radial club hand • pollicisation • cleft hand correction • recreation of first web space (various conditions) • excision of major vascular malformations and reconstruction resultant defects • excision of malignant tumours of bone and soft tissue including compartmentectomy and reconstruction of resultant defects. • axillary lymphadenectomy

Appendix 3

Core Surgical Training Syllabus

Core Overview

The purpose of the initial stage (early years) (CT1 - 3) is to allow the trainee to develop the basic and fundamental surgical skills common to all surgical specialties, together with a few surgical skills relevant to Urology.

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

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

By the end of CT2/3, trainees, (including those following an academic pathway), will have acquired to the defined level:

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

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

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

- Anatomy
- Physiology

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

Module 2: Common surgical conditions

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

Module 3 Basic surgical skills

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

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

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

- To take informed consent for straightforward cases.

Module 5: Perioperative care of the surgical patient

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

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

- To safely assess the multiply injured patient.
- To safely assess and initiate management of patients with
- traumatic skin and soft tissue injury
- chest trauma
- a head injury
- a spinal cord injury
- abdominal and urogenital trauma
- vascular trauma
- a single or multiple fractures or dislocations
- burns

Module 7: Surgical care of the paediatric patient

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

Module 8: Management of the dying patient

- To manage the dying patient appropriately.
- To manage the dying patient in consultation with the palliative care team.

Module 9: Organ and tissue transplantation

- To understand the principles of organ and tissue transplantation.

- To assess brain stem death and understand its relevance to continued life support and organ donation.

Module 10: Professional behaviour

- To provide good clinical care
- To be a good communicator
- To teach and to train
- To keep up to date and know how to analyse data
- To understand and manage people and resources within the health environment
- To promote good Health
- To understand the ethical and legal obligations of a surgeon

CORE SURGICAL TRAINING MODULES

MODULE 1	BASIC SCIENCES	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	• To acquire and demonstrate underpinning basic science knowledge appropriate for the practice of surgery, including:- • Applied anatomy: Knowledge of anatomy appropriate for surgery • Physiology: Knowledge of physiology relevant to surgical practice • Pharmacology: Knowledge of pharmacology relevant to surgical practice centred around safe prescribing of common drugs • Pathology: Knowledge of pathological principles underlying system specific pathology • Microbiology: Knowledge of microbiology relevant to surgical practice Imaging: • Knowledge of the principles, strengths and weaknesses of various diagnostic and interventional imaging methods	Course completion certificate MRCS	
Knowledge	Applied anatomy: • Development and embryology • Gross and microscopic anatomy of the organs and other structures • Surface anatomy • Imaging anatomy		Strongly recommended: Life support Critical care Desirable Anatomy

	This will include anatomy of thorax, abdomen, pelvis, perineum, limbs, spine, head and neck as appropriate for surgical operations that the trainee will be involved with during core training (see Module 2). Physiology: General physiological principles including: • Homeostasis • Thermoregulation • Metabolic pathways and abnormalities • Blood loss and hypovolaemic shock • Sepsis and septic shock • Fluid balance and fluid replacement therapy • Acid base balance • Bleeding and coagulation • Nutrition This will include the physiology of specific organ systems relevant to surgical care including the cardiovascular, respiratory, gastrointestinal, urinary, endocrine and neurological systems. Pharmacology: • The pharmacology and safe prescribing of drugs used in the treatment of surgical diseases including analgesics, antibiotics, cardiovascular drugs, antiepileptic, anticoagulants, respiratory drugs, renal drugs, drugs used for the management of endocrine disorders (including diabetes) and local anaesthetics. • The principles of general		Team-Based Human Factors

	anaesthesia • The principles of drugs used in the treatment of common malignancies • Can describe the effects and potential for harm of alcohol and other drugs including common presentations, wide range of acute and long term presentations (e.g. trauma, depression, hypertension etc.), the range of interventions, treatments and prognoses for use of alcohol and other drugs. Pathology: General pathological principles including: • Inflammation • Wound healing • Cellular injury • Tissue death including necrosis and apoptosis • Vascular disorders • Disorders of growth, differentiation and morphogenesis • Surgical immunology • Surgical haematology • Surgical biochemistry • Pathology of neoplasia • Classification of tumours • Tumour development and growth including metastasis • Principles of staging and grading of cancers • Principles of cancer therapy including surgery, radiotherapy, chemotherapy, immunotherapy and hormone therapy		

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

MODULE 2	COMMON SURGICAL CONDITIONS		ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	This section assumes that trainees have general medical competences consistent with a doctor leaving Foundation in the UK. It also assumes an ongoing commitment to keeping these skills and knowledge up to date as laid out in GMP. It is predicated on the value that surgeons are doctors who carry our surgery and require competence. To demonstrate understanding of the relevant basic scientific principles for each of these surgical conditions and to be able to provide the relevant clinical care as defined in modules assessment and management as defined in Modules 1 and 4.		Certificate of successful completion of course MRCS	
Topics	Presenting symptoms or syndromes • Abdominal pain • Abdominal swelling • Change in bowel habit • Gastrointestinal haemorrhage • Rectal bleeding • Dysphagia • Dyspepsia • Jaundice	To include the following conditions • Appendicitis • Gastrointestinal malignancy • Inflammatory bowel disease • Diverticular disease • Intestinal obstruction • Adhesions • Abdominal hernias • Peritonitis • Intestinal perforation • Benign oesophageal disease • Peptic ulcer disease • Benign and malignant hepatic,		Strongly recommended: Basic surgical skills Basic laparoscopic skills Fracture treatment Desirable Imaging interpretation Desirable (Cardiothoracic Surgery / Plastic Surgery): • Anastomosis • Angiography

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

	Genitourinary disease Presenting symptoms or syndrome • Loin pain • Haematuria • Lower urinary tract symptoms • Urinary retention • Renal failure • Scrotal swellings • Testicular pain	To include the following conditions • Genitourinary malignancy • Urinary calculus disease • Urinary tract infection • Benign prostatic hyperplasia • Obstructive uropathy		
	Trauma and orthopaedics Presenting symptoms or syndrome • Traumatic limb and joint pain and deformity • Chronic limb and joint pain and deformity • Back pain	To include the following conditions • Simple fractures and joint dislocations • Fractures around the hip and ankle • Basic principles of Degenerative joint disease • Basic principles of inflammatory joint disease including bone and joint infection • Compartment syndrome • Spinal nerve root entrapment and spinal cord compression • Metastatic bone cancer • Common peripheral neuropathies and nerve injuries		

	Disease of the Skin, Head and Neck Presenting symptoms or syndrome • Lumps in the neck • Epistaxis • Upper airway obstructions	To include the following conditions • Benign and malignant skin lesions • Benign and malignant lesions of the mouth and tongue		
	Neurology and Neurosurgery Presenting symptoms or syndrome • Headache • Facial pain • Coma	To include the following conditions • Space occupying lesions from bleeding and tumour		
	Endocrine Presenting symptoms or syndrome • Lumps in the neck • Acute endocrine crises	To include the following conditions • Thyroid and parathyroid disease • Adrenal gland disease • Diabetes		

MODULE 3	BASIC SURGICAL SKILLS	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	• Preparation of the surgeon for surgery • Safe administration of appropriate local anaesthetic agents • Acquisition of basic surgical skills in instrument and tissue handling.	WBA- PBA, CBD, DOPS	

	• Understanding of the formation and healing of surgical wounds • Incise superficial tissues accurately with suitable instruments. • Close superficial tissues accurately. • Tie secure knots. • Safely use surgical diathermy • Achieve haemostasis of superficial vessels. • Use suitable methods of retraction. • Knowledge of when to use a drain and which to choose. • Handle tissues gently with appropriate instruments. • Assist helpfully, even when the operation is not familiar. • Understand the principles of anastomosis • Understand the principles of endoscopy		
Knowledge	Principles of safe surgery • Preparation of the surgeon for surgery • Principles of hand washing, scrubbing and gowning • Immunisation protocols for surgeons and patients Administration of local anaesthesia • Choice of anaesthetic agent • Safe practise Surgical wounds • Classification of surgical wounds • Principles of wound management • Pathophysiology of wound healing • Scars and contractures • Incision of skin and subcutaneous		Strongly recommended: Basic surgical skills Tissue handling/suturing Strongly recommended (Paediatric Surgery): • Basic suturing and wound management Desirable (Cardiothoracic Surgery / Plastic

	tissue: ○ Langer's lines ○ Choice of instrument ○ Safe practice • Closure of skin and subcutaneous tissue: ○ Options for closure ○ Suture and needle choice • Safe practice • Knot tying ○ Range and choice of material for suture and ligation ○ Safe application of knots for surgical sutures and ligatures • Haemostasis: ○ Surgical techniques ○ Principles of diathermy • Tissue handling and retraction: ○ Choice of instruments • Biopsy techniques including fine needle aspiration cytology • Use of drains: ○ Indications ○ Types ○ Management/removal • Principles of anastomosis • Principles of surgical endoscopy		Surgery): • Anastomosis • Endoscopy
Clinical Skills	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning • Administration of local anaesthesia • Accurate and safe administration of		

	local anaesthetic agent 4 Preparation of a patient for surgery • Creation of a sterile field • Antisepsis • Draping		
Technical Skills and Procedures	4 Preparation of the surgeon for surgery • Effective and safe hand washing, gloving and gowning 4 Administration of local anaesthesia • Accurate and safe administration of local anaesthetic agent 4 Incision of skin and subcutaneous tissue: • Ability to use scalpel, diathermy and scissors 4 Closure of skin and subcutaneous tissue: • Accurate and tension free apposition of wound edges 4 Knot tying: • Single handed • Double handed • Instrument • Superficial • Deep 3 Haemostasis: • Control of bleeding vessel (superficial) • Diathermy • Suture ligation • Tie ligation • Clip application • Transfixion suture		

	4 Tissue retraction: • Tissue forceps • Placement of wound retractors 3 Use of drains: • Insertion • Fixation • Removal 3 Tissue handling: • Appropriate application of instruments and respect for tissues • Biopsy techniques 4 Skill as assistant: • Anticipation of needs of surgeon when assisting		

MODULE 4	THE ASSESSMENT AND MANAGEMENT OF THE SURGICAL PATIENT	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	To demonstrate the relevant knowledge, skills and attitudes in assessing the patient and manage the patient, and propose surgical or non-surgical management.	Examinations- MRCS	
Knowledge	The knowledge relevant to this section will be variable from patient to patient and is covered within the rest of the syllabus – see common surgical conditions in particular (Module 2). As a trainee develops an interest in a particular speciality then the principles of history taking and examination may be increasingly applied in that context.		Strongly recommended: Life Support Critical Care ATLS / APLS Desirable: Team working Human Factors
Clinical Skills	4 Surgical history and examination (elective and emergency) 3 Construct a differential diagnosis 3 Plan investigations 3 Clinical decision making 3 Team working and planning 3 Case work up and evaluation; risk management 3 Active participation in clinical audit events 3 Appropriate prescribing 3 Taking consent for intermediate level intervention; emergency and elective 3 Written clinical communication skills 3 Interactive clinical		

	communication skills: patients 3 Interactive clinical communication skills: colleagues		

MODULE 5	PERI-OPERATIVE CARE	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	To assess and manage preoperative risk To manage patient care in the peri-operative period To conduct safe surgery in the operating theatre environment To assess and manage bleeding including the use of blood products To care for the patient in the post-operative period including the assessment of common complications To assess, plan and manage post-operative fluid balance To assess and plan perioperative nutritional management	WBA Course test completion certificate	
Knowledge	Pre-operative assessment and management: • Cardiorespiratory physiology • Diabetes mellitus and other relevant endocrine disorders • Fluid balance and homeostasis • Renal failure • Pathophysiology of sepsis – prevention and prophylaxis • Thromboprophylaxis • Laboratory testing and		Strongly recommended: Basic surgical skills Life Support Critical Care Strongly recommended (Paediatric Surgery): • Safe surgery

	imaging • Risk factors for surgery and scoring systems • Pre-medication and other preoperative prescribing • Principles of day surgery Intraoperative care: • Safety in theatre including patient positioning and avoidance of nerve injuries • Sharps safety • Diathermy, laser use • Infection risks • Radiation use and risks • Tourniquet use including indications, effects and complications • Principles of local, regional and general anaesthesia • Principles of invasive and non-invasive monitoring • Prevention of venous thrombosis • Surgery in hepatitis and HIV carriers • Fluid balance and homeostasis Post-operative care: • Post-operative monitoring • Cardiorespiratory physiology • Fluid balance and homeostasis • Diabetes mellitus and other relevant endocrine		Desirable Human Factors Team-working

	disorders • Renal failure • Pathophysiology of blood loss • Pathophysiology of sepsis including SIRS and shock • Multi-organ dysfunction syndrome • Post-operative complications in general • Methods of postoperative analgesia To assess and plan nutritional management • Post-operative nutrition • Effects of malnutrition, both excess and depletion • Metabolic response to injury • Methods of screening and assessment of nutritional status • Methods of enteral and parenteral nutrition Haemostasis and Blood Products: • Mechanism of haemostasis including the clotting cascade • Pathology of impaired haemostasis e.g. haemophilia, liver disease, massive haemorrhage • Components of blood • Alternatives to use of blood products • Principles of		

	administration of blood products • Patient safety with respect to blood products Coagulation, deep vein thrombosis and embolism: • Clotting mechanism (Virchow Triad) • Effect of surgery and trauma on coagulation • Tests for thrombophilia and other disorders of coagulation • Methods of investigation for suspected thromboembolic disease • Principles of treatment of venous thrombosis and pulmonary embolism including anticoagulation • Role of V/Q scanning, CTpulmonary angiography, D-dimer and thrombolysis • Place of pulmonary embolectomy • Prophylaxis of thromboembolism: • Risk classification and management of DVT • Knowledge of methods of prevention of DVT, mechanical and pharmacological Antibiotics: • Common pathogens in surgical patients • Antibiotic sensitivities • Antibiotic side-effects		

	• Principles of prophylaxis and treatment Metabolic and endocrine disorders in relation perioperative management • Pathophysiology of thyroid hormone excess and deficiency and associated risks from surgery • Causes and effects of hypercalcaemia and hypocalcaemia • Complications of corticosteroid therapy • Causes and consequences of Steroid insufficiency • Complications of diabetes mellitus • Causes and effects of hyponatraemia • Causes and effects of hyperkalaemia and hypokalaemia		
Clinical Skills	3 Pre-operative assessment and management: • History and examination of a patient from a medical and surgical standpoint • Interpretation of pre-operative investigations • Management of co morbidity • Resuscitation • Appropriate preoperative prescribing including premedication		

	3 Intra-operative care: • Safe conduct of intraoperative care • Correct patient positioning • Avoidance of nerve injuries • Management of sharps injuries • Prevention of diathermy injury • Prevention of venous thrombosis 3 Post-operative care: • Writing of operation records • Assessment and monitoring of patient's condition • Post-operative analgesia • Fluid and electrolyte management • Detection of impending organ failure • Initial management of organ failure • Principles and indications for Dialysis • Recognition, prevention and treatment of post-operative complications 3 Haemostasis and Blood Products: • Recognition of conditions likely to lead to the diathesis • Recognition of abnormal bleeding during surgery		

	• Appropriate use of blood products • Management of the complications of blood product transfusion 3 Coagulation, deep vein thrombosis and embolism • Recognition of patients at risk • Awareness and diagnosis of pulmonary embolism and DVT • Role of duplex scanning, venography and d-dimer measurement • Initiate and monitor treatment of venous thrombosis and pulmonary embolism • Initiation of prophylaxis 3 Antibiotics: • Appropriate prescription of antibiotics 3 Assess and plan preoperative nutritional management • Arrange access to suitable artificial nutritional support, preferably via a nutrition team including Dietary supplements, Enteral nutrition and Parenteral nutrition 3 Metabolic and endocrine disorders • History and examination in patients with endocrine and electrolyte disorders		

	• Investigation and management of thyrotoxicosis and hypothyroidism • Investigation and management of hypercalcaemia and hypocalcaemia • Peri-operative management of patients on steroid therapy • Peri-operative management of diabetic patients • Investigation and management of hyponatraemia • Investigation and management of hyperkalaemia and hypokalaemia		
Technical Skills and Procedures	2 Central venous line insertion 4 Urethral catheterisation		Strongly recommended (Paediatric Surgery) Desirable

MODULE 6	ASSESSMENT AND MANAGEMENT OF PATIENTS WITH TRAUMA (INCLUDING THE MULTIPLY INJURED PATIENT)	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	Assess and initiate management of patients with chest trauma • who have sustained a head injury • who have sustained a spinal cord injury • who have sustained	WBA Course test and certificate	

	abdominal and urogenital trauma • who have sustained vascular trauma • who have sustained a single or multiple fractures or dislocations • who have sustained traumatic skin and soft tissue injury • who have sustained burns • Safely assess the multiply injured patient. • Contextualise any combination of the above • Be able to prioritise management in such situation as defined by ATLS, APLS etc It is expected that trainees will be able to show evidence of competence in the management of trauma (ATLS / APLS certificate or equivalent).		
Knowledge	General • Scoring systems for assessment of the injured patient • Major incident triage • Differences In children Shock • Pathogenesis of shock • Shock and cardiovascular physiology		Strongly recommended: Life Support Critical Care Wound management ATLS / APLS Desirable: Team-working Human Factors

	• Metabolic response to injury • Adult respiratory distress syndrome • Indications for using uncross matched blood Wounds and soft tissue injuries • Gunshot and blast injuries • Stab wounds • Human and animal bites • Nature and mechanism of soft tissue injury • Principles of management of soft tissue injuries • Principles of management of traumatic wounds • Compartment syndrome Burns • Classification of burns • Principle of management of burns Fractures • Classification of fractures • Pathophysiology of fractures • Principles of management of fractures • Complications of fractures • Joint injuries Organ specific trauma • Pathophysiology of thoracic trauma		Trauma management

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

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

MODULE 7	SURGICAL CARE OF THE PAEDIATRIC PATIENT	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	To assess and manage children with surgical problems, understanding the similarities and differences from adult surgical patients To understand the issues of child protection and to take action as appropriate	WBA MRCS	
Knowledge	• Physiological and metabolic response to injury and surgery • Fluid and electrolyte balance • Thermoregulation Safe prescribing in children • Principles of vascular access in children • Working knowledge of trust and Local Safeguarding Children Boards (LSCBs) and Child Protection Procedures • Basic understanding of child protection law		Strongly recommended: Critical Care Child protection Desirable Team-working

	• Understanding of Children's rights • Working knowledge of types and categories of child maltreatment, presentations, signs and other features (primarily physical, emotional, sexual, neglect, professional) • Understanding of one personal role, responsibilities and appropriate referral patterns in child protection • Understanding of the challenges of working in partnership with children and families • Recognise the possibility of abuse or maltreatment • Recognise limitations of own knowledge and experience and seek appropriate expert advice • Urgently consult immediate senior in surgery to enable referral to paediatricians • Keep appropriate written documentation relating to child protection matters • Communicate effectively with those involved with child protection, including children and their families		
Clinical Skills	3 History and examination of the neonatal surgical patient 3 History and examination of paediatric surgical patient 3 Assessment of respiratory and cardiovascular status 3 Undertake consent for		

	surgical procedures (appropriate to the level of training) in paediatric patients		

MODULE 8	MANAGEMENT OF THE DYING PATIENT	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	Ability to manage the dying patient appropriately. To understand consent and ethical issues in patients certified DNAR (do not attempt resuscitation) Palliative Care: Good management of the dying patient in consultation with the palliative care team.	MRCS	
Knowledge	Palliative Care: • Care of the terminally ill • Appropriate use of analgesia, antiemetics and laxatives Principles of organ donation: • Circumstances in which consideration of organ donation is appropriate • Principles of brain death Understanding the role of the coroner and the certification of death		Desirable Team-working Human Factors
Clinical Skills	3 Palliative Care: • Symptom control in the terminally ill patient 3 Principles of organ donation: • Assessment of brain stem death		Strongly recommended (Paediatric Surgery: • Ethical issues • Palliative care • Communication

	• Certification of death		

MODULE 9	ORGAN AND TISSUE TRANSPLANTATION	ASSESSMENT TECHNIQUE	AREAS IN WHICH SIMULATION SHOULD BE USED TO DEVELOP RELEVANT SKILLS
Objective	To understand the principles of organ and tissue transplantation	MRCS	
Knowledge	• Principles of transplant immunology including tissue typing, acute, hyperactute and chronic rejection • Principles of immunosuppression • Tissue donation and procurement • Indications for whole organ transplantation		