Trauma & Orthopaedic Curriculum Mapped to Simulation Options

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

We aspire to provide equality of access to all trainees for opportunities in simulation, but recognise that cost and availability of some high tech facilities may limit access locally. There will be scope for a range of simulations from low to high fidelity and low to high technology. Many of these will be available locally but some will be provided at national or regional centres. This will help to provide uniformity of standards across training and orthopaedics (T&O) in the UK – deliverable and affordable for all trainees. Other benefits to the use of simulation include trainees who have 'timeout' eg maternity leave or longterm sickness, and who might be able to access these opportunities during their periods of absence, or as part of a return to practice period, to recover skills that have degraded during the period of absence; trainees not in full-time training may benefit if experiences can be accessed outwith clinical areas; and for the purpose of retraining surgeons whose skills are called into question.

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

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

Trauma and orthopaedics has a long and established track record in the area of simulation and simulated tasks. Whilst the Training Standards Committee is anxious to embrace technology enhanced learning, our priority must be the expert supervision of trainees and appropriate preparation of trainers. We have endeavoured to explore aspects of simulation, which can be easily and inexpensively accessed by T&O trainers and trainees throughout the country. Ideally, facilities should be available close to the clinical area, with expert supervision/feedback available, and accessed in a flexible way around patient workload. Although the focus is on error avoidance and risk management, we have worked hard to ensure this is not at the expense of innovation and creativity.

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

BACKGROUND

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

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

1. Be patient centred and service driven

2. Be educationally coherent

3. Be innovative and evidence based

4. Deliver high quality educational outcomes

5. Deliver value for money

6. Ensure equity of access and quality of provision.

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

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

SIMULATION OPPORTUNITIES

On Site Equipment Assembly (equ)

For rarer procedures where the trainee is expected to take a low level of responsibility, they should be able to gather and assemble the appropriate equipment e.g. application of halo traction or application of a pelvic external fixator.

Low Tech/Cost Options

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

Examples

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

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

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

Removal of malignant tumour

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

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

Scarf Osteotomy for Hallux Valgus

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

Arterial and Nerve Repair

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

Tendon Repair, Decompression, Lengthening and Transfer

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

Cementing Techniques

To be practiced using cement and a large barrelled syringe.

Debriding a Wound

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

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

Peer/Simulated Patient Skills Practice (PSP)

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

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

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

Example of a patient with back pain

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

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

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

Bone Models (bon)

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

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

Cadaveric Surgery (cad)

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

Grouping Simulations

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

Paediatrics

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

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

The surgical approaches are largely the same ones as in adult orthopaedics so trainees need to learn to do them carefully on small people. The unfamiliar

approaches (mainly anterior to the hip) can be learned on an adult cadaver.

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

Courses

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

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

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

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

Other Technology Enhanced Learning

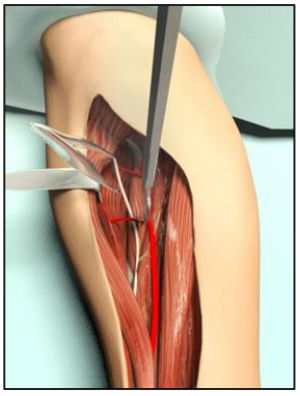
Virtual Learning Environment

A wide variety of Virtual Learning Environments or “Learning Management Systems” are available. Regardless of which system is used, it should facilitate student registration, deliver course materials, communicate, test and track, as well as being relevant and logically organised.

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

Touch Surgery

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



http://www.touch-surgery.com

Assessment

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

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

AUDIT

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

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

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

Applied Clinical Skills Mapped to Simulation Options

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
1 = Has observed or knows of	**4 = Able to manage without assistance including potential common complications**
2 = Can manage with assistance	**5 = Able to manage complex cases and their associated potential complications**

Strongly recommended for early years CT/ST1 – 4 by August 2013

Aspirational/optional or later years for focused training – by August 2013

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma General				
Compartment syndrome				
Fasciotomy for compartment syndrome	1	4	5	**cad**
Measurement of compartment pressures	1	4	5	**equ**
Correction of malunion or other deformity	0	4	5	**bon**
Evacuation of haematoma	2	5	5	**LT/C**
Excision / ablation of ingrowing nail	1	5	5	**cad**
Iliac crest bone graft harvesting	2	5	5	**cad**
Infection				
Incision and drainage of abscess	3	5	5	**LT/C**
Irrigation and debridement native joint for infection	1	4	5	**equ**
Metalware and frames				
Application of external fixator (not spanning or Ilizarov)	0	4	5	**bon**
Application of Ilizarov frame	0	3	5	**bon**
Application of skeletal traction	1	5	5	**equ**
Application of spanning external fixator	0	4	5	**bon**
Removal external fixator or frame	2	5	5	**equ**
Removal K wires or skeletal traction	2	5	5	**equ**
Removal metal	2	4	5	**bon**
Neurovascular injuries				
Arterial repair +/- graft	0	1	5	**cad/ LT/C**
Nerve repair	0	3	5	**cad/ LT/C**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Open reduction and fixation of periprosthetic fracture	0	3	5	
ORIF osteochondral fragment in joint	0	3	5	**cad**
Removal foreign body from skin / subcutaneous tissue	2	5	5	**LT/C**
Tendon repair	1	4	5	**LT/C**
Wound management				
Free flap	0	1	1	**cad**
Full thickness skin graft	0	3	5	**cad**
Muscle flap	0	1	1	**cad**
Pedicle flap	0	1	1	**cad**
Split skin graft	0	3	5	**cad**
Transposition flap	0	1	1	**cad**
Wound closure	3	5	5	**LT/C**
Wound debridement	3	5	5	**LT/C**
Elective General (Site Non Specific)				
Aspirations / injections				
Aspiration / injection ankle joint	0	4	5	**cad/man**
Aspiration / injection elbow joint	0	4	5	**cad/man**
Aspiration / injection foot joint	0	4	5	**cad/man**
Aspiration / injection hip joint	0	3	5	**cad/man**
Aspiration/ injection hand and wrist	0	4	5	**cad/man**
Aspiration / injection knee joint	2	5	5	**cad/man**
Aspiration / injection shoulder joint	0	5	5	**cad/man**
Botulinum toxin injection - musculoskeletal	0	3	5	**cad/man**
Benign tumour excision (not exostosis)	0	3	5	**LT/C**
Biopsy bone - needle	0	3	5	**LT/C**
Biopsy bone - open	0	3	5	**LT/C**
Currettage pinsites	0	5	5	
Cyst bone curettage +/- bone graft	0	3	5	**LT/C**
Distraction lengthening of bone upper limb	0	2	5	**equ**
Endoprosthetic replacement for malignant bone tumour - not femur / humerus / tibia	0	1	5	
Epiphysiodesis	0	1	5	
Exostosis / osteochondroma excision	0	3	5	
Injection of bone cyst	0	1	5	
Malignant tumour excision	0	1	5	**LT/C**
Nerve decompression / neurolysis	2	4	5	
Osteomyelitis excision including sequestrectomy	0	3	5	**LT/C**
Soft tissue procedures				
Biopsy soft tissue	0	3	5	**LT/C**
Bursa excision	0	4	5	**LT/C**
Ganglion excision	0	4	5	**LT/C**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Muscle biopsy	0	4	5	**LT/C**
Release contracture joint	0	3	5	
Synovectomy	0	3	5	**cad/ LT/C**
Tendon decompression	0	4	5	**LT/C**
Tendon lengthening	0	3	5	**LT/C**
Tendon transfer	0	3	5	**LT/C**
Tenodesis	0	3	5	**DIY**
Amputations				
Forequarter amputation	0	1	5	**eqi**
Above elbow amputation	0	2	5	**cad**
Below elbow amputation	0	2	5	**cad**
Finger amputation	0	4	5	**cad**
Hindquarter amputation	1	1	5	**cad**
Above knee amputation	0	3	5	**cad**
Through knee amputation	0	1	5	**eqi**
Below knee amputation	1	4	4	**cad**
Through ankle amputation	0	1	5	**equ**
Hindfoot amputation	0	2	5	**cad**
Midfoot amputation	0	1	5	**cad**
Toe amputation	0	4	5	**cad**

Applied Clinical Skills: Spine

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Spine				
Cervical Spine				
Anterior column reconstruction cervical spine	0	1	5	**cad,ani,equ**
Anterior fixation fracture / dislocation cervical spine	0	1	5	**cad,ani,equ**
Application halo / tong traction cervical spine	0	1	5	**equ, LT/C**
MUA fracture / dislocation cervical spine	0	1	5	**cad,ani,equ,bon**
Non-classifiable cervical spine trauma procedure	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction cervical spine	0	1	5	**cad,ani,equ,bon**
Posterior fixation fracture / dislocation cervical spine	0	1	5	**cad,ani,equ,bon**
Brachial Plexus				
Exploration / repair / grafting brachial plexus	0	1	5	**cad**
Exploration of brachial plexus	0	1	5	**cad**
Repair +/- grafting brachial plexus	0	1	5	**cad**
Thoracic Spine				
Anterior column reconstruction thoracic spine	0	1	5	**cad,ani,equ,bon**
Anterior decompression / fixation thoracic spine	0	1	5	**cad,ani,equ,bon**
Anterior decompression thoracic spine	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction thoracic spine	0	1	5	**cad,ani,equ,bon**
Posterior decompression / fixation thoracic spine	0	1	5	**cad,ani,equ,bon**
Posterior decompression thoracic spine	0	1	5	**cad,ani,equ,bon**
Lumbar Spine				
Anterior column reconstruction lumbar spine	0	1	5	**cad,ani,equ,bon**
Anterior decompression / fixation lumbar spine	0	1	5	**cad,ani,equ,bon**
Anterior decompression lumbar spine	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction lumbar spine	0	1	5	**cad,ani,equ,bon**
Posterior decompression / fixation lumbar spine	0	1	5	**cad,ani,equ,bon**
Posterior decompression lumbar spine	0	1	5	**cad,ani,equ,bon**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Elective Spine				
Cervical Spine				
Anterior column reconstruction cervical spine	0	1	5	**cad,ani,equ,bon**
Cervical disc replacement	0	1	5	**cad,ani,equ,bon**
Cervical laminectomy	0	1	5	**cad,ani,equ,bon**
Cervical laminoplasty	0	1	5	**cad,ani,equ,bon**
Cervical vertebrectomy for myelopathy	0	1	5	**cad,ani,equ,bon**
Excision hemivertebra	0	1	5	**cad,ani,equ,bon**
Fixation and fusion procedures				
Anterior decompression +/- fixation / fusion (C2 - C7)	0	1	5	**cad,ani,equ,bon**
Atlantoaxial fixation +/- fusion	0	1	5	**cad,ani,equ,bon**
C1 pedicle screws and C2 fusion	0	1	5	**cad,ani,equ,bon**
Occipital / cervical / thoracic fusion	0	1	5	**cad,ani,equ,bon**
Occipital cervical fusion	0	1	5	**cad,ani,equ,bon**
Occipito-cervical fusion +/- fixation	0	1	5	**cad,ani,equ,bon**
Posterior decompression +/- fixation / fusion (C2 - C7)	0	1	5	**cad,ani,equ,bon**
Transarticular screws C1/C2	0	1	5	**cad,ani,equ,bon**
Investigations and injections				
Biopsy cervical spine	0	1	5	**cad,ani,equ,bon**
Discogram	0	1	5	**cad,ani,equ,bon**
Epidural	0	1	5	**cad,ani,equ,bon**
Nerve root / facet joint injection cervical spine	0	1	5	**cad,ani,equ,bon**
Osteotomy for spine sagittal plain imbalance	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction cervical spine	0	1	5	**cad,ani,equ,bon**
Revision cervical discectomy	0	1	5	**cad,ani,equ,bon**
Thoracic outlet obstruction				
Excision cervical / 1st rib	0	1	5	**cad,ani,equ,bon**
Thoracic outlet release (not excision cervical / 1st rib)	0	1	5	**cad,ani,equ,bon**
Thoracic Spine				
Anterior column reconstruction thoracic spine	0	1	5	**cad,ani,equ,bon**
Costoplasty	0	1	5	**cad,ani,equ,bon**
Excision hemivertebra	0	1	5	**cad,ani,equ,bon**
Fixation or fusion procedures				
Anterior decompression +/- fixation / fusion	0	1	5	**cad,ani,equ,bon**
Posterior decompression +/- fixation / fusion	0	1	5	**cad,ani,equ,bon**
Investigations and injections				
Biopsy thoracic spine	0	1	5	**cad,ani,equ,bon**
Discogram	0	1	5	**cad,ani,equ,bon**
Kyphosis correction				
Kyphoplasty corpectomy	0	1	5	**cad,ani,equ,bon**
Kyphosis correction - anterior and posterior	0	1	5	**cad,ani,equ,bon**
Kyphosis correction - anterior only	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction thoracic spine	0	1	5	**cad,ani,equ,bon**
Scoliosis correction - anterior release +/- instrumentation	0	1	5	**cad,ani,equ,bon**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Scoliosis correction - posterior fusion +/- instrumentation	0	1	5	**cad,ani,equ,bon**
Scoliosis correction				
Anterior release + posterior fusion and instrumentation for scoliosis	0	1	5	**cad,ani,equ,bon**
Growing rods for scoliosis	0	1	5	**cad,ani,equ,bon**
Lengthening of growing rods for scoliosis	0	1	5	**cad,ani,equ,bon**
Localiser cast for scoliosis	0	1	5	**cad,ani,equ,bon**
Scoliosis correction - anterior release +/- instrumentation	0	1	5	**cad,ani,equ,bon**
Scoliosis correction - posterior fusion +/- instrumentation	0	1	5	**cad,ani,equ,bon**
Thoracic disc replacement	0	1	5	**cad,ani,equ,bon**
Vertebroplasty	0		5	**cad,ani,equ,bon**
Thoracoscopic spinal procedures +/- instrumentation	0	1	5	**cad,ani,equ,bon**
Lumbar Spine				
Anterior column reconstruction lumbar spine	0	1	5	**cad,ani,equ,bon**
Decompression lumbar spine without fusion (not discectomy alone)	0	2	5	**cad,ani,equ,bon**
Discectomy open / micro	0	2	5	**cad,ani,equ,bon**
Excision hemivertebra	0	1	5	**cad,ani,equ,bon**
Fixation and fusion procedures				**cad,ani,equ,bon**
ALIF	0	1	5	**cad,ani,equ,bon**
Decompression lumbar spine with fusion +/- fixation	0	1	5	**cad,ani,equ,bon**
PLIF	0	1	5	**cad,ani,equ,bon**
TLIF	0	1	5	**cad,ani,equ,bon**
Investigations and injections				
Caudal epidural injection	0	3	5	**cad,ani,equ,bon**
Discogram	0	1	5	**cad,ani,equ,bon**
Epidural	1	3	5	**PSP,man**
Facet joint injection lumbar spine	0	1	5	**cad,ani,equ,bon**
Nerve root injection lumbar spine	0	1	5	**cad,ani,equ,bon**
Lumbar disc replacement	0	1	5	**cad,ani,equ,bon**
Lumbar spine - dynamic neutralisation system	0	1	5	**cad,ani,equ,bon**
Osteotomy for spine sagittal plain imbalance	0	1	5	**cad,ani,equ,bon**
Posterior column reconstruction lumbar spine	0	1	5	**cad,ani,equ,bon**
Revision lumbar discectomy	0	1	5	**cad,ani,equ,bon**
Vertebroplasty	0	1	5	**cad,ani,equ,bon**

Applied Clinical Skills: Shoulder

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Shoulder				
Clavicle				
ORIF clavicle fracture	0	4	5	**bon/cad**
ORIF non-union clavicle fracture	0	3	5	**bon/cad**
SC joint dislocation closed / open reduction	0	3	5	**bon/cad**
SC joint instability/open stabilisation	0	2	5	**bon/cad**
Shoulder				
Acromioclavicular joint dislocation acute ORIF	0	3	5	**bon/cad**
Anterior dislocation shoulder				
Anterior dislocation shoulder closed reduction	2	5	5	**PSP**
Anterior dislocation shoulder open reduction +/- fixation	0	3	5	**bon/cad**
Fracture proximal humerus				
Fracture proximal humerus hemiarthroplasty	0	3	5	**bon/cad**
Fracture proximal humerus interlocking IM nail	0	3	5	**bon/cad**
Fracture proximal humerus ORIF	0	3	5	**bon/cad**
Glenoid fracture ORIF	0	2	5	-
Irrigation and debridement native joint for infection - shoulder	0	2	5	-
Posterior dislocation shoulder				
Posterior dislocation shoulder closed reduction	0	3	5	**PSP**
Posterior dislocation shoulder open reduction +/- fixation	0	3	5	**bon/cad**
Scapula fracture ORIF	0	2	5	**bon/cad**
Humerus				
Fracture diaphysis humerus				
Fracture diaphysis humerus non-operative	1	4	5	**PSP**
Non-union ORIF +/- bone grafting	0	3	5	**bon/cad**
Fracture diaphyseal humerus application of external fixator	0	3	5	**bon/cad**
Fracture diaphyseal humerus non-union - ORIF +/- bone grafting	0	3	5	**bon/cad**
Fracture diaphysis humerus IM nailing	0	4	5	**bon/cad**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Fracture diaphysis humerus ORIF plating	0	4	5	**bon/cad**
Elective Shoulder				
Clavicle				
Osteotomy and internal fixation of clavicle malunion	0	2	5	
Shoulder				
Arthroscopic procedures				**man**
Arthroscopic arthrolysis for capsulitis of shoulder	0	4	5	**man**
Arthroscopic biceps tenodesis	0	2	5	**man**
Arthroscopic subacromial decompression	0	4	5	**man**
Arthroscopic removal loose body - shoulder				**man**
Arthroscopy diagnostic - shoulder	0	4	5	**man**
Capsular / rotator cuff repair				**man**
Anterior repair for instability arthroscopic	0	2	5	**man**
Anterior repair for instability open including capsular shift	0	2	5	**man**
Posterior repair for instability including capsular shift	0	2	5	**man**
Rotator cuff repair (arthroscopic) +/- acromioplasty	0	2	5	**man**
Rotator cuff repair (open) +/- acromioplasty	0	2	5	**man**
MUA shoulder	0	4	5	**PSP**
Shoulder arthrodesis	0	1	5	-
Shoulder arthroplasty				
Hemiarthroplasty shoulder (elective)	0	2	5	**bon/cad**
Resurfacing hemiarthroplasty of shoulder	0	2	5	**bon/cad**
Reverse polarity (inverse) shoulder replacement	0	2	5	**bon/cad**
Shoulder replacement revision	0	1	5	**bon/cad**
Total shoulder replacement	0	2	5	**bon/cad**
Shoulder girdle procedures				
Acromioclavicular joint excision - arthroscopic / open / lateral clavicle	0	2	5	**bon/cad**
Acromioclavicular joint reconstruction (eg Weaver Dunn)	0	2	5	**bon/cad**
Acromioplasty open	0	3	5	**bon/cad**
Latarjet procedure	0	2	5	**bon/cad**
Levator scapulae transfer for trapezius palsy	0	1	5	**bon/cad**
Scapulothoracic fusion	0	1	5	**bon/cad**
Humerus				
Endoprosthetic replacement for malignant bone tumour - humerus	0	1	5	-

Applied Clinical Skills: Elbow

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
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2 = Can manage with assistance	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Elbow				
Elbow				
Application of spanning external fixator	0	2	5	**bon/equ**
Capitellum ORIF	0	3	5	**bon/cad**
Coronoid fractures				
Coronoid fracture ORIF	0	2	5	**bon**
Dislocated elbow +/- fracture:				
Dislocated elbow +/- fracture closed reduction	0	4	5	**PSP**
Dislocated elbow +/- fracture open reduction +/- fixation	0	3	5	**bon/cad**
Intraarticular distal humerus fracture ORIF	0	4	5	**bon/cad**
Irrigation and debridement native joint for infection – elbow	0	3		**bon/cad**
Lateral condyle fracture ORIF	0	4	5	**bon/cad**
Medial condyle / epicondyle fracture MUA / percutaneous wire / ORIF	0	4	5	**bon/cad**
Olecranon fracture ORIF	0	4	5	**bon/cad**
Radial head / neck fracture				
Radial head / neck fracture ORIF	0	3	5	**bon/cad**
Radial head excision	0	4	5	**bon/cad**
Radial head replacement for fracture	0	4	5	**bon/cad**
Supracondylar elbow fracture				**bon**
Supracondylar elbow fracture MUA +/- percutaneous wires	0	4	5	**PSP**
Supracondylar elbow fracture open reduction	0	4	5	**bon/cad**
Tendon repairs				
Repair of distal biceps tendon rupture	0	3	5	**cad**
Forearm				
Fasciotomy for compartment syndrome	1	4	5	**cad**
Fracture shaft radius / ulna:				
Fracture shaft radius / ulna IM nailing	0	3	5	**bon/cad**
Fracture shaft radius / ulna MUA & POP	0	4	5	**PSP**
Fracture shaft radius / ulna ORIF	0	4	5	**bon/cad**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Galeazzi fracture ORIF	0	4	5	**bon/cad**
Monteggia fracture ORIF	0	4	5	**bon/cad**
Elective Elbow				
Elbow				
Arthrolysis elbow (open/arthroscopic)	0	2	5	**man**
Arthroscopy elbow diagnostic	0	2	5	**man**
Arthoscopy elbow therapeutic	0	2	5	**man**
Arthrotomy elbow	0	4	5	**man**
Excision radial head +/- synovectomy	0	2	5	**man**
OK procedure	0	2	5	**man**
Tennis / golfer elbow release	0	4	5	**cad**
Total elbow replacement				
Total elbow replacement	0	2	5	**bon/cad**
Total elbow replacement - aseptic revision	0	1	4	**bon/cad**
Total elbow replacement for trauma	0	1	5	**bon/cad**
Total elbow replacement revision 1st stage	0	1	4	**bon/cad**
Total elbow replacement revision 2nd stage	0	1	4	**bon/cad**
Ulnar nerve decompression / transposition	0	4	5	**bon/cad**
Forearm				
Forearm malunion correction or other deformity	0	1	5	**bon/cad**

Applied Clinical Skills: Hand

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Hand				
Wrist				
Fracture distal radius:				
Fracture distal radius – closed non-op	3	5	5	**PSP**
Fracture distal radius external fixation	1	4	5	**bon**
Fracture distal radius MUA & percutaneous wires	3	5	5	**PSP**
Fracture distal radius ORIF	1	4	5	**bon/cad**
Application of spanning external fixator	1	4	5	**bon/cad**
Arterial repair - wrist	0	1	5	**cad/ LT/C**
Vein repair – wrist	0	1	5	**cad/ LT/C**
Carpal fracture / dislocation:				
Carpal fracture / dislocation MUA & percutaneous wires	0	3	5	**bon**
Carpal fracture / dislocation MUA & POP	0	3	5	**PSP**
Carpal fracture / dislocation ORIF	0	3	5	**bon**
Irrigation and debridement prosthesis for infection – wrist	0	2	5	**ani**
Nerve repair - wrist	0	3	5	**LT/C**
Replantation of hand	0	0	1	**cad**
Revascularisation of hand	0	0	1	**cad**
Scapho-lunate ligament reconstruction	0	2	5	**cad**
Scaphoid fracture:				
Scaphoid fracture non-operative	2	3	5	**PSP**
Scaphoid fracture MUA & percutaneous wires	0	2	5	**bon/cad**
Scaphoid fracture non-union ORIF +/- graft (excluding vascularised graft)	0	2	5	**bon/cad**
Scaphoid fracture non-union using vascularised graft	0	2	5	**bon/cad**
Scaphoid fracture ORIF	0	2	5	**bon/cad**
Hand				
1st ray fracture / dislocation				
1st ray fracture / dislocation external fixation	0	2	5	**bon/cad**

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

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Metacarpal fracture (not 1st or 5th) ORIF	0	3	5	**bon/cad**
Metacarpal fracture (not 1st or 5th) external fixation	0	3	5	**bon/cad**
Neurovascular injuries				
Arterial repair +/- graft hand / digit	0	1	2	**LT/C/cad**
Nerve repair hand / digit	1	4	5	**LT/C/cad**
Revascularisation finger	0	1	2	**LT/C/cad**
Vein repair +/- graft hand / digit	0	1	2	**LT/C/cad**
Phalangeal fracture non-op	2	4	5	**PSP**
Phalangeal fracture MUA & percutaneous wires	1	4	5	**bon**
Phalangeal fracture MUA +/- POP	2	4	5	**PSP**
Phalangeal fracture ORIF	0	3	5	**bon**
Removal foreign body from skin / subcutaneous tissue	3	5	5	**ani**
Replantation finger	0	1	2	**cad**
Skin graft				
Free flap	0	1	5	**cad**
Full thickness skin graft	2	3	5	**cad**
Pedicle flap	0	2	5	**cad**
Reversed radial forearm flap	0	2	3	**cad**
Split skin graft	2	4	5	**cad**
Transposition flap	0	2	3	**cad**
Tangential excision of hand burns	0	1	2	**cad**
Tendon repair				
Spaghetti wrist	0	2	5	**cad**
Tendon repair extensor	2	5	5	**ani/ LT/C**
Tendon repair flexor zone 1	0	2	5	**cad**
Tendon repair flexor zone 2	0	2	5	**cad**
Tendon repair flexor zone 3-5	0	4	5	**cad**
Wound closure				
Delayed primary or secondary	1	4	5	**LT/C**
Wound debridement	1	4	5	**LT/C**
Elective Hand				
Wrist				
Arthrodesis wrist (includes partial arthrodesis)	0	3	5	**cad**
Arthroscopy wrist	0	2	5	**man/cad**
Carpal tunnel decompression	3	5	5	**cad**
De Quervain's decompression	1	5	5	**cad**
Decompression / synovectomy tendons	0	3	5	**cad**
Denervation wrist	0	3	5	**cad**
Excision distal ulna	0	4	5	**cad**
Ganglion excision at wrist	2	5	5	**LT/C**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Proximal row carpectomy	0	2	5	**cad**
Radial shortening	0	2	5	**cad**
Surgery for chronic carpal instability	0	2	5	**cad**
TFCC				
Repair TFCC - arthroscopic	0	2	5	**cad**
Repair TFCC - open	0	2	5	**cad**
Ulna shortening	0	3	5	**cad**
Ulnar nerve decompression at wrist	0	3	5	**cad**
Wrist arthroplasty	0	2	5	**cad**
Hand				
Carpal tunnel decompression	3	5	5	**cad**
Congenital hand operation				
Congenital hand operation - clinodactyly	0	1	4	-
Congenital hand operation - complex reconstruction of congenital hand deformity	0	1	2	-
Congenital hand operation - camptodactyly	0	1	2	-
Congenital hand operation - correction of radial club hand	0	1	2	-
Congenital hand operation - lengthening procedures	0	1	2	-
Congenital hand operation - removal supernumerary digits	0	1	3	-
Congenital hand operation - separation of syndactyly	0	1	3	-
Dupuytren's contracture operation				
Dupuytrens contracture operation - dermofasciectomy	0	2	5	**cad**
Dupuytren's contracture operation - primary multiple digits	0	3	5	**cad**
Dupuytren's contracture operation - primary single digit	0	3	5	**cad**
Dupuytren's contracture operation - recurrent multiple digits	0	2	5	**cad**
Dupuytren's contracture operation - recurrent single digit	0	2	5	**cad**
Excision synovial cyst	0	3	5	**LT/C**
Finger malunion correction or other deformity	0	2	5	**cad**
Fusion of MCPJ or IPJ	0	3	5	**cad**
MCPJ replacement	0	2	5	**cad**
PIPJ replacement - hand (other)	0	2	5	**cad**
PIPJ replacement - hand (silastic)	0	2	5	**cad**
Soft tissue reconstruction hand	0	2	5	**cad**
Synovectomy	0	3	5	**cad**
Tendon procedures				
Tendon graft hand	0	2	5	**cad**
Tendon transfer hand	0	2	5	**cad**
Tenolysis hand tendon	0	2	5	**cad**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Tenosynovectomy	0	2	5	**cad**
Trapezium excision or replacement	0	3	5	**cad**
Trigger finger release	2	5	5	**cad**
Trigger thumb release	1	5	5	**cad**

Applied Clinical Skills: Hip

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Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Hip				
Pelvis				
Acetabular fracture ORIF	0	2	4	**bon/cad**
Pelvic fracture:				
Pelvic fracture external fixator application	1	3	5	**bon/equ**
Pelvic fracture ORIF	0	2	5	**bon/cad**
Sacroiliac joint percutaneous screw fixation	0	1	5	**bon/cad**
Sacrum ORIF	0	1	4	**bon/cad**
Hip				
Dislocated hip				
Dislocated hip (no prosthesis) - closed reduction	1	4	5	**PSP**
Dislocated hip (no prosthesis) - open reduction +/- fixation	0	3	5	**bon/cad**
Dislocated hip hemiarthroplasty - closed reduction	2	4	5	**PSP**
Dislocated hip hemiarthroplasty - open reduction	0	4	5	**bon/cad**
Dislocated total hip replacement - closed reduction	2	4	5	**PSP**
Dislocated total hip replacement - open reduction	0	4	5	**bon/cad**
Extracapsular fracture				
Extracapsular fracture CHS / DHS	3	5	5	**bon**
Extracapsular fracture intramedullary fixation	0	5	5	**bon**
Extracapsular fracture other fixation	0	4	5	**bon**
Intracapsular fracture				
Intracapsular fracture bipolar hemiarthroplasty	0	5	5	**bon**
Intracapsular fracture hemiarthroplasty excluding bipolar	2	5	5	**bon**
Intracapsular fracture internal fixation	1	5	5	**bon**
Intracapsular fracture THR	1	4	5	**bon**
Irrigation and debridement native joint for infection - hip	0	4	5	**cad/eqi**
Irrigation and debridement prosthesis for infection - hip	0	4	5	**cad/eqi**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Periprosthetic fracture of hip				
Open reduction and fixation of periprosthetic fracture - hip	0	3	5	**bon/cad**
Revision THR for periprosthetic fracture of hip	0	2	5	**bon/cad**
Femur				
Diaphyseal fracture				
Diaphyseal femur fracture application of external fixator	0	3	5	**bon**
Diaphyseal femur fracture intramedullary nailing	0	5	5	**bon**
Diaphyseal femur fracture plate/screw fixation	0	4	5	**bon**
Diaphyseal femur fracture spica cast application	0	3	3	**PSP**
Fasciotomy for compartment syndrome	1	4	5	**cad**
Femoral non-union				
Femoral non-union (application of frame) +/- bone grafting	0	2	5	**bon/cad**
Femoral non-union (without frame) +/- bone grafting	0	2	5	**bon/cad**
Reconstruction of avulsed proximal hamstrings	0	1	5	**bon/cad**
Subtrochanteric fracture				
Subtrochanteric fracture intramedullary fixation	0	4	5	**bon**
Subtrochanteric fracture plate/screw fixation	0	3	5	**bon**
Elective Hip				
Pelvis				
Sacrococcygeal joint injection / MUA	0	3	5	**cad**
Sacro-iliac joint injection	0	3	5	**cad**
Hip				
Adductor tenotomy - hip	0	3	5	**cad**
Arthrodesis hip	0	2	5	**bon/cad**
Arthroscopy hip - diagnostic	0	1	5	
Arthroscopy hip - therapeutic	0	1	5	
Arthrotomy hip	0	3	5	**cad**
Aspiration / injection hip joint	0	3	5	**cad**
Excision arthroplasty hip (e.g. Girdlestone)	0	3	5	**cad**
Femoral head AVN				
Core decompression of femoral head for AVN	0	3	5	**cad**
Vascular graft femoral head for AVN	0	2	3	**cad**
Femeroacetabular impingement				
Open hip debridement for femeroacetabular impingement syndrome	0	1	4	**cad**
Iliopsoas release / lengthening	0	2	5	**cad**
Osteotomy pelvis - not for DDH	0	1	3	**cad**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Revision THR				
1 stg of 2 stg rev infected THR - removal of prosthesis +/-insertion of cement spacer / antibiotic beads	0	2	5	**bon/cad**
2 stg of 2 stg rev infected THR - removal of spacer/beads	0	2	5	**bon/cad**
Single stage revision THR acetabular component	0	2	5	**bon/cad**
Single stage revision THR both components	0	2	5	**bon/cad**
Single stage revision THR femoral component	0	2	5	**bon/cad**
Total Hip Replacement				
THR cemented	1	4	5	**bon/cad**
THR hybrid	1	4	5	**bon/cad**
THR surface replacement	1	2	5	
THR uncemented	1	4	5	**bon/cad**
Femur				
Endoprosthetic replacement for malignant bone tumour - femur	1	2	4	**bon/cad**
Femoral malunion correction or other deformity	0	2	4	**bon/cad**
Osteotomy corrective (not for DDH)	0	2	4	**bon/cad**

Applied Clinical Skills: Knee

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Knee				
Knee				
Acute arthroscopy for knee trauma	0	3	5	**man**
Application of spanning external fixator	0	2	5	**bon**
Intraarticular fracture distal femur ORIF	0	3	5	**bon**
Irrigation and debridement native joint for infection (open or arthroscopic) - knee	1	4	5	**cad**
Irrigation and debridement prosthesis for infection - knee	1	4	5	**cad**
Knee MUA +/- POP	2	5	5	**PSP**
Patella fracture				
Patella dislocation closed reduction +/- open repair	1	4	5	**cad**
Patella fracture ORIF	0	4	5	**bon**
Patellectomy	0	4	5	**cad**
Periprosthetic fracture of knee				
Open reduction and fixation of periprosthetic fracture - knee	0	2	5	**bon/cad**
Revision TKR for periprosthetic fracture of knee	0	3	5	**bon/cad**
Soft tissue repair				
Acute ligament repair	0	3	5	**LT/C /cad**
Patella tendon repair	0	4	5	**LT/C /cad**
Quadriceps tendon repair	0	4	5	**LT/C /cad**
Supracondylar fracture (not intraarticular)				
Supracondylar fracture (not intraarticular) DCS / blade plate etc	0	4	5	**bon**
Supracondylar femur fracture (not intraarticular) external fixation	0	4	5	**bon**
Supracondylar femur fracture (not intraarticular) Intramedullary fixation	0	4	5	**bon**
Supracondylar femur fracture (not intraarticular) MUA & POP	0	4	5	**PSP**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Tibial plateau fracture				
Repair of tibial spine	0	3	5	**bon**
Tibial plateau fracture arthroscopically assisted fixation	0	2	5	**cad**
Tibial plateau fracture ORIF with plates & screws	0	4	5	**bon**
Tibial plateau fracture treatment with circular frame	0	2	4	**bon**
Tibia & Fibula				
Diaphyseal tibial fracture				
Diaphyseal tibial fracture external fixation (including frame)	1	3	5	**bon**
Diaphyseal tibial fracture intramedullary nailing	1	4	5	**bon**
Diaphyseal tibial fracture MUA & POP	1	5	5	**PSP**
Tibial shaft plating	0	3	5	**cad**
Fasciotomy for compartment syndrome	2	5	5	**cad**
Tibial non-union				
Tibial non-union circular frame management	0	2	3	**eqi**
Tibial non-union intramedullary nailing +/- bone grafting	0	2	3	**bon**
Tibial non-union ORIF +/- bone grafting	0	2	3	**bon**
Elective Knee				
Knee				
Arthroscopic partial meniscectomy	1	5	5	**man/cad**
Arthroscopic procedures				
Arthroscopic excision of Hoffa's fat pad	0	4	5	**man/cad**
Arthroscopic lateral release	0	4	5	**man/cad**
Arthroscopic menisectomy	0	5	5	**man/cad**
Arthroscopic removal loose bodies knee	0	4	5	**man/cad**
Arthroscopic synovectomy	0	3	5	**man/cad**
Arthroscopy knee diagnostic	1	5	5	**man/cad**
Meniscal repair (arthroscopic)	0	3	5	**man/cad**
Aspiration / injection knee joint	2	5	5	**man/cad**
Below knee amputation	1	4	5	**cad**
Cartilage regeneration procedures				
Abrasion arthroplasty / microfracture - knee	0	2	5	**man/cad**
Mosaicplasty - knee	0	2	4	**man/cad**
Osteochondral allografting - knee	0	2	4	**man/cad**
Autologous chondrocyte implantation	0	2	5	**man/cad**
Knee arthroplasty				
Patella resurfacing alone	0	1	3	**LT/C**
Patello-femoral joint replacement	0	1	3	**bon**
TKR	1	4	5	**bon/cad**
Unicompartmental knee replacement	0	3	5	**bon**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
MUA knee	2	4	5	**PSP**
Osteotomy distal femoral	0	2	4	**bon/cad**
Osteotomy proximal tibial	0	2	5	**bon/cad**
Patella realignment	0	3	5	**bon/cad**
Patella tendon decompression (open / arthroscopic)	0	3	5	**cad**
Release contracture knee	0	2	4	**cad**
Revision TKR				
1 stg of 2 stg rev infected TKR - removal of prosthesis +/- insertion of cement spacer / antibiotic beads	0	2	5	**bon/cad**
2 stg of 2 stg rev infected TKR - removal of spacer/beads	0	2	5	**bon/cad**
Revision TKR for periprosthetic fracture of knee	0	2	5	**bon/cad**
Single stage revision TKR	0	2	5	**bon/cad**
Soft tissue reconstruction				
ACL reconstruction - arthroscopic	0	2	5	**man/cad**
ACL reconstruction - open	0	2	5	**man/cad**
Reconstruction of posterolateral corner of knee	0	2	5	**man/cad**
PCL reconstruction	0	2	5	**man/cad**
Revision ACL reconstruction	0	1	5	**man/cad**
TKR	1	4	5	**bon/cad**
Tibia & Fibula				
Endoprosthetic replacement for malignant bone tumour - tibia	1	2	3	**bon/cad**
Tibia or fibula malunion correction or other deformity	0	2	4	**bon/cad**
Tibial lengthening	0	1	2	**bon/cad**

Applied Clinical Skills: Foot and Ankle

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Topic	CORE	ST3-ST8	SPECIALTY INTEREST	
Trauma Foot and Ankle				
Ankle				
Ankle fracture / dislocation				
Ankle fracture / dislocation MUA & POP	3	5	5	**PSP**
Ankle fracture / dislocation ORIF	3	5	5	**bon/cad**
Application of spanning external fixator	0	2	5	**bon/cad**
Irrigation and debridement native joint for infection - ankle	1	3	5	**cad**
Irrigation and debridement prosthesis for infection - ankle	0	2	5	**cad**
Pilon fracture				
Pilon fracture ex-fix	0	2	5	**bon/cad**
Pilon fracture ORIF	0	2	5	**bon/cad**
Pilon fracture treatment with circular frame	0	2	5	**bon/cad**
Foot				
Amputation toe / ray for trauma	0	3	5	**cad**
Calcaneal fracture				
Calcaneal fracture ex-fix	0	2	5	**bon**
Calcaneal fracture ORIF	0	2	5	**cad**
Metatarsal fracture ORIF	0	2	5	**bon**
Phalangeal fracture MUA +/- K wire +/- ORIF	1	3	5	**bon**
Removal foreign body from skin / subcutaneous tissue	2	5	5	**LT/C**
Talar subtalar or midtarsal fracture / dislocation				
Lisfranc fracture ORIF	0	3	5	**bon**
Midtarsal fracture / dislocation ORIF	0	3	5	**bon**
Subtalar fracture / dislocation ORIF	0	3	5	**bon**
Talar fracture / dislocation ORIF	0	3	5	**bon**
Talectomy	0	3	5	**bon**
Tarsometatarsal arthrodesis	0	2	5	**bon**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	
Achilles tendon repair	1	4	5	**cad**
Tendon repair in foot	0	3	5	**LT/C**
Elective Foot and Ankle				
Ankle				
Arthrodesis ankle (open /arthroscopic)	0	2	5	**bon/cad**
Arthroplasty ankle	0	2	4	**bon/cad**
Arthroscopic procedures				
Arthrodesis ankle - arthroscopic	0	1	4	**man/cad**
Arthroscopy ankle diagnostic	0	2	5	**man/cad**
Arthroscopy ankle therapeutic	0	2	4	**man/cad**
Arthrotomy ankle	0	2	5	**cad**
Aspiration / injection ankle joint	0	3	5	**man/cad**
Ligament repair / reconstruction				
Ankle - lateral ligament reconstruction	0	2	5	**cad**
Ankle - lateral ligament repair	0	2	5	**cad**
Ankle - medial ligament repair	0	2	5	**cad**
Pantalar arthrodesis	0	2	5	**cad**
Tendon procedures				
Decompression tendons at ankle	0	2	5	**cad**
Gastrocnemius lengthening	0	2	4	**cad**
Tendo achilles reconstruction for neglected rupture	0	2	4	**cad**
Tendo-achilles lengthening	0	2	4	**cad**
Foot				
Akin osteotomy of proximal phalanx great toe	0	2	5	**bon/cad**
Amputation toe / ray	0	3	5	**bon/cad**
Ankle chielectomy	0	2	5	**bon/cad**
Arthrodesis procedures				
Ankle	0	2	5	**bon/cad/ LT/C**
Hindfoot	0	2	5	**bon/cad/ LT/C**
Midtarsal	0	2	5	**bon/cad/ LT/C**
Forefoot and toes	0	2	5	**bon/cad/ LT/C**
Aspiration / injection foot joint	0	3	5	**bon/cad/ LT/C**
Calcaneal osteotomy	0	2	5	**bon/cad/ LT/C**
Excision Haglund's deformity	0	2	5	**bon/cad/ LT/C**
Excision of accessory navicular	0	2	5	**bon/cad/ LT/C**
Excision of tarsal coalition	0	2	5	**bon/cad/ LT/C**
First metatarsal osteotomy				
First metatarsal osteotomy - basal	0	2	5	**bon**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	
First metatarsal osteotomy - distal	0	3	5	**bon/cad**
First metatarsal osteotomy – other	0	3	5	**bon/cad**
First metatarsal osteotomy - Scarf	0	3	5	**bon/cad**
First MTPJ procedures				
First MTPJ arthrodesis	0	3	5	**bon/cad**
First MTPJ cheilectomy	0	3	5	**bon/cad**
First MTPJ excision arthroplasty	0	3	5	**bon/cad**
First MTPJ replacement arthroplasty (silastic or other)	0	2	4	**bon/cad**
First MTPJ soft tissue correction	0	3	5	**bon/cad**
Foot malunion correction or other deformity	0	2	4	**bon/cad**
Forefoot arthroplasty (Mann Thompson / Stainsby / Other	0	2	5	**bon/cad**
Ingrowing toenail operation	2	5	5	**bon/cad**
Lesser metatarsal osteotomy	0	2	5	**bon/cad**
Lesser toe excision part/all phalanx	0	3	5	**bon/cad**
MTPJ cheilectomy - not 1st	0	3	5	**bon/cad**
Soft tissue procedures				
Excision of Morton's neuroma	0	3	5	**cad**
Fifth toe soft tissue correction	0	3	5	**cad**
Lesser toe tenotomy	0	3	5	**cad**
Plantar fascia release	0	3	5	**cad**
Tendon decompression or repair	0	3	5	**cad**
Tendon transfer foot	0	3	5	**cad**
Tibialis posterior reconstruction	0	3	5	**cad**
Talectomy	0	2	5	**cad**
Wedge tarsectomy	0	2	5	**cad**

Applied Clinical Skills: Children's Trauma and Orthopaedics

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level and stage of training.	
Competence Levels	
0 = No experience expected	**3 = Can manage whole but may need assistance**
1 = Has observed or knows of	**4 = Able to manage without assistance including potential common complications**
2 = Can manage with assistance	**5 = Able to manage complex cases and their associated potential complications**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
Trauma Paediatrics				
Supracondylar elbow fracture				
Supracondylar elbow fracture MUA +/- percutaneous wires	1	4	5	**PSP/bon**
Supracondylar elbow fracture open reduction	0	3	5	**bon**
Forearm fractures				
Manipulation and POP forearm	1	5	5	**PSP**
Manipulation and K wire forearm	0	4	5	**LT/C/bon**
Titanium elastic nailing paediatric long bone	0	2	5	**bon**
Slipped upper femoral epiphysis				
Dunn procedure for slipped upper femoral epiphysis	0	2	5	**bon/cad**
Slipped upper femoral epiphysis percutaneous cannulated screw fixation	0	2	5	**bon/cad**
Drainage of septic arthritis of the hip	0	2	5	**cad (adult)**
Repair of avulsion of tibial eminence	0	2	5	**bon**
ORIF paediatric ankle fracture	0	4	5	**bon**
Obstetric brachial plexus injury: exploration / repair / grafting	0	1	2	**cad (adult)**
Elective Paediatrics				
Cerebral Palsy				
Adductor tenotomy - hip	0	2	5	**cad (adult)**
Botulinum toxin injection - musculoskeletal	0	2	5	**LT/C**
Hamstring lengthening	0	2	5	**cad (adult)**
Iliopsoas release / lengthening	0	2	5	**cad (adult)**
MTPJ arthrodesis	0	2	5	**bon**
Patella realignment	0	2	5	**bon**
Steindler's release	0	1	5	**cad (adult)**
Tendo-achilles lengthening	0	2	5	**bon**
Tendon transfer foot	0	1	5	**cad (adult)**
Tendon transfer not hand / foot	0	1	5	**cad (adult)**

Topic	CORE	ST3-ST8	SPECIALTY INTEREST	simulation
CTEV correction				
Arthrodesis for recurrence for CTEV	0	1	5	**bon**
Bony release for recurrence for CTEV	0	1	5	**cad (adult)**
CTEV correction	0	1	5	**bon/cad**
Ilizarov correction for CTEV	0	1	5	**bon**
Percutaneous tendo-achilles release for CTEV	0	2	5	**cad (adult)**
Posterior release for CTEV	0	1	5	**cad (adult)**
Postero-medial release for CTEV	0	1	5	**cad (adult)**
Soft tissue release for recurrence for CTEV	0	1	5	**cad (adult)**
Tibilialis anterior transfer for CTEV	0	1	5	**cad (adult)**
DDH				
Application of hip spica	0	2	5	**LT/C**
Hip MUA	0	2	5	**PSP**
Open reduction for DDH	0	1	5	**bon/cad**
Osteotomy hip - pelvic for DDH	0	1	5	**bon/cad**
Osteotomy hip - proximal femoral for DDH	0	1	5	**bon/cad**
Distraction lengthening of bone upper limb	0	1	5	**bon/cad**
Excision of physeal bar (Langenskjold procedure)	0	1	5	**bon/cad**
Femoral lengthening	0	1	5	**bon/cad**
GA change of POP	0	3	5	**bon/cad/equ**
Repair of avulsion of tibial eminence (child)	0	2	5	**bon/cad**
Sternomastoid release (torticollis)	0	1	5	**bon/cad**
Tibial lengthening	0	1	5	**bon/cad**