A Competency Based Curriculum 2007

Specialist Training in Trauma and Orthopaedics

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OCAP Steering Group

British Orthopaedic Trainees Association

Trauma & Orthopaedic SAC

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Questions, Comments, Updates

Questions and feedback are welcomed.
They should be addressed in the first instance to David Pitts, Professor D I Rowley and Clare Marx via admin@ocap.org.uk from whom updates to this document may also be obtained.

Sponsors

Much of the work done in this Curriculum is based on the work of the Orthopaedic Competence Assessment Project which has over a period of three years been sponsored by:

- Stryker
- Smith & Nephew
- Zimmer UK
- Aesculap-Braun

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Special Thanks

Timetable for production of this Curriculum has placed considerable demands on a number of individuals. We would like to express our thanks to not only them but their partners and families who have suffered the endless phone calls at strange hours. We would also like to express our thanks to the secretarial staff who have typed, re-typed and formatted this document in such a short space of time.

PMETB: What is a Curriculum?

A statement of the intended aims and objectives, content, experiences, outcomes and processes of an educational programme including:

- a description of the training structure [entry requirements, length and organisation of the programme including its flexibilities, and assessment system],
- a description of expected methods of learning, teaching, feedback and supervision

The curriculum should cover both generic professional and specialty specific areas.

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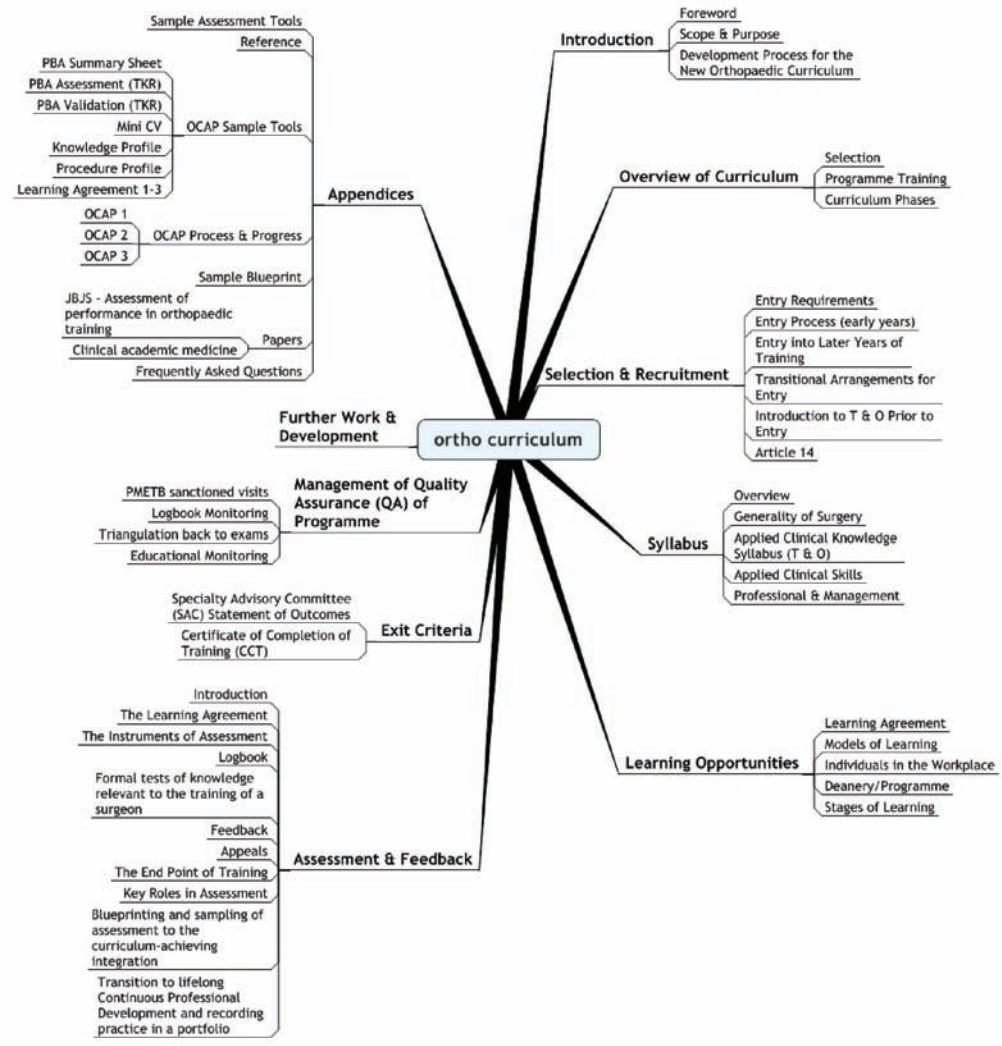

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1. Introduction

a) FOREWORD

What do we expect of the Trained Trauma and Orthopaedic (T&O) Surgeon?

The Specialist Advisory Committee (SAC) in T&O Surgery has already defined the Standard at 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 CCT will have been trained in the generality of Orthopaedics and Trauma when they have been assessed as having completed the competencies laid out in the Orthopaedic and Trauma curriculum. The syllabus is for the generality of Trauma and Orthopaedics and this will be assessed in the summative Intercollegiate Specialty Board Exam which trainees must have completed by the end of their training. This will form part of the trainee's portfolio which will also include workplace based assessments, the evidence of previous learning agreements and RITA assessments. The Portfolio will be assessed in its entirety at the final RITA G assessment prior to the recommendation of the award of the CCT.*
>
> *Towards the end of training in the generality of the discipline the overwhelming majority will have begun to develop a subspecialty interest prior to CCT. This will continue post CCT and is likely to be formally assessed in a subsequent peer review process.*
>
> *Such an individual will then be able to join and lead a multidisciplinary team which will receive, assess and definitively manage the majority of patients who need emergency treatments. They will provide a similar service for a range of common Orthopaedic conditions. In both Trauma and Orthopaedic services they will recognise the need to refer rarer and prescribed conditions for more specialised definitive management."*

PMETB presented the partners involved in the organisation and delivery of training with the challenge to develop and introduce a competency based curriculum in which the knowledge, attitudes and skills required for a trainee to be judged as worthy of a CCT are explicitly defined and assessed.

In this document we in T&O surgery present our curriculum. The methods, syllabus and processes to deliver that curriculum are outlined together with assessment tools necessary to ensure that the trainees enrolled in T&O surgical training from 2007 onwards can demonstrate that "The Standard" has been achieved.

The Trainees in T&O have been familiar for several years with the tools of competency assessment laid out in the Orthopaedic Competency Assessment Project. Those tried and tested tools have now been further developed and used to support the delivery and assessment of the syllabus. Trainees and Trainers alike should have confidence in processes involved and view the "New" Curriculum as an opportunity to further standardise training throughout the United Kingdom ensuring a very high quality of CCT recipient. This document is inevitably just the beginning of the next phase in T&O education. We intend to build and strengthen the process of training and assessment as the lessons from the introduction of this new curriculum emerge.

For the future we hope that all concerned, especially the Public and Patients, will welcome this initiative as being in the best interests of those receiving T&O care and ensure that only those appropriately supervised and trained surgeons deliver that care through out the UK .

Clare Marx
Tony Banks
Lester Sher
David I Rowley
David Pitts

b) SCOPE & PURPOSE

Purpose

This Curriculum is produced to guide Orthopaedic training in the UK by providing accessible information for both the trainee and the trainer, who are seen as its primary audience. The Curriculum aims to make the 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. Although the Curriculum is a technical document written primarily for a professional orthopaedic audience it also seeks to provide transparent guidance for all, in particular the general public and patients.

Target Audience

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

- Validating bodies
- Collaborating groups
- Training Program Directors
- Trainers
- Trainees
- Employers

It is written for a professional audience, accessible to the general public / anyone who has a role in T&O Training.

Guiding Principles

During the development of the Orthopaedic Competence Assessment Project (OCAP, see historical overview section 1-5) tools and methodology in T&O initial interviews with trainers and trainees gave rise to a series of guiding principles. These principles informed the OCAP programme and have now been adopted to underpin the design process of the new orthopaedic curriculum.

A radical alternative

"A problem cannot be solved by the same technology used to create it" (Einstein)

In the current surgical training environment there have already been major changes that radically affect the amount of time and resources available. Designing a curriculum that merely revised the existing paperwork 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.

In designing the materials and delivering the curriculum we have tried to learn from our experience and that of others. Historically we observed in the JCHST Competence Working Party that there were difficulties moving forward that were attributable as much to change management and innovation issues as to the actual content of the assessment task. The curriculum has been designed with the intention of gaining as much support from the Orthopaedic community as possible in order to facilitate the innovation process.

Competence focused

The acquisition of operating experience is an important factor in surgical training and so any curriculum to be used "in the workplace" should be competence focused. Competence may be defined simply as

"… an individual's ability to perform in the workplace to the required standard … competences 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 competence. One conceptual standpoint states that a competence is simply a demonstrable ability to do something, using directly observable performance as evidence. Another understands competence as being a: '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 aspects 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 give evidence for it.

Within our particular competence 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 professional judgement.

The development of professional judgment is a key outcome 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 competence in individual skill areas to prove competence in professional judgement.[3]

Flexible and easy (intuitive) to use

Each programme, and every trainer, will wish to

[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

retain a degree of individuality, whether of organisation (4, 6 or 8 month attachments) or specialty selection. 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. A full integration of the orthopaedic curriculum with the orthopaedic e-logbook, for example, is work in progress.

Adaptable to a variety of contexts

Each programme delivers its orthopaedic service (and training) in an entirely different "geography". If trainees are to be taught in the work place then the curriculum tools must in some way take into account this difference between the work places in which they are being assessed. These workplaces differ not only in the facilities for education but also in the length of attachments, frequency of supervised sessions and attitudes to training and teaching (naturally some of these factors vary within each centre and between trainers). T&O has tried to limit the effect of these differences by creating a "delivery mechanism" (from the OCAP) which is currently facilitating the implementation of the curriculum.

One element of the trainee's portfolio

Much surgical training happens in midst of service delivery and is therefore subservient to the needs of the patient. This may severely limit the window of opportunity during which skills may be observed, articulated and evaluated. The hospital environment, where many trainers do not have their own office space and distractions abound, is hostile to finding time and space to meet and talk. Most surgeons join the profession to perform surgery. They acknowledge the need to train but appreciate the evaluation of training to be part and parcel of service delivery.

With these factors 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 tools.

Driven by the trainee

We have put responsibility into the hands of those who hold largest stake in seeing training happen – the trainees themselves! 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 (through OCAP) provides tools to guide the trainee in getting the best from their trainer in a mutually supportive and mature relationship.

Useable, valid and reliable

From the beginning we have borne in mind that the materials need to satisfy these three criteria. 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.

Validity

Questions of validity (truth) may be addressed in several different ways. Does the implementation of the whole system make a valid improvement in the outcomes of training? Are the index 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. The OCAP process came into being because there was no objective measurement of surgical competence at present. 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 index procedures and Procedure Based Assessments 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 firmly 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 over time.

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.

Holistic in approach

The Competence Working Party guidelines, resonating with PMETB's own later guidance incorporated "generic skills" such as communication and teamwork into our thinking from the start. It was clear from conversations with training directors that many problems encountered amongst trainees had their roots in the area of personal effectiveness. In the past many of these problems were not identified until year 3 or 4 of training but it is desirable that they are recognised at a much earlier stage in order to ensure a solution. This also raised the problem of the trainers' ability in this area. For this reason materials have been included that will help both sides to develop their awareness and competence in these vital skills.

Formative and summative

The notion of a summative assessment where a trainer (possibly external) observes a trainee's performance in a pass/fail scenario was rejected at an early stage after two pilots. On one hand there seemed to be insurmountable logistic and resource problems but more importantly training in the workplace is an ongoing activity and assessment should resonate with its formative nature. It was decided that all workplace assessments should be formative, giving feedback to the trainee to inform and guide their future performance. It was noted, however, that such assessments would, as a whole, be a useful summary of the trainee's ability to learn and progress. The successful completion of a PBA for example is not seen as a license to operate in that procedure but as a single component of a wider assessment of the trainee's ability to learn operative procedures and perform them on a variety of patients with differing degrees of severity and complexity in their condition.

Electronic application

It has been clear from the beginning that to gather data from a workplace based curriculum requires electronic application to facilitate this. Sadly the levels of IT "literacy" encountered in OCAP pilots were highly variable and, more importantly, access to IT resources in NHS Trusts is extremely patchy (according to 2006 OCAP data). We have therefore sought to demonstrate the possibility of an easy transfer to a digital system whilst maintaining a paper-based system as the primary resource in these early stages while agreements are reached.

c) DEVELOPMENT PROCESS FOR THE NEW ORTHOPAEDIC CURRICULUM

Creation of the new Orthopaedic Curriculum could legitimately be seen as evolutionary based on consensus within the profession. The present work builds on substantial foundations laid over a period of years by a variety of individuals.

- ***Pre 2001***

At this point the orthopaedic curriculum documents were in the form of the BOA's "blue book", syllabus of Clinical Knowledge which has formed the foundation for the present 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 JCHST 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:

1. 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

2. 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, which pay due deference to the experience of the trainees and the facilities available from the training
   - A research portfolio which should follow the current JCHST 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 objective 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 competence map linking the methods of delivery, assessment and curriculum content, to ensure no serious gaps
3. That a number of experiments should be encouraged in order to develop materials to support the portfolio process.

The *Orthopaedic Competence Assessment Project* 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 competence 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, has now produced a competence based portfolio of educational tools which have been piloted and validated. This body of work has formed the basis of orthopaedic higher surgical training UK-wide since August 2005

The *Intercollegiate Surgical Curriculum Project* (ISCP) began its work in 2003, and since then, the Department of Health has funded two subsequent ISCP project phases, including, the current phase – a national pilot of the changes proposed – which commenced in September 2005. Orthopaedics has contributed extensively to this project whenever the opportunity has arisen and the Procedure Based Assessment tools originally developed in orthopaedics have formed the model of all specialties. So far the ISCP has failed to deliver a usable curriculum for T&O, this has driven the need to produce this curriculum.

- ***Present***

An editorial group was convened by the present Chair of the Orthopaedic 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 has drawn together material from a number of sources to create the present document which it is anticipated will form a focus for considerable discussion, debate and refinement following its review by PMETB.

- ***Future***

Subject to the appropriate funding having been identified it is proposed that the Orthopaedic Curriculum will be reviewed through a specially created sub-committee of the SAC. This group will review material and debate on an ongoing basis throughout the year with a yearly face to face meeting at which amendments to the Curriculum will be ratified and a new document issued if necessary. Membership of this group will be decided by the Orthopaedic SAC and will include representatives from the BOA and the British Orthopaedic Trainees Association as well as a lay member.

2. 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. For the majority of their working lives they will be expected to deal with bony and soft tissue injuries admitted through their local A&E Departments. 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:

- Lower limb joint reconstruction (hip and knee replacements and associated procedures).
- Hip surgery • Ankle and foot
- Knee surgery (bony and soft tissue)
- 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 competence in the general practice of orthopaedic and trauma surgery and the successful completion of the interspecialty examination. By the time they acquire the CCT they may already have developed a special interest in one of the above named areas.

a) SELECTION

T&O will select all surgeons at the earliest possible stage (this will eventually be from FY2). However, there will be some transitional years in the immediate future during which adjustments from the current status quo will enable those who have already gained some experience to access formal training and complete their educational goals.

b) PROGRAMME OF TRAINING

The early years ST1 and ST2 will enable those selected to show their capabilities and, subject to assessment, to pass seamlessly into ST3. It is anticipated that the majority of those entering the program will need a further 6 indicative years after ST2 to achieve the standard dictated for the awarding of a CCT in T&O. Part of the later years (ST6+) assessment will include the successful completion of the Intercollegiate specialty examination.

c) ASSESSMENT

During the first year (ST1) we will utilise a Learning Agreement (including PBA assessments) within the first 8 months, enabling trainers and trainees to assess the trainee's progress and potential. This agreement will formally be reviewed on two occasions during this period by a RITA-like process. A process of counselling will be instituted at an early stage if there is doubt on either side as to choice of career path or change of mind as to the direction of future career. The assessment tools for the early years are described within this curriculum as are those for the later years of training.

The award of a Certificate of Completion of Training occurs at the completion of training once the Trainee has demonstrated their competence in the entire range of skills, knowledge and attitudes described in Good Medical Practice, including competence in the general practice of orthopaedic and trauma surgery. By the time they acquire the CCT they may already have developed an interest in one of the above named specialist areas.

By the end of ST2 the trainee will have to demonstrate knowledge germane to the general principles of surgery and knowledge specific to training in Trauma and as Orthopaedics.

This is best done by MCQ and EMI.

The trainee will, as a normal part of their later training, begin to explore sub-specialist interests. This exploration will form a normal part of the learning agreement (s) and be subject to routine workplace based assessment (e.g. PBA) informing CCT (as any other attachment). The interest that many trainees develop at this stage will not be assessed in terms of specialty content for the purposes of CCT. It will, however, be a valuable developmental stage which will inform the trainee's own CPD agenda for the future.

Before the award of the CCT the trainee will need to demonstrate in a formal summative assessment of the curriculum the applied knowledge, skills, attitudes and judgements of an Orthopaedic surgeon practicing independently in the generality of the discipline.

d) CURRICULUM PHASES

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

The Initial Phase (ST1-2)

The initial phase ST1 stresses the learning of essential generic surgical principles shared by all surgical specialties and the acquisition of skills for the management of trauma. Initial focus will be fractures to the neck of the femur and to the ankle as well as a general ability to manage other low velocity fractures normally expected to be seen in A&E and admitted or referred on to fracture clinics. ST2 then expands the trauma vocabulary and consolidates generic surgical principles of in- and out- patient care as well as providing an introduction to the principles of modern elective orthopaedic practice by the commencement of the modular attachments, described below (intermediate phase).

The Intermediate Phase (ST3-6)

The next period of training takes the trainee to an intermediate level, usually involving six month specialist attachments in the sub specialist areas described above and referred to hereafter as Modules. The trainee would be expected to acquire in each area of orthopaedics a level of knowledge, skills and professionalism expected of a consultant surgeon practising in a district general hospital setting where they will be receiving trauma and managing most common orthopaedic conditions.

The Final Phase (ST7-8)

Following the acquisition of all or most competencies defined above, a further period of focused training and experience will be planned in one or more of the sub-specialist modules described above. This will be assessed as part of the CCT but this does not imply that sub-specialisation is completed at this stage (see above).

The Outcome of Training

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 act as the primary consultant for the small number of rare orthopaedic emergencies which may occur. They will deal with the majority of these cases definitively. The consultant will also make appropriate referral to other specialists within the discipline, depending on local circumstances, for those patients who are best served by a colleague with a specific expertise.

The acquisition of a CCT will define an individual who could work in a multi disciplinary team with other more experienced surgeons.

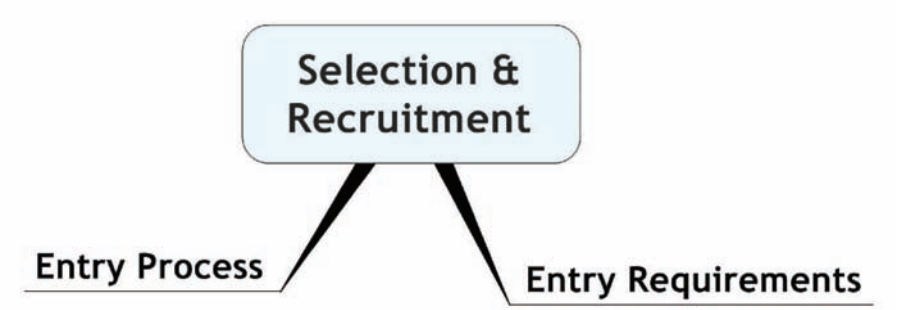
This individual would be expected to assess emergencies as they arise, resuscitate and definitively treat the majority, referring on some of the more specialised cases as described above. In the final phase of training, although the CCT holder will already have proven competencies in one or more of the specialist areas, further acquisition of skills, professionalism and knowledge in the sub specialist areas will continue during Continuous Professional Development.

Any defined specialist interest will ultimately need to be competency proven, probably through peer review of a portfolio of work developed through CPD. The acquisition of a CCT permits the Orthopaedic Surgeon to be placed on the specialist register of the GMC as a T&O surgeon but gives no guarantee of appointment to a particular post. The final decision as to suitability for a Consultant appointment lies with the designated Appointment Committee and the job description.

Trainees who for whatever reason opt out of training prior to acquisition of CCT need special consideration. Those who choose to practice with less than the minimum level of training to achieve CCT will require supervision by a CCT holder.

Independent practice and full responsibility for action require a doctor who has reached the stage of being able to make critical and independent judgements. Even within focused specialty practice, such an individual requires training in the round, as evidenced by CCT.

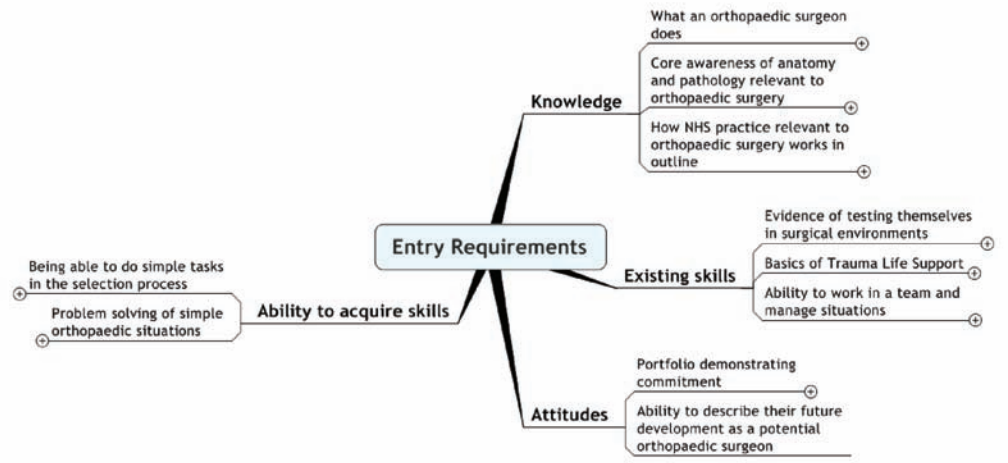
3. Selection and Recruitment



We anticipate selection into Trauma and Orthopaedic Surgery being part of the national selection process into surgery taking place simultaneously in individual Deaneries across the UK. In time recruitment will be exclusively from F2. In the present transition certain SHOs will be eligible for selection.

The selection process will be non discriminatory; prior exposure to a T&O experience during F1/2 will not be an essential prerequisite although evidence of knowledge of, commitment to, and enthusiasm for T&O are all highly desirable attributes.

a) ENTRY REQUIREMENTS



It is important that the knowledge, attitudes and skills that are required to be able to train and then practice as an Orthopaedic Surgeon are identified and verified in the selection process. The diagram above summarises desirable attributes in an individual wishing to train in T&O and are described in more detail below.

i. Knowledge

a. What an orthopaedic surgeon does

i. Trauma care

- Low velocity fractures make up the most part of care
- The management of multiply injured patients
- Fracture fixation

ii. Elective care

- How orthopaedics is divided up into sub-specialities
- Environments where elective care is administered

b. Core awareness of anatomy and pathology relevant to orthopaedic surgery

i. A knowledge of the basic lay out of the musculoskeletal system

ii. Some examples of applied anatomy

1. Nerve root origins and their significance
2. Joint structure and function

iii. Soft tissue pathophysiology

iv. Basic biomechanical awareness

v. The response of the body to trauma and surgery

c. How NHS practice relevant to orthopaedic surgery works in outline

i. The relationship between trauma and elective services

ii. Existing Skills

a. Evidence of testing themselves in surgical environments

i. Basic surgical skills

- Student exposure
- Voluntary exposure in Foundation

b. Basics of Trauma Life Support

- More than statutory requirements in Foundation

c. Ability to work in a team and manage situations

i. Scenario discussions around team situations

ii. Situation awareness

iii. Attitudes

a. Portfolio demonstrating commitment

i. Student electives

ii. Student projects

iii. Published work

iv. Audits carried out

v. Intercalated degrees

vi. Other activities outwith the curriculum relevant to a career in orthopaedics

- Voluntary work
- Visits

b. Ability to describe their future development as a potential orthopaedic surgeon

iv. Ability to acquire skills

a. Being able to do simple tasks in the selection process

i. Knot tying

ii. Three dimensional orientation with a simple endoscopic model

b. Problem solving of simple orthopaedic situations

a) OSCE type settings of simple things
Looking at an x ray
Seeing the normal
See the obviously abnormal
Looking at a set of blood investigations related to bones and joints

b) Orthopaedic trauma case based discussions

b) ENTRY PROCESS (EARLY YEARS)

An initial paper/electronic based selection process will match candidates against broad generic criteria indicating a propensity for surgical training. Selection into T&O will be facilitated by face-to-face interviews with Orthopaedic Surgeons as part of the selection process.

Selection centres will provide aptitude testing (as yet undefined) with smaller deaneries being part of a regional selection process to preserve a national standard for selection.

At present we expect that the selection centre will provide information linked to previous education and experience on the applicant's motivation (towards surgery in general and T&O in particular) together with a judgement as to their ability to be trained.

c) ENTRY INTO LATER YEARS OF TRAINING

There will be a need to provide for entry into a variety of levels of training for those applying from research and academic posts, career posts, after assessment under Article 14 and periods of absence after career breaks.

1. Intermediate phase ST3-6

To permit entry into the later stages of training ST3-6 a selection process would be conducted in a similar manner to the earlier years entry with an initial electronic screening followed by selection against specialty specific criteria.

In order to standardise this process the specialty specific criteria will be developed in the first tranche of the "Future Plans and Development" – section 9. The basis of these criteria will be the competencies required to enter at each level.

For example entry to ST3 will require completion of the competencies required to successfully complete ST2 including the test of knowledge applied at this stage.

2. Final Phase ST6-8

It is anticipated that in order to access the final phases of training it would be necessary to have completed all the modular competencies equivalent to completing ST6 and to be able to demonstrate that the applicant had a level of knowledge sufficient to complete the Intercollegiate Specialty Exam in T&O within 12 months of entering at this level.

d) TRANSITIONAL ARRANGEMENTS FOR ENTRY

During Transition criteria will be available for all levels of entry mapped against the competencies that will be required for successful completion of each Specialty Training level ST1-8.

e) INTRODUCTION TO T&O PRIOR TO ENTRY

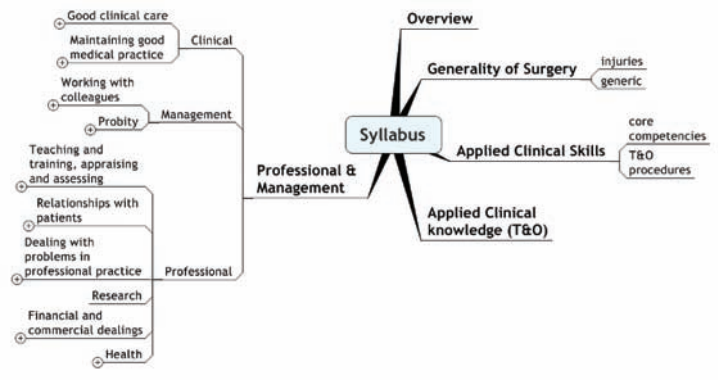
Prior to entry into T&O the specialty will, in collaboration with Royal Colleges and specialist associations, make introductory material available to potential candidates in the form of Websites (information and contacts), Summer Schools (knowledge and experience) and Careers Fairs (contacts and questions).

f) ARTICLE 14

Those individuals applying to access the specialist register by having their evidence of training and experience assessed by the processes laid out under Article 14 will need to demonstrate that their skills, knowledge and attitudes are of the same standard as those who have achieved the CCT as described in this curriculum.

Individuals who have been assessed under Article 14 as requiring additional skills and knowledge may need to enter training in order to fulfil these requirements. They will be considered for an earlier stage of training dependent on the requirements identified.

4. Syllabus



a) OVERVIEW

The first part of the syllabus is common to all nine SAC defined surgical disciplines and contains skills and knowledge expected of any surgeon in training. This syllabus is presented in a form already agreed with the other SACs in a format they all are comfortable with. It also contains that part of T&O that a trainee from another discipline of surgery would be expected to be familiar with and so is suitable for posts which might be part of a more generic early years surgical training programme.

The Syllabus supporting T&O has three distinct elements which capture the skills, knowledge and attitudes 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 is capable of being audited for scope and quality.

The three T&O components consist of:-

- Applied Clinical Knowledge with specific application in the context of T&O.
- 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 and Management, which brings together key competence groupings under GMP headings to emphasise knowledge, skills and attitudes which are essential both clinically and generally in order to be a practicing surgeon at the same time as practising the specifics of surgery.

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. We are in full sympathy with the public's expectation of surgeons to perform at the highest levels of skill and with appropriate attitudes in a patient centred approach to practice.

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 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 & Management section of the curriculum.

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). Also they must acquire skills in straightforward orthopaedic practice, such as the application of a plaster or safe infiltration of a joint. These are dealt with in the generality syllabus.

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 PBA's).

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

The Procedures section of the syllabus contains all the operations currently listed in the T&O log book, in a format that ensures immediate resonance (and eventual electronic integration).

Assessment of competence in procedures is dealt with in depth in section 6 of this curriculum (see section 6-2). In order to facilitate workplace based assessment 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 section 6-4. 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 are assessed on the following four point scale:

1. has observed or knows of
2. can manage with assistance
3. can manage whole but may need assistance
4. competent to manage without assistance including complications

All key procedures (PBA) must be mastered to level 4 and the remainder at a minimum of level 2, except in rarer and very specialized areas when this will simply not be practicably possible. The detailed levels of all the procedures are indicated in the syllabus.

Professional & Management

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 Clinical Practice for convenience. 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 way points within key stages. These stages are described in detail in section 5 which describes the learning opportunities and contextualizes them in the real world of clinical training. At these way points the trainee's progress through the syllabus may be helpfully reviewed.

The first way point is after what is termed the "early years". Here trainees and trainers must be able to be certain that career choice is correct and ability matches aspiration. The generality of surgical knowledge must be mastered and basic skills acquired. Once an NTN has been confirmed at the end of this period the trainee must be comfortable that they have both the motivation and the ability required to succeed.

The second way point is towards the end of training, after the middle years period, when the generality of the discipline will have been covered and competence 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 a Fellowship examination. 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 competence 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. The nature of this last part will vary and the different options are outlined in section 5.

Standards and values

Mastery

The standards set 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 aspirations of trainees must aspire to "Mastery", especially as specialist interests begin to be honed. Mastery means 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 environments with their trainees will ensure that training programmes "aim high".

Transparency

This syllabus is available to trainers and trainees alike – there are no separate documents or agendas. 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 confidentiality appropriately.

Partnership

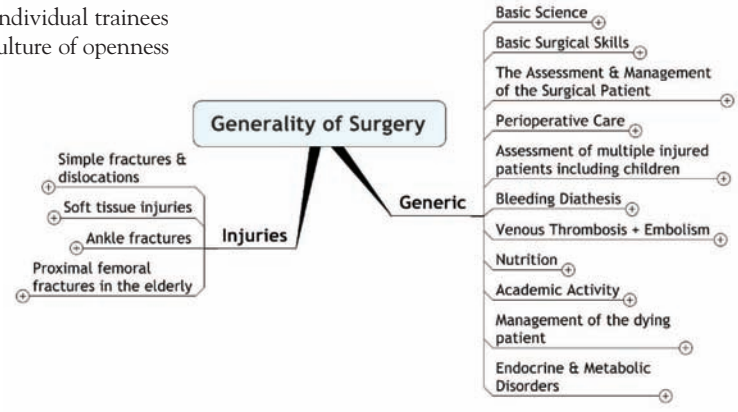
The curriculum lays out relationships of the key stakeholders around the premise that the trainee is responsible for her or his own learning. A mature partnership with designated trainers and training programme directors is expected and the record of achievement will be explicit.

b) GENERALITY OF SURGERY

This component contains that which is germane to surgery in the general sense and would be expected of any individual who might practice in any of the SAC defined disciplines of surgery.

All surgeons must possess core qualities of skills and attitudes. They must also have underpinning knowledge which is essential in order to train. Within the context of T&O the following syllabus must be mastered in the early years. Not only will this underpin T&O training but will also provide generic competencies should a trainee for whatever reason decide to change career pathway during or up to the end of the early years of T&O training. Beyond that period most of the skills knowledge and attitudes acquired will only be germane to a career in T&O and perhaps to a smaller extent to some related disciplines.

This section has been included in order to ensure compatibility with other surgical specialties who are using the same material through ISCP. It is also directly relevant to any surgical trainee from outwith T&O who may wish to enrich their overall experience through an attachment in T&O.



Generality of Surgery Syllabus

This outline is taken from the ISCP syllabus and will be common to all disciplines.

The knowledge or skill level expected is indicated on the following four point scale: once achieved the level should be maintained throughout.

1 = Knows of	**3** = Knows generally
2 = Knows basic concepts	**4** = Knows specifically and broadly

Topic **Generic**	ST1 – 2	ST3 – 6	ST7 – 8
Basic Science			
Knowledge:			
Applied anatomy:			
• Development, organs and structures, surface and imaging anatomy of thorax, abdomen, pelvis, perineum, limbs, neck as appropriate for surgical operations	**4**		
Physiology:			
• Homeostasis	**4**		
• Thermoregulation	**3**		
• Metabolic pathways	**3**		
• Blood loss	**4**		
• Sepsis	**4**		
• Fluid balance and fluid replacement therapy	**4**		
• Metabolic abnormalities	**3**		
Pathology:			
• Inflammation	**4**		
• Wound healing	**4**		
• Cellular injury	**4**		
• Vascular disorders	**4**		
• Disorders of growth, differentiation and morphogenesis	**4**		
• Tumours	**4**		
• Surgical immunology	**3**		
• Surgical haematology	**3**		
Microbiology:			
• Surgically important microorganisms	**4**		
• Sources of infection	**4**		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Asepsis and antisepsis	**4**		
• Sterilisation	**4**		
• Antibiotics	**4**		
• High risk patient management	**4**		
Radiology:			
• Principles of diagnostic and interventional radiology	**3**		
Basic Surgical Skills			
Knowledge:			
Incision of skin and subcutaneous tissue:			
• Langer's lines	**4**		
• Healing mechanism	**4**		
• Choice of instrument	**4**		
• Safe practice	**4**		
• Basic Surgical Skills course	**4**		
Closure of skin and subcutaneous tissue:			
• Options for closure	**4**		
• Suture and needle choice	**4**		
• Safe practice	**4**		
Knot tying:			
• Choice of material	**4**		
Haemostasis:			
• Techniques	**4**		
Tissue retraction:			
• Choice of instruments	**4**		
Use of drains:			
• Indications	**4**		
• Types	**4**		
• Management/removal	**4**		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Tissue handling:			
• Choice of instruments	4		
Clinical Skills:			
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	4		
• Double handed	4		
• Instrument	4		
• Superficial	4		
• Deep	4		
Haemostasis:			
• Control of bleeding vessel (superficial)	4		
• Diathermy	4		
• Suture ligation	4		
• Tie ligation	4		
• Clip application	4		
Tissue retraction:			
• Tissue forceps	4		
• Placement of wound retractors	4		
Use of drains:			
• Insertion	4		
• Fixation	4		
• Removal	4		
Tissue handling:			
• Appropriate application of instruments and respect for tissues	4		
Skill as assistant:			
• Anticipation of needs of surgeon when assisting	4		
The Assessment and Management of the Surgical Patient			
Clinical Skills:			
• Surgical history and examination (elective and emergency)	3	4	
• Construct a differential diagnosis	3	4	
• Plan investigations	3	4	
• Clinical decision making	3	4	
• Case work up and evaluation; risk management	3	4	
• Active participation in MDTs	3	4	
• Taking consent for intermediate level intervention; emergency and elective	3	4	
• Written clinical communication skills	3	4	
• Interactive clinical communication skills: patients	3	4	
• Interactive clinical communication skills: colleges	3	4	
Perioperative Care			
Knowledge:			
Preoperative assessment and management:			
• Cardiorespiratory physiology	4	4	
• Diabetes mellitus	3	3	
• Renal failure	3	3	
• Pathophysiology of blood loss	4	4	
• Pathophysiology of sepsis	4		
• Risk factors for surgery and scoring systems	4		
• Principles of day surgery	3		
Intraoperative care:			
• Safety in theatre	4		
• Sharps safety	4		
• Diathermy, laser use	4		
• Infection risks	4		
• Radiation use and risks	3		
• Tourniquets	4		
• Principles of local, regional and general anaesthesia	3		
Postoperative care:			
• Cardiorespiratory physiology	4		
• Diabetes mellitus	3		
• Renal failure	3		
• Pathophysiology of blood loss	4		
• Pathophysiology of sepsis	4		
• Complications specific to particular operation	4		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Critical care	2	3	3
Blood Products:			
• Components of blood	4		
• Alternatives to use of blood products	4		
Antibiotics:			
• Common pathogens in surgical patients	4		
• Antibiotic sensitivities	4		
• Antibiotic side-effects	4		
• Principles of prophylaxis and treatment	4		
Clinical Skills:			
Preoperative assessment and management:			
• History and examination	4		
• Interpretation of preop investigations	4		
• Management of comorbidity	3		
• Resuscitation	4		
Intraoperative care:			
• Safe conduct of intraoperative care	4		
Postoperative care:			
• Assessment of patient's condition	4		
• Postoperative analgesia	4		
• Fluid and electrolyte management	4		
• Monitoring of postoperative patient	4		
• Detection of impending organ failure	4		
• Initial management of organ failure	4		
• Use of MDT meetings	4		
Blood Products:			
• Appropriate use of blood products	4		
• Management of the complications of blood product transfusion	4		
Antibiotics:			
• Appropriate prescription of antibiotics	4		
Professional Skills:			
Preoperative assessment and management:			
• Communication with patient and relatives	3	4	
• Liason with physicians and ITU staff	2	3	

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Intraoperative care:			
• Communication with other staff members	3	4	
Postoperative care:			
• Communication with patient and relatives	3	4	
• Liason with physicians and ITU staff	2	3	
Blood Products:			
• Communication with patient and relatives	4	4	
Assessment of multiple injured patients including children			
Knowledge:			
• Anatomy	3		
• Pathogenesis of shock	3		
• Differences In Children	1		
Clinical Skills:			
• History and examination	4		
• Investigation	3		
• Resuscitation and early management according to ATLS and APLS guidelines	4		
• Referral to appropriate surgical subspecialties	3		
Technical Skills and Procedures:			
• Central venous line insertion	3		
• Chest drain insertion	3		
• Diagnostic peritoneal lavage	2		
Bleeding Diathesis			
Knowledge:			
Diagnosis:			
• Mechanism of haemostasis	3		
• Pathology of impaired haemostasis e.g. haemophilia, liver disease, massive haemorrhage	3		
Treatment:			
• Understands use of blood products	3		
Clinical Skills:			
Diagnosis:			
• Recognition of conditions likely to lead to the diathesis	4		
• Recognition of abnormal bleeding during surgery	3		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Treatment:			
• Avoidance by correct surgical techniques	3		
• Corrective measures, e.g. warming, packing	3		
Professional Skills:			
Diagnosis:			
• Communication with laboratory staff	0		
Treatment:			
• Communication with anaesthetist, theatre team and laboratory staff	0		
Venous Thrombosis + Embolism			
Knowledge:			
Coagulation:			
• Clotting mechanism (Virchow Triad)	2		
• Effect of surgery and trauma on coagulation	2		
• Tests for thrombophilia and other disorders of coagulation	2		
Diagnosis:			
• Methods of investigation for suspected thromboembolic disease	2		
Treatment:			
• Anticoagulation, heparin and warfarin	4		
• Role of V/Q scanning, CT angiography and thrombolysis	2		
• Place of pulmonary embolectomy	2		
Prophylaxis:			
• Knowledge of methods of prevention, mechanical and pharmacological	3		
Clinical Skills:			
Coagulation:			
• Recognition of patients at risk	4		
Diagnosis:			
• Awareness of symptoms and signs associated with pulmonary embolism and DVT	3		
• Role of duplex scanning, venography and d-dimer measurement	2		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Treatment:			
• Initiate and monitor treatment	3		
Prophylaxis:			
• Awareness at all times of the importance of prophylaxis	4		
Professional Skills:			
Coagulation:			
• Protocol management	0		
Diagnosis:			
• Ability to organise and time appropriate investigation	0		
Treatment:			
• Prioritisation of investigation and treatment	0		
• Patient counselling	0		
Prophylaxis:			
• Able to implement in the team setting the culture of prophylaxis	0		
Nutrition			
Knowledge:			
• Effects of malnutrition, both excess and depletion	3		
• Methods of screening and assessment	3		
Clinical Skills:			
• Arrange access to suitable artificial nutritional support, preferably via a nutrition team: Dietary supplements	3		
• Arrange access to suitable artificial nutritional support, preferably via a nutrition team: Enteral nutrition	2		
• Arrange access to suitable artificial nutritional support, preferably via a nutrition team: Parenteral nutrition	1		
Academic Activity			
Knowledge:			
Research:			
• Research methodology	2		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Teaching:			
• Teaching methods	**2**		
Clinical Skills:			
Research:			
• Ability to analyse published evidence	**2**		
Teaching:			
• Ability to teach small groups	**3**		
Management of the dying patient			
Knowledge:			
Palliative Care:			
• Care of the terminally ill	**3**		
• Analgesia	**4**		
• Antiemetics	**3**		
• Laxatives	**3**		
Principles of organ donation:			
• Circumstances in which consideration of organ donation is appropriate	**3**		
• Principles of brain death	**3**		
• Understanding the role of the coroner and the certification of death	**3**		
Clinical Skills:			
Palliative Care:			
• Symptom control in the terminally ill patient	**3**		
Professional Skills:			
Palliative Care:			
• Communication with the patient and relatives	**0**		
• Liason with the palliative care team	**0**		
Principles of organ donation:			
• Communication with relatives	**0**		
• Liason with the transplant team	**0**		
• Learn to cope with crisis and mortality	**0**		
Endocrine and Metabolic Disorders			
Knowledge:			
Thyrotoxicosis			

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Pathophysiology of thyroid hormone excess and associated risks from surgery	**4**		
Hypothyroidism			
• Pathophysiology of thyroid hormone deficiency and associated risks from surgery	**4**		
Hypercalcaemia			
• Causes and effects of hypercalcaemia	**3**		
Cortico-steroid therapy			
• Complications	**4**		
• Steroid insufficiency	**4**		
Diabetes Mellitus			
• Complications	**4**		
Hyponatraemia			
• Pathophysiology of fluid and electrolyte balance	**4**		
• Causes of hyponatraemia	**4**		
Clinical Skills:			
Thyrotoxicosis			
• History and examination	**4**		
• Investigation of thyrotoxicosis	**3**		
Hypothyroidism			
• History and examination	**4**		
• Investigation	**4**		
Hypercalcaemia			
• Investigation of hypercalcaemia	**3**		
• Treatment of hypercalcaemia	**3**		
Cortico-steroid therapy			
• Peri-operative management of patients on steroid therapy	**4**		
Diabetes Mellitus			
• Peri-operative management of diabetic patients	**4**		
Hyponatraemia			
• Treatment	**4**		
Professional Skills:			
• Liaise with endocrinologists			
• Liaise with diabetic team			

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Injuries (from iscp initial)			
Simple fractures and dislocations			
Knowledge:			
• Anatomy and physiology of the locomotor system and spinal cord	**4**		
• Understanding of imaging techniques e.g. MRI, CT, bone scan, USS)	**3**		
• Patho-physiology of bone healing	**3**	**4**	
• Principles of management of fractures.	**4**	**4**	
• Principles of management of joint dislocations	**4**	**4**	
• Principles of Management of pathological fractures	**3**	**4**	
Clinical Skills:			
Examination of the limbs and joints	**3**	**4**	
Interpretation of plain radiographs	**3**	**4**	
Ability to describe a fracture/ dislocation from an x ray	**4**	**4**	
Classification of closed and open fractures,	**4**	**4**	
Assessment, investigation and management of low velocity closed fractures and dislocations encountered in a fracture clinic.	**4**	**4**	
Ability to prescribe rehabilitation	**3**	**4**	
Technical Skills and Procedures:			
• Reduction of simple fractures and dislocations.	**4**	**4**	
• Techniques of immobilisation including casting and safe splintage of these injuries	**4**	**4**	
Soft tissue injuries			
Knowledge:			
• Anatomy and physiology of the locomotor system and spinal cord	**3**	**4**	
• Appreciation of mechanism of injury and forces applied in the production of injuries to skin, ligaments, tendons, nerves, muscles, blood vessels and compartment syndrome	**3**	**4**	
• Understanding of imaging techniques e.g. MRI, CT, bone scan, USS	**3**	**4**	
• Principles of management of soft tissue injury	**3**	**4**	
Clinical Skills:			
• Examination of the limbs and joints with special reference to the identification of the precise anatomical injury	**3**	**4**	
• Interpretation of plain radiographs	**3**	**4**	
• Appreciation of stable vs. unstable injuries and the role of splintage or mobilisation as the primary strategy	**3**	**4**	
• Ability to prescribe rehabilitation	**3**	**4**	
Technical Skills and Procedures:			
• Debridement and suture of simple wounds	**4**		
• Techniques of immobilisation including casting and safe splintage of these injuries	**4**		
Professional Skills:			
• Achievement of generic skills in team working and communicating with patients, relatives and the surgical team as described in the generic template.	**3**	**4**	
Ankle fractures			
Knowledge:			
• Knowledge of the mechanism and patterns of ankle fractures, understanding bony and soft tissue elements	**4**		
• Classification of ankle fractures	**4**		
Clinical Skills:			
• Assessment of the patient with an ankle fracture.	**4**		
• Recognition of the dislocated joint and structures at risk	**4**		
Technical Skills and Procedures:			
• Reduction of the dislocated ankle and safe cast immobilization	**4**		

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Open reduction and internal fixation of a simple ankle fracture by lag screw and plate fixation	2/3	4	
Professional Skills:			
• Communication with patient and relatives as well as multi-disciplinary team so as to provide optimum care	3	4	
Proximal femoral fractures in the elderly			
Knowledge:			
• Knowledge of the biology of proximal femoral fractures in the elderly	4		
• Classification of major fracture patterns	4		
• Epidemiology and natural history of condition	3	4	
Clinical Skills:			
• Assessment of the elderly proximal femoral fracture patient including mental status, fitness for surgery, propensity to fall and bone fragility	4		
• Postoperative care of the frail patient	3	4	
Technical Skills and Procedures:			
• The setting up of a patient with an extra capsular fracture on the fracture table and safe reduction of the fracture	4		
• Insertion of fixation devices to extra capsular fractures	4		
• Limited performance of hemiarthroplasty for intracapsular fracture of the hip	2/3	4	
Professional Skills:			
• Communication with patient and relatives as well as multi-disciplinary team so as to provide optimum care	3	4	

c) APPLIED CLINICAL KNOWLEDGE SYLLABUS (T&O)

All T&O surgeons need to understand the scope of their discipline and ultimately to varying degrees of depth depending on their sub-specialist interest in future practice. There are some things all T&O surgeons must know well and these are delineated in the following section (defined as level **4**). Crucially, knowledge changes and this section acknowledges that all T&O surgeons can no longer know everything about all aspects of their chosen discipline. With this in mind trainees must reflect on the need to update and change their knowledge base throughout their career. Trainees must know what they do not know, have the skills to find out using modern technology and display the self awareness, humility and commitment to continuously pursue the search.

Applied Clinical Knowledge Syllabus (T&O)

A trainee must be able to apply the knowledge listed below in the relevant clinical situations. They should demonstrate their competence by the ability to verbalise express the knowledge and justify any action or decision.

1 = Knows of	**3** = Knows generally
2 = Knows basic concepts	**4** = Knows specifically and broadly
4s = Competence level (4) needed only by those trainees selecting this area as a sub-specialist interest	

Topic **Basic Science & Miscellaneous**	ST1 – 2	ST3 – 6	ST7 – 8
Basic Science			
Anatomy:			
• Clinical and functional anatomy with pathological and operative relevance	**3**	**4**	**4**
• Anatomy (and embryology) of nervous and vascular systems	**3**	**4**	**4**
• Surgical approaches to the limbs and axial skeleton	**2**	**4**	**4**
• Anatomy (and embryology) of musculoskeletal system	**3**	**4**	**4**
Tissues:			
• Bone - Structure & Function	**3**	**4**	**4**
• Cartilage - articular, meniscal - Structure & Function	**3**	**4**	**4**
• Muscle and tendon - Structure & Function	**3**	**4**	**4**
• Synovium - Structure & Function	**3**	**4**	**4**
• Ligament - Structure & Function	**3**	**4**	**4**
• Nerve - Structure & Function	**3**	**4**	**4**
• Intervertebral disc - Structure & Function	**2**	**3**	**3**
Physiology, Biochemistry & Genetics:			
• Structure and function of connective tissues	**2**	**3**	**3**
• Application/relevance of modern genetics to orthopaedic disease and treatment	**2**	**3**	**3**
• Shock - types, physiology, recognition and treatment	**3**	**4**	**4**
• Metabolism and hormonal regulation	**3**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Metabolic and immunological response to trauma	**3**	**4**	**4**
• Blood loss in trauma/surgery, fluid balance and blood transfusion	**4**	**4**	**4**
• Bone grafts, bone banking and tissue transplantation	**3**	**4**	**4**
Biomechanics & Bioengineering:			
• Biomechanics of musculoskeletal tissues	**2**	**3**	**3**
• Biomechanics of fracture fixation	**3**	**4**	**4**
• Tribology of natural and artificial joints	**1**	**3**	**3**
• Design of implants and factors associated with implant failure (wear, loosening)	**1**	**3**	**4s**
• Kinematics and gait analysis	**1**	**2**	**3s**
• Biomaterials	**1**	**2**	**3s**
Bone & Joint Disease			
Orthopaedic Oncology:			
• Knowledge of the presentation, radiological features, pathological features, treatment and outcome for common benign and malignant tumours	**2**	**4**	**4**
• Understanding of the principles of management of patients with metastatic bone disease in terms of investigation, prophylactic and definitive fixation of pathological fractures and oncological management	**2**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Knowledge of the presenting features, management and outcome of soft tissue swellings, including sarcomas	1	3	4s
General:			
• Osteoarthritis	2	4	4
• Osteoporosis	2	4	4
• Metabolic bone disease	2	4	4
• Rheumatoid arthritis and other arthropathies (inflammatory, crystal, etc)	2	4	4
• Haemophilia	1	2	4s
• Inherited musculoskeletal disorders	1	3	4s
• Neuromuscular disorders - inherited and acquired	1	3	3
• Osteonecrosis	2	4	4
• Osteochondritides	2	3	3
• Heterotopic ossification	2	3	3
• Metastases	2	4	4
Investigations:			
• Blood tests	3	4	4
• Musculoskeletal imaging: x-ray, contrast studies (myelography, arthrography), CT, MR, ultrasound, radioisotope studies	2	4	4
• Effects of radiation	3	3	3
• Bone densitometry	2	3	3
• Electrophysiological investigations	2	3	3
Operative Topics:			
• Tourniquets	3	4	4
• Design of theatres	2	3	3
• Anaesthesia - principles and practice of local and regional anaesthesia and principles of general anaesthesia	2	2	2
Infection, Thromboembolism & Pain:			
• Infection of bone, joint, soft tissue, including tuberculosis, and their prophylaxis	2	4	4
• Sterilisation	2	3	3
• Thromboembolism and prophylaxis	2	4	4
• Behavioural dysfunction and somatization	2	3	3
• AIDS and surgery in high-risk patients	2	4	4
• Pain and pain relief	3	3	3
• Skin preparation	4	4	4
• Complex regional pain syndromes e.g. Reflex Sympathetic Dystrophy and Causalgia	2	3	3
Prosthetics & Orthotics:			
• Principles of design	1	3	3
• Prescription and fitting of standard prostheses	1	3	3
• Principles of orthotic bracing for control of disease, deformity and instability	1	3	3
Research & Audit:			
• Design and conduct of clinical trials	1	3	3
• Data analysis and statistics - principles and applications	1	2	2
• Principles of Epidemiology	1	2	2
• Audit	3	4	4
Medical Ethics:			
• Duties of care	3	4	4
• Informed consent	3	4	4
• Medical negligence	3	4	4
Hand Surgery			
Basic Science			
Anatomy of:			
• The wrist/MCP/PIP/DIP joints and CMC joint of the thumb	3	3	4s
• The flexor and extensor mechanism of the fingers including interaction between extrinsic and intrinsic mechanism	3	3	4s
• The posture of the thumb in pinch, power and key grip	3	3	4s
• The nerve supply to the hand	3	3	4s
• The closed compartments of forearm and hand	2	4	4
Pathology:			
• An understanding of the special circumstances associated with swelling and the effects of rising pressure in a closed compartment secondary to infection and injury	3	4	4

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• An understanding of the special circumstances in which oedema causes fibrosis and permanent stiffness	3	4	4
• Tendon injury and healing	3	4	4
• Nerve injury and healing	3	4	4
• An appreciation of the imbalances and deformities associated with inflammatory arthritis	1	3	4s
• A classification system for congenital hand disorders	n/a	2	4s
• Langers lines	3	4	4
• Hand tumours (e.g. ganglion/ enchondroma)	1	3	4s
• Dupuytren's disease	1	3	4s
Clinical Assessment:			
• History of examination of hand and wrist in the assessment of tendons, distal radioulnar and radiocarpal joints	3	3	4s
• Ability to elicit median, ulnar and radial nerve function and disorders	3	3	4s
• Recognition of patterns of presentation of common compressive neuropathies and brachial neuralgia	3	4	4
• Assessment of intrinsic and extrinsic motors in digits and recognition of common deformities and deficiencies	2	3	4s
• Awareness of presentation of work-related hand disorders	2	3	4s
• Ability to examine and assess common rheumatoid hand deformities, e.g.: inferior radioulnar subluxation and carpal translocation; MCP subluxation and ulnar drift; digital Boutonniere and swan neck; thumb Boutonniere deformity and CMC disease	1	3	4s
• Ability to recognise and assess focal hand swellings	2	4	4
Investigations:			
• Interpretation of plain and stress x-rays of wrist. A knowledge of other views	2	3	4s
• Awareness of role of MRI/bone scan/arthrography/arthroscopy	1	4	4s
• Place and interpretation of nerve conduction studies	1	4	4s
Treatment:			
• Knowledge of a strategy of management for the osteo arthritic rheumatoid hand. Understanding of the place of soft tissue reconstruction, joint fusion, interposition and excision arthroplasty in the treatment of the arthritic hand and wrist.	1	3	4s
• Knowledge of the management of stenosing tenovaginitis	1	3	4s
• Knowledge of the principles of treatment for common flexor and extensor tendon injuries and of the common surgical approaches to the digital flexor and extensor compartments	3	3	4s
• Fractures of metacarpals and phalanges	3	3	4s
• Familiarity with the surgical treatment of Dupuytren's disease	1	3	4s
• Awareness of the principles of tendon transfer for the reconstruction of mediun, ulnar and radial nerve palsy and familiarity with simple transfers, e.g. indicis to EPL	1	2	4s
• Knowledge of splinting techniques and rehabilitation principles	3	4	4s
• Ability to plan management for finger tip injuries and undertake closed management	3	4	4s
• Knowledge of surgical approach to digits with particular regard to the restoration of function and prevention of stiffness	3	4	4s
• Knowledge of the levels for digital amputation	2	4	4s
• Injuries of ulnar collateral ligament of thumb	2	3	4s
• Dislocations of carpus and carpal instability	2	4	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Knowledge of closed and operative options of treatment for fractures of distal radius and common carpal injuries including scaphoid non union.	4	4	4s
• Familiarity with the surgical treatment of common compressive neuropathy	3	3	4s
• Ability to manage common hand infections	3	4	4s
Knee			
Basic Science			
Anatomy:			
• Knowledge of regional anatomy of the knee, including:	3	4	4
• Surface anatomy	3	4	4
• Neural and vascular structures and their relations with particular reference to standard anterior and posterior surgical approaches	3	4	4
• Bones and joints	3	4	4
• Functional anatomy of ligaments and supporting muscles	3	4	4
• Innervation of the knee including controlling musculature	3	4	4
• The extent and function of the synovium and bursae of the knee	3	4	4
• The structure and function of the menisci, and articular cartilage	3	4	4
Biomechanics:			
• The mechanics of the patello-femoral mechanism	1	3	4s
• The medial and lateral weight-bearing joints and their inter-relationship	2	4	4s
• The cruciate and collateral ligaments and other ligamentous and muscular supports	2	4	4s
• Menisci and articular cartilage	3	4	4
Pathology:			
• The mechanism of ligamentous, bony and combined trauma to the knee and healing potential	3	4	4

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• A complete knowledge of arthritides, including degenerate wear, ageing changes and traumatic damage	2	4	4
• Pathology of inflammatory disease and infection affecting the knee	2	4	4
• The response of synovium to debris	2	3	4s
• Benign and malignant conditions in the knee and surrounding structures including recognised classification where appropriate	2	3	4s
Clinical Assessment:			
A sound knowledge and understanding of:			
• History and examination of the knee to include relevant surrounding structures	3	4	4
• The standard clinical signs of the knee and relevant adjacent structures and competent skill in describing these	3	4	4
• A critical understanding of rating and outcome measures in common use	1	3	4s
Investigations:			
Indications for and interpretations of:			
• Radiographs – standard and specialised	1	3	4s
• Blood investigation	2	4	4
• Aspiration	3	4	4
• Special investigations including CT, MRI and radioisotope scanning	3	4	4
• Arthroscopy	2	3	4s
• Biomechanical testing	1	2	4s
Treatment:			
A sound knowledge of conservative and surgical management, including the indications for referral to a specialist of:			
• Paediatric disorders, including deformity, dislocations, epiphyseal disorders, osteochondritis and discoid meniscus	2	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Adolescent disorders including patello femoral and meniscal dysfunction, osteochondritis dissecans	2	3	4s
• Young adult disorders including patello femoral and meniscal injuries, instability and ligament deficiency, synovial disorders, benign and malignant tumours	2	4	4
• Degenerative and inflammatory arthritis, including a balanced understanding of conservative and surgical options, including osteotomy, arthrodesis and arthroplasty	2	4	4
• Traumatic disorders including skin and soft tissue injuries, fractures and dislocations of patella, tibia and femoral components, ligament ruptures and internal derangement of the knee. Conservative and surgical indications and detailed methods of treatment. Outcomes of conservative and operative management	3	4	4
• Infections, particularly infections and inflammations of the bursae, intra-articular sepsis, prevention and management of sepsis in implant surgery	3	4	4
• A sound working knowledge of the range of arthroplasties for primary and revision surgery for patello femoral, unicompartmental and total replacement of the knee with particular reference to secure bone anchorage, alignment, ligament stability and optimising range of movement; a good knowledge of post-operative complications, their prophylaxis and management	2	4	4
• A knowledge of the indications and techniques of revision surgery particularly for aseptic and septic loosening	n/a	3	4s
• A knowledge of simple arthroscopic surgery including meniscectomy, trimming and shaving	2	4	4
• An appreciation of complex arthroscopic procedures	1	3	4s
• An appreciation of medical and surgical techniques available to repair and replace articular cartilage	1	3	4s
Ankle & Foot Surgery			
Basic Science			
Anatomy:	3	4	4
• Bones and articulations	3	4	4
• Ligamentous structures - ankle/ hindfoot/midfoot	3	4	4
• Plantar fascia and MTP anatomy	3	4	4
• Surface markings of neural and vascular structures	3	4	4
• Tendon anatomy	3	4	4
• Muscle compartments of the foot	3	4	4
Biomechanics:			
• Function of the lower limb and foot in gait	2	4	4
• Ankle and subtalar joint	2	4	4
• Plantar fascia mechanisms	2	4	4
• Tendon function	2	4	4
• Orthoses and footwear	2	4	4
Pathology:			
Arthritides			
• Degenerative joint disease	2	4	4
• Rheumatoid foot disease	1	4	4
Neuropathy			
• Neuropathic joint and skin changes	1	3	4s
Tumours			
• E.g. osteoid osteoma and plantar fibroma	1	3	4s
Clinical Assessment:			
• History and clinical examination of the foot and ankle in order to assess pain, joint function, deformity, nerve, muscle and tendon function	3	4	4
Ability to recognise and assess the following diseases of the ankle and foot:			
Neurological disorders:			
• Charcot joint	1	3	4s
• Morton's neuroma	2	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Nerve entrapment	2	3	4s
• Neurological foot deformity	2	3	4s
Trauma:			
• Evaluation of skin and soft tissue injury	4	4	4
• Compartment syndrome	4	4	4
• Recognition of all fractures and dislocations	3	4	4
Ankle and hindfoot disorder:			
• Hindfoot pain	1	3	4s
• Ankle instability	1	3	4s
• Heel pain	1	4	4
• Degenerative disease of the ankle	1	3	4s
• Rheumatoid arthritis	1	3	4s
• Osteochondritis dissecans of talus	2	4	4
Forefoot disorders:			
• Hallux valgus	1	4	4s
• Hallux rigidus	1	4	4s
• Lesser toe deformities	1	4	4s
• Metatarsalgia	1	4	4s
• Inflammatory arthritis	2	3	4s
Tumours:			
• Ability to recognise and assess local foot swellings	1	4	4
Diabetic foot:	2	4	4
Complex foot deformity			
• Flatfoot deformity - mobile and rigid	1	3	4s
• Cavus deformity	1	3	4s
• Residual congenital foot deformity	1	3	4s
Investigations:			
Radiograph:			
• Standard foot and ankle views	4	4	4
CT, MRI and Scintigraphy:			
• Knowledge of role of these ancillary investigations in certain specific conditions e.g. infection, tumour, tibialis posterior rupture, osteonecrosis	2	4	4
EMG:			
• Relevance to foot and ankle disorders	1	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Treatment:			
Non-operative:			
• Knowledge of rational basis for the use of footwear modifications, orthoses and total contact casting	1	3	4s
Operative:			
• Detailed knowledge of closed and operative methods for management of fractures and dislocations of ankle, hindfoot and forefoot, including knowledge of common reconstructive surgical procedures for foot deformity including hallux valgus, lesser toe deformity, acquired flat-foot, to include arthrodesis, osteotomy and soft-tissue reconstruction	3	4	4
• Knowledge of common amputations through foot and ankle	3	4	4
• Knowledge of common reconstructive surgical procedures for degenerative and inflammatory disorders of ankle and foot including arthrodesis, arthroplasty, excision arthroplasty procedures to first ray both proximal and distally for management of hallux valgus and rigidus	1	3	4s
Hip			
Basic Science			
Anatomy:			
• Basic knowledge of the regional anatomy of the hip including:	3	4	4
• Development of the hip joint	3	4	4
• Relationship of bony elements	3	4	4
• Blood supply of the femoral head	3	4	4
• Anatomical course of all major regional vessels and nerves	3	4	4
• The capsule, labrum and related ligaments	3	4	4
• An understanding of the action, anatomy and innervation of the regional musculature	3	4	4
• Detailed knowledge of the applied anatomy of common surgical approaches to the hip (medial, anterior, lateral and posterior)	3	4	4

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Biomechanics:			
• An understanding of the lever arms, muscles and body weight forces that produce the joint reaction force in both normal and abnormal hips	**2**	**3**	**4s**
• An understanding of the application of these principles to the rationale of both pelvic and femoral osteotomies, and replacement arthroplasty	**1**	**3**	**4s**
• Knowledge of the tribological properties of materials used for articulating surfaces	**1**	**3**	**4s**
• Knowledge of the biocompatibility and mechanical properties of materials in common use in total hip arthroplasty	**1**	**3**	**4s**
Pathology:			
• Basic knowledge of the pathology of pyogenic and non-pyogenic arthritis, slipped upper femoral epiphysis [SUFE], Perthes' disease and hip dysplasia	**2**	**4**	**4**
• Mechanism and pattern of common fractures and fracture dislocations around the hip (intracapsular, extracapsular, acetabular and periacetabular, femoral head, etc)	**3**	**4**	**4**
• Knowledge of the pathology of osteoarthritis, rheumatoid arthritis and the seronegative arthritides at the hip and of osteonecrosis of the femoral head	**2**	**4**	**4**
• Familiarity with current theories of the aetiopathogenesis of osteoarthritis	**1**	**4**	**4**
• An understanding of the microbiological rationale for the prevention of sepsis in total hip arthroplasty	**3**	**4**	**4**
Clinical Assessment:			
• A sound knowledge of clinical assessment of the hip, lumbosacral spine and knee. Particular reference should be paid to the gait, the Trendelenberg sign, limb length, loss of movement and deformity at the joint	**3**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• The trainee needs to be well informed of current opinion regarding aetiopathogenesis, clinical presentation and appropriate investigation of:	**2**	**3**	**4s**
• Proximal femoral fractures (intracapsular, extracapsular) and simple fracture dislocations of the hip	**4**	**4**	**4**
• Osteoarthritis and the inflammatory arthropathies	**2**	**4**	**4**
• Perthes' disease	**2**	**3**	**4s**
• Slipped upper femoral epiphysis	**2**	**3**	**4s**
• Septic arthritis	**3**	**4**	**4**
• Osteonecrosis	**3**	**4**	**4**
• Soft tissue conditions around the hip (snapping hip, gluteus medius tendonitis, etc)	**2**	**4**	**4**
A working knowledge of the clinical presentations and investigations of:			
• The sequelae of CDH and hip dysplasia	**1**	**3**	**4s**
• The sequelae of SUFE	**3**	**3**	**4s**
• Juvenile chronic arthritis	**1**	**3**	**4s**
• Non pyogenic arthritis	**2**	**3**	**4s**
• The painful total hip replacement	**1**	**3**	**4s**
Investigation:			
• A working knowledge of the interpretation of plain radiographs, dynamic arthrography, CT, bone scintigraphy and MRI of the hip region	**2**	**4**	**4s**
• A working classification of proximal femoral and periacetabular fractures. Also, mechanisms and classification of failure of joint replacement and of periprosthetic fractures	**3**	**4**	**4**
Treatment:			
• **Non-operative**			
An understanding of the principles of traction, bracing and spica immobilisation	**3**	**3**	**4s**
An understanding of the non operative aspects of the management of hip pathology	**3**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Operative			
• A thorough knowledge of soft tissue surgery, osteotomy, arthrodesis and arthroplasty (excision and replacement). A sound knowledge of anterior, anterolateral, lateral and posterior approaches to the hip and of the complications associated with each	3	4	4
• A sound knowledge of: internal fixation of proximal femoral fractures, hemiarthroplasty for intracapsular fractures, primary total hip replacement for OA and inflammatory arthropathies in the elderly, simple proximal femoral osteotomies. Familiarity with potential complications (i.e. thromboembolism, sepsis, dislocation, etc) and be aware of current opinion on the prevention and management of these complications	3	4	4
• A knowledge of the indications for, and principles of, complex proximal femoral osteotomies, hip arthroscopy, reconstruction of the hip in young adults (JCA and hip dysplasia, etc), complex hip revision surgery	1	3	4s
• An appreciation of complex acetabular and pelvic fractures, complex periacetabular osteotomies	3	3	4s
• An understanding of the place of modern technologies such as, joint resurfacing procedures minimally invasive hip replacements and computer assisted implantation in the management of hip pathology and the attendant risks and complications	2	3	4s
The Spine			
Basic Science			
Anatomy:			
• Development of the spine, spinal cord and nerve roots	3	3	4s
• Surgical anatomy of the cervical, dorsal and lumbosacral spine	3	4	4
• Anterior and posterior surgical approaches to the spine at each level	3	4	4
Biomechanics:			
• Basic knowledge of the bio-mechanics of the cervical and lumbosacral spines	2	3	4s
• An understanding of the biomechanics of spinal instability as applied to trauma, tumour, infection and spondylolysis/listhesis	1	3	4s
• Biomechanics of spinal deformity	1	2	4s
• A knowledge of the basic mechanics of spinal instrumentation	1	2	4s
Pathology:			
• Pathophysiology of the ageing spine and degenerative disc disease	3	4	4
• Acute and chronic infections of the spine	1	3	4s
• Pathology of spinal deformity	1	3	4s
• Pathology of the acutely prolapsed cervical and lumbar disc	2	4	4
• Recognition of patterns of spinal injury and associated cord and nerve root damage	3	3	4s
• Tumours of the spine	1	3	4s
Clinical Assessment:			
• A thorough knowledge of general and orthopaedic history-taking and examination	3	4	4
• A knowledge of the assessment of spinal deformity	1	3	4s
• An understanding of the assessment of thoracic pain	1	3	4s
• A sound knowledge of clinical assessment of the spine for low back pain, sciatica, spinal claudication, neck pain, radiating arm pain, spinal injury and incipient myelopathy	2	4	4
• A knowledge of the assessment of spinal tumour	2	3	4s
• A basic knowledge of the assessment of a patient after failed spinal surgery	1	2	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Investigation:			
• A thorough knowledge of the basic investigations required in spinal surgery, specifically: blood tests, plain radiographs, bone scintigraphy, discography, electrophysiological studies [including cord monitoring], CT scanning, MRI scanning	**2**	**3**	**4s**
• A thorough knowledge of how each of these investigations contributes to the diagnosis and management of each of the major areas of spinal disease	**2**	**3**	**4s**
Treatment:			
Non-operative			
• A knowledge of the non-surgical methods available for the treatment of low back pain, sciatica, claudication, neck pain, spinal deformity, instability, tumour, infection and fracture to include:	**2**	**4**	**4**
• Analgesics and NSAIDs, physiotherapeutic regimes, pain clinic techniques, bracing, use of radiotherapy and chemotherapy, non-operative management of spinal injuries	**1**	**3**	**4s**
Operative			
• A sound knowledge of the indications for and operative surgical management of the acute prolapsed lumbar intervertebral disc, spinal stenosis, lumbar spinal instability due to spondylolysis/listheses	**2**	**4**	**4**
• A knowledge of the indications for, and operative surgical management of the acutely prolapsed cervical disc, cervical stenosis, spinal injury and the surgery of spinal infection	**2**	**3**	**4s**
• A basic knowledge of the surgery of spinal deformity and tumours of the spine	**1**	**3**	**4s**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Trauma			
Basic Science			
Anatomy:			
• Applied to diagnosis and surgical treatment of common bone, joint and soft tissue injuries	**4**	**4**	**4**
• Knowledge of those anatomical structures particularly at risk from common injuries or in surgical approaches	**4**	**4**	**4**
• Physeal anatomy and its application to injury	**3**	**4**	**4**
Biomechanics:			
• Application to open reduction and internal fixation of fractures and external skeletal fixation	**3**	**4**	**4**
• Applied to fracture formation and fracture treatment both operative and non-operative	**3**	**4**	**4**
• Biomechanics of implants and fracture fixation systems, including their material properties	**3**	**4**	**4**
Epidemiology and Research Methods:			
• Research and audit methods including the design of clinical trials	**2**	**3**	**3**
Pathology:			
• Applied to fracture and soft tissue healing, including skin, muscle, tendon and neurological structures	**4**	**4**	**4**
• Classification systems for fractures and dislocations	**3**	**4**	**4**
• Pathology of non-union of fractures	**4**	**4**	**4**
• Response of the body, and local musculoskeletal tissues to infection	**4**	**4**	**4**
• Systemic response of body to major injury	**4**	**4**	**4**
• Mechanisms underlying Acute Respiratory Distress Syndrome and similar life threatening conditions	**4**	**4**	**4**
• Science of fluid replacement therapy in the acutely injured including application to the treatment of burns	**4**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Science of treatment of compartment syndrome	4	4	4
• Response of infants, children and the elderly to injury	4	4	4
Clinical Assessment:			
• Initial clinical assessment of the patient with severe injury, including spinal cord injury, soft tissue injury, burns and head injury	4	4	4
• Assessment of all types of fracture and dislocation, their complications, early and late	4	4	4
• Identification of life threatening/limb threatening injuries. Understanding priorities of treatment	4	4	4
Investigations:			
• Knowledge of the principles, application and side effects of commonly used investigations, including radiographs, CT and MRI scans, radio-isotope imaging, ultrasound scans and electrophysiological investigations	3	4	4
Treatment:			
• Knowledge of different treatment options for musculoskeletal injury, both non-operative and operative. Ability to analyse the pros and cons for each method	3	4	4
• Ability to manage the overall care of the severely injured	3	4	4
• Ability to undertake the complete treatment of all types of common fracture and dislocation including the bone and soft tissue treatment of open fractures and the treatment of pathological fractures	3	4	4
• Where common injuries are normally treated by a sub specialist (e.g. spinal injury, arterial injury or intra cranial haemorrhage) there should be ability to manage the initial treatment of the patient and know the principles of the specialist treatment	3	4	4
• Principles of reconstructive surgery for the injured, including treatment of non-union and mal-union of fractures, bone defects, chronic post-traumatic osteomyelitis and delayed treatment of nerve injury; principles of soft tissue reconstruction	3	4	4
• The principles of amputation in the injured and the rehabilitation of such patients	3	4	4
Paediatric Orthopaedic Surgery			
Basic Science			
• Detailed knowledge of the growth of bones, physeal anatomy and its application to fracture types and pathological processes and infection in particular	2	4	4
• Knowledge of the anatomy of bones and joints in the growing child and its application to growth and deformity	2	4	4
• Knowledge of the neurological processes involved in the production of deformity e.g. spina bifida, cerebral palsy and muscular dystrophy	2	3	4s
Clinical Assessment:			
• Core knowledge should be at least that of a general orthopaedic textbook	2	4	4
• 'Expert' knowledge, i.e. the level of the speciality journal is required for those wishing to pursue a career in children's orthopaedics	2	3	4s
• The trainee must be able to clinically examine a child competently and to relate effectively with the family	2	4	4
• The trainee must be able to make proper management decisions in paediatric practice and to refer appropriately for treatment	2	3	4s
Investigations:			
• Knowledge of the indications for plain x-ray, arthrogram, CT, MRI and the ability to interpret the images	1	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Knowledge of the indications for the use of ultrasound and nuclear imaging	1	3	4s
• Awareness of the limitations of certain investigations in paediatric practice	1	3	4s
Treatment:			
• A sound knowledge of normal variants, e.g. knock knees, bow legs and flat feet	1	3	4s
A detailed knowledge of the treatment for			
• Fractures (including non-accidental injury) and growth plate injuries and recognise the sequelae	3	4	4
• Bone and joint infection	3	4	4
• Common childhood orthopaedic conditions, e.g. irritable hip, anterior knee pain	1	3	4s
A working knowledge of the treatment for			
• Slipped epiphysis	2	3	4s
• Perthes' disease	1	3	4s
• Developmental dysplasia of the hip	1	3	4s
• Talipes	1	3	4s
• Scoliosis	1	3	4s
• Simple foot deformities (e.g. hallux valgus, metatarsus varus)	1	3	4s
• Simple congenital hand abnormalities (e.g. trigger thumb)	1	3	4s
• Osteogenesis imperfecta	2	3	4s
• Skeletal dysplasias	1	3	4s
• Tarsal coalitions	1	3	4s
• Torticollis	1	3	4s
• Leg length discrepancy	1	3	4s
A knowledge of			
• Screening services for congenital abnormalities	1	3	4s
• Assessment of physical disability	1	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Shoulder & Elbow			
Basic Science			
Anatomy:			
Basic knowledge of the regional anatomy of the shoulder including			
• Detailed anatomy of the sternoclavicular, acromioclavicular, glenohumeral and elbow joints to include the connecting bones, muscles and tendons acting across them, neurovascular supply, bursae and relationships to local structures	3	4	4
• Surgical approaches: deltopectoral and posterior approaches to glenohumeral joint; superior (McKenzie) approach to rotator cuff; and surgical approaches to the acromioclavicular and sternoclavicular joints	3	4	4s
• Structure and function of the above joints; a clear understanding of the static and dynamic stabilisers of the glenohumeral and elbow joints	3	4	4
Biomechanics:			
• Biomechanics of the shoulder and elbow to the level of the currently published specialist journals	2	3	4s
• Knowledge of the various types of shoulder and elbow prostheses including the factors influencing design, wear and loosening to the level of the currently published specialist journals	1	3	4s
Pathology:			
• Sound knowledge of all commonly encountered benign and malignant conditions affecting the shoulder girdle, elbow and surrounding soft tissues	1	3	4s
• A basic understanding of the pathology of:			
• Impingement and rotator cuff disorders	2	3	4s
• Instability of the shoulder and the elbow	2	3	4s

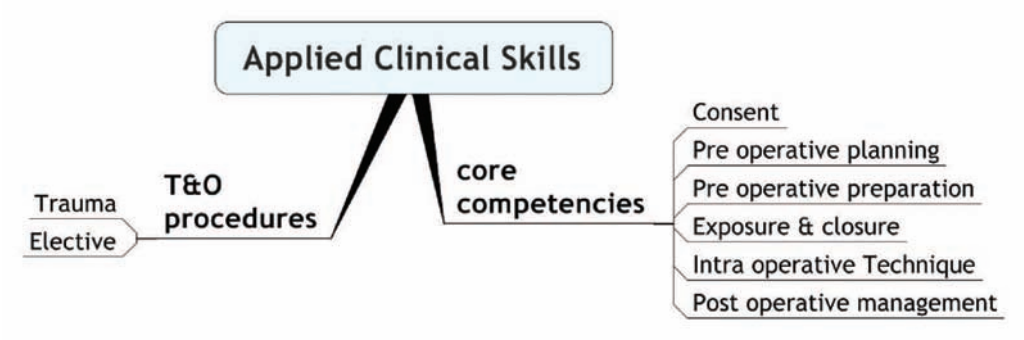
Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Inflammatory and degenerative conditions affecting the articular cartilage and synovium	2	3	4s
• Infection	2	4	4
• Adhesive capsulitis of the shoulder	2	3	4s
• The pathology of the stiff elbow	2	3	4s
• Disorders such as ulnar neuritis and tennis or golfer's elbow	2	3	4s
Clinical Assessment:			
• Detailed history and examination of the painful, stiff or unstable shoulder or elbow	3	4	4
• Knowledge of clinical tests used specifically to assess instability of the shoulder and elbow, rotator cuff disorders, the stiff shoulder or elbow and the use of local anaesthetic in assessment. Examples are the apprehension tests for shoulder instability, impingement signs and tests, Gerber's lift off test, Napoleon's sign, elbow instability tests, ulnar nerve assessment	2	4	4
• Knowledge of conditions causing referred symptoms to the shoulder and elbow (e.g. cervical spine diseases, entrapment neuropathies and thoracic outlet disorders)	3	4	4
• Knowledge to the level of a basic specialist shoulder textbook of common conditions affecting the shoulder including instability, impingement, rotator cuff tears, adhesive capsulitis, osteoarthritis, rheumatoid disease, avascular necrosis, biceps tendon disorders, fractures of the proximal humerus and clavicle, and disorders of the acromioclavicular and sternoclavicular joints and scapula	3	4	4

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Knowledge to the level of a basic specialist elbow textbook of common conditions affecting the elbow including instability, osteoarthritis, rheumatoid arthritis, causes of stiffness, soft tissue problems such as medial and lateral epicondylitis, neuropathies and fractures around the elbow	3	4	4
Investigation:			
• Knowledge of plain radiographs as used to assess shoulder and elbow disorders. This should include a knowledge of those special views (e.g. Modified axial, Stryker notch, Supraspinatus Neer outlet and cubital tunnel views) required to assess adequately the conditions which commonly affect the shoulder and elbow. The ability to recognise correctly normal and abnormal abnormalities on plain radiographs	3	4	4
• Knowledge of the value of ultrasound, arthrography, CT and MRI as used to assess the shoulder and elbow. An ability to identify straightforward abnormalities on CT and MRI (e.g. full thickness and partial thickness rotator cuff tears on MRI and the pathological anatomy of fractures around the shoulder and elbow using CT)	3	4	4s
• Knowledge of the use and abuse of arthroscopy of the shoulder and elbow including a knowledge of normal and abnormal arthroscopic findings	2	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Treatment:			
Non-operative			
• An ability to supervise the non-operative management of fractures, dislocations and soft tissue injuries around the shoulder and elbow	**3**	**4**	**4**
• An in-depth knowledge of the management of straightforward fractures and dislocations of the shoulder girdle and elbow. Knowledge of the treatment options for more complex fractures with an understanding that these might more appropriately be referred to someone with a special interest; examples of these might include four part fractures of the proximal humerus and complex intraarticular fractures of the distal humerus. An ability to recognise upper limb injuries involving injuries to the brachial plexus and refer on as appropriate	**3**	**4**	**4**
• A knowledge of injection techniques for both the shoulder and the elbow	**2**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Knowledge of both the non-operative and operative treatment of common disorders such as recurrent anterior traumatic instability of the shoulder, rotator cuff impingement and small rotator cuff tears, adhesive capsulitis, acromioclavicular joint pain	**2**	**3**	**4s**
Operative			
• A knowledge of the management of soft tissue elbow disorders such as lateral and medial epicondylitis and ulnar neuropathy	**2**	**3**	**4s**
• Knowledge of the indications, options and complications for prosthetic replacement of the shoulder and elbow. A detailed knowledge of the surgical techniques is not required	**2**	**3**	**4s**
• Knowledge of the indications and benefits of arthroscopy of the shoulder and elbow. An ability to perform an arthroscopic assessment of the shoulder is expected but a knowledge of the techniques of arthroscopic surgery procedures is not required	**1**	**3**	**4s**
• Understanding the principles of management of tumours around the shoulder and elbow	**1**	**3**	**4s**

d) APPLIED CLINICAL SKILLS



Recording a particular 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 problem and extrapolate that to dealing with problems in general.

Core competencies

The skills syllabus is not simply a list of procedures and levels of competence to do something essentially manual or visuo-spatial, but considers each procedure as a whole from the first encounter with the patient preoperatively to their management afterwards and onwards to discharge. The list of skills are captured in the core domains of consent etc listed below. They are then within each domain broken down further to explore different facets of each domain in terms of different types of skill some of which may be verbal, involve interpretation or judgment as well as manual ability etc.

The way that this is interpreted in assessment is explained on section 6-4.

CORE COMPETENCIES

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

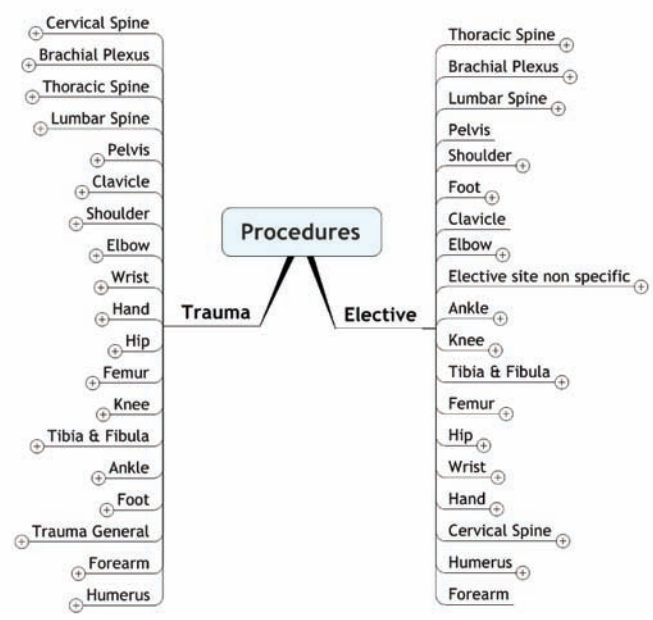
V Intra operative Technique

- 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

Procedures



Clinical Procedures Syllabus

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.

1 = Knows of	**3** = Knows generally
2 = Knows basic concepts	**4** = Knows specifically and broadly
4s = Competence level (4) needed only by those trainees selecting this area as a sub-specialist interest	

Topic **General**	ST1 – 2	ST3 – 6	ST7 – 8
Clinic Activity in T&O	**2**	**4**	**4**
Trauma			
Trauma General:			
Free flap	**1**	**1**	**1**
Full thickness skin graft	**1**	**3**	**4s**
Muscle flap	**1**	**1**	**4s**
Nerve repair	**1**	**2**	**4s**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Pedicle flap	**1**	**1**	**4s**
Removal external fixator or frame	**3**	**4**	**4**
Removal foreign body from skin / subcutaneous tissue	**3**	**4**	**4**
Removal K wires or skeletal traction	**4**	**4**	**4**
Split skin graft	**1**	**3**	**4s**
Transpositional flap	**1**	**1**	**4s**
Wound closure, delayed primary or secondary	**4**	**4**	**4**
Wound Debridement	**3**	**4**	**4**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Axial Skeleton:			
Cervical Spine			
Anterior fixation fracture / dislocation cervical spine	**1**	**1**	**3s**
Application halo / tong traction cervical spine	**1**	**2**	**3s**
MUA fracture / dislocation cervical spine	**1**	**2**	**3s**
Posterior fixation fracture / dislocation cervical spine	**1**	**2**	**3s**
Thoracic Spine			
Anterior decompression / fixation thoracic spine	**1**	**2**	**4s**
Posterior decompression / fixation thoracic spine	**1**	**2**	**4s**
Lumbar Spine			
Anterior decompression / fixation lumbar spine	**1**	**2**	**4s**
Posterior decompression / fixation lumbar spine	**1**	**2**	**4s**
Pelvis			
Acetabular fracture ORIF	**1**	**2**	**4s**
Pelvic fracture:			
• Pelvic fracture external fixator application	**1**	**3**	**4s**
• Pelvic fracture ORIF	**1**	**2**	**4s**
Upper Limb:			
Brachial Plexus			
Exploration / repair / grafting brachial plexus	**1**	**1**	**3s**
Clavicle			
ORIF clavicle fracture	**1**	**3**	**4s**
ORIF non-union clavicle fracture	**1**	**2**	**4s**
Shoulder			
Anterior dislocation shoulder			
• Anterior dislocation shoulder closed reduction	**3**	**4**	**4**
• Anterior dislocation shoulder open reduction +/- fixation	**1**	**2**	**4s**
Acromioclavicular joint dislocation acute ORIF	**1**	**3**	**4s**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Fracture proximal humerus ORIF	**2**	**3**	**4s**
Glenoid fracture ORIF	**1**	**2**	**4s**
Posterior dislocation shoulder closed reduction	**3**	**4**	**4**
Humerus			
Fracture diaphysis humerus non-op:	**4**	**4**	**4**
• Non-union ORIF +/- bone grafting	**1**	**2**	**4s**
• Fracture diaphysis humerus IM nailing	**1**	**3**	**4s**
• Fracture diaphysis humerus MUA +/- POP	**2**	**4**	**4**
• Fracture diaphysis humerus ORIF plating	**2**	**4**	**4**
Elbow			
Dislocated elbow +/- fracture:			
• Dislocated elbow +/- fracture closed reduction	**3**	**4**	**4**
• Dislocated elbow +/- fracture open reduction +/- fixation	**2**	**3**	**4s**
Intraarticular distal humerus fracture ORIF	**2**	**3**	**4s**
Lateral condyle fracture ORIF	**2**	**3**	**4**
Medial condyle / epicondyle fracture MUA / K wire / ORIF	**2**	**4**	**4**
Olecranon fracture ORIF	**2**	**4**	**4**
Dislocated elbow +/- fracture:			
• Radial head / neck fracture MUA +/- K wire	**3**	**4**	**4**
• Radial head / neck fracture ORIF	**2**	**4**	**4**
• Radial head replacement for fracture	**1**	**3**	**4**
Supracondylar fracture:			
• Supracondylar fracture MUA +/- K wires	**2**	**3**	**4**
• Supracondylar fracture **ORIF**	**1**	**3**	**4**
Forearm			
Fasciotomy for compartment syndrome	**1**	**4**	**4**
Fracture distal radius:			
• Fracture distal radius – closed non-op	**1**	**4**	**4**
• Fracture distal radius external fixation	**2**	**3**	**4s**

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Fracture distal radius MUA & percutaneous wires	2	3	4
• Fracture distal radius MUA & POP	3	4	4
• Fracture distal radius ORIF	2	3	4s
Fracture shaft radius / ulna:			
• Fracture shaft radius / ulna IM nailing	1	3	4s
• Fracture shaft radius / ulna MUA & percutaneous wires	2	4	4
Fracture shaft radius / ulna MUA & POP	2	4	4
Fracture shaft radius / ulna ORIF	2		4
Wrist			
Carpal fracture / dislocation:			
• Carpal fracture / dislocation MUA & percutaneous wires	2	3	4s
• Carpal fracture / dislocation MUA & POP	2	4	4
• Carpal fracture / dislocation ORIF	1	2	4s
Scaphoid fracture non-op	3	4	4
Scaphoid fracture ORIF	1	3	4s
Scaphoid fracture MUA & percutaneous wires	1	3	4s
Scaphoid fracture non-union ORIF +/- graft	1	2	4s
Hand			
Carpal fracture / dislocation:			
• 5th metacarpal fracture / dislocation non-op	3	4	4
• 5th metacarpal fracture / dislocation MUA & percutaneous wires	3	4	4
• 5th metacarpal fracture / dislocation MUA & POP	2	4	4
• 5th metacarpal fracture / dislocation ORIF	2	4	4
Finger tip reconstruction	2	4	4
Infection:			
• Infection hand drainage (not tendon sheath)	2	4	4
• Infection tendon sheath drainage	2	4	4
IPJ fracture / dislocation:			
• IPJ fracture / dislocation MUA & percutaneous wires	2	4	4
• IPJ fracture / dislocation MUA +/- POP	2	4	4
• IPJ fracture / dislocation ORIF	2	4	4
Ligament repair hand	2	3	4s
Metacarpal fracture (not 1st or 5th) non-op	3	4	4
Metacarpal fracture (not 1st or 5th) MUA & Percutaneous wires	2	4	4
Metacarpal fracture (not 1st or 5th) MUA +/- POP	2	4	4
Metacarpal fracture (not 1st or 5th) ORIF	2	4	4
Phalangeal fracture non-op	3	4	4
Phalangeal fracture MUA & percutaneous wires	2	4	4
Phalangeal fracture MUA +/- POP	2	4	4
Phalangeal fracture ORIF	2	3	4s
Tendon repair:			
• Tendon repair extensor	3	4	4
• Tendon repair flexor	2	4	4
MCPJ fracture / dislocation:			
• MCPJ fracture / dislocation MUA & Percutaneous wires	2	3	4s
• MCPJ fracture / dislocation MUA +/- POP	2	3	4s
• MCPJ fracture / dislocation ORIF	2	3	4s
Lower Limb:			
Hip			
Dislocated hip:			
• Dislocated hip closed reduction	2	4	4
• Dislocated hip open reduction +/- fixation	1	2	4s
Extracapsular fracture:			
• Extracapsular fracture CHS / DHS	3	4	4
• Extracapsular fracture intramedullary fixation	3	4	4
• Extracapsular fracture other fixation	3	4	4
Intracapsular fracture:			

Topic	ST1 – 2	ST3 – 6	ST7 – 8
• Intracapsular fracture hemiarthroplasty	2	4	4
• Intracapsular fracture internal fixation	3	4	4
• Intracapsular fracture intracapsular fracture THR	2	3	4
Femur			
Diaphyseal fracture closed:			
• Diaphyseal fracture traction or spica in child	1	3	4s
• Diaphyseal fracture intramedullary nailing	2	4	4
• Diaphyseal fracture plate/screw fixation	2	4	4
Fasciotomy for compartment syndrome	3	4	4
Subtrochanteric fracture:			
• Subtrochanteric fracture intramedullary fixation	2	4	4
• Subtrochanteric fracture plate/screw fixation	3	4	4
Supracondylar fracture (not intraarticular):			
• Supracondylar fracture (not intraarticular) DCS / blade plate etc	2	3	4s
• Supracondylar fracture (not intraarticular) intramedullary fixation	2	3	4s
Knee			
Acute haemarthrosis arthroscopy	1	3	4s
Acute ligament repair	1	2	4s
Intraarticular fracture distal femur ORIF	1	2	4s
Patella dislocation closed reduction +/- open repair	2	4	4
Patella fracture ORIF	2	4	4
Patella tendon repair	2	4	4
Quadriceps tendon repair	2	4	4
Tibial plateau fracture	1	3	4s
Tibial plateau fracture arthroscopically assisted fixation	1	3	4s
Tibial plateau fracture ORIF with plates & screws	1	3	4s
Tibial plateau fracture treatment with circular frame	1	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Tibia & Fibula			
Diaphyseal tibial fracture external fixation (including frame)	2	3	4s
Diaphyseal tibial fracture intramedullary nailing	2	4	4
Diaphyseal tibial fracture MUA & POP	3	4	4
Tibial shaft plating	2	3	4
Fasciotomy for compartment syndrome	1	3	4
Tibial non-union:			
• Tibial non-union circular frame management	1	2	4s
• Tibial non-union intramedullary nailing +/- bone grafting	1	3	4s
Ankle			
Ankle fracture / dislocation:			
• Ankle fracture / dislocation MUA & POP	3	4	4
• Ankle fracture / dislocation ORIF	3	4	4
Pilon fracture:			
• Pilon fracture ORIF	1	2	4s
• Pilon fracture with circular frame	1	2	4s
Tendoachilles repair	2	4	4
Foot			
Amputation toe / ray for trauma	2	4	4
Calcaneal fracture ORIF	1	2	4s
Metatarsal fracture ORIF	1	4	4
Phalangeal fracture MUA +/- K wire +/- ORIF	2	4	4
Talar, subtalar or midtarsal fracture / disloc:			
• Talar, subtalar or midtarsal fracture / dislocation MUA +/-POP +/- K wires	1	3	4s
• Talar, subtalar or midtarsal fracture / dislocation ORIF	1	3	4s
Achilles Tendon Repair	1	3	4
Elective			
Elective site non specific:			
Aspiration / injection joint	3	4	4
Benign tumour excision (not exostoses)	2	4	4
Biopsy bone - needle	1	4	4

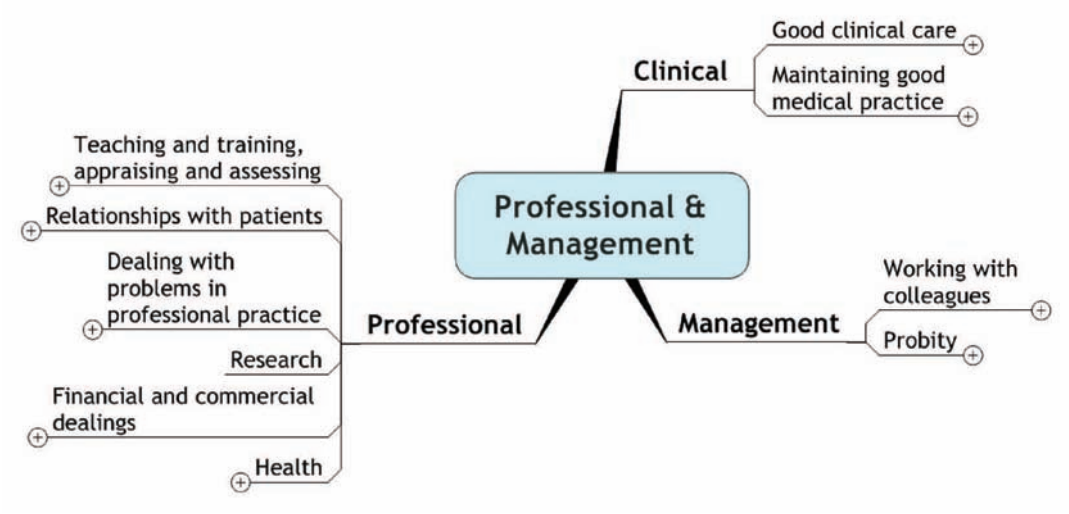
Topic	ST1 – 2	ST3 – 6	ST7 – 8
Biopsy bone - open	1	4	4
Bursa excision	3	4	4
Cyst bone curettage +/- bone graft	1	4	4
Epiphysiodesis	n/a	3	4s
Malignant tumour excision	1	2	3s
Axial Skeleton:			
Cervical Spine			
Anterior decompression +/- fixation / fusion (C2-C7)	n/a	1	3s
Atlantoaxial fixation +/- fusion	n/a	1	3s
Biopsy cervical spine	n/a	2	4s
Excision cervical / 1st rib	n/a	1	3s
Nerve root / facet joint injection cervical spine	n/a	1	4s
Occipito-cervical fusion +/- fixation	n/a	1	3s
Posterior decompression +/- fixation / fusion (C20C7)	n/a	1	3s
Thoracic Spine			
Anterior decompression +/- fixation / fusion	n/a	1	3s
Biopsy thoracic spine	n/a	1	3s
Posterior decompression +/- fixation / fusion	n/a	2	4s
Scoliosis correction - anterior release +/- instrumentation	n/a	1	3s
Scoliosis correction - posterior fusion +/- instrumentation	n/a	1	3s
Lumbar Spine			
Caudal epidural injection	n/a	2	4s
Decompression lumbar spine with fusion +/- fixation	n/a	2	4s
Decompression lumbar spine without fusion (not disectomy alone)	n/a	2	4s
Discectomy open / micro	1	3	4s
Nerve root / facet joint injection lumbar spine	1	2	4s
Brachial Plexus			
Exploration / repair / grafting brachial plexus	1	1	3s
Upper Limb:			
Shoulder			
Acromioclavicular joint excison - arthroscopic / open / lateral clavicle	n/a	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Acromioclavicular joint reconstruction (e.g. Weaver Dunn)	n/a	2	4s
Acromioplasty open	n/a	2/3	4s
Anterior repair for instability arthroscopic	n/a	2	4s
Anterior repair for instability open including capsular shift	n/a	4	4
Arthroscopic subacromial decompression	n/a	3	4s
Arthroscopy diagnostic	1	4	4s
Rotator cuff repair (open or arthroscopic) +/- acromioplasty	n/a	2	4s
Total shoulder replacement	1	2	4s
Upper Arm:			
Elbow			
Arthrolysis elbow (open/arthroscopic)	n/a	2	4s
Arthroscopy elbow diagnostic	n/a	2	4s
Arthoscopy elbow therapeutic	1	2	4s
Arthrotomy elbow	2	4	4
Excision radial head +/- synovectomy	1	2	4s
Radial head replacement	1	3	4s
Tennis / golfer elbow release	1	3	4s
Total elbow replacement	1	2	4s
Ulnar nerve decompression / transposition	1	4	4
Forearm:			
Wrist			
Arthrodesis wrist (includes partial arthrodesis)	n/a	3	4s
Arthroscopy wrist	n/a	1	3s
Carpal tunnel decompression	1	4	4
De Quervain's decompression	1	4	4
Excision distal ulna	1	3	4s
Ganglion excision at wrist	3	4	4
Ulna shortening	1	2	4s
Ulnar nerve decompression at wrist	1	4	4
Hand			
Dupuytrens contracture operation	1	3	4
Excision synovial cyst	1	4	4
Fusion of MCPJ or IPJ	1	3	4s
MCPJ replacement	n/a	2	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Soft tissue reconstruction hand	1	3	4s
Tendon transfer hand	1	2	4s
Trapezium excision or replacement	n/a	2	4s
Trigger finger release	1	4	4
Trigger thumb release	1	4	4
Lower Limb:			
Hip			
Arthrodesis hip	n/a	1	3s
Arthrogram hip	n/a	1	4s
Arthroscopy hip - diagnostic	n/a	1	4s
Arthroscopy hip - therapeutic	n/a	1	4s
Arthrotomy hip	2	4	4
Excision arthroplasty hip (e.g. Girdlestone)	n/a	3	4s
Open reduction for DDH	n/a	2	4s
Osteotomy hip - pelvic for DDH	n/a	2	4s
Osteotomy hip - proximal femoral for DDH	n/a	2	4s
Osteotomy pelvis - not for DDH	n/a	2	4s
Revision Total Hip Replacement	n/a	3	4s
Revision THR acetabular component	n/a	3	4s
Revision THR both components	n/a	3	4s
Revision THR femoral component	n/a	3	4s
Slipped upper femoral epiphysis:			
• Slipped upper femoral epiphysis open reduction	n/a	2	3s
• Slipped upper femoral epiphysis pinning	n/a	3	4s
Total Hip Replacement:			
• THR cemented	1	4	4
• THR hybrid	1	4	4
• THR surface replacement	1	2	4s
• THR uncemented	1	3	4s
Femur			
Amputation above knee	1	4	4
Femoral lengthening	n/a	2	4s
Osteotomy corrective (not for DDH)	n/a	2	4s
Knee			
ACL reconstruction	1	2	4s
Arthroscopic lateral release	1	3	4s
Arthroscopic partial meniscectomy	1	3	4s

Topic	ST1 – 2	ST3 – 6	ST7 – 8
Arthroscopic removal loose bodies knee	1	3	4s
Arthroscopic synovectomy	1	2	4s
Arthroscopic knee diagnostic	2	4	4
Osteotomy distal femoral	n/a	2	4s
Osteotomy proximal tibial	n/a	2	4s
Patella realignment	n/a	3	4s
Patella resurfacing alone	n/a	3	4s
Revision TKR	n/a	3	4s
TKR	n/a	4	4
Unicompartmental knee replacement	n/a	3	4s
Tibia & Fibula			
Amputation below knee	1	4	4
Tibial lengthening	n/a	2	4s
Ankle			
Arthrodesis ankle	1	2	4s
Arthroplasty ankle	n/a	2	4s
Arthroscopy ankle diagnostic	n/a	2	4s
Arthroscopy ankle therapeutic	n/a	2	4s
Arthrotomy ankle	n/a	4	4
Decompression tendons at ankle	n/a	4	4
Tendoachilles lengthening	n/a	4	4
Foot			
Amputation toe / ray	1	4	4
Calcaneal osteotomy	n/a	2	4s
CTEV correction	n/a	2	4s
Fifth toe soft tissue correction	n/a	3	4s
First metatarsal osteotomy	n/a	4	4
First MTPJ arthrodesis	n/a	4	4
First MTPJ excision arthroplasty	n/a	4	4
First MTPJ soft tissue correction	n/a	4	4
Hindfoot arthrodesis	n/a	3	4s
Ingrowing toenail operation	3	4	4
Lesser metatarsal osteotomy	n/a	3	4s
Lesser toe arthrodesis	n/a	4	4
Lesser toe excision part/all phalanx	n/a	4	4
Lesser toe tenotomy	n/a	4	4
Tendon decompression or repair	n/a	4	4
Tendon transfer foot	n/a	2	4s
Wedge tarsectomy	n/a	2	4s

e) PROFESSIONAL & MANAGEMENT



Introduction

In this section of the syllabus we have used the new Senate of Surgery Continuing Professional Development (CPD) classification (Clinical, Professional, Management) to provide an ongoing framework which also maps to Good Medical Practice. By so doing we not only create an accessible syllabus for both clinical and non-clinical skills but also lay a foundation for lifelong learning (and CPD) that will serve trainees as well as consultants. A detailed definition of Senate CPD headings can be found in "Maintaining Your Performance" a Senate publication.

The focus of the Professional & Management syllabus is on "being a surgeon" as much as it is on "doing surgery". This syllabus articulates for the first time many topics passed on as tacit knowledge previously through an informal socialisation process. This work is still in development and we are indebted to Gareth Holdsgrove and the Royal College of Psychiatry for their permission to use material from their syllabus extensively.

This is at present the least developed part of the syllabus excepting the clinical skills it encompasses. This will be covered in section 9 – "Future Work and Development".

Professional & Management Syllabus

Skills and competence levels are indicated on the following point scale:

1 = Knows of	**3** = Can do but may need prompting
2 = Can do when guided	**4** = Competent to perform without assistance or prompting

GOOD CLINICAL PRACTICE

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
CONSULTATION The ability to create and sustain a therapeutic and ethically sound relationship with patients. The use of effective listening skills to elicit and provide information using effective verbal and non-verbal explanatory, questioning and writing skills.	Demonstrate an understanding of core disease processes in T&O and how these may express themselves in a clinical history in terms of symptoms	Elicit and clearly record a complete appropriate history, including the chief complaint, the history of the present illness, past medical history, medication, general medical history, family history, and personal and social history.	Maintain the centrality of the best interest of the patient through the consistent application of ethical codes to all aspects of assessment, treatment and case management.			
	Demonstrate adherence to local, professional and national codes of practice.	Communicate effectively with patients and families using verbal, non-verbal and written skills as appropriate.	Practice in a manner that seeks to optimise the consent of patients in all aspects of their assessment, treatment and care.			
	Acknowledge diversity relating to age, gender, race, culture, disability, spirituality and sexuality.	Share information with patients and carers in a clear, timely and meaningful fashion.	Show respect to all patients and their carers.			
PATIENT EXAMINATION AND INVESTIGATION The ability to perform a general and relevant musculoskeletal examination in a logical systematic manner.	Use a widely accepted diagnostic system to assist in making the diagnosis and differential diagnosis in each case.	Identify when a situation is sufficiently complex or multifaceted to require a further opinion.	Demonstrate an empathic approach to the assessment of all people with injuries or musculoskeletal disability.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
	State the indications for, and limitations of, tests that are used to evaluate musculoskeletal disorders. radiographs, CT, MRI etc and use these tests appropriately in clinical practice.	Engage with patients, carers, service user groups and significant others to identify issues, problems and good practice in relation to consent.	Be aware of and work within own competence, seeking advice from others when necessary.			
		Determine which further investigations are appropriate for achieving a comprehensive understanding of each patient.	Use own experience and evidence elicited from patients, carers, and colleagues to identify problems and understand situations.			
PATIENT EVALUATION AND RECORD KEEPING Be able to synthesise information to make a plan and then express it in written and verbal form	Delineate appropriate differential diagnoses. Based on a relevant assessment demonstrate the knowledge and ability to develop and document a course of action in the domains described below	Prioritise referrals, negotiate settings and urgency.	Recognise the limits of your own competence.			
	Formulate an evaluation plan using appropriate medical, laboratory, radiological and psychological examinations.	Maintain medical records that are:- • legible • timely	Keep a realistic outlook as to what can be achieved			
	Formulate a differential diagnosis for major presenting problems.	Capture essential information useful to medical and non-medical health professionals.	Simultaneously respect patient privacy and contemporary frameworks for confidentiality.			
	Determine what further diagnostic actions may be needed.	Synthesise information into logical treatment plans.	Demonstrate the ability to know when there is little more you can do.			
	Assess changes in clinical status and alter management in response to such changes.	Demonstrate the ability to make a clear and concise case presentation.				

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
PATIENT EVALUATION AND RECORD KEEPING ***cont.***	Develop individualised care plans (within contemporary healthcare system framework).					
APPLICATION OF SCIENTIFIC KNOWLEDGE	Demonstrate and maintain an adequate knowledge base and at all times correctly apply it to patient care.	Develop and maintain systems and resources to keep up to date with knowledge and its application.	Be open to new ideas and developments that will improve patient care.			
ENSURE PRACTICE IS EVIDENCE BASED	In order to practice ethically orthopaedic surgeons must demonstrate: adherence to local and professionally prescribed codes of ethical conduct and practice within their knowledge base.	Demonstrate the ability to renew and keep up to date in their learning.	Demonstrate commitment to revalidation by developing, maintaining and routinely practicing critical self-awareness.			
	Work within the boundaries of local management systems and guidelines.	Provide and accept clinical and professional supervision.	Respond constructively to assessments and appraisals of professional competence and performance.			
		Actively participate in a program of clinical governance. Take part in regular and systematic medical and clinical audit, recording data honestly and, where necessary, responding to audit findings so as to improve practice.	Work with colleagues to monitor and maintain their awareness of the quality of care they provide.			
MAINTAINING YOUR PERFORMANCE		Contribute to the programme of clinical audit.	Review personal clinical practice and compare it with established standards.			
		Participate in significant event reviews and assist in implementing learning outcomes that arise.				

MAINTAINING GOOD MEDICAL PRACTICE

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
MAINTAINING YOUR PERFORMANCE ***cont.***		Participate in risk management initiatives including training and development of policy and procedure.	Surgeons should demonstrate a commitment to continued professional development by keeping up to date with clinical advances throughout their working life.			
		Listen to the views of patients and carers and deal with complaints in a sensitive and cooperative manner.				
		Give due weight and consideration to relevant clinical guidelines.				
		Demonstrate a commitment to research.				
DEMONSTRATE AWARENESS OF THE QUALITY OF CARE YOU PROVIDE	Identify own knowledge, skills, strengths and weaknesses within clinical, managerial, teaching and research practice.	Use own experience and evidence of elicited from patients, carers, and colleagues to identify problems and understand situations.	Act assertively and say no to unreasonable requests.			
	Employ methods of self-evaluation to determine developmental needs.	Use appropriate methods and sources to evaluate personal experience and knowledge.	Monitor and evaluate own clinical and managerial practice to establish its effectiveness.			
		Use strengths and weaknesses to specify continuing professional development needs.	Recognise, reflect and integrate own psychological processes into practice.			
		Identify, seek out and pursue opportunities to enhance professional performance.	Monitor stress levels and identify signs of dysfunctional stress.			
		Take appropriate action to optimise opportunities and resolve problems.	Apply stress management techniques to contain and minimise stress levels.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
DEMONSTRATE AWARENESS OF THE QUALITY OF CARE YOU PROVIDE ***cont.***		Introduce changes to strategies to accommodate unpredicted events.	Acquire necessary sources of support to accommodate changed strategy.			
CLINICAL GOVERNANCE	Develop and apply knowledge of means of evaluating the quality of care in a systematic way.	Evaluate the quality of care provided, interpret the findings and make appropriate improvements.	Recognise and practice within the limits of own competence.			
			Utilise evaluations and feedback in practice.			
TEACHING AND TRAINING, APPRAISAL AND ASSESSING						
AS A MANAGER OF ONE'S SELF AND ONE'S TIME	Ensure own practice recognizes values, respects and is sensitive to cultural ethnic and religious diversity of other people with whom one may interact in a teaching environment.	Set objectives for self that are specific, measurable and achievable.	Identify opportunities to apply creative and innovative techniques, principles and solutions.			
		Manage time and resources in a manner that promotes own emotional well being, mental health and personal safety.	Evaluate creative and innovative techniques, principles and solutions for validity and relevance.			
		Monitor and evaluate feedback.	Elicit information about areas of best practice, unease and discontent.			
		Minimize unhelpful interruptions to and digressions from planned work.				
		Deal with emergency and crisis situations as they arise and review and reschedule work-plan accordingly.				
		Regularly review progress towards meeting objectives and reschedule plans.				
		Plan activities that are consistent with objectives and personal resources.				

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
AS A MANAGER OF ONE'S SELF AND ONE'S TIME ***cont.***		Realistically estimate time needed for activities and make allowances for unforeseen circumstances.				
		Judge the depth and range of information needed to make decisions.				
		Take decisions as soon as sufficient information is available.				
ASSESS, APPRAISE AND EVALUATE LEARNING AND LEARNERS	Demonstrate an understanding of education as applied to medicine.	Prepare appropriate teaching materials ensuring, for example, that visual aids are relevant, readable etc.	Show a personal commitment to teaching and learning, and a willingness to develop as both a doctor and a teacher.			
	Develop an understanding of the principles of adult learning, and apply these in your teaching	Plan educational activities, clearly setting out overall aims and intended learning outcomes.	Demonstrate an enthusiasm for the specialty.			
	Understand the methodologies involved in how to carry out evaluations of teaching, and of educational events as a whole.	Teach in a way that is both professional and suited to your own personality, and is also appropriate to the audience and occasion.	Demonstrate sensitivity and responsiveness to the educational needs of students and junior doctors.			
	Knowledge to be able to interpret and report on findings from evaluations, identifying the best aspects and areas for possible improvement.	Assess information needs and aspirations of audiences and take account of these in planning and delivering educational events.	Interact appropriately with adult learner.			
SUPERVISE AND MENTOR LEARNERS (STUDENTS AND TRAINEES)	Demonstrate a good working knowledge of the assessment methods used in your training program.	Evaluate and provide feedback on individual (including self-assessment) and team performance.	Recognise that assessment, appraisal and evaluation are essential elements in medical education and must be undertaken carefully.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
SUPERVISE AND MENTOR LEARNERS (STUDENTS AND TRAINEES) ***cont.***	Describe the difference between formative and summative assessment, and outline the role of each in medical education.	Competently use the workplace based assessment methods used in conjunction with the curriculum and the Foundation Program.	Ensure that assessments and appraisals comply with the governing principles and are carried out honestly and fairly.			
	Demonstrate a good understanding of the PMETB *Principles of Assessment*.	Provide feedback (including negative feedback).				
	Develop expertise in applying the PMETB Principles.	Assess, appraise and supervise the performance of others.				
	Explain the principles of validity, reliability, feasibility and fairness in assessment and appraisal.	Record and report findings accurately and clearly.				
PROVIDE REFERENCES	Identify the skill needs of junior and multi-disciplinary colleagues in the context of providing optimal patient care.	Respond appropriately and effectively to problems in team or individual performance.	Demonstrate a willingness to supervise the work of less experienced colleagues.			
	Demonstrate an understanding of the responsibilities of the doctor as a supervisor, teacher and mentor.	Provide clinical supervision so that assessments of performance can be observed.	Demonstrate a recognition of the importance of good supervision and mentoring by personal example.			
	Demonstrate an understanding of the points that should be included in a reference and ways in which the reference can be most usefully structured.	Prepare and deliver appropriate teaching and support to increase the clinical skills of junior and multi-disciplinary colleagues.	Ensure that students and junior doctors are properly supervised.			
		Prepare structured and meaningful references.	Ensure levels of performance are accurately reflected in references so that they are fair and honest			

CONDUCT PROFESSIONAL PATIENT RELATIONSHIPS

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
GOOD COMMUNICATION	Communicate appropriately, orally and in writing, with patients, carers and colleagues.	Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties, other professionals, and other community based resources and shall demonstrate the ability to communicate their concerns to others within the care system.	Demonstrate the ability to obtain, interpret and evaluate consultations from other medical specialties, other professionals, and other community based resources and shall demonstrate the ability to communicate their concerns to others within the care system.			
	Ensure that patients are aware of their rights and how to initiate complaint procedures.	Demonstrate the ability to communicate effectively with the patient and their carers, while also respecting confidentiality:	Demonstrate the ability to communicate effectively with the patient and their carers, while also respecting confidentiality.			
	Ensure that patients have access to information, advice and advocacy at all stages of the treatment process.	Listen actively, asking questions, clarifying points and rephrasing other statements to check mutual understanding of clinical issues.	Ensure that patients have access to information, advice and advocacy at all stages of the treatment process.			
	Provide preventive education and advice, where available, that is understandable and practical.	Ensure that interventions and plans are clearly communicated to patients and opportunities given for appropriate input, so that the patient's views, wishes and beliefs are always taken into account.	Ensure that patients are aware of their rights and how to initiate complaint procedures.			
		Take responsibility to fully inform the next of kin should a patient die.	Adopt a patient-focused approach to practice that acknowledges the rights, values and strengths of the patient in all circumstances.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
OBTAIN INFORMED CONSENT	Be aware of the laws of the country in which one is working with respect to the conventions of consent for both adults and children.	Obtain informed consent.	Be open transparent and realistic about outcomes, complications and consequences of care.			
	Be aware of one's responsibility to persons incapable of giving informed consent through age or impediment.	Work with interpreters where necessary to address issues, problems and best practice in relation to cultural, ethnic and religious diversity.	Treat everyone the same within given differences of values systems in different ethnic and religious backgrounds.			
RESPECT CONFIDENTIALITY	The surgeon must respect the right of patients to be fully involved in decisions about their care. They must be familiar with the guidance in the booklet *Seeking Patients' Consent: The Ethical Considerations*.	The surgeon wherever possible, must be satisfied, before providing treatment or investigating a patient's condition, that the patient has understood what is proposed and why, any significant risks or side effects associated with it, and has given consent.	Wherever and whenever possible, the surgeon should work with patients and carers to develop collaborative management plans.			
	Treat information about patients as confidential. In exceptional cases follow the guidance in the booklet *Confidentiality: Protecting and Providing Information* and be prepared to justify your decision to the patient, if appropriate, and to the GMC and the courts, if called on to do so.	Empower the patient to decide the level of risk they are prepared to take with their health and safety. This includes working with the tension between promoting safety and positive risk taking, including assessing and dealing with possible risks for service users, carers, family members, and the wider public.	Encourage active choices and participation in care and treatment.			

	Knowledge	.Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
MAINTAINING TRUST	Demonstrate the ability to promote people's rights and responsibilities and recognise the service user's right to privacy, dignity, respect and confidentiality.	Develop a relationship of trust with their patient by observing confidentiality.	Respect the ethical principles behind the concept of confidentiality by not allowing personal relationships to undermine the trust which patients place in them.			
	Be aware of and respect the right of patients to a second opinion.	Record and only appropriately share information.	Be polite, considerate, respectful and truthful.			
		Clearly demonstrate respect for patients' privacy and dignity.	Never use ones professional position to establish or pursue a sexual or improper emotional relationship with a patient or someone close to them.			
		Engage and sustaining relationships with service users in a manner that maximizes their participating and optimizes co-operation and consent.	Be readily accessible to patients and colleagues when they are on duty.			
	Recognise that a professional relationship with a patient may be ended where the trust between the doctor and patient is broken.	Ensure that arrangements are made quickly for the continuing care of the patient, and hand over records to the patient's new doctors as soon as possible.	Ensure that a decision to end a professional relationship with a patient must be fair and not contravene guidance.			
	Demonstrate knowledge of the risks and continuity of care difficulties associated with transfer of patient care between professionals.		Demonstrate that the decision about ending must be guided by what is in the patient's best interest.			

DEALING WITH PROBLEMS IN PROFESSIONAL PRACTICE

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
GENERAL ISSUES	Demonstrate knowledge of how such issues as risk management, severity and complexity of illness, and effective use of resources might influence decisions about endings.	Demonstrate the ability to place the safety of patients first	Be open to seeking advice from supervisors or colleagues as appropriate.			
	Recognise that safety of patients must come first at all times.	Protect patients from risk or harm posed by another doctor's, or other health care professional's conduct, performance or health, including problems arising from alcohol or other substance abuse.	Do not end relationships with patients solely because they have made complaints, or because of the financial impact of their care or treatment on the practice.			
	Awareness of appropriate person/s at your place of work and the procedures to follow to convey serious concerns.	Practice autonomously by reporting or investigating without delay where there are serious concerns about a colleague's performance, health or conduct, to establish whether they are well-founded, and to protect patients.	Demonstrate an open, self reflective attitude towards endings, including their possible significance to both the patient and practitioner.			
			Identify and question own values, prejudices, stereotypes and beliefs and sources of structural discrimination within own practice.			
			Ensure decisions and action taken towards resolution of professional dilemmas are in line with guidance, and use principles of ethical reasoning.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
RECOGNISE THAT IT IS MANDATORY TO OFFER ALL ASSISTANCE FORMAL ENQUIRIES AND TO PROVIDE INFORMATION TO CORONER OR PROCURATOR FISCAL IN RELATION TO AN INQUEST OR INQUIRY INTO A DEATH	Demonstrate an awareness that it is mandatory to co-operate with any complaints procedure or formal inquiry into the care and treatment of a patient.	Recognise and take steps to address tensions, conflicts and imbalances between patients and their carers.	Demonstrate and awareness of a patient's right to expect a prompt, open, constructive and honest response to a complaint and the ability to respond in an appropriate and sensitive manner including where necessary an apology without prejudice to the care or treatment being offered or arranged.			
	Knowledge of contemporary NHS complaints procedure.	Contribute to the development and maintenance of systems that respond proactively to complaints about disadvantage and discrimination.	Require and accept that a patient's complaint must not prejudice the care or treatment provided or arranged for that patient.			
	Demonstrate an awareness of legal obligations in criminal and civil law.	Demonstrate the ability to write reports and provide evidence in court.	The doctor must assist the coroner or procurator fiscal by responding to inquiries and by offering all relevant information to an inquest or inquiry into a patient's death. The only exception is if the evidence may lead to criminal proceedings being taken against the surgeon.			
	Awareness of mandatory requirement to offer all assistance to a coroner or procurator fiscal in relation to an inquest or inquiry into a patient's death.	Adopt and encourage a positive, non-discriminatory approach to professional practice and relationships.	Demonstrate an awareness of, and sensitivity towards, ethical issues that might affect professional relationships.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
RECOGNISE THAT IT IS MANDATORY TO OFFER ALL ASSISTANCE FORMAL ENQUIRIES AND TO PROVIDE INFORMATION TO CORONER OR PROCURATOR FISCAL IN RELATION TO AN INQUEST OR INQUIRY INTO A DEATH ***cont.***	Knowledge of inquest procedures within the UK.	Follow ethical principles at all times in dealing with patients and colleagues.				
	Recognise that there must be adequate cover for any part of the practice not covered by an employer's indemnity scheme and initiate appropriate action.					
	Acknowledge that all decisions, working practices and the working environment must be lawful, with particular regard to employment, equal opportunities and health and safety law.					
	Demonstrate a basic understanding of employment rights and law, specifically relevant to interviewing.					
	Be aware of the major ethical principles and how these should influence working relationships with colleagues.					
WORKING WITH COLLEAGUES						
WORK EFFECTIVELY AS A MEMBER AND A LEADER OF MULTIDISCIPLINARY TEAMS	Identify key aspects of different cultures and subcultures, including lifestyle, colour, gender, sexuality and age.	Identify sources of discrimination, disadvantage and oppression within the processes, procedures and practices of the clinical and multidisciplinary teams.	Identify and question own values, prejudices, stereotypes and beliefs and sources of structural discrimination within own practice.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
WORK EFFECTIVELY AS A MEMBER AND A LEADER OF MULTIDISCIPLINARY TEAMS ***cont.***	Demonstrate an awareness of team structure, roles and responsibilities.	Promote the value of cultural, ethnic and religious diversity in the clinical team and the multidisciplinary team.	Contribute to the development of systems that promote anti-oppressive practice and address structural and individual causes of disadvantage, discrimination and oppression in the mental health service.			
AWARENESS OF THE ROLES AND RESPONSIBILITIES OF MULTI-DISCIPLINARY TEAMS	Demonstrate an understanding of how to effectively and appropriately lead, manage and work as a member of a team of healthcare professionals.	Work effectively within multi-disciplinary team structures as member, consultant or leader.	Help maintain a healthy, safe and productive working environment.			
	Understand the dynamics of chairing, facilitating and contributing to meetings.	Help to establish a shared and clear purpose for work, service and activities within clinical, multidisciplinary teams and across agencies.				
LEADING TEAMS	Have an understanding of team dynamics including strengths and weaknesses of different team member types.	Use authority sensitively and assertively to resolve conflict, resistance and disagreement.	Use authority appropriately and leading effectively, practicing with consent and recognizing power imbalances and patient vulnerability.			
	Know how to design and implement business/service plans to meet identified needs or policy requirements.	Identify and prioritize tasks and responsibilities.	Co-ordinate and motivate the team appropriately.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
LEADING TEAMS ***cont.***	Have knowledge of clinical governance and other audit and risk management processes.	Be able to make judgments and recommendations on resource allocation both to patients and within and across services.	Demonstrate clinical leadership skills and seek to foster and encourage junior colleagues to develop theirs.			
	Knowledge of functional and dysfunctional teams.	Demonstrate the following team skills: • To work effectively within a healthcare organisation • an understanding of your role and that of others within a team setting	Be aware of and work within own competence, seeking advice from others when necessary.			
		Gather, handle and interpret data on team performance.	Promote the values, skills and perspectives of T&O in clinical teams.			
TAKING UP APPOINTMENTS	Understand ones obligations to verbal and written contractual commitments.	Be able to read and negotiate a contract.	Respect for promises to authorities and colleagues.			
SHARING INFORMATION WITH COLLEAGUES	Demonstrate and awareness of contemporary principles and practice of quality assurance, benchmarking and standard setting.	Manage any problems referring problems outside of remit to senior colleagues.	Give praise and encouragement where appropriate.			
	Demonstrate an awareness that in addition to patient-specific clinical records, surgeons who manage will have responsibilities for financial, employment, research and other records.	Keep clear, accurate, legible and contemporaneous management records of relevant decisions and transactions in accordance with the law and good practice.	Compile, store, use and dispose of records honestly, with proper regard to patient and staff confidentiality, and make them available to those authorised to access them.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
SHARING INFORMATION WITH COLLEAGUES ***cont.***	Demonstrate a clear knowledge and understanding of the duties you have to patients, and when you should or should not legally delegate or devolve responsibility in their interests.	Compile, store, use and dispose of records honestly, with proper regard to patient and staff confidentiality, and make them available to those authorised to access them.	Routinely demonstrate good communication, including listening with respect and responding promptly to requests for information.			
		Establish and maintain effective links with relevant organisations to ensure that the profession and its concerns and issues are represented.				
APPROPRIATELY ASSUME, DELEGATE AND DEVOLVE RESPONSIBILITY	Demonstrate an understanding, through personal practice and explanation to others, of local issues of service availability and access relevant to legislation, custom and practice.	Ensure smooth transfer of care in either direction, and give as complete a picture as possible to the receiving doctor, as it will be necessary to their taking over the safe conduct and management of the patient.	Delegate or devolve responsibility in the patient's best interests, and not primarily to reduce your own workload.			
	Demonstrate an understanding of the protocols for transfer of care between services and ensure that these are followed.					

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
ACCESS ADVICE, ASSISTANCE AND SECOND OPINION WHEN DELEGATING AND MAKING REFERRALS	Appropriately assume, delegate and devolve responsibility.	Exercise appropriate professional skills and knowledge in assuming, delegating and devolving responsibility.	Consistently demonstrate appropriate professional behaviour when assuming, delegating and devolving responsibility.			
	Identify procedures to access advice and assistance and second opinion.	Find sources of advice assistance and second opinions relevant to the problem at hand.	Treat receiving or referring professionals with respect and courtesy.			
	Liaise with GPs, other colleagues, patients and carers regarding appropriateness of referrals, and establish what services are available.	Inform the patient of the reason for referral and the expected outcomes.	Involve the patient and carers in the decision to refer.			
		Inform agencies, referrers and other workers of the outcome of the referral at all key points.	Take account of the views of members of the clinical team or other workers/agencies when making referrals.			
PROBITY						
RELEVANT CONTEMPORARY LEGISLATION	Recognise that any information published must conform with the law and with the guidance issued by the Advertising Standards Authority.		Ensure that patients' vulnerability or lack of medical knowledge is never exploited.			
			Ensure that information the surgeon publishes about their services must not put pressure on people to use a service, for example by arousing ill-founded fear for their future health.			
WRITING REPORTS	Demonstrate a sound, contemporary and working knowledge of mental health and allied legislation.	Correctly and appropriately interpret relevant legislation and explain its implications for a specific situation.	Ensure that your practice conforms to prevailing legislation and codes of conduct and practice.			

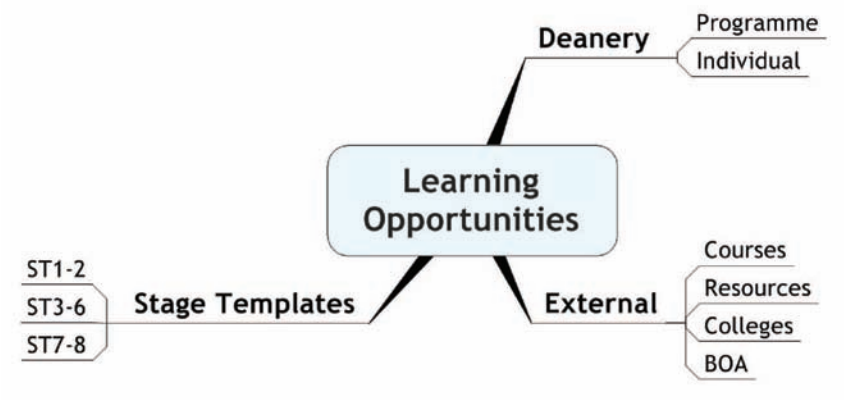
	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
WRITING REPORTS ***cont.***	Demonstrate an appropriate knowledge of gathering, organising and providing evidence.	Formulate opinions clearly and present them to other professionals and as evidence to the courts, including employment review tribunals.	Act in accordance with contemporary codes of practice and conduct.			
	Demonstrate an understanding that the purpose of these reports is to inform the judges and facilitate them in decision-making.	Use appropriate language, for example avoiding use of medical jargon and write concise and precise reports.	Demonstrate a willingness to teach and support others in ensuring that reports and evidence are complete, honest and accurate.			
CARRY OUT AND SUPERVISE RESEARCH	Perform a literature search.	Critically appraise new research publications.	Interpret research findings, taking proper account of the strengths and limitations of evidence-based medicine in applying it to patients.			
	Formulate a clinical question to be answered.	Design an effective randomized controlled trial with statistician assistance understanding the issues around effect and power.	Share all aspects of the trial with patients and the rest of the health care team.			
	Devise a research plan to answer the question.	Design an effective case control study with statistician assistance.	Receive and positively respond to constructive criticism regarding the research (e.g. re-draft a paper following reviewers' comments).			
	Assess the relevance of each of the resulting references to the original questions, and formulate integrated answers.	Design a longitudinal cohort study with statistician assistance.	Demonstrate motivation and ability to work independently.			
	Change your clinical practice accordingly, and write this up as a case report.	Be able to interpret a large scale epidemiological study of either prevalence or incidence.	Monitor and evaluate own research knowledge and evidence-based practice to establish its effectiveness.			

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
CARRY OUT AND SUPERVISE RESEARCH ***cont.***	Develop your own research questions as a result.	Enter data onto a database, use a spreadsheet (such as Excel) and a statistical analysis package (such as SPSS) with help from a statistician, if necessary.				
	Conduct research and disseminate findings in accordance with agreed principles and practices.	Demonstrate the ability to use and interpret basic statistical analyses: tests for normality appropriate use of parametric/non parametric statistics.				
	Describe how to judge relative quality of journals through impact factors and citation indices.	Submit an application for ethical approval to a Local Research Ethics Committee.				
		Contribute to the body of surgical knowledge and practice through formal and informal methods.				
		Report and present results honestly and appropriately.				
		Carry out electronic literature searches on internet and library databases.				
		Carry out a piece of research (size and scope appropriate to time available).				
		Be involved in the recruitment of patients to the study, receive training in appropriate assessment issues, and subsequently be involved in assessments for research.				

	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
CARRY OUT AND SUPERVISE RESEARCH *cont.*		Draft a research proposal containing: main objectives				
PROPERLY MANAGE FINANCIAL COMMERCIAL INTERESTS	Demonstrate and apply in professional practice knowledge of relevant legislation, guidance and practices.		Demonstrate honesty and openness in any financial arrangements with patients by: Not putting pressure on patients to accept private treatment.			
CONFLICTS OF INTEREST			Not encouraging your patients to give, lend or bequeath money or gifts which will directly or indirectly benefit you.			
			Not putting pressure on patients or their families to make donations to other people or organisations.			
			Providing information about fees and charges before obtaining patients' consent to treatment.			
			Not exploiting patients' vulnerability or lack of medical knowledge when making charges for treatment or services.			
			If charging fees, informing patients if any part of the fee goes to another doctor.			

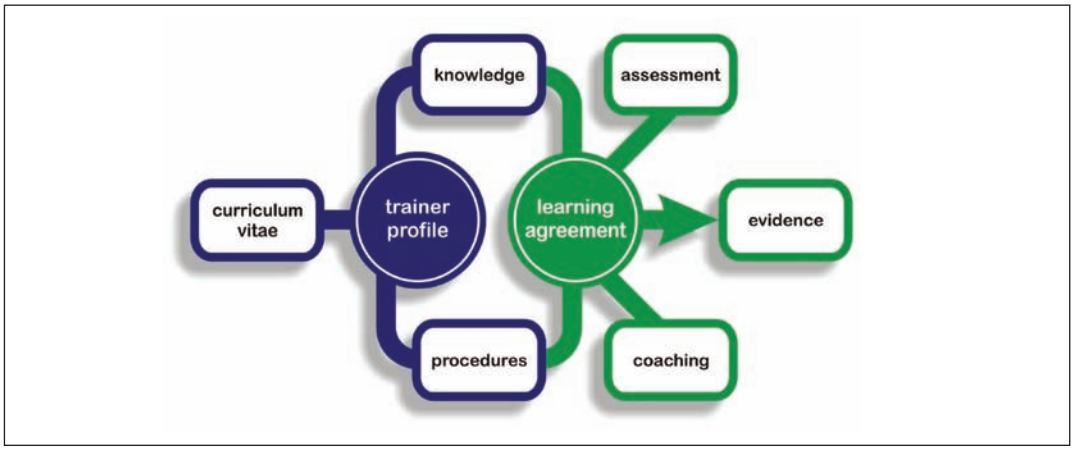
	Knowledge	Skills	Attitudes	ST1 – 2	ST3 – 6	ST7 – 8
CONFLICTS OF INTEREST *cont.*			The surgeon must be honest in financial and commercial dealings with employers, insurers and other organisations or individuals by: If managing finances, making sure funds are used for the purpose for which they were intended and are kept in a separate account from personal finances.			
			Declaring any relevant financial or commercial interest.			
HEALTH						
ADVICE AND TREATMENT FOR MENTAL AND PHYSICAL HEALTH PROBLEMS	Demonstrate a knowledge of Occupational Health and professional regulatory mechanisms.	Maintain a system for monitoring your own physical and mental health.	Do not rely on your own assessment of potential risks to others through your own health.			
		Develop strategies to handle the emotional and physical impact of one's performance	Take action to address ill health that is affecting performance.			
		Identify and assess potential threats to physical and emotional well-being.	Maintain personal, physical and emotional well being and mental health to enable competent performance at work.			
		Identify physical, behavioural, emotional or cognitive signs and symptoms that might impact upon professional performance at work.	Accept and follow advice (including treatments and modifications to your own practice)			

5. Learning Opportunities



a) LEARNING AGREEMENT

The Learning Agreement between the trainer and the trainee forms the cement that binds together the Orthopaedic 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 already in place (since August 2005) through the OCAP Project.
The diagram below summarises the process:



1. From a series of templates based on the Orthopaedic syllabi the trainer creates a "trainer profile" which summarises the skills, attitudes and knowledge focus of their particular attachment and how they practice T&O.
2. Using this profile (together with "Learning Agreement Record") the trainer establishes a Learning Agreement with the trainee agreeing not only the focus of the procedures for the attachment but also which PBAs or other assessment tools are to be used. This customises the training period to the particular needs of that particular trainee.
3. As the attachment progresses the trainer provides feedback to the trainee as part of the agreement through PBAs and other assessment tools.

4. Midway through the attachment the Learning Agreement targets are reviewed in a second Educational Appraisal using the "Learning Agreement Record". If necessary further reviews can be instituted by either the trainer or trainee.

5. Any additional items identified or targets that are falling behind are then addressed in the remainder of the attachment.

6. At the end of the attachment the final Educational Appraisal uses the "Learning Agreement Record" to review the Learning Agreement as a whole and progress is recorded on specific PBAs using the "PBA Assessment Summary". This end of attachment appraisal is very important and should clearly delineate whether both trainer(s) and trainee agree that the agreed competencies have or have not been achieved.

7. All evidence and reflective records from the agreement are taken by the trainee to the annual Formal Educational Review (RITA).

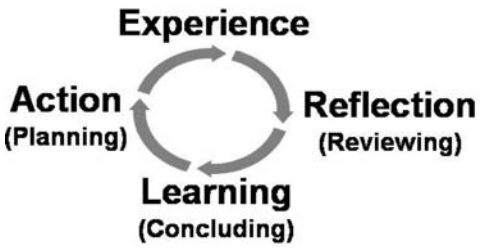
As the Orthopaedic Curriculum develops it is planned that adjustments will be made to the Learning Agreements through the mechanism of the trainer profile (and potentially through a trainee profile). The profiles and forms used throughout the learning agreement will in the immediate future be linked to the trainees' e-logbook so that at a yearly formal Educational Review (RITA) the review panel may consider not only the qualitative evidence from the learning agreement but also the quantative evidence provided by the logbook. This seamless interface will also offer opportunities to quality assure the process through the cross referencing of PBAs to logbook activity and to monitor the impact that the implementation of assessments (PBAs) in specific procedures has on the availability of learning opportunities in those procedures. A full description of the OCAP tools with illustrations can be found in appendix (c).

b) MODELS OF LEARNING

i. Educational Models

There are numerous educational models theories and papers that have relevance 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

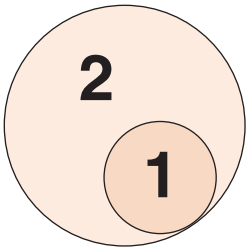


David Kolb's learning Cycle illustrates the importance of reflection in the learning process. Without the key activities of reflecting and drawing conclusions learning is reduced to a series of events with no connection to changes or improvements in behaviour or competence.

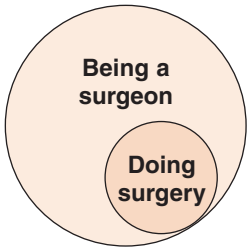
The T&O curriculum encourages reflective learning on the part of both trainer and trainee in the learning agreement. All trainers are required to reflect on their own practice in the production of a trainer profile which is shared with each trainee at the start of an attachment. The trainee in turn uses this profile to reflect on their own progress to date, sharing this with the trainer if the first learning agreement meeting where, together, they set goals for the attachment. As the attachment progresses PBA and other formative 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 opportunity to reflect on the attachment as a whole and draw conclusions to be actioned in the next attachment.

What surgeons learn

Argyris & Schon 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.

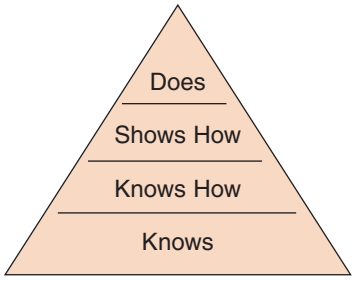


Similarly it is not enough for a surgical trainee to learn the specific details of clinical work (doing surgery) without simultaneously extending their competence in being a surgeon, a much wider activity.



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 & Management syllabus represents the breadth of surgical activity beyond the solution of clinical problems (Good Medical Practice).

Assessment of learning

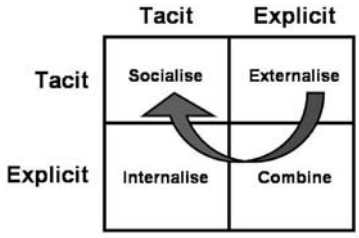


George Miller provided a framework for assessment in his pyramid model. In Miller's view a portfolio of assessments need to be used to evaluate the trainee at different levels.

In the T&O curriculum Procedure Based Assessments target the highest levels of the pyramid. Mini CEX, CBD and PAT address middle levels and the examination focuses largely at the 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 onboard" or internalises 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 and management syllabus covers skills 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.

ii. Learning Environment

As surgery is a craft specialty it is essential that trainees are able to acquire their specialist surgical skills in the work place under progressive levels of supervision. 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, 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 environment is provided.

c) INDIVIDUALS IN THE WORKPLACE

Trainees

Individual trainees must take the 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 Accident and 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 would be expected to take advantage of external learning opportunities.

- Attend programme based Core Curriculum 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 internet based 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 not required to have completed any formal training but where possible expected to have completed a Training the Trainer, and a diversity course. In future it is anticipated that trainers will have to demonstrate that they are competent and fit for purpose in their trainer role. This is discussed in "Further Work and Development" (see section 9-1).

In the meantime the SAC in T&O has specified standards that they wish trainers to demonstrate.

Trainers must

1. Produce and maintain an up to date profile (Templates available on the OCAP web site). This should contain:
   - a Curriculum Vitae in the agreed style
   - a Knowledge profile relating to the published syllabus
   - a Procedures profile relating to the published syllabus
2. Be familiar with and understand the published Curriculum for Trauma and Orthopaedic surgery
3. Be registered, and maintain the e-log book for their practice as it relates to training
4. Be prepared to demonstrate their commitment to training by the completion of training courses in educational method, assessment, feedback, equality and diversity and curriculum delivery
5. Be willing to participate in the deanery training program and RITA assessment process
6. Be in a substantive appointment as a CCST/CCT registered specialist

7. Maintain their good standing with the GMC and undergo annual appraisals as part of this process

The new consultant contract gives the opportunity to declare and have recognised this commitment although it is acknowledged that the time component devoted is unlikely in many cases to be fully recognised within the job plan.

d) DEANERY/PROGRAMME

The Programme director should produce an outline rotation for each Stage of training to enable trainees to acquire the necessary skills and knowledge to fulfil each stage of their educational requirements. The outline rotation may need to be adjusted subject to the outcomes of the RITA process. As schools of surgery develop and RITA is revised this role will be suitably modified.

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 Courses

External organizations regularly promote and organize 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 General Meeting.

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

e) STAGES OF LEARNING

i. The Early Years (ST1-2)

All SAC's through JCHST have agreed the generic component of skills and knowledge germane to the generality of surgery (see section 4-3). In addition the Professional and Management syllabus in this document details the generic qualities to be developed and assessed in the delivery of good clinical care. (see section 4-34)

The purpose of ST1 is to provide an introduction to the overarching principles of surgical practice within this context of T&O and in addition specific experience in the early care of traumatised patients, the management of simple fractures and mastery of the core principles of fixation seen in those fractures on which surgery is commonly performed. In ST1 there is an induction to the principles underlying all surgical practices. Core operative skills and perioperative management will be acquired during this attachment.

An attachment to a Trauma and Orthopaedic Department recognised for training will take place within the first year. This period and level of training could also be utilised by any other branch of surgery as part of their acquisition of generic competencies.

During ST1 and ST2, exposure to a range of relevant disciplines not already encountered in F1 and F2 is desirable. Attachments in any discipline of surgery including attachments in, Plastics, Neurosurgery, A+E Medicine, General Surgery offering relevant acute experience or critical care may occur in the ST1 and ST2 years. In some Deaneries 4 month attachments may take place and in some cases 6 months. We would recommend that at least 12 months T+O should be undertaken within the ST1 and ST2 years and that a minimum of 4 months T&O should be experienced in ST1. Ideally there should be 8 months of T&O in the ST1 year and a further 8 months in the ST2 year with a 4 month attachment in the complementary specialties in each of these years.

At the end of ST1 training the young surgeon should be competent in managing a simple closed fracture and should be able to recognise (if not treat) common complications and certainly know when to ask for help. They should also feel able to fix routine extra-capsular hip fractures with supervision and also, with supervision perform a hip hemi-arthroplasty and simple screw and plate fixation of ankle fractures. This should include pre and post operative care. They should be able to demonstrate common sense and judgement.

The purpose of ST2 is to consolidate the experience of generic surgical practice seen in the previous year and to extend the knowledge of the care of the injured.

By the end of the second year the trainee will have acquired competence in the outpatient management of the majority of low velocity fractures commonly seen in fracture clinics and will have developed an understanding of the natural history of these conditions and the proper management of commonly seen complications.

The trainee should have already acquired competencies including hip fixation and hemiarthroplasty of the hip and this ability will be built on and consolidated. During this second year operative experience will extend to include exposure to intra-medullary nailing techniques of the femur and tibia and the various operative techniques for treating distal radial fractures as well as plating for forearm fractures. Exposure to the principles of management of complex, intra articular and open fractures will have occurred.

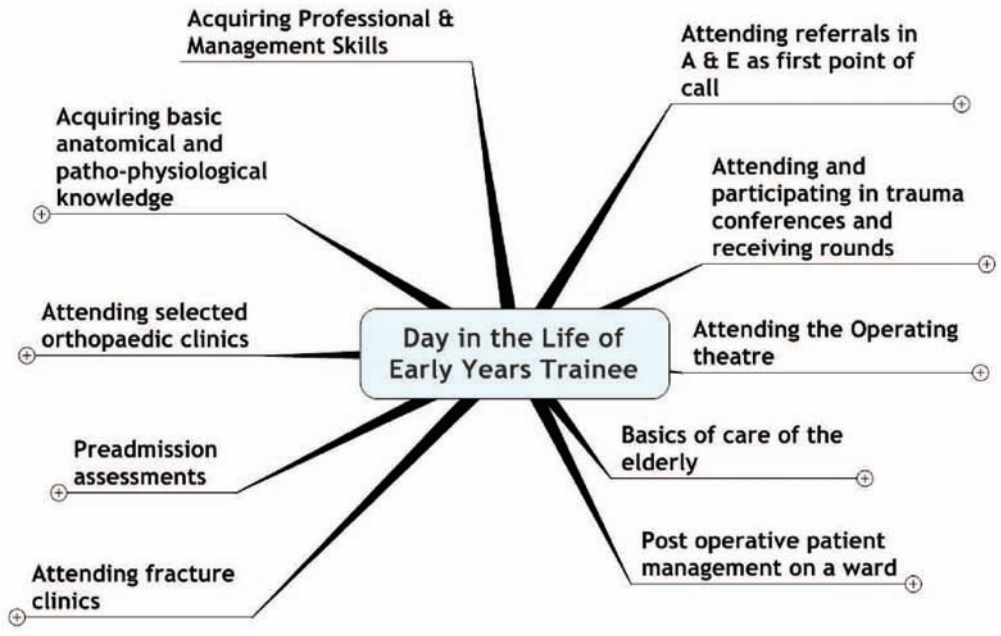
By the end of this fourth postgraduate year (ST2) the trainee should have acquired a sound ability to oversee the day-to-day management of inpatients and the supervision and support of the F1 and F2 doctors. The trainee should by this stage have demonstrated a sound understanding of reflective practice and should have undertaken and presented a number of audit projects.

During this year there may be limited exposure to aspects of the elective practices of the major orthopaedic subspecialties such as lower limb joint replacement, and arthroscopic techniques as well as possible exposure to foot and ankle, hand and possibly spine practice. This would not however be the main object of these training years.

The T&O components of ST1 and ST2 will be spent within recognized Trauma and Orthopaedic attachments attached to a number of trainers spanning several of the possible anatomical interest zones.

The ST1 module will be entirely devoted to Traumatology and depending on the competencies achieved at least 50-75% of available time in ST2 should be occupied with trauma related duties. By the end of the ST2 year the trainee will be expected to have completed the requirements of the test of knowledge prescribed for early years and the subsection related to T&O when this is available.

The context in which this actually will be taking place is summarised in the diagram below and subsequently expanded on in the text. We have taken the liberty of paraphrasing a well known section "Day in the Life" (copyright Sunday Times) in a Sunday supplement which seems to exactly express what we are trying to achieve in the descriptions.



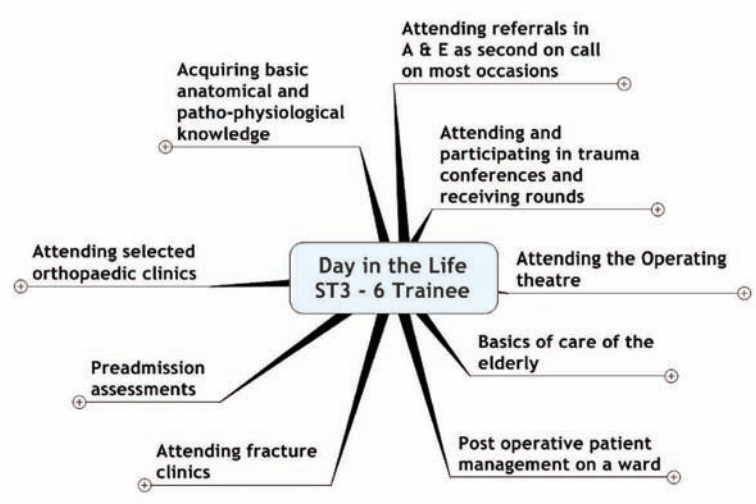
Summary: A day in the life of an early years trainee

- Care of traumatized patient
- Orthopaedic emergencies
- Managing patients in a busy orthopaedic unit
- An introduction to elective orthopaedics

1. **Attending referrals in A&E as first point of call**
   - Will be first on to take calls from A&E
   - Will be supported by a more senior trainee as well as a consultant
2. **Attending and participating in trauma conferences and receiving rounds**
   - Presenting cases at the meeting
   - Having an input as to the overall management of the patient
   - Maintaining a perspective between surgical and medical expediencies for an individual patient
   - Building up an experience base from the discussions they are attendant to
3. **Attending the Operating theatre**
   - Organising a trauma list
   - Liaising with theatre staff
   - Liaising with radiographers
   - Liaising with anaesthetists
   - Scrubbing and assisting
   - Carrying out a range of procedures under supervision
     - Closed manipulation of fractures
     - Application of acute casts and slabs
     - Setting up a femoral neck fracture on the operating table
     - Doing an angled screw plate
     - Performing Hemiarthroplasty
     - Fixing a simple fracture such as an olecranon or a less complex ankle fracture

a. **Mastering a limited range of common trauma situations**
   - Manipulation of most closed fractures and dislocations
   - Fixed angle screw plate for neck of femur fractures
   - Fixing a simple ankle fracture
   - Applying a simple external fixator
   - Doing a tension band

4. **Basics of care of the elderly**
   - Dehydration
   - Electrolyte imbalance
   - Common medical problems
   - Arranging for ongoing care
   - Rehabilitation team awareness
5. **Post operative patient management on a ward**
   - Fluid balance
   - Surgical complications
   - Bleeding
   - Infection
   - DVT and embolism
   - Dislocation
     - Medical complications
   - Chest pain
   - Stroke
   - Collapse
   - Pneumonia etc
6. **Attending fracture clinics**
   - Management of closed fractures
   - Recognising complications and what to do
   - Knowing when to refer or defer to a more experienced or expert opinion
   - Applying a secondary cast and or a brace
   - Being able to communicate with colleagues in and out of hospital regarding patient management
     - Being able to write clear notes
     - Dictate and check a succinct letter to the GP
7. **Preadmission assessments**
   - Work with the preadmission team
   - Supervise situations where the protocol is in question
   - Anticipate problems and trouble shoot
8. **Attending selected orthopaedic clinics**
   - Be exposed to assessment of any of a number of common problems such as arthritis
   - Be able to take a history
   - Be able to examine a patient
   - Generally
   - Musculoskeletally
   - Be able to participate in discussions about management
9. **Acquiring basic anatomical and patho-physiological knowledge**
   - Germane to surgery in a general sense
   - Germane to the levels required to train as an orthopaedic and trauma surgeon to the level of CCT



ii. ST3 – 6 Overview

This is the stage when the trainee obtains many of the operative orthopaedic 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 ST1/2 doctor

The intermediate phase includes further training in trauma and the introduction of sub-specialist 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. A training post is likely to be a combination of general orthopaedics and "orthopaedics with an interest" in one of the specialist areas.

The majority of posts include trauma on call according to a roster 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, this is to be encouraged. Occasionally posts will contain no trauma commitment, but this is unusual. Overall approximately fifty percent of training experience should be allocated to the specialist subjects and fifty percent to trauma.

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

1. **Attending referrals in A&E**
   - Working with consultant as a member of polytrauma team
2. **Attending and participating in trauma conferences and receiving round**
   - Presenting cases and discussing complexities
   - Supervising the overall management plan
   - Making decisions about the balance of medical and surgical problems
   - Building on an experience base from the discussions
3. **Attending the operating theatre**
   - Organising an elective list
   - Liaising with theatre staff
   - Liaising with radiographers
   - Liaising with anaesthetists
   - Scrubbing, assisting and performing elective surgery with increasingly light supervision Carrying out a range of elective procedures depending on modular attachment
     - Performance based assessment procedures to level 4 (see procedures sheet)
     - Other procedures to levels prescribed if the opportunity presents itself.
   - Carrying out a range of trauma procedures under decreasing levels of supervision

- Performing some trauma procedure to the point of mastery Increasing competence in a range of Open Reductions and Internal Fixation
- Nailings of lower limb long bones
- Full range of ankle fractures
- Increasingly supervising ST1/2 trainees in their tasks
- Attending and participating in trauma conferences and receiving rounds
- Acknowledging limitations in complex fractures and knowing when to refer

4. **Basics of surgery for the elderly**
   - Advanced surgical decision making relating to aspects of elderly care e.g. surgery for osteoporotic fractures
     - Surgery in the elderly mentally infirm
     - Surgery in ASA group 3 and 4 patients
5. **Post operative patient management on a ward**
   - Fluid balance
   - Surgical complications
     - Bleeding, Infection, DVT and embolism, Dislocation
   - Medical complications
     - Chest pain, Stroke, Collapse, Pneumonia etc
6. **Attending fracture clinics**
   - Management of closed fractures
   - Treating complications
   - Knowing when to refer or defer to a more experienced or expert opinion
   - Applying and adjusting fracture position in a secondary cast and/or a brace
   - communicating with colleagues in and out of hospital regarding patient management
     - Write clear notes
     - Dictate and check a succinct letter to the GP
7. **Preadmission assessments**
   - Work with the preadmission team
   - Supervise situations where the protocol is in question
   - Anticipate problems and trouble shoot
8. **Attending selected orthopaedic clinics**
   - Gaining experience of assessment of any of a number of common problems such as arthritis
     - take a history
     - examine a patient
   - Generally
   - Musculoskeletally
     - participate in discussions about management
9. **Acquiring basic anatomical and patho-physiological knowledge**
   - Germane to surgery in a general sense
   - Germane to the levels required to train as an orthopaedic and trauma surgeon to the level of CCT

iii. 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 and attitudes 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 attachments 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 trainees declared field of interest in your 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.
- Unrecognised UK "Fellowships" must obtain recognition from PMETB .This will probably be delegated to deaneries or the SAC Trainees must be aware that it is essential to check with programme directors and the SAC when considering less formal "Fellowships" to ensure that they have the recognition which means that they can provide appropriate level of experience for the training in the competencies they require.
- Fellowships abroad in specialist areas. Such posts MUST be discussed and approved by the SAC in advance and prospective provisional recognition must have been given for the attachment to be approved by the deanery. At the end of the fellowship abroad a report must be submitted for approval by the SAC. The trainee MUST NOT assume that this period of training will be automatically recognised.
- 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 forthcoming. The SAC wishes to support academic development but within the context of training.
- The Trainee would be required to successfully complete the Intercollegiate Specialty Examination in T&O during this last phase of training.

The emphasis on this final phase of training is that it is Trainee focused and Trainee led and owned. Trainees are encouraged to fashion a programme which suits them. An initial dialogue with the Training Programme Director followed by checking with the SAC will ensure a smooth process towards CCT.

iv. Academic T&O Surgery

There is a network of T&O academic departments which enjoy a variable degree of stability, often threatened by the relatively short term strategies enforced on universities by the Research Assessment Exercise. T&O surgery is particularly vulnerable because outcomes from orthopaedic surgical developments may not occur for between seven and ten years.

Musculoskeletal medical teaching, despite it being intuitively a significant part of medical education spanning general practice, traumatology as well as specialist surgery also has variable representation across medical schools.

The curriculum must therefore a) encourage academic T&O activity and b) be as flexible as possible in permitting motivated trainees to pursue an academic career in research and or teaching. We therefore entirely subscribe to the Academy of Royal Colleges position as described in their recent report and reproduced here for ease of use in appendix (e).

Specifically we would encourage trainees who wish to follow an academic route do so once selected for T&O training after F2. Bearing in mind the phases, the best time to follow academic studies is after the early years phase once the discipline has been well sampled and the trainee is settled in their projected career pathway. The modular nature of training here is ideally suited to a very flexible programme often required by an academic pursuing research and with the vagaries of funding associated with it. We also support the Walport report encouraging proactive appointments of motivated and talented clinical academic surgeons.

There is a newly proposed teaching route and we have no experience of this at the moment.
We would suggest the outline flow diagrams in appendix (e) could as easily be interpreted for teaching as well as research. All potential academic teachers should pursue their universities teaching and learning qualification policies.

6. Assessment & Feedback

a) 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 designated trainer and the trainee through a process of informal day to day encounters supported by formal and regular educational appraisals.

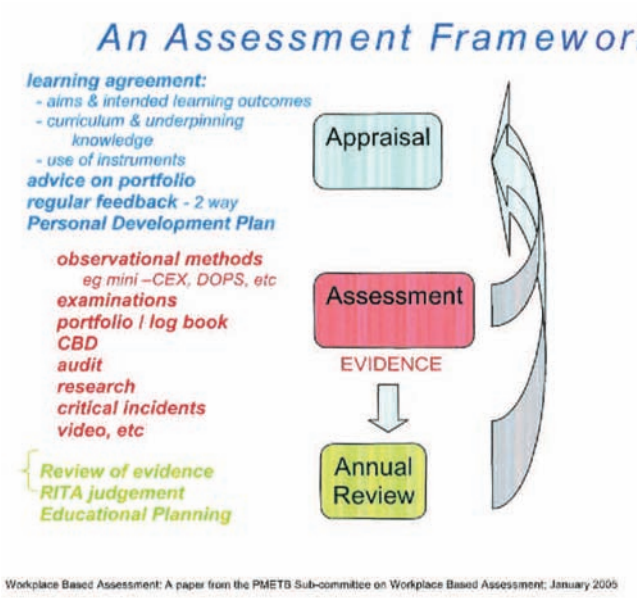
The assessment framework is constructed along the lines proposed by the PMETB sub-committee on workplace based assessment and illustrated below (Ref PMETB Jan 2005). The feedback process has three stages.

- Reaching a learning agreement and reviewing it – educational appraisal
- Structured assessment in the workplace
- An annual review which has two components

  a. 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

  b. An educational review between trainee and designated members of the local training committee (RITA) 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:



Workplace Based Assessment: A paper from the PMETB Sub-committee on Workplace Based Assessment; January 2005

The only exception to the above process will be in ST1 when at least two high educational stakes 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.

b) THE LEARNING AGREEMENT

Learning agreements (described in detail in section 5 of this document) 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.

In ST1 and 2 the learning opportunities permit scrutiny of an aptitude and motivation in surgery in the general sense and through progressive exposure to trauma, T&O in particular. This period of training can be seen as progressive over the necessary time period.

After ST2 the modular nature of training in T&O dictates that learning occurs as a result of reflection on the experience within an attachment defined by the specialty interests of a trainer. These learning opportunities have been articulated in the stage templates in ST3-6 in particular (see section 5) i.e. in this phase the training is modular although the general acquisition and educational trajectory overall can be seen as progressive.

The learning agreement enables the trainer (in consultation with the trainee) 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 attachment. The selection of assessment tools within the learning agreement (e.g. PBAs) 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.

c) 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 reviews will occur at least twice a year in ST1 and usually annually thereafter. 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 at the standards laid out in this curriculum.

T&O recognises the need to test skills and knowledge 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 skills and knowledge (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.

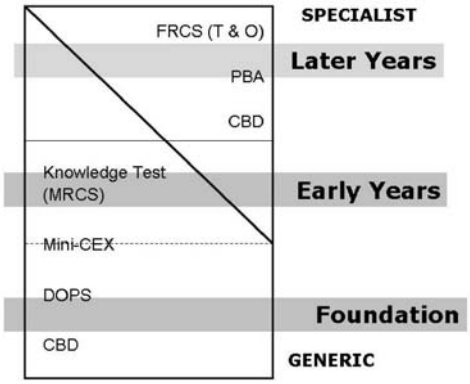
With this in mind the early assessments consist largely of elements carried forward from Foundation, applied in the context of the generality of surgery; and set within the learning agreement for any attachment. This will be found in the utilisation of Mini CEX, DOPs and 360 degree instruments such as PAT. We also plan to utilise case based discussions depending on the outcomes of ongoing pilots.

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 early years instruments are common to all 9 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 skills, knowledge and attitudes germane 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.



A full guide to all early years instruments can be found on the Modernising Medical Careers website at www.mmc.nhs.uk/pages/assessment:-

CEX (Clinical Evaluation Exercise)

A direct observation of clinical skills on the ward 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 (d). 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 Practical Skills)

Initially these will build from Foundation skills outlined in the Foundation curriculum commonly agreed. For surgery in a general sense a basket of potential DOPS is described in the Intercollegiate Surgical Curriculum Project including some specific to T&O.

The concept is simply that commonly performed straight forward procedures will be observed in operating room and clinic or ward settings. This would 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 follow in future years.

PAT (Peer Assessment Tool)

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 behaviours and skills.

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.

Workplace based assessment opportunities will occur in the environments described in section 5 – learning opportunities section (c). They form the mainstay of assessment beyond ST2 and are discussed in detail below. Samples of PBA tools can be found in appendix (d).

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. NB: A PBA is not a checklist of how to perform the procedure (see appendix (c)).

- The range of proposed 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 PBA 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 trainer who is good technically but a poor communicator.

The indicative PBAs for T&O are as follows:-

1. Carpal Tunnel Decompression
2. Digital and Palmar Fasciectomy
3. Diagnostic Arthroscopy & simple Arthroscopic Procedures
4. Total Knee Replacement
5. First Ray Surgery
6. Total Hip Replacement
7. Lumbar Discectomy
8. Compression Hip Screw for Intertrochanteric Fracture Neck of Femur
9. Hemiarthroplasty Intracapsular Fracture Neck of Femur
10. Application of Limb External Fixator
11. Operative Fixation of Weber B Fracture of Ankle
12. Fixation of Patella Fractures by Tension Band Wiring + Olecranon
13. Intramedullary Nailing for Femoral or Tibial Shaft Fractures
14. Tendon Repair

In development:

- Shoulder Diagnostic Arthroscopy & Subacromial Decompression
- Shoulder Hemiarthroplasty
- Paediatric Non-accidental Injury
- Paediatric Irritable Hip

As part of the trauma based early years elements of the curriculum certain procedures in Procedure Based Assessments including fixation of an ankle fracture, management of a closed fracture and the internal fixation of an extra capsular fracture of the hip will be mandatory.

Beyond ST2 the PBAs will be agreed during educational appraisals, depending on a trainees needs and the realistic expectation of this being available within the context of an individual trainer's practice, as part of the learning agreement. The PBAs selected will be related to a particular attachment, however, all PBAs give indications of more generalized progression as indicated through the summary sheets. It cannot be over emphasized how important it is to view the PBAs holistically and not to see them as assessments of competence in a single procedure.

In order to progress to CCT the majority of PBAs recommended above should be achieved to level 4 (that expected of a consultant in the NHS). We acknowledge that at present some procedures may be difficult to experience 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.

d) LOGBOOK

1. The history of the eLogbook

In 1998 the BOA Logbook Project was launched in the Northern Deanery of England

In November 2000 the Faculty of Medical Informatics in the RCSEd offered to assist in developing the Logbook concept into an integrated Orthopaedic Trainee management and analysis system. In December 2000 The BOA, the Orthopaedic SAC and the Royal College of Surgeons of Edinburgh agreed to work together to:-

1. Develop a specification for the data to be collected
2. Develop a specification for the Logbook analysis
3. Raise funds for the Logbook development via the BOA with sponsorship subsequently obtained from the JBJS, the Charnley Trust, the Wishbone Trust and from Smith & Nephew, Johnson and Johnson and subsequently from Biomet Europe.

During the following 2 years a number of beta versions of the logbook were trialled in UK deaneries, allowing an openly based critique to refine the workings of the project.

In July 2003 the Orthopaedic SAC held discussions with the Joint Committee on Higher Surgical Training about making the eLogbook compulsory for Trauma and Orthopaedic trainees. This was approved together with annual payments by trainees of £30 per year.

Since October 2003 the eLogbook has been working uninterrupted with very few problems. In April 2004 the JCHST was given an on-line presentation of the T&O eLogbook and it was agreed that it should be further developed to cover all surgical specialties. The Chairman of the JCHST also indicated that future development should be regarded as an Intercollegiate product and that it was likely that the emerging web based curriculum and the eLogbook would be linked. The JCHST Committee resolved that the eLogbook design should indicate its Intercollegiate nature and the crests of all four Colleges were added accordingly. To reinforce this, in Dec 2003, the Chairman of JCHST wrote to Professor Wallace asking him to make it clear in any further correspondence that the future development of the eLogbook should be regarded as an Intercollegiate project and that the Edinburgh College was undertaking this work on behalf of the JCHST.

In September 2005 a paper was published describing the features of the eLogbook and how the information entered was and could be used in the future.

(Sher L, Reed M, Calvert P, Wallace WA, Lamb A (2005) Influencing the national training agenda: the UK and Ireland Orthopaedic eLogbook and operative training in trauma orthopaedic surgery evidence from Logbooks. **JBJS(Br) 87-B: 1182-6**).

From January 2006 a complete ePortfolio, which includes the eLogbook was launched for all UK Surgical Specialties and in April 2006 the ePortfolio was extended for use by medical students, PRHOs and SHOs.

By May 2006 the T&O eLogbook included 428 distinct T&O operation descriptions and users had loaded onto the database over 1.25 million operations in which they had been involved.

2. The Functions of the current eLogbook/ePortfolio

Varying levels of access are available to the detailed data on the eLogbook website which ultimately belongs to each of the users who have uploaded the data.

- Trainees and trainers can have access to their own and normalized data
- Training Programme directors can access all trainee and trainer consolidated data in a particular programme and are able to study data of their own trainees when they are out of programme in the UK.
- The SAC Chair has access to all UK trainee and Trainer data

3. What the eLogbook/ePortfolio offers to SpRs in Trauma and Orthopaedics

The eLogbook allows the SpR 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 JCHST coding scheme which is as follows:-

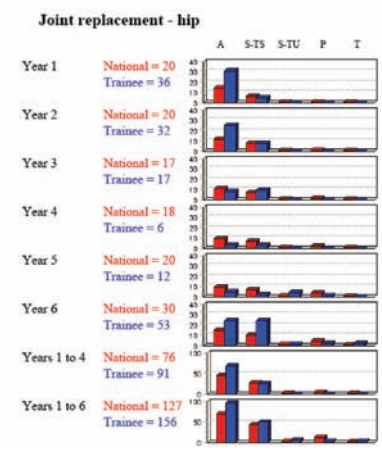
A	=	Assisted at the operation
S-TS*	=	Supervised – Trainer Scrubbed
S-TU	=	Supervised – Trainer Unscrubbed but in Theatre
P	=	Performed operation (not supervised in Theatre)
T	=	Training a more junior trainee plus an added field of:-
O	=	Observed

(* in Orthopaedics 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 "normalize" 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 RITA 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.



4. What the eLogbook/ePortfolio offers to Trainers in Trauma and Orthopaedics

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 Training Programme Director and the SAC

5. What the eLogbook/ePortfolio offers to Training Programme Directors in Trauma and Orthopaedics

The data available to the Training Programme Director 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 an uncommitted trainer.

6. What the eLogbook offers to the SAC in Trauma and Orthopaedics

The Chair of the SAC has the capacity to examine individual trainees, trainers, Training Programmes and even national trends in the practice of Trauma and Orthopaedic surgery. A recent example has been the ability to demonstrate if there is any potentially deleterious effect of an Independent Sector Treatment Centre (ISTC) on the elective surgical experience of trainees working in adjacent NHS hospitals.

7. 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 Orthopaedic & Accident Surgery. It is one of a number of unique tools developed by Orthopaedic Surgeons for Orthopaedic Surgeons (including OCAP and the ePortfolio) and is now finding a place in the other surgical specialities in the UK.

e) FORMAL TESTS OF KNOWLEDGE RELEVANT TO THE TRAINING OF A SURGEON

Before the end of ST2 we will expect a trainee to demonstrate knowledge in the basic surgical sciences (germane to all surgery), anatomical knowledge of sufficient depth to facilitate training in T&O and specific patho-physiological and biomechanical knowledge relevant to musculoskeletal surgery.

As this assessment is designed specifically to test knowledge and to a limited degree application of knowledge then this aspect of progress should be assessed by the most reliable methods available. The evidence strongly supports an MCQ and EMI model of not less than three to four hours and three hundred questions long (ref Van der Vleuten 1996).

The application of knowledge and its use in judgement will be assessed in the final T&O FRCS examination.

f) FEEDBACK

The regular reviews of progress, known as Educational Appraisals,(at least 3 per 6 month attachment) to be made by trainers and their trainees will be informed by the workplace based assessments and are designed to provide considered feedback (in addition to that provided at the end of a PBA) as soon as possible in the learning and teaching cycle. They also contribute evidence to the portfolio for more formal appraisal during Formal Educational Reviews (RITA).

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.

Usually more formal workplace based assessment episodes (e.g. PBAs) will be triggered by trainees who feel ready to move on. Occasionally a trainer may trigger a workplace based assessment either to encourage confidence or occasionally to highlight concerns.

i. The educational appraisal – short loop feedback

Short loop feedback should be ongoing between trainee and designated trainer through workplace based instruments 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 Formal Educational Review (RITA).

ii. Annual review- long loop feedback

A longer loop feedback will follow the high stakes summative element of the annual Formal Educational Review (RITA). This will be designed to plan progression. The end of training interval Educational Appraisals between designated trainers and trainees will generate a view as to whether the learning agreements were achieved and so progression is or is not recommended. The final Educational Appraisal at the end of a training attachment will be a very important event and as such will be a prominent component of the portfolio presented for annual review. The evidence supporting an agreed position about progression will include:-

- The workplace based instruments as described above. Sufficient evidence should be provided to ensure the instruments provide valid and reliable assessments. Measures 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). Our own evidence on validity has been published and reliability data is currently being formalised (appendix (c)).

- 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 and all the procedures and expected level of achievement defined in the syllabus on sections 6-5 to 6-6.
- Evidence of achievement of summative exams. As indicated a test knowledge will occur in ST1 - ST2 and the candidate must show evidence of having the level of knowledge which permits training. An exit examination is in place for the purposes of quality assurance.
- Evidence of reflective practice through a critical appraisal of study leave, courses etc.
- Evidence from previous RITAs.

The annual review (Formal Educational Review) will carry out a paper review of all the evidence and confirm for the trainee whether progress has been made.

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 workplace assessments. It is the role of the first part of the annual review to ensure that the agreed position between a trainee and his or her 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 program director.

The second phase of the annual review will determine what needs to be next achieved 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.

g) APPEALS

A trainee will be able to appeal at various stages of the assessment process.

In the first instance if a trainee disagrees with a workplace based assessment judgment they should first discuss it with the assessor (who is likely to be their assigned trainer) acting in a different capacity. Both trainer and trainee should sign off an agreed position.

If a position cannot be agreed the trainee should be able to have a confidential and non prejudicial discussion with the program director. The program director may ask for an independent assessment after a discussion with the trainee.

At both these levels the aim should be dispute resolution in adult – adult relationships.

Should a trainee remain dissatisfied they must take up the matter with the local deanery utilising local appeals mechanisms. The local Dean must remain the final arbiter.

If a trainee is dissatisfied with the annual review this would be a matter for the local Dean to resolve through their own transparent mechanisms.

h) THE END POINT OF TRAINING

Training will be deemed complete when the trainee has populated the curriculum knowledge and procedures maps/ syllabi 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. These are described in terms of a blueprint to these learning outcomes below. The description of the outcomes in terms of a practicing orthopaedic and trauma surgeon are described in section 7-1.

i) 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 head of the training program 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 orthopaedic surgery.

i. 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 workplace based assessments agreed as triggered by trainer and or trainee 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 training program director 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 Medical Defence Unions or 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.

ii. The Designated Trainer

The designated trainer must complete learning agreements and reviews according to the set protocols. They will work in partnership with trainees to give timeous feedback and ensure all appropriate documents are signed and validated. With the trainee they should ensure the evidence prepared for educational review 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 training program director.

The designated trainer will also be carrying 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 assessment must have been trained and be competent in the application of the instruments described.

iii. The Training Program Director

The training program director is responsible for the whole program and accountable locally to the School of Surgery and nationally to the SAC in T&O. The training programme director is the first port of call should a trainee have difficulty – either personally or with their designated trainer. 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.

iv. The Specialist Advisory Committee

The SAC will provide external quality assurance of the program as described in section 8 of the document.

v. The Deanery and School of Surgery

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

j) BLUEPRINTING AND SAMPLING OF ASSESSMENT TO THE CURRICULUM- ACHIEVING INTEGRATION

Outcome Medical Practice	Assessment Method				
	CBD	Mini-CEX	Mini-PAT	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 and examples are included as appendix (e).

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 skills, knowledge and attitudes required of a T&O surgeon practising as leader of an on call team and delivering emergency and elective services as defined in section 7 of the document.

The blueprint of assessment methodology mapped back to Good Medical Practice is shown below and relates back to the outcomes in terms of clinical, professional and management activities laid out in appendix (f).

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 the sampling across the blueprint. Workplace based assessment should map back to the procedure and knowledge syllabi 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 workplace based assessments. It will also generate an overall profile of a trainee's ability across the spectrum of the syllabus which is appropriately sampled.

k) 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 receiving and management of trauma and emergencies etc as described in section 7. However we accept that the selected specialist interest will require further development.

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

The criteria of CPD are laid out by the senate of surgery in their position paper ("Monitoring Your Performance" Senate of Surgery publications 2004). The next goal for a newly appointed consultant will be to receive accreditation for a declared area of expertise which we expect to occur post CCT (and so out with the scope of this curriculum and PMETB). We expect this to be acquired through peer review of the portfolio and not through set piece examinations.

The end point of life long professional learning will be the point at which (many years past retirement in most cases) a surgeon ceases to maintain an interest in, or contribute to, the profession.

7. Exit Criteria & QA

a) 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 number of satisfactory RITAs which will demonstrate to both professional colleagues and the public the level of training required to work as an independent consultant surgeon in T&O.

In order to satisfy the RITA G 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 workplace PBA's to make a reliable assessment that a satisfactory standard has been reached
- Attendance certificates for professional development courses
- Evidence of publications and presentations
- Legal documents
- Evidence that during their training the trainee has satisfied the intercollegiate specialty examinations board
- E-log book consolidation data
- 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 Orthopaedic Surgeon
- Evidence that the Programme director has scrutinised the learning agreements and PBA's 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 RITA G process the SAC will recommend to the JCHST that a CCT be issued by PMETB

b) CERTIFICATE OF COMPLETION OF TRAINING (CCT)

At the end of training a CCT will be awarded when the trainee has satisfied PMETB 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 attitudes, skills, and judgement of a surgeon capable of independent practice.

The SAC recommendation to PMETB 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 trainees portfolio which also includes work place based assessments and the evidence of previous learning agreements and RITA assessments. The Portfolio will have been assessed in its entirety at the final RITA G 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 subspecialty 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.

8. Management of Quality Assurance (QA) of Programme

a) PMETB SANCTIONED VISITS

In the past the SAC (T&O) has been responsible (reporting to JCHST) for the QA of training programmes in the United Kingdom and Ireland. Standards for training have, in the past, been laid down by the SAC. Traditionally such inspections are carried out at five year intervals together with trigger visits for any problem areas within those training programmes. The SAC has appointed a liaison officer responsible for each area throughout the United Kingdom and Ireland.

The PMETB has recently taken over this role with a changed format. The PMETB use a 'sample check' of hospitals within a Deanery training programme. The PMETB also sanction trigger visits where problems are perceived, at the request of the Deans or the programme directors.

In addition to representatives from the specialty, lay persons have, as in the past, joined the inspection team.

The Postgraduate Deans will continue to monitor this process and the SAC will continue to assist the Deanery in this task.

b) LOGBOOK MONITORING

The trainees in T&O currently use the BOA – Edinburgh Logbook the data contained in which belongs to the trainee. Certain key individuals within the training programme have access to that date with the permission of the trainee:

- The programme director has access to the data from the area they administer.
- The SAC liaison officer has access to the trainees' data in their region of responsibility.
- The SAC chairman has access to all programmes throughout the United Kingdom and Ireland.

This gives the SAC a powerful tool to access all data allowing programmes to be compared both from the perspective of both the range and number of procedures carried out. An individual trainee will evaluated on the basis of how he or she compares with the national average for any given procedure.

Consolidation evidence will be provided in whatever form the Deans and the PMETB require.

c) TRIANGULATION BACK TO EXAMS

The SAC are represented on the Intercollegiate Examination Board responsible for setting the content and standard of the FRCS (T&O) examination. Examination questions are set and mapped against the Clinical Knowledge syllabus laid down within the curriculum. The clinical component of the examination is also expected to follow the profile of the curriculum.

The SAC are provided, through the Examination Board, with a breakdown of individual marking performances of the examiners. Examiners with a marking profile at the extreme of the distribution of the marks can be identified and the pass rate of individual programmes can be compared. Such data is always interpreted in context and is never disseminated in its raw form.

d) EDUCATIONAL MONITORING

Individual Trainee Appraisal

The Educational Appraisal meeting at which the learning agreement is agreed and reviewed must be done on at least 3 occasions, the beginning, middle and end of the attachment. Job plans, courses and general progress can also be discussed at this point along with any personal issues.

Contracts can be reviewed and changed according to individual circumstances in consultation with the programme director. Trainees must also return their feedback to the Deanery using the relevant ("green") assessment forms.

This Educational Appraisal process can be formalised at any time by the invitation of a member of the Deanery if necessary. Such meetings are documented in an open and transparent manner (once or twice per year).

The Annual Review (RITA)

This is a formal review process held on a regular basis (once per trainee per year). It is controlled by the Post Graduate Dean. Evidence of progress of training must be demonstrated at this meeting by the portfolio. The portfolio includes:

- Logbook reports
- PBA Summary sheets
- Course record
- Trainers report
- Exam evidence (if appropriate)
- Record of research
- Record of audit
- Record of publications
- Record of presentations

Any courses or specific future development for the trainee can be planned at such a meeting.

The core RITA team consists of the Programme Director, the Regional Advisor and the Post Graduate Dean (or representative). In addition a member of the university department and a member of the STC are normally included. A trainer can be invited to discuss a particular trainee if necessary on an open, transparent procedure basis. The SAC liaison officer should be present at the RITA process, particularly when there are perceived problems within the programme.

9. Further Work and Development

As indicated from the start this is a living curriculum and will change when it is rational to instigate developments which are evidence based either directly from our own monitoring or through a review of current best practice. Quality assurance will be designed to enhance the curriculum.
We also acknowledge we have particular pieces of work to complete.
These include:-

- Ongoing review and development of the PBAs
- Further validation and reliability testing of the assessment instruments
- Further blueprinting such that workplace based assessments integrate with formal tests and examinations
- The competency proving of trainers.
- Assessment of professional skills competencies

We anticipate a sustained programme of work prioritising the need to ensure that assessment instruments would stand up to challenge in any disputes.

Ongoing review and development of the PBAs

Our ongoing consultation in pilots in Northern and North Western Deaneries and with our trainees and some trainers on a panel suggest we should extend the range of PBAs in some specialty specific areas. This has been alluded to in the list on PBAs in the assessment section. We anticipate that PBAs will take some time to finally "bed down" into a workable number which can be reliably measured.

Further validation and reliability testing of the assessment instruments

Pilot testing of PBAs and a triangulation exercise with the logbook has confirmed that the PBAs have at least face validity. We as yet have no evidence of predictive validity..
We are, as we submit the curriculum, designing and have funding for a study of construct validity and reliability. This project will also compare T&O trainees with general surgery trainees who will use identically structured assessments, naturally customised to general surgical procedures. The study will be designed around the use of Generalisability theory and should be completed by the end of 2006.

Further blueprinting such that workplace based assessments 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 workplace based assessments 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.

The competency proving of trainers

We have alluded to the essential "buy in" by busy practicing orthopaedic surgeons who understand their obligations to training. However we have also alluded to current tensions between that necessity and the need to deliver timeous, high quality and accountable service. In general the best trainers are the best practitioners, but formulating that competency is a challenge.
We again acknowledge that we are not alone and would be looking to get agreement at the Academy of Medical Royal Colleges on how we might assure training competency over and above what we have achieved so far.
Whatever the vital educational imperative to achieve this it cannot be divorced from current tensions in political and terms and conditions of service issues.

Assessment of Professional Competencies

Clinical Skills will be assessed in the workplace and so must "professional" skills. The same constraints apply and so a similar assessment method will be developed.

It is 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 PBA, with competence statements that can be mapped across a wide range of activities.

A pilot version of such a form is in development using the validated Non Operative Technical Skills in Surgery (NOTSS) system from the RCSEd/University of Aberdeen project. Full details of NOTSS can be found on the website (www.abdn.ac.uk/iprc/notss).

10. Appendices

a) SAMPLE ASSESSMENT TOOLS

- Case-based Discussion (CbD)

Intercollegiate Surgical Curriculum Pilot

Case-based Discussion (CbD)

Please complete the questions using a cross: ☒ Please use black ink and CAPITAL LETTERS

Trainee's surname:

Trainee's forename:

GMC Number: Hospital:

Trainee level: ST1 ☐ ST2 ☐ ST3 ☐ ST4 ☐ ST5 ☐ ST6/7 ☐

Specialty: ☐ Cardio ☐ General ☐ Neuro ☐ O&M ☐ Otol ☐ Paed ☐ Plast ☐ T&O ☐ Urology

Clinical setting:

Clinical problem category:

Focus of clinical encounter: Medical record keeping ☐ Clinical Assessment ☐ Management ☐ Professionalism ☐

Complexity of case: Low ☐ Average ☐ High ☐

Please grade the following areas using the scale below:	Below expectations for level of training		Borderline for level of training	Meets expectations for level of training	Above expectations for level of training		U/C*
	1	2	3	4	5	6	
1. Medical Record Keeping							
2. Clinical Assessment							
3. Investigation and Referrals							
4. Treatment							
5. Follow-up and Future Planning							
6. Professionalism							
7. Overall Clinical Judgement							

* U/C Please mark this if you have not observed the behaviour and therefore feel unable to comment.

Anything especially good?	**Suggestions for development:**
Agreed action:	

Not at all — Highly

Trainee satisfaction with CbD 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Assessor satisfaction with CbD 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Have you had training in the use of this assessment tool?
☐ No ☐ Yes: Face to face
☐ Yes: Read Guidelines ☐ Yes: Web/CD Rom

Time taken for observation (in minutes):

Time taken for feedback (in minutes):

Assessor's signature: ..... GMC Number Date: / /
(Educational Supervisor)

Assessor's name:
(Educational Supervisor)

- Direct Observation of Procedure Skills (Surgical DOPS)

Intercollegiate Surgical Curriculum Pilot
Direct Observation of Procedural Skills (Surgical DOPS)

Please complete the questions using a cross: ☒ Please use black ink and CAPITAL LETTERS

Trainee's surname:

Trainee's forename:

GMC number: Hospital:

Specialty: ☐ Cardio ☐ General ☐ Neuro ☐ O&M ☐ Otol ☐ Paed ☐ Plast ☐ T&O ☐ Urology

Trainee level: ST1 ☐ ST2 ☐ ST3 ☐ ST4 ☐ ST5 ☐ ST6/7 ☐

Procedure Number: Name of procedure:

Assessor's position: Consultant ☐ SASG ☐ SpR ☐ Nurse ☐ Other HCP ☐ Self ☐

Difficulty of procedure: Easier than usual ☐ Average difficulty ☐ More difficult than usual ☐

Number of times procedure performed by trainee:

Please grade the following areas using the scale below:	Below expectations for level of training		Borderline	Meets expectations	Above expectations for level of training		U/C*
	1	2	3	4	5	6	
1. Describes indications, relevant anatomy, & details of procedure							
2. Obtains informed consent, after explaining procedure & comps							
3. Prepares for procedure according to an agreed protocol							
4. Administers effective analgesia or safe sedation (if no anaesthetist)							
5. Demonstrates good asepsis and safe use of instruments/sharps							
6. Performs the technical aspects in line with the guidance notes							
7. Deals with any unexpected event or seeks help when appropriate							
8. Completes required documentation (written or dictated)							
9. Issues clear post-procedure instructions to patient and/or staff							
10. Communicates with patient & staff in a professional manner							
11. Overall ability to perform whole procedure*							

* U/C Please mark this if you have not observed this aspect and therefore feel unable to comment

Please use this space to record areas of strength or any suggestions for development

Assessor training? No ☐ Written ☐ Web/CD ☐ Workshop ☐ Time taken for observation (mins): _____
Time taken for feedback (mins): _____

Assessor's surname:

Assessor's signature: ..... GMC Number Date: / /

Not at all — Highly

Trainee satisfaction with Surgical DOPS 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐
Assessor satisfaction with Surgical DOPS1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Acknowledgements: Adapted with the permission of the UK Royal Colleges of Physicians

Surgical DOPS

Completed and available on ISCP Website	Author
Application of a secondary cast in the plaster room during a fracture clinic to a forearm or leg	David I Rowley
Insertion of traction pins	David I Rowley
Intra articular injections for joint aspiration	David I Rowley
Removal of K wire	David I Rowley
Opening and closure of a wound	David I Rowley
Debriding a simple wound	David I Rowley
Excision and direct suture of skin lesion	
Use of Z-plasty	

- Mini-Clinical Evaluation Exercise (CEX)

Intercollegiate Surgical Curriculum Pilot

Mini-Clinical Evaluation Exercise (CEX)

Please complete the questions using a cross: ☒ Please use black ink and CAPITAL LETTERS

Trainee's surname:

Trainee's forename:

GMC Number: Hospital:

Trainee level: ST1 ☐ ST2 ☐ ST3 ☐ ST4 ☐ ST5 ☐ ST6/7 ☐

Specialty: ☐ Cardio ☐ General ☐ Neuro ☐ O&M ☐ Otol ☐ Paed ☐ Plast ☐ T&O ☐ Urology

Clinical setting:

Clinical problem category:

New or FU: New ☐ FU ☐ Focus of clinical encounter: History ☐ Diagnosis ☐ Management ☐ Explanation ☐

Complexity of case: Low ☐ Average ☐ High ☐ Assessor's position: Consultant ☐ SASG ☐ SpR ☐ Other HCP ☐ Self ☐

Please grade the following areas using the scale below:	Below expectations for level of training		Borderline for level of training	Meets expectations for level of training	Above expectations for level of training		U/C*
	1	2	3	4	5	6	
1. History taking							
2. Physical Examination Skills							
3. Communication Skills							
4. Clinical Judgement							
5. Professionalism							
6. Organisation/Efficiency							
7. Overall Clinical Care							

* U/C Please mark this if you have not observed the behaviour and therefore feel unable to comment.

Anything especially good?	Suggestions for development:
Agreed action:	

Not at all Highly

Trainee satisfaction with Mini-CEX 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Assessor satisfaction with Mini-CEX 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

Have you had training in the use of this assessment tool?
☐ No ☐ Yes: Face to face
☐ Yes: Written Training ☐ Yes: Web/CD Rom

Time taken for observation (in minutes): ☐

Time taken for feedback (in minutes): ☐

Assessor's signature: ..... GMC Number ☐☐☐☐☐☐☐ Date: / /

Assessor's surname:

Acknowledgements: Adapted with the permission of the American Board of Internal Medicine

- Mini-PAT (Peer Assessment Tool)

Intercollegiate Surgical Curriculum Pilot

Mini-PAT (Peer Assessment Tool)

Please complete the questions using a cross: ☒ Please use black ink and CAPITAL LETTERS

Trainee's surname:

Trainee's forename:

Trainee's GMC number: Hospital:

Assessor's name:

How do you rate this trainee in their:	Below expectations for level of training		Borderline for level of training	Meets expectations for level of training	Above expectations for level of training		U/C*
	1	2	3	4	5	6	
Good Clinical Care							
1. Ability to diagnose patient problems							
2. Ability to formulate appropriate management plans							
3. Awareness of their own limitations							
4. Ability to respond to psychosocial aspects of illness							
5. Appropriate utilisation of resources e.g. ordering investigations							
Maintaining good medical practice							
6. Ability to manage time effectively/ prioritise							
7. Technical skills (appropriate to current practice)							
Teaching and Training, Appraising and Assessing							
8. Willingness and effectiveness when teaching/training colleagues							
Relationship with Patients							
9. Communication with patients							
10. Communication with carers and/or family							
11. Respect for patients and their right to confidentiality							
Working with colleagues							
12. Verbal communication with colleagues							
13. Written communication with colleagues							
14. Ability to recognise and value the contribution of others							
15. Accessibility/Reliability							
16. Overall, how do you rate this doctor compared to a doctor ready to complete this level of training?							

* U/C Please mark this if you have not observed the behaviour and therefore feel unable to comment.

Do you have any concerns about this doctor's probity or health? [ ] Yes [ ] No

If yes please state your concerns:

PTO:

Anything especially good?	Please describe any behaviour that has raised concerns or should be a particular focus for development:

Your gender: ☐ Male ☐ Female

Your ethnic group:

- ☐ British
- ☐ Irish
- ☐ Other white background
- ☐ Caribbean
- ☐ African
- ☐ Any other black background
- ☐ Indian
- ☐ Pakistani
- ☐ Bangladeshi
- ☐ Other Asian background
- ☐ White and black Caribbean
- ☐ White and black African
- ☐ White and Asian
- ☐ Any other mixed background
- ☐ Chinese
- ☐ Any other ethnic group

Which environment have you primarily observed the doctor in?
(please choose one answer only)

- ☐ Inpatients
- ☐ Outpatients
- ☐ Both In and Out-patients
- ☐ A&E/Admissions
- ☐ Intensive care
- ☐ Theatre
- ☐ Other (please specify) ☐

Your position:

☐ Consultant ☐ SASG ☐ SpR ☐ Foundation/PRHO
☐ Nurse ☐ SHO ☐ Allied Health Professional
☐ Other (please specify) ☐

If you are a Nurse or AHP how long have you been qualified? ☐ years

Length of working relationship: ☐ months

Have you had training in the use of this assessment tool?

☐ No
☐ Yes: Have read guidelines

How long has it taken you to complete this form? (in minutes)?: ☐

Assessor satisfaction with mini-PAT

Not at all 1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ Highly 10☐

Assessor's signature: .....GMC Number ☐☐☐☐☐☐☐ Date: / /

Assessor's name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Acknowledgements: Mini PAT is derived from SPRAT (Sheffield Peer Review Assessment Tool)

b) REFERENCES

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Van Der Vleuten CPM, (1996) The Assessment of Professional Competence: Developments, Research and Practical Implications.
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c) OCAP: Process & Progress (additional information)

OCAP is a practical attempt to improve the quality of HST in orthopaedics through the introduction of a competence based portfolio of coaching and assessment tools.

OCAP is a joint project of the BOA and orthopaedic SAC initiated (using industrial sponsorship) by a group of experienced orthopaedic trainers following the JCHST Working Party report in 2002, based on work going back to the early 1990's. That report recommended that trainees' portfolios should include competence focused assessments covering a wide range of surgical and 'generic' skills. The project has the full backing of BOTA who have provided invaluable input and support.

Assessing Diverse Experience

OCAP's work on competence assessment began with a review of four training centres. Each of these centres delivers its orthopaedic service (and training) in an entirely different "geography". If trainees are to be assessed in the work place then the assessment tools must in some way take into account this difference between the work places in which they are being assessed. These workplaces differ not only in the facilities for education but also in the length of attachments, frequency of supervised sessions and attitudes to training and teaching (naturally some of these factors vary within each centre and between trainers). This work was followed up later with questionnaires which revealed a wide variation in even the most basic aspects of training experience. As changing circumstances reduce the time available for training, and the volume of experience available to the trainee OCAP is an attempt to structure the training experience so that the trainee can derive maximum benefit from it.

OCAP has tried to limit the effect of these differences and maximise training opportunities by creating a "delivery mechanism" within which the assessments sit.

More Paperwork?

Trainees and trainers already face a mountain of paper. Although the OCAP tools will be implemented initially as a set of simple paper based items they have been designed from the start with the potential to fit both desktop PC and PDA environments. Eventually this will not only erode the paperwork mountain but also facilitate audit. However, using an electronic platform does raise technical, training and data protection issues, with which we are grappling at present.

Key design features

The core feature of the materials is that they are driven by the trainee and, beyond the initial creation of a trainer profile, they place no extra demands on the trainer. They are competence focused (an assessment of what can be 'observed' in the workplace) and deliberately designed with an open

architecture to respond to new developments. The OCAP tools have already been adapted in collaboration with the General Surgery (OPCOMP) team and are seen as a model of good practice by PMETB.

We have been careful to validate the selection and content of the PBA's and continue to ensure that they are not only reliable but also robust and fit for purpose.

Consultation and collaboration have been key features of the OCAP project to date and all feedback on any aspect of the project is welcomed.

Materials can be downloaded from the OCAP website (www.ocap.org.uk) using e-logbook passwords and user names.

FAQ About Trainer Profiles

(a) How long should it take to complete a trainer profile?

About 1 hour (Knowledge 10 mins, Procedures 10 mins, Mini-CV 40 mins). Some trainers and pilots have taken up to 3hrs, problems included, could not paste a picture into a document, could not delete rows in word table, did not have a secretary, did not involve the trainee, tried to produce an over-detailed Knowledge profile (or just suffered from terminal procrastination).

(b) Can I just use my existing CV?

35 pages of *what you have done* does not communicate *who you are* and certainly does not communicate your expectations of the trainee. Many of the problems with trainees occur when communication breaks down (end up sending e-mails to each other). The Mini-CV and particularly the sections on personal relationship info is about communication and relationship building, it is about who you are and what your values are, it is about *being a surgeon* not just *doing surgery* and a picture does help, especially for first year trainees.

(c) The procedures I do aren't included in the procedures template

This is based on the e-logbook so it should cover most things but it is intended to be a personal document so please feel free to add your own procedures in the appropriate sections, having deleted the inappropriate ones.

(d) I don't have time to teach my trainee everything on the knowledge profile

The Knowledge profile is an aid to trainee's learning, not a teaching syllabus for the trainer, it helps the trainer to see where the trainee thinks they are at the start and would like to get to by the end. The Knowledge profile should (over time) list resources to help with issues identified in PBA's, it is not intended to be an assessment tool to replace the exam!

Why can't I do it all my own way?

It has taken 3 years, building on 10 years experience, gaining agreement from over 200 orthopaedic trainers that this (validated) system will work, it would be interesting to hear why you think yours will be better. The system has lots of flexibility built into it but in order to eventually make it electronic there are some things that must be the same. Sadly because of many other changes already in place such as EWTD the status quo cannot be the way forward.

FAQ About Procedure Based Assessments

(a) How long should a PBA take?

The same time as any procedure usually takes when it is done by the trainee, plus 10 - 15 minutes afterwards (between cases) to review, give feedback and fill in the form. Naturally this may take slightly longer at the early stages of a trainee's career where few assessments have taken place for a lengthy period or at the start of the project when trainers and trainees are unfamiliar with the materials. Where PBAs have taken trainers much longer (45 mins to review and give feedback in one case) there are two common problems. If you do not do it immediately after the procedure (leave it until the end of the week or the next week) it will take longer because neither the trainer or the trainee remember clearly what happened and it is more likely that they will disagree on what happened. Second common problem is turning the PBA into a teaching session which whilst not a bad thing to do will certainly take longer than 10 or 15 mins.

(b) What does a completed PBA mean?

It is NOT a license to operate unsupervised! It DOES give the trainer confidence to allow trainee greater responsibility. A completed set of PBAs demonstrates the competence to learn procedures and perform them to set protocol and standard.

FAQ About the status of OCAP

(a) Does OCAP Assessment replace the RITA?

No, OCAP is intended to support the present RITA process and in the early stages the yellow and green RITA forms will continue to be used. OCAP will provide useful (in some cases vital) evidence for discussion in the RITA interview. It will identify problems at an earlier stage and reinforce positive feedback for the able trainee.

(b) Isn't this a bit simple for year 5 and 6 trainees?

Post FRCS trainees should find it straightforward to complete the procedures in the current set of PBAs.

The completion of this set will be of enormous value in preparation for the transition to a consultant's role where they will be required to use these materials as trainers. It also gives valuable feedback and reassurance on quality of their own work some of which may not have been regularly reviewed by a consultant. We envisage the development of PBAs that would be used more specifically for senior trainees which may be the same procedures but in greater depth or more probably more highly specialised procedures identified by more specialist societies.

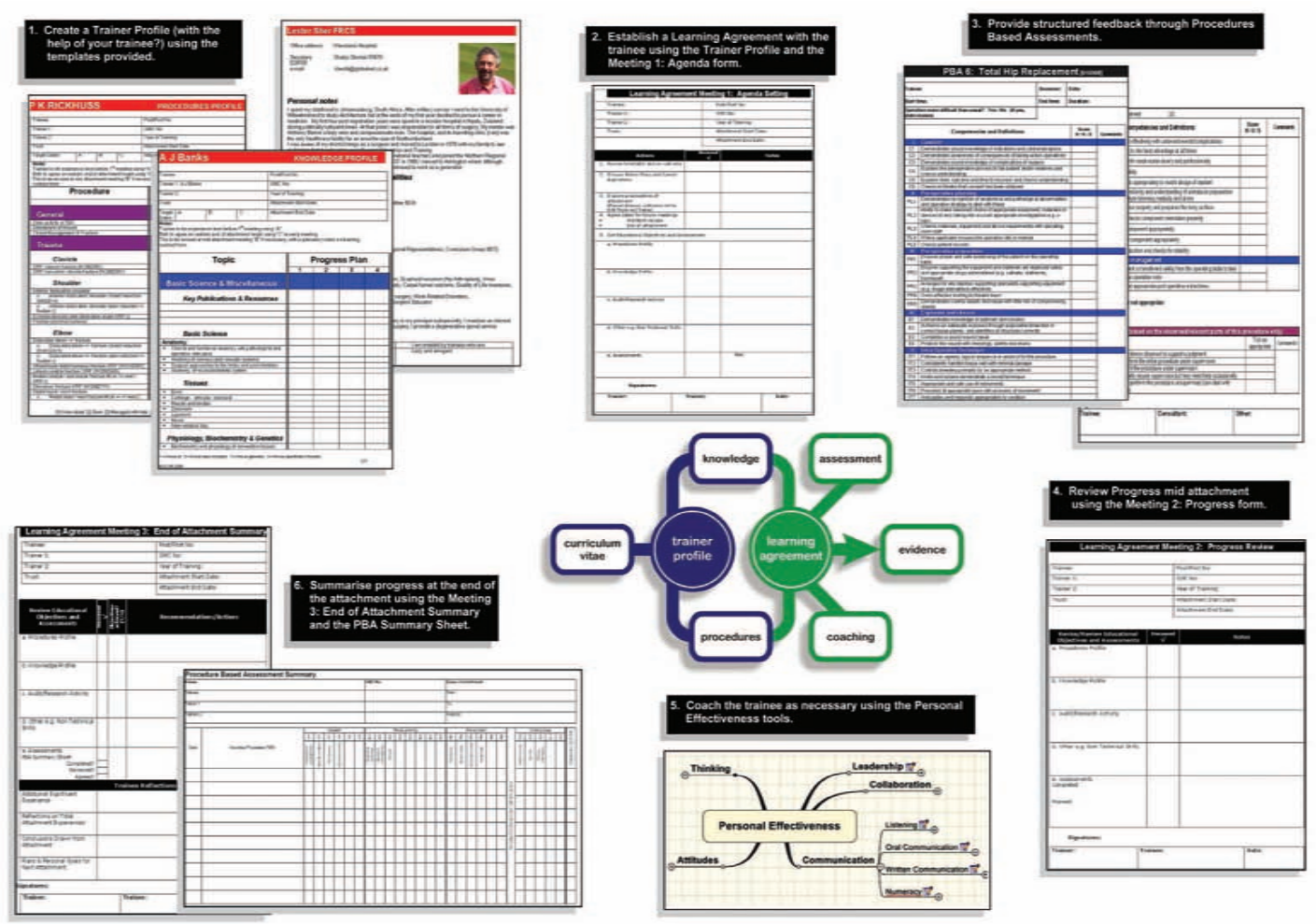
(c) Doesn't this duplicate the log book?

No, the teams of both OCAP and the e logbook have been liaising closely to exploit the synergy between the two sets of tools. Assessment of competence is primarily a qualitative issue, the logbook clearly relates to the quantity of procedures and thus the depth of experience the trainee acquires. The log book and OCAP should be seen as complementary initiatives, both informing RITA.

(d) Does OCAP replace the exam?

No. The exam tests knowledge and the ability to apply that knowledge in decision making. OCAP PBAs test the understanding of knowledge and the skills of applying it in the workplace.

This diagram was reduced in size from an original poster and can be downloaded from the website at www.ocap.org.uk



d) OCAP: SAMPLE TOOLS

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
I.	**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		
II.	**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		
III.	**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)		

Templates for all forms in A4 format can be dowloaded from www.ocap.org.uk

Competencies and Definitions		Score N/U/S	Comments
PR7	Ensures appropriate drugs administered		
PR8	Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively		
IV.	**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		
V.	**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		
VI.	**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		

Templates for all forms in A4 format can be dowloaded from www.ocap.org.uk

Global summary			
Level at which completed elements of the PBA were performed		Tick as appropriate	Comments
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	Competent to perform the procedure unsupervised (could deal with complications)		

Signatures:

Trainee: Assessor(s):

Procedure Based Assessment Validation Worksheet

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)
	I. 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

	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)
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

	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)
C4		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	
	II. 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*

	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)
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		
	III. 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

	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)
		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 anesthetic team to ensure prescribed drugs administered	Assumes drugs have been administered without checking	Fails to check with anaesthetic team that drugs have been administered

	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)
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		
	IV. 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

	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)
	V. 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

	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)
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 with the anaesthetist	Sets positive tone with appropriate greeting. Sets clear goals and expectations	Proceeds with next step of procedure without anaesthetic advice (where required)	Fails to inform anaesthetist of key 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*

	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)
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 demonstratably 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 demonstratably set*
	VI. 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

Trainer Profile:

a) Mini CV

CLARE MARX FRCS

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PERSONAL NOTES

I trained at University College London and after SHO jobs became a registrar and then Senior registrar in London on the Westminster UCH and RNOH rotation. My fellowship was at the Brigham and Women's Hospital Boston MA in Arthroplasty surgery.

In 1990 I became a Consultant at St Mary's and St Charles' Hospital London with a special interest in lower limb Arthroplasty. During this time I was involved with and wrote one of the original modules for the STEP distance learning course for the Royal College of Surgeons and organised the introductory course for the clinical students at St. Mary's

I taught and ran ATLS courses in London and then Ipswich.

In 1993 I moved to Ipswich where I have continued to practise predominately lower limb arthroplasty. I am a member of BHS and BASK

I was Clinical director for Orthopaedics for 4 years, Chairman of the LNC and Chairman of the Medical Staff Committee.

ORGANISATIONS / WIDER RESPONSIBILITIES

Presently

Chairman of the Specialist Advisory Committee in Trauma and Orthopaedic Surgery (2006-2008)

- Currently writing the T&O Curriculum for PMETB
- Planning T&O Specialist Training with MMC

Chairman of the Quality Assurance working group of the Intercollegiate surgical curriculum project.

Member of the Board and Examiner for the Intercollegiate Specialty Exam in Trauma and orthopaedics

Member of the Council of the British Orthopaedic Association

I have undertaken Professional standards reviews and reported for the health Service Ombudsman.

PUBLISHED WORK

Papers with reference to Hip and knee replacements

ESSENCE OF PRACTICE

My elective practice is now almost entirely devoted to adult lower limb primary and revision arthroplasty. The practice attracts difficult primary and revision problems and tertiary referrals.

In addition there is a regular on call Trauma duty.

EXPECTATIONS OF TRAINEES

I'm looking for trainees who are

Keen to learn and involve themselves with the clinical and organisational aspects of the attachment, and who are prepared to question and discuss my clinical decisions.

I am irritated by trainees who are

Untidy, disorganised, unforthcoming and arrive late for clinical duties.

b) Knowledge Profile

JOHN EDGE KNOWLEDGE PROFILE (010305)				
Trainee:				Post/Post No:
Trainer 1:				GMC No:
Trainer 2:				Year of Training:
Trust:				Attachment Start Date:
Target Dates:	A:	B:	C:	Attachment End Date:

Notes:

Trainee to list experience level before 1st meeting using "A"

Both to agree on realistic end of attachment target using "C" at early meeting

This to be revised at mid attachment meeting "B" if necessary, with explanatory notes on learning contract form.

Topic	**Progress Plan**			
Basic Science & Miscellaneous	**1**	**2**	**3**	**4**
KEY PUBLICATIONS & RESOURCES				
Human Anatomy RMH McMinn				
Grants Atlas of Anatomy				
Apleys system of orthopaedics and fractures				
Practical orthopaedic exposures McRae				
Physical examination in orthopaedics Apley and Soloman				
Clinical orthopaedic examination Ronald McRae				
BASIC SCIENCE				
Anatomy:				
• Clinical and functional anatomy with pathological and operative relevance				
• Surgical approaches to the limbs and axial skeleton				
TISSUES				
• Bone				
• Cartilage - articular, mensical				
• Muscle and tendon				
• Synovium				
• Ligament				
• Nerve				
• Intervertebral disc				

Topic	Progress Plan			
Basic Science & Miscellaneous	**1**	**2**	**3**	**4**
PHYSIOLOGY, BIOCHEMISTRY & GENETICS				
Biochemistry and physiology of connective tissues				
• Shock - types, physiology, recognition and treatment				
• Blood loss in trauma/surgery, fluid balance and blood transfusion				
• Bone grafts, bone banking and tissue transplantation				
BIOMECHANICS & BIOENGINEERING				
• Biomechanics of musculoskeletal tissues				
• Biomechanics of fracture fixation				
• Tribology of natural and artificial joints				
• Design of implants and factors associated with implant failure (wear, loosening)				
• Biomaterials				
BONE & JOINT DISEASE				
ORTHOPAEDIC ONCOLOGY				
• Knowledge of the presentation, radiological features, pathological features, treatment and outcome for common benign and malignant tumours				
• Understanding of the principles of management of patients with metastatic bone disease in terms of investigation, prophylactic and definitive fixation of pathological fractures and oncological management				
• Knowledge of the presenting features, management and outcome of soft tissue swellings, including sarcomas				
GENERAL				
• Osteoarthritis				
• Osteoporosis				
• Metabolic bone disease				
• Rheumatoid arthritis and other arthropathies (inflammatory, crystal, etc)				
• Osteonecrosis				
• Osteochondritides				
• Heterotopic ossification				
• Bone and soft tissue sarcomas				
• Metastases				

Topic	Progress Plan			
Basic Science & Miscellaneous	**1**	**2**	**3**	**4**
INVESTIGATIONS				
• Blood tests				
• Musculoskeletal imaging: x-ray, contrast studies (myelography, arthrography), CT, MR, ultrasound, radioisotope studies				
• Effects of radiation				
• Bone densitometry				
• Electrophysiological investigations				
OPERATIVE TOPICS				
• Tourniquets				
• Design of theatres				
• Anaesthesia - principles and practice of local and regional anaesthesia and principles of general anaesthesia				

c) Procedures Profile

A J Banks PROCEDURES PROFILE

Trainee:				Post/Post No:
Trainer 1:	A J Banks			GMC No:
Trainer 2:				Year of Training:
Trust:				Attachment Start Date:
Target Dates:	A:	B:	C:	Attachment End Date:

Notes:

Trainee to list experience level before 1st meeting using "A"

Both to agree on realistic end of attachment target using "C" at early meeting

This to be revised at mid attachment meeting "B" if necessary, with explanatory notes on learning contract form.

Procedure	Assessment				
Trauma	**1**	**2**	**3**	**4**	**5**
HIP					
Dislocated hip					
Dislocated hip closed reduction					
Dislocated hip open reduction +/- fixation					
Extracapsular fracture					
Extracapsular fracture CHS / DHS					
Extracapsular fracture intramedullary fixation					
Extracapsular fracture other fixation					
Intracapsular fracture					
Intracapsular fracture hemiarthroplasty					
Intracapsular fracture internal fixation					
Intracapsular fracture intracapsular fracture THR					
FEMUR					
Diaphyseal fracture					
Diaphyseal fracture intramedullary nailing					
Diaphyseal fracture plate/screw fixation					
Fasciotomy for compartment syndrome					
Subtrochanteric fracture					
Subtrochanteric fracture intramedullary fixation					
Subtrochanteric fracture plate/screw fixation					
Supracondylar fracture (not intraarticular)					
Supracondylar fracture (not intraarticular) DCS / blade plate etc					
Supracondylar fracture (not intraarticular) intramedullary fixation					
KNEE					
Acute haemarthrosis arthroscopy					
Acute ligament repair					
Intraarticular fracture distal femur ORIF					
MUA +/- POP					
Patella dislocation closed reduction +/- open repair					
Patella fracture ORIF					
Patella tendon repair					
Quadriceps tendon repair					
Tibial plateau fracture					

Procedure	Assessment				
Trauma	**1**	**2**	**3**	**4**	**5**
Tibial plateau fracture arthroscopically assisted fixture					
Tibial plateau fracture ORIF with plates & screws					
Tibial plateau fracture treatment with circular frame					
TIBIA & FIBULA					
Diaphyseal tibial fracture					
Diaphyseal tibial fracture external fixation (including frame)					
Diaphyseal tibial fracture intramedullary nailing					
Diaphyseal tibial fracture MUA & POP					
Tibial shaft plating					
Fasciotomy for compartment syndrome					
Tibial non-union					
Tibial non-union circular frame management					
Tibial non-union intramedullary nailing +/- bone grafting					
ANKLE					
Ankle fracture / dislocation					
Ankle fracture / dislocation MUA & POP					
Ankle fracture / dislocation ORIF					
Pilon fracture					
Pilon fracture ORIF					
Pilon fracture with circular frame					
Tendoachilles repair					
FOOT					
Amputation toe / ray for trauma					
Metatarsal fracture ORIF					
Phalangeal fracture MUA +/- K wire +/- ORIF					
Tendon repair					
TRAUMA GENERAL					
Removal foreign body from skin / subcutaneous tissue					
Removal K wires or skeletal traction					
Removal metal					
Split skin graft					
FOREARM					
Fasciotomy for compartment syndrome					
Fracture distal radius					
Fracture distal radius external fixation					

Learning Agreement Record

Trainee: A Trainee	Trust: Any Town	Year of Training: ST4
Trainer 1: D Trainer	Post/Post No: 999	Attachment Start Date: 01.01.07
Trainer 2:	GMC No: 666	Attachment End Date: 31.06.07

1. Practicalities	**MEETING 1** *01/04/07*	**MEETING 2** *12/03/07*	**MEETING 3** *21/06/07*
	Discussed Y / N		
a) Review timetable and on-call rota	Y		
b) Explore practicalities of attachment (Planned absences, conferences etc for both Trainer and Trainee)	*Leave 12 – 19 Jan, Trainer sabbatical Feb 07*		
c) Agree dates for future meetings *i)* Mid-term review *ii)* End of attachment	Y		
d) Discuss future Plans and Career Aspirations	*N*	*Interest in hand*	

2. Educational Objectives and Assessments Summary (see overleaf for detail)	
f) Have the targets within the Learning Agreement been achieved? Y / N (please specify any actions or recommendations for future attachments)	*Yes, need to pay urgent attention to xxx in next attachment*

3. Trainee End of Attachment Reflections	
a) Significant experience in additionto routine training (courses,meetings etc)	*Internal Fxn Course, RCSEd Essential Ex Fix, Audit paper accepted by JBJS*
b) Reflections on total attachment experiences	*Pleased with xxxx, found difficulty xxx built on previous attachment in that xxx,*
c) Conclusions drawn from attachment	*Very interested hand fellowship, not interested total joints*
d) Plans, targets & personal goals for next attachment	*Focus on MRI interpretation. Increase log book numbers ex fix. More realistic targets at start.*

2. Educational Objectives and Assessments			
	MEETING 1 *01/01/07*	**MEETING 2** *12/03/07*	**MEETING 3** *21/06/07*
	Discussed Y / N (plus notes in addition to Trainer Profile)		
a) Applied Clinical Skills (Procedure Profile)	*Y*	*Pre-op planning to be improved*	*Y*
b) Applied Clinical Knowledge (Knowledge Profile)	*Y*	*Lacking adequate knowledge depth with biomechanics of hips*	*Y*
c) Professional & Management	*N*	*Needs to practice OR team management, more frequent communication*	*N*
d) Audit / Research Activity	*N*	*N*	*Write up audit paper and submit*
e) Assessments: *i)* Identified & Reviewed?	*CBD* *PBA 9 & 11*	*Y*	*Y*
ii) Completed (whole or in part?)		*PBA 9 consent needs attention* *PBA 11 not attempted as yet*	*All complete*
iii) PBA Summary Sheet completed?		*updated*	*Y*

Signatures:

Trainers:	Trainee:	Date:
D Trainer	*A Trainee*	*21/06/07*

THE JOURNAL OF BONE & JOINT SURGERY (BRITISH)

■ ANNOTATION

Assessment of performance in orthopaedic training

D. Pitts,
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J. L. Sher

From TORT Centre, Ninewells Hospital and Medical School and Wansbeck General Hospital, Northumberland, England

The reliable measurement of performance is a problem faced by training authorities worldwide. At a recent international orthopaedic conference, none of a group of experienced orthopaedic educators could report significant progress on this issue.

The current Record of In Training Assessment (RITA) process which relies on simple assessment forms filled in by trainers and trainees is regarded widely as inadequate and lacking in objectivity. More robust evidence is needed.

The Orthopaedic Competence Assessment Project (OCAP), a combined initiative of the Education Committee of the British Orthopaedic Association and the Specialist Advisory Committee (SAC) in Trauma & Orthopaedics was given the remit to improve training through a competency-based portfolio of coaching and assessment tools. These instruments had to be easily understood by a range of trainers and trainees, not time-consuming and simple to apply.

OCAP recognises the need for a battery of tools to address the different aspects of performance. These have been described by Miller[1] who refers to different levels of assessment which are best tested in different ways (Fig. 1). In Miller's pyramid, 'knowing' and 'knowing how' are reliably tested in well-defined examination formats and set-piece assessments, such as clinical examinations and orals can monitor 'shows how'. However, 'does' requires real-time assessment and it is to this need that OCAP has responded.

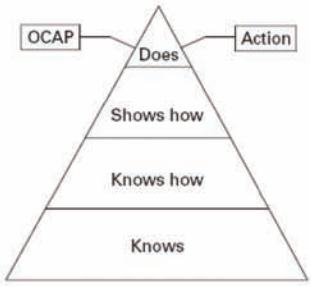

Fig. 1

Miller's pyramid.

Any assessment needs to be valid and reliable. Validity is well served by real clinical situations. Reliability, which is equally important, requires a tool which is practical, consistent and easy to repeat.

The instruments described below follow the principles of Miller[1] and Norman.[2] In this arti-

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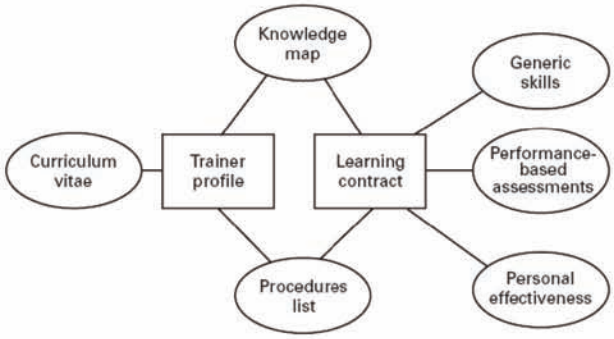

Fig. 2

Diagram of the Orthopaedic Competence Assessment Project system and tools.

PROCEDURES PROFILE

Procedure	Assessment				
	1	2	3	4	5
Hip					
Slipped upper femoral epiphysis					
Slipped upper femoral epiphysis open reduction		A			G
Slipped upper femoral epiphysis pinning		A			G
THR					
THR cemented		A			G
THR hybrid	A			G	
THR surface replacement	A			G	
THR uncemented		A			G

Fig. 3

An extract from Procedures Profile showing trainee's estimate of their position at start (A) and goal (G) for end of attachment (1, know about; 2, seen; 3, managed with help; 4, managed; 5, confident to manage).

KNOWLEDGE PROFILE

Topic	Progress plan			
	1	2	3	4
Hip				
Clinical assessment				
▪ A sound knowledge of clinical assessment of the hip, lumbosacral spine and knee. Particular reference should be paid to the gait, the Trendelenburg sign, limb length, loss of movement and deformity at the joint			A	G
▪ The trainee needs to be well informed of current opinion regarding aetiopathogenesis, clinical presentation and appropriate investigation of:		A		G
o Proximal femoral fractures (intracapsular, extracapsular) and simple fracture dislocations of the hip			A	G
o Osteoarthritis and the inflammatory arthropathies		A	G	
o Perthes' disease		A	G	
o Slipped upper femoral epiphysis		A	G	
o Septic arthritis		A	G	
o Osteonecrosis		A	G	
o Soft-tissue conditions around the hip (snapping hip, gluteus medius tendonitis, etc)		A	G	

Fig. 4

An extract from Knowledge Map showing trainee's estimate (A) of their position at start and agreed goal (G) for end of attachment (1, knows of; 2, knows basic concepts; 3, knows generally; 4, knows specifically and broadly).

cle, we describe the instruments, their validation and how reliability might be ensured.

OCAP instruments (Fig. 2)

The package consists of two types of instrument: agenda setting/coaching, and assessment.

The agenda-setting instruments of the trainer profile have been piloted and found to be acceptable in two large training programmes in the United Kingdom. The assessment instruments are also complete in terms of validity, but reliability studies are ongoing. The personal effectiveness instruments which coach and test generic skills are at an early stage of development.

How OCAP works. In advance of an attachment, trainers and trainees exchange information about themselves. A trainee's portfolio is shared with the trainer who provides a personal profile for the trainee. This profile is easily formatted from a database of 'knowledge' and 'procedures' and

Table I. List of performance-based assessments

1	Clinic activity in trauma and orthopaedics
2	Debridement of a wound
3	Carpal tunnel decompression
4	Digital and palmar fasciectomy
5	Diagnostic arthroscopy and simple arthroscopic procedures
6	Total knee replacement
7	First ray surgery to the foot
8	Total hip replacement
9	Lumbar discectomy
10	Compression hip screw for intertrochanteric fracture neck of femur
11	Hemiarthroplasty intracapsular fracture neck of femur
12	Application of limb external fixator
13	Operative fixation of Weber B fracture of ankle
14	Fixation of patella fractures by tension band wiring
15	Fixation olecranon fractures by tension band wiring
16	Intramedullary nailing for femoral or tibial shaft fractures
17	Tendon repair
18	Closed management of fractures

outlines the surgical training available in an attachment. The profile describes the procedures the trainer performs regularly and the knowledge base to underpin this activity. Both parties then meet at the start of the attachment and draw up a learning agreement of which the key objectives are: to identify the trainee's level of knowledge and experience; to set realistic goals and expectations for the attachment; to agree the knowledge which should be acquired during the attachment and to define those aspects of the trainee's performance to be assessed at the end of the attachment.

The agreement needs regular review by both parties, including a formal review at mid-attachment. However, plans may have to change according to circumstances. For example, a target may become unrealistic due to unforeseen circumstances such as ill health or prove to be overly optimistic. At the end of the attachment, the goals need to be compared with achievement. This comparison provides evidence for the summative RITA.

Figure 3 is an extract from a Procedures Profile showing a trainee's estimate (A) of their position at start of attachment and the goal for the end of the job (G).

Figure 4 is an extract from a Knowledge Map which similarly compares a trainee's estimate of their position at the start and finish of an attachment.

Performance-based assessments

A cornerstone of OCAP is the collection of performance-based assessments. These are formal, structured assessments of clinical activity (including surgical performance). They take a holistic approach, including understanding a problem, communicating, planning, operating and ensuring clear post-operative instructions.

Performance-based assessments identify and capture relevant activity, which is performed in sufficient numbers

Table II. The core content of performance-based assessments

I		Consent
	C1	Demonstrates sound knowledge of (contra) indications
	C2	Demonstrates sound knowledge of complications of surgery
	C3	Demonstrates awareness of specific problems at surgery generated by the disease being treated
	C4	Explains the peri-operative process to the patient and/or relatives and checks understanding
	C5	Explains likely outcome and time to recovery and checks understanding
II		Pre-operative planning
	PL1	Demonstrates recognition of anatomical and pathological abnormalities and operative strategy to deal with these
	PL2	Ability to make reasoned choice of appropriate device (if any) using appropriate investigations e.g. x-rays
	PL3	Checks equipment and device requirements with operating room staff
	PL4	Where applicable ensures the limb is marked
III		Pre-operative preparation
	PR1	Ensures proper and safe positioning of the patient on the operating table
	PR2	Ensures devices e.g. diathermy and tourniquet are deployed safely
	PR3	Arranges for and deploys supporting equipment e.g. imaging intensifiers effectively
	PR4	Adequately prepares a sterile operating field
IV		Exposure and closure
	E1	Demonstrates knowledge of optimum skin incision
	E2	Demonstrates respect for soft tissues including skin
	E3	Achieves an adequate exposure and identifies all structures correctly
	E4	Completes a sound reconstruction
	E5	Protects the wound properly with dressings and splints
V		Intra-operative technique
	IT1	Follows a logical sequence or protocol for the procedure
	IT2	Adheres to hospital protocols and policies
	IT3	Anticipates and responds appropriately to variation
	IT4+	See individual performance-based assessments for detail
VI		Closing the loop
	CL1	Ensures the patient is transferred from operating table to bed
	CL2	Construct a clear operation note, retaining the equipment documentation and checking x-rays where appropriate
	CL3	Gives documented and sensible post-operative instructions
	CL4+	See individual performance-based assessments for detail

Table III. An example of a logbook correlation

		A	STS	STU	P	T	Total exposure in years 1 to 6	Total actually performed in years 1 to 6
	All elective in Deanery X	353	314	137	190	7	1001	641
	All elective in Deanery X	391	223	84	247	20	965	554
1	Clinic activity in trauma and orthopaedics							
2	Debridement of a wound							
3	Hand – carpal tunnel decompression	4	6	4	40	6	60	50
4	Hand Dupuytren surgery	9	7	1	4	0	21	12
5	Knee arthroscopy with procedure	24	21	23	38	1	107	82
5	Knee arthroscopy	9	10	11	17	1	48	38
5	Shoulder and elbow – shoulder arthroscopy with procedure	10	7	1	1	0	19	9
5	Shoulder and elbow – shoulder arthroscopy	2	2	1	1	0	6	4
6	Joint replacement knee	51	39	5	12	1	108	56
7	Foot and ankle – hallux valgus surgery	13	10	1	7	1	32	18
7	Foot and ankle – lesser toe surgery	5	6	2	6	0	19	14
7	Foot and ankle – midfoot and hindfoot surgery	13	5	1	3	0	22	9
8	Joint replacement hip	62	38	4	12	1	117	54
9	Spine – discectomy	7	2	0	0	0	9	2
9	Spine – decompression	6	2	0	0	0	8	2
10	Trauma – hip fractures (intracapsular)	8	13	7	59	8	95	79
11	Trauma – hip fractures (extracapsular)	3	6	7	47	10	73	60
12	Trauma – application of external fixator	5	5	1	5	1	17	11
13	Trauma – ORIF* ankle	5	10	4	33	4	56	47
14	Trauma – ORIF patella	1	1	0	2	0	4	3
15	Trauma – ORIF olecranon	1	2	1	5	1	10	8
16	Trauma – femoral nails	6	9	3	8	1	27	20
16	Trauma – tibial nails	3	6	1	6	1	17	13
17	Hand – tendon repair	3	3	1	13	1	21	17
18	Trauma – MUA† + Kirschner wiring	3	4	8	59	8	82	71

* ORIF, open reduction and internal fixation

† MUA, manipulation under anaesthesia

A, assisted; STS, surgeon with trainer scrubbed; STU, surgeon with trainer present but unscrubbed; P, surgeon with trainer available but not in the operating room; T, teaching junior surgeon

often enough to allow reliable measurement. They allow data capture through observations of a series of similar events. This is akin to the mini clinical examination and history taking skills (CEX) and simple practical procedures such as establishing an intravenous line which are based on work by Norcini et al.[3] They found that snapshots of clinical activity can be used reliably provided about 15 similar but unrelated events are assessed by properly trained observers. The Royal College of Physicians expects about 40 CEX's to be provided over the five years of Higher Medical Training (personal communication).

OCAP uses a Delphi method (consensus of an expert group) of validating performance-based assessment. We identified 18 activities which were felt by a nominated group of experts to be representative of trauma and orthopaedic surgery. These include work in the wards and clinics, and commonly performed operations (Table I). Each operation is split into domains, including consent, common to pre-operative planning, preparation and surgical technique. Each domain has further components, the majority being all the performance-based assessments and all can be related to the outcomes defined in 'Good Clinical Practice'.[4] In each domain the trainee is required to demonstrate evidence of knowledge and skills (Table II).

In order to validate the performance-based assessment and its domains, meetings of trainers and trainees took place in two regions of the United Kingdom. These were followed up by postal questionnaires. The overwhelming response was that the instruments are relevant, easily usable and supported the impression of the Delphic groups, confirming that the identified performance-based assessments are realistic.

More recently we correlated the current performance-based assessment with the frequency of activity reported in the National Trauma and Orthopaedic Log Book.[5] Table III shows that in general the Delphi method of identifying commonly performed procedures is confirmed. However, there are problems ensuring that the procedures are performed often enough to permit reliable interpretation of data. For example, there was strong consensus that the application of an external fixator contains unique competencies. However, trainees seldom encounter this procedure outside a specialist attachment. As Sher et al[6] point out, unless all training opportunities are used it would be difficult adequately to assess competence in many procedures.

The strengths of OCAP include a consolidation sheet which not only lists procedures but also maps the domains of competency (Fig. 5). This permits a training director to record experience of core procedures and identify progress in the domains. For example, a trainee may be performing well technically but be consistently identified as a poor communicator. Such observations, especially when made

PBA consolidation sheet

Trainee: _____

Trainer(s): _____ Date(s): _____

Indicative procedures (PBA)	Technical																																				
	Consent					Pre op planning						Pre op prep'n				Expose close					Intra op tech								Closing loop							
	C1	C2	C3	C4	C5	PL1	PL2	PL3	PL4	PL5	PL6	PR1	PR2	PR3	PR4	E1	E2	E3	E4	E5	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	CL1	CL2	CL3	CL4	CL5	CL6
	Implications & complications	Specific problems	Perioperative	Outcome/recovery		Anatomy & pathology	Discuss & investigations	OR staff				Positioning	Device safety	Equipment safety	Sterile field	Incision	Soft tissue	Exposure	Reconstruction	Wound protection	Individual features	Logical protocol	Follows protocol	Variations					Patient transfer	Op note	Post op instructions			

Additional significant experience	Reflections on total attachment experiences	Conclusions drawn from attachment	Plans & personal goals for next attachment

Fig. 5

An example of the performance-based assessment consolidation sheet

by different observers, provide powerful information for appraisal.

The current status of OCAP

OCAP instruments have been reviewed and triangulation studies indicate they are valid. Early work shows they are reliable and further inter-observer studies are under way. Trainers and trainees have been provided with a structure based on conventional educational instruments and given a means of mapping back to core competencies. The evolving synergy with the orthopaedic log book gives strong supporting evidence of training activity.

We now have a curriculum which meets the standards prescribed by national validating bodies and uses practicable language and taxonomy for trainers and trainees.

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Clinical academic medicine

The way forward

A report from the Forum on Academic Medicine

November 2004

Royal College of Physicians

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3 Training to be an academic surgeon

The Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, and the Royal College of Physicians and Surgeons of Glasgow

Introduction

3.1 The Royal Colleges of Surgeons of England and of Edinburgh, and the Royal College of Physicians and Surgeons of Glasgow, have played a positive role in developing the careers of academic surgeons through fellowships awarded by their research boards and links with other bodies such as the MRC. Many of the specialist societies have also set up research fellowships for young surgeons. In addition, the Academy of Medical Sciences and the Health Foundation have set up both Clinician Scientist Awards and Senior Awards specially targeted at surgery. The potential for high quality surgical research has never been greater and many excellent young people carry out very high quality research, although overall they are not retained in academic surgery.

3.2 The following contribution takes account of all surgical specialties.

3.3 Academic surgery is under particular threat because universities have high expectations of clinical academics in terms of high impact research, which can be difficult to achieve by doctors who are also required to perfect and maintain technical skills. Another pressure is the need for clinical throughput within the NHS. These problems are a particular issue for the specialties where there is a need to maintain a high level of hand–eye coordination and manual dexterity for continued clinical competence. This issue could be addressed by integrating academic surgeons into specialist teams.

3.4 The main difficulties affecting academic surgery are:

- attracting good young people back into academic surgery at the late SpR/clinical lecturer level after they have completed an MD or PhD
- nurturing and protecting their research skills at this stage
- recruiting and retaining senior people at the clinical senior lecturer level.

3.5 There is a real need to increase the numbers of academic surgeons because of the need to train the increased numbers of medical students planned for the future, and the junior doctors thus produced. The aim of this section of the report is to address these demands by providing advice and making recommendations with respect to clinical career pathways in academic surgery. The specific aims are to:

- Provide schemes for academic surgeons who plan to pursue careers in research and teaching
- Produce academic surgeons who will improve patient care through clinical research (including evidence-based studies)
- Facilitate translation of the advances in basic research to improve patient health.

Objectives

3.6 The objectives are to:

- Establish flexible career pathways for those pursuing a career in academic surgery, whether in research or teaching
- Ensure that flexibility in training is achieved by formulating *ad personam* programmes
- Ensure that, whatever route is chosen by academic trainees, their acquisition of clinical skills is equivalent to that of their non-academic colleagues, although it may be more limited in scope
- Work with the PMETB and the Joint Committee on Higher Surgical Training (JCHST) to develop new competency-based assessment processes that will support 'high flyers' to enable them to progress at an appropriate pace through their clinical training programme
- Ensure that the current practice of allowing time for research during the clinical training programme is continued for those who wish to do so.

Pathways for careers in academic surgery

Recommended entry requirements

3.7 Individuals who wish to enter a clinical career pathway for academic surgery:

- Should have demonstrated academic potential, for example by having a good BSc degree, or equivalent, and/or by the publication of papers and reviews, or by having completed an MB/PhD programme
- Will have completed their two-year Foundation training – some may have had exposure to academic 'tasters' in Foundation year 2
- Will have obtained or be intent on obtaining surgical training and will obtain their Membership of the Royal College of Surgeons (MRCS) during the early part of specialist training
- Will generally be expected to obtain a two- to three-year Fellowship leading either to an MD or a PhD as their first period of research.

Proposals for academic career pathways

3.8 The Savill Report[3] indicated that two periods of research training are required for clinician scientists. The first period is to obtain a higher degree, eg an MD or PhD, and the second period is to enable the trainee to establish their independent research programme, before or shortly after obtaining a CCT. Individuals pursuing a career in teaching are likely to obtain a higher degree during the first academic training period and then gain educational qualifications.

First period of training

3.9 Clinical academics will need to obtain a CCT in one of the surgical specialties, as well as an MD or PhD. Thus, academic trainees need to combine their research training with their clinical training, which will be similar to that of non-academic surgeons. Individuals interested in pursuing a teaching career could combine their research training with an educational course that would lead to a qualification in education. Essentially this will comprise a two- or three-year research fellowship taken as an out-of-programme period after the surgical trainee has won

a position on an SpR training programme. We hope that this becomes the norm rather than a two- to three-year fellowship taken before the trainee obtains a position as an SpR.

3.10 It is recognised that flexibility within these schemes will be required, and that *ad personam* schemes will need to be devised within these guidelines. In addition, as before, a non-CCT route to the Specialist Register will also be available on an *ad personam* basis.

Second period of training

3.11 The main purpose of this period is to enable the academic trainee to establish their independent research programme or develop their teaching skills. Although it is hoped that this would be started just before CCT, it is likely that in many instances it will be started just afterwards. It will combine clinical and research work as a post-CCT Fellow.

3.12 It will usually take place once the trainee has obtained an MD or PhD. This period of training may be accomplished either by obtaining an appropriate four- to five-year fellowship, or by securing an appointment as a lecturer/senior lecturer. The fellowship may be advantageous in allowing greater flexibility for periods of study abroad, and by allowing periods that are free from any teaching or administrative commitments. Individuals who obtain a Clinician Scientist Fellowship will be eligible for a NTN(A), and this scheme may be enlarged to include clinical lecturers in the future. Individuals pursuing a teaching career would, at this stage, consider undertaking further training in educational methods and development of curricula, and gain higher qualifications in education. Figure 2 shows the optional routes available to those training to be academic surgeons.

Funding opportunities

3.13 Aside from College and specialist society fellowships, the MRC, Cancer Research UK and Wellcome Trust offer Research Training Fellowships, and Clinician Scientist or Advanced Fellowships for the first and second periods of training respectively.

Role of the Royal Colleges of Surgeons

3.14 Academic trainees need to be nurtured carefully. There should be a system whereby senior academic surgeons can mentor trainee clinical academic surgeons. The Research Boards of the Royal Colleges of Surgeons and their specialist societies/boards have a role to play in developing and supporting such a system.

3.15 The Royal Colleges of Surgeons support the idea that senior academic surgeons be appointed in teams of two or three to provide a critical mass of clinical and academic work. Academic departments of surgery will need to be focused in their research and clinical work. In most universities, this may mean that only a few of the surgical specialties can be supported with full academic teams.

3.16 During the second period of research, the Royal Colleges of Surgeons and their specialist societies/boards through the Royal College of Surgeons Specialist Advisory Committees should ensure that the academic surgeon has a carefully constructed and focused clinical and research programme. Academic surgeons should have enough clinical exposure to maintain clinical skills and enough time to ensure progress in research and teaching.

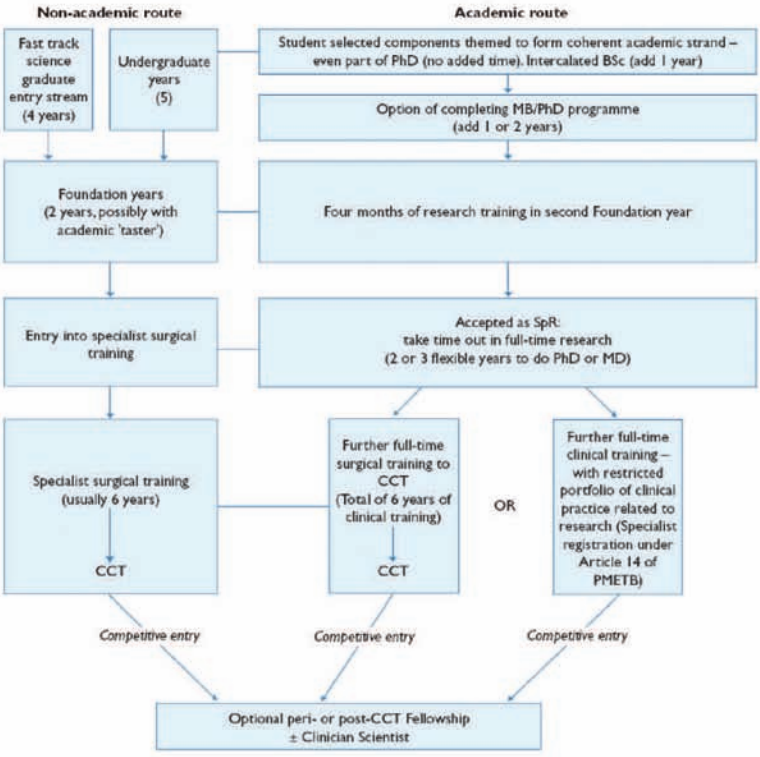

Fig 2 Career pathways for academic surgical trainees. CCT = Certificate of Completion of Training.

3.17 The Royal Colleges of Surgeons, through the JCHST and PMETB, should encourage flexibility for academic trainees' training programmes, tailored to their individual requirements.

3.18 The Royal Colleges of Surgeons should consider setting up pump-priming funding for new clinical senior lecturer posts in surgery.

3.19 This section of the report may be read in conjunction with *Clinical academic careers – surgery*,[15] a paper recently approved by the Council of the Royal College of Surgeons of England.

f) BLUEPRINT SAMPLES FOR EXAM DEVELOPMENT

Orthopaedic Surgery - Higher Surgical Training

Knee	Good clinical care	Communication skills	Maintaining good medical practice	Maintaining trust	Working with colleagues	Teaching and training	Basic sciences	Decision making ??	Research	Professional development
Competencies	History taking, examin., note keeping Time & risk managt., decision making Life support	With patients With colleagues With reports Giving evidence	Learning Evidence, audit & guidelines	Professional behaviour Ethics & legal issues	Team members Hospital & GP Hospital & other agencies	Teaching Presentations	Anatomy Biomechanics & BioengineeringPhysiology, Biochemistry & Genetics Bone & Joint disease: Ortho. OncologyBone & Joint disease: General Investigations Operative topics Infection, thromboembolism & pain			Management Leadership Organisational awareness Diversity Learning
Ligamentous, bony & combined trauma										
Arthritides										
Inflammatory disease & infection										
Benign & malignant conditions										
Deformity										
Epiphysial disorders										
Osteochondritis										
Discoid meniscus										
Patello femoral & meniscal injury										

Knee	Good clinical care	Communication skills	Maintaining good medical practice	Maintaining trust	Working with colleagues	Teaching and training	Basic sciences	Decision making ??	Research	Professional development
Competencies	History taking, examin., note keeping Time & risk managt., decision making Life support	With patients With colleagues With reports Giving evidence	Learning Evidence, audit & guidelines	Professional behaviour Ethics & legal issues	Team members Hospital & GP Hospital & other agencies	Teaching Presentations	Anatomy Biomechanics & BioengineeringPhysiology, Biochemistry & Genetics Bone & Joint disease: Ortho. OncologyBone & Joint disease: General Investigations Operative topics Infection, thromboembolism & pain			Management Leadership Organisational awareness Diversity Learning
Instability of knee										
Ligament def.										
Synovial disorders										
Soft tissue injuries										
Ligament rupture										
Dislocations of patella/tibia/fibula										
Fractures of patella/tibia/fibula/ femoral part										
Internal derangement of knee										
Infections										
Inflammation of bursae										
Synovial disorders										

g) FREQUENTLY ASKED QUESTIONS

Selection & Recruitment

1. **Will experience gained in undergraduate electives/attachments be considered in selection for run-through training?**

   Yes. Any extra-curricular experience gained as a student or postgraduate which helps the applicant to fulfil the entry requirements defined in this curriculum will be advantageous. This might include evidence of electives or special study modules where relevant skills, knowledge or attitudes have been enhanced.

2. **Will I be disadvantaged in the selection process if I have not worked in T&O during Foundation 1 & 2?**

   No. The content of your Foundation programme will not be considered. However, evidence of extra-curricular activity relevant to the entry requirements defined in this curriculum may be considered.

3. **Will experience gained in "time limited" training posts be counted towards future selection and progression for run-through training?**

   Yes, if trainees in time-limited training posts ensure that they continue to compile portfolios demonstrating the acquisition of the skills, knowledge and attitudes defined in this curriculum.

4. **What methods of appeal do I have if I believe my experience has not been fairly recognised towards selection or run-through training?**

   Your Foundation posts as such will not be taken into account but extra experience from courses, visits to departments, or voluntary experience can be. You can also submit information from your undergraduate folder. An appeals process will be run by appointing deaneries.

5. **How much importance will be attached to published research and higher degrees for selection into run-through training in T&O?**

   Research may be advantageous where it can be shown to have enhanced the relevant attributes of the applicant as set out in this curriculum. For example a completed project would help to demonstrate commitment. However, research alone will not fulfil all of the entry requirements defined in this curriculum.

6. **Can I sit the MRCS before being selected for run-through training and would this be advantageous in the selection process?**

   The MRCS or what replaced it is unlikely to be available pre selection it would confer no advantage in the selection process.

7. **What would happen if I wanted to change specialties after I have entered run-through training?**

   A trainee is entitled to apply for entry into another specialty at any stage of the training programme depending on the availability of training posts. Whether the trainee is successful will depend on their ability to fulfil the entry requirements of the desired specialty. If successful, the trainee's portfolio will be used to decide the level at which they can enter the desired training programme.

Syllabus and Assessment

1. **Can I progress to ST3 if I have not passed the generic exam in ST2?**

   No. Progression through training depends upon satisfactory completion of assessments at each stage. The exam is an important component of assessment during ST2.

2. **Where can I find evidence of the validity of the new WPBAs such as mini-CEX, DOPS, PATs and PBAs?**

   Mini-CEX, DOPS and PAT are primarily foundation tools that will be carried over into Higher Surgical Training but their use will diminish as HST progresses. PBAs have been developed specifically for Higher Surgical Training and have been extensively piloted in Orthopaedics which is where they originated. Some information on their development and validity can be found in a paper published last September (JBJS ref). In addition there is a more extensively reliability study being conducted in Autumn 2006 which will study the use of the instruments in General Surgery and Orthopaedics.

3. **What happens if I am deemed to be unsatisfactory in a work placed based assessment (WPBA)?**

   The trainee should have the opportunity to retake the WPBA as soon as the trainee and their trainer agree that sufficient further training has taken place. If the trainee continues to be unsatisfactory in WPBAs the programme director and RITA panel will decide, on the basis of all the evidence in the trainees portfolio, if the trainee can receive further remedial training or if they should be removed from the training programme.

4. **What do I do if I disagree with the outcome of a WPBA?**

   The outcome should be discussed with the trainer and if necessary the programme director. With the agreement of the programme director the trainee should be permitted to take the WPBA once again with different assessors.

5. **What do I do if I believe the training in a particular attachment to be sub-standard?**

   The problem should first be discussed with the programme director or chair of the local training committee. If this is impractical or unsatisfactory then the trainee should contact the SAC link person for their training region. The trainee should consider collecting supportive evidence such as logbook data, corroboration from other trainees and request that the SAC review previous trainee assessments of the post in question.

6. **Have the rules for taking time out of training for research or personal reasons changed?**

   No. Trainees will still be entitled to request time out of programme. They will need to seek approval, as before, from the programme director, postgraduate dean and SAC.

7. **What happens if I do not pass the Intercollegiate Specialty Exam in ST7 or 8?**

   A trainee will not be able to obtain a CCT without successfully passing the intercollegiate specialty exam. Trainees will need to remain in training until they are successful or in very rare circumstances opt not to complete their training if they are unable to pass the exam

8. **Can I complete my training in less than 8 years if I achieve my competencies more rapidly?**

   Completion of training will be defined by the issue of a CCT. This can be issued when the trainee can demonstrate to the SAC that they have satisfactorily attained all the competencies defined in this curriculum. It may, therefore, be possible for a few trainees to obtain a CCT in less than eight years.

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The ArgO Medical Education Programme is designed to support orthopaedic Registrars throughout their training years. ArgO connects members to a number of educational resources including worldwide Fellowship opportunities, courses and to key opinion leaders. Membership of the Programme is free and is open to all orthopaedic Registrars in the United Kingdom and the rest of the world.

The Programme is led by a key group of orthopaedic surgeons from around the UK. This Steering Group meet quarterly to provide guidance to the design, operation and functionality of the Programme.

Some of the benefits ArgO offers its members are:

- Fellowship opportunities
- Listings of orthopaedic courses
- Unique key opinion leader question section
- Course and fellowship review facility
- Direct access to Orthopedic Hyperguide Question bank
- Direct access to Orthopedic Hyperguide Podcasts
- Member discounts
- Fellowship information evenings
- Prize draws

Please visit the website on www.argoregistrars.co.uk to become a member or alternatively email admin@argoregistrars.co.uk for further information.

We look forward to welcoming you to the ArgO Medical Education Programme.

One resource…….a world of opportunity

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