

## **Specialty Training Requirements (STR)**

Name of Specialty:	Orthopaedic Surgery
Chair of RAC:	A/Prof Ernest Kwek
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**Note :** In addition to the training requirements stated in this STR, residents must comply with any other regulatory requirements or practice-based requirements mandated by the healthcare institutions or place of practice.

## Scope of Orthopaedic Surgery

*Orthopaedic Surgery* is the branch of medical practice concerning the musculoskeletal system, including bones, cartilage, joints, muscles, ligaments, tendons and other connective tissues. It involves the diagnosis, investigation and care of musculoskeletal conditions throughout all stages of life, and management includes both surgical and non-surgical modalities. Areas of orthopaedic practice may further be grouped under various practice and subspecialty headings, depending on local and institutional conventions, such as general orthopaedics, adult reconstructive surgery, sports surgery, orthopaedic trauma, regional orthopaedics (upper limb regions, lower limb regions, spine), musculoskeletal oncology and paediatric orthopaedics.

## Purpose of the Residency Programme

The purpose of the Orthopaedic Surgery Residency Programme is to provide residents with the knowledge and skills, both clinical and surgical, in all areas of orthopaedic surgery necessary to become qualified orthopaedic surgeons who are technically competent and able to provide care of sound quality to all orthopaedic patients. Given the wide scope of orthopaedic practice, the 6-year residency programme is designed to allow Residents to rotate and gain meaningful exposure to all major areas of orthopaedic practice before they exit the programme and qualify as specialists in Orthopaedic Surgery.

## Admission Requirements

At the point of application for this residency programme,

- a) applicants must be employed by employers endorsed by Ministry of Health (MOH), and
- b) residents who wish to switch to this residency programme must have waited at least one year between resignation from his/her previous residency programme and application for this residency programme.

At the point of entry to this residency programme, residents must have fulfilled the following requirements:

- c) Hold a local medical degree or a primary medical qualification registrable under the Medical Registration Act (Second Schedule);
- d) Have completed Post-Graduate Year 1 (PGY1); and
- e) Have a valid Conditional or Full Registration with Singapore Medical Council.

## Selection Procedures

Applicants must apply for the programme through the annual residency intake matching exercise conducted by Ministry of Health Holdings (MOHH).

Continuity plan: Selection should be conducted via a virtual platform in the event of a protracted outbreak whereby face-to-face on-site meeting is disallowed and cross institution movement is restricted.

### Less Than Full Time Training

Less than full time training is not allowed. Exceptions may be granted by Specialist Accreditation Board (SAB) on a case-by-case basis.

### Non-traditional Training Route

The programme should only consider the application for mid-stream entry to residency training by an International Medical Graduates (IMG) if he/she meets the following criteria:

- a) He/she is an existing resident or specialist trainee in the United States, Australia, New Zealand, Canada, United Kingdom and Hong Kong, or in other centres/countries where training may be recognised by the Specialist Accreditation Board (SAB)
- b) His/her years of training are assessed to be equivalent to the local training by JCST and/or SAB.

*Applicants may enter residency training at the appropriate year of training as determined by the Programme Director and RAC. The latest point of entry into residency for these applicants is Year 1 of the senior residency phase.*

### Separation

The PD must verify residency training for all residents within 30 days from the point of notification for residents' separation / exit, including residents who did not complete the programme.

### Duration of Specialty Training

The training duration must be 36 months of junior residency and 36 months of senior residency.

Maximum candidature: All residents must complete the training requirements, requisite examinations and obtain their exit certification from JCST not more than 36 months beyond the usual length of their training programme. The total candidature for Orthopaedic Surgery is 72 months Orthopaedic Surgery residency + 36 months candidature.

### "Make-up" Training

"Make-up" training must be arranged when residents:

- Exceed days of allowable leave of absence / duration away from training; or
- Fail to make satisfactory progress in training.

The duration of make-up training should be decided by the Clinical Competency Committee (CCC) and should depend on the duration away from training and/or the time deemed necessary for remediation in areas of deficiency. The CCC will review

residents' progress at the end of the "make-up" training period and decide if further training is needed.

Any shortfall in core training requirements must be made up by the stipulated training year and / or before completion of residency training.

### Learning Outcomes: Entrustable Professional Activities (EPAs)

Residents must achieve level 4 of the following EPAs by the end of residency training:

	Title
<b>EPA 1</b>	Managing orthopaedic patients in the ward
<b>EPA 2</b>	Running emergency orthopaedics operating lists
<b>EPA 3</b>	Performing common elective operations
<b>EPA 4</b>	Managing orthopaedic patients in an outpatient setting
<b>EPA 5</b>	Managing acute emergency admissions when on call

Information on each EPA is provided in [here](#).

### Learning Outcomes: Core Competencies, Sub-competencies and Milestones

The programme must integrate the following competencies into the curriculum, and structure the curriculum to support resident attainment of these competencies in the local context.

Residents must demonstrate the following core competencies:

#### 1) Patient care and Procedural Skills

Residents must demonstrate the ability to:

- Gather essential and accurate information about the patient
- Counsel patients and family members
- Make informed diagnostic and therapeutic decisions
- Prescribe and perform essential medical procedures
- Provide effective, compassionate and appropriate health management, maintenance, and prevention guidance
- Provide competent preadmission care, hospital care, operative care, and follow-up care (including rehabilitation) of orthopaedic patients
- Make informed diagnostic and therapeutic decisions based on patient information and preferences, up-to-date scientific evidence, and clinical judgement
- Develop and carry out patient management plans
- Use information technology to support patient care decisions and patient education
- Prescribe and perform essential medical and invasive procedures essential for the practice of orthopaedic surgery
- Provide health care services aimed at preventing health problems or maintaining health

- Use investigatory and analytic thinking approach to clinical situations
- Apply the basic and clinically supportive sciences which are appropriate to orthopaedic surgery

## **2) Medical knowledge**

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care.

## **3) System-based practice**

Residents must demonstrate the ability to:

- Work effectively in various health care delivery settings and systems relevant to their clinical specialty
- Coordinate patient care within the health care system relevant to their clinical specialty
- Incorporate considerations of cost awareness and risk/benefit analysis in patient care
- Advocate for quality patient care and optimal patient care systems
- Work in inter-professional teams to enhance patient safety and improve patient care quality. This includes effective transitions of patient care and structured patient hand-off processes.
- Participate in identifying systems errors and in implementing potential systems solutions

## **4) Practice-based learning and improvement**

Residents must demonstrate a commitment to lifelong learning.

Resident must demonstrate the ability to:

- Investigate and evaluate patient care practices
- Appraise and assimilate scientific evidence
- Improve the practice of medicine
- Identify and perform appropriate learning activities based on learning needs

## **5) Professionalism**

Residents must demonstrate a commitment to professionalism and adherence to ethical principles including the SMC's Ethical Code and Ethical Guidelines (ECEG).

Residents must:

- Demonstrate professional conduct and accountability
- Demonstrate humanism and cultural proficiency
- Maintain emotional, physical and mental health, and pursue continual personal and professional growth
- Demonstrate an understanding of medical ethics and law

## 6) Interpersonal and communication skills

Residents must demonstrate ability to:

- Effectively exchange information with patients, their families and professional associates.
- Create and sustain a therapeutic relationship with patients and families
- Work effectively as a member or leader of a health care team
- Maintain accurate medical records

## Other Competency: Teaching and Supervisory Skills

Residents must demonstrate ability to:

- Teach others
- Supervise others

## Learning Outcomes: Others

Residents must attend Medical Ethics, Professionalism and Health Law course conducted by Singapore Medical Association and Geriatric Medicine Modular Course by Academy of Medicine Singapore (AMS).

Residents must complete following courses within a year before or after the recommended year of completion if he / she has not attended them prior to commencement of residency. Residents with a valid Advanced Trauma Life Support (ATLS) certification at the beginning of R2 need not re-attend the course.

Recommended year of completion	Compulsory courses
R1	<ul style="list-style-type: none"><li>• Suturing</li><li>• Plaster Application</li><li>• Traction</li><li>• X-ray Reading Course</li><li>• Basic Communication Skills</li><li>• Evidence Based Medicine (EBM)</li><li>• ATLS Course</li></ul>
R2	<ul style="list-style-type: none"><li>• Basic Fracture Fixation Course</li><li>• Biomechanics Course</li></ul>
R3	Nil
R4	Nil
R5	<ul style="list-style-type: none"><li>• SMA Ethics Course</li></ul>
R6	<ul style="list-style-type: none"><li>• Postgraduate Course in Orthopaedics</li></ul>
R6 (with effect from July 2019 intake)	<ul style="list-style-type: none"><li>• Knee Arthroscopy Course</li><li>• Hip &amp; Knee Arthroplasty Course</li><li>• Spine Course</li></ul>

## Curriculum

The curriculum and detailed syllabus relevant for local practice must be made available in the Residency Programme Handbook and given to the residents at the start of residency.

The PD must provide clear goals and objectives for each component of clinical experience.

### Learning Methods and Approaches: Scheduled Didactic and Classroom Sessions

Residents are expected to attend rotation specific department CME including topical teaching, audits, journal club and Mortality and Morbidity / Peer Review Learning meetings. Attendance for these are tracked at department level.

Residents are required to meet the following minimum attendance at the Singapore Orthopaedic Association (SOA) Saturday lectures:

- R1: Attendance will be optional
- R2 to R4: Minimum of 50% attendance
- R5 to R6: Minimum of 75% attendance

### Learning Methods and Approaches: Clinical Experiences

Residents must complete the following rotations in R1:

- 3 months of Anaesthesia (including 2 weeks of Intensive Care)
- 3 months of Emergency Medicine
- 6 months of General Surgery

Residents must complete the minimum duration of subspecialty rotations from R2 to R6 as follows:

- At least 6 months of General Orthopaedics and Trauma (3 months of trauma rotation must be in R2 and in another sponsoring institution)
- At least 3 months of Hand Surgery
- At least 3 months of sports related surgery including arthroscopy and arthroscopic reconstruction
- At least 3 months of Paediatric Orthopaedic Surgery
- At least 3 months of adult reconstructive surgery including arthroplasty and foot and ankle surgery
- At least 3 months of musculoskeletal oncology
- At least 3 months of spinal surgery (3 months of spine rotation must be in R5 and in another sponsoring institution)

*R6 can be a research and elective year. The first 6 months of R6 can be utilised to complete compulsory postings of R2-R5 or elective postings of their choice. The remaining 6 months can be used for elective posting or research. R6 residents should only undertake full-time research posting if they are able to fulfil the minimum clinical and operative experience as stipulated above and fulfil the requirements for exit examination.*

In the event of a protracted outbreak, whereby face-to-face on-site meeting is disallowed and cross-institution movement is restricted, residents should resume their rotations in their own sponsoring institution.

#### Learning Methods and Approaches: Scholarly / Teaching Activities

Residents must complete at least two oral presentations at the SOA Annual Scientific Meeting and / or at recognised international conferences. The 2 oral presentations should not be for the same paper/study.

In the event of a protracted outbreak, residents should only present at online conferences.

#### Learning Methods and Approaches: Documentation of Learning

Residents must attain a minimum log of 200 surgical cases as a surgeon or first assistant per year from R2 to R6 (a minimum of 1000 cases for those 5 years), and 750 outpatient cases per year.

In R2 to R6, the residents must perform at least 25 cases as first surgeon supervised per year out of the 200 cases per year. The complexity and number of the cases as surgeon should be increasing as the residents advance in training.

For residents to be logged as first surgeon, they should perform at least 75% of the surgery either independently or supervised depending on the level and skill of the resident. First assistant must be involved in planning, positioning and review of the patient pre- and post-operation.

Residents must attain the following minimum number of procedures by the end of residency training.

Procedures	Level of Competency (to be achieved by)		Minimum number
Fixation of paediatric elbow fractures	First Assistant	R5	5
Carpal tunnel release	First Assistant	R5	10
Hip fractures fixation	Surgeon	R6	30
Total knee arthroplasty (TKA)	Surgeon	R6	30
Knee arthroscopy	Surgeon	R6	30
ACL reconstruction	First Assistant	R6	10
Operative treatment of femoral and tibial shaft fractures	Surgeon	R6	25
Ankle fracture fixation	Surgeon	R6	15



Spine decompression / posterior spine fusion	First Assistant	R6	15
All oncology procedures	First Assistant	R5	10
Shoulder arthroscopy	First Assistant	R6	15
Radius and ulna fixation	Surgeon	R6	20
Hip arthroplasty (include total and bipolar)	Surgeon	R6	20
Foot and ankle reconstructive procedures	First Assistant	R6	15
All other emergency and elective paediatric procedures	First Assistant	R5	25
<b>Total All Cases</b>	A minimum of 200 surgical cases as a surgeon or 1st assistant per year from R2 to R6 <u>and</u> a minimum of 1,000 cases for those 5 years has already been stipulated in the training requirements		

Case logs should be electronically documented on an electronic system (e.g. MedHub). The PDs and CCC would review the case logs. This is to ensure that the resident has had an adequate exposure to clinical material and sufficient, supervised experience in operative procedures. This is to confirm that a resident is prepared for the independent practice of operative orthopaedics.

### Summative Assessments

	Summative assessments	
	Clinical, patient-facing, psychomotor skills etc.	Cognitive, written etc.
R6	<b>Exit Examination</b> 1. Viva Voce – 4 stations (30 mins each) 2. Clinical Examinations – 2 intermediate cases (20 mins each) and 6 short cases (total 30 mins)	<b>Exit Examination</b> Written examination - 120 SBA MCQs (2 hr 15 mins)
R5	Nil	Nil
R4	Nil	Nil
R3	<b>MMed (Orthopaedic Surgery) – total 10 stations:</b> 1) 8 Viva stations <sup>#</sup> - 10 minutes each	Nil

	2) 1 Viva (communication) station – 15-minute station with standardized patient 3) Written examination: Evidence-based Orthopaedics Station (Article Critique) – 10 minutes reading of published articles and 20 minutes for answering questions	
R2	Nil	Nil
R1	<b>Primary MMed (General Surgery) / Intercollegiate Membership of the Royal Colleges of Surgeons (IMRCS) Diploma</b> Part B – OSCE (20 stations, including 2 preparatory stations)	<b>Primary MMed (General Surgery) / IMRCS Diploma</b> Part A – Written Examination (300 SBA MCQs)

S/N	<b><u>Learning outcomes</u></b>	<b><u>Summative assessment components</u></b>				
		Component a: Primary MMed/ IMRCS	Component b: MMed (Ortho Surgery)	Component c: JSF MCQ	Component d: JSF Viva	Component e: Clinical Exam
1	EPA 1: Managing orthopaedic patients in the ward		✓	✓	✓	✓
2	EPA 2: Running emergency orthopaedics operating lists		✓	✓	✓	
3	EPA 3: Performing common elective operations		✓	✓	✓	✓
4	EPA 4: Managing orthopaedic patients in an outpatient setting		✓	✓	✓	✓
5	EPA 5: Managing acute emergency admissions when on call		✓	✓	✓	✓