Specialty Training Requirements (STR)

Name of Specialty:	Intensive Care Medicine
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Contents

Scope of Intensive Care Medicine

Intensive Care Medicine (ICM) is a medical subspecialty concerned with the prevention, diagnosis and management of patients who are critically ill and are under imminent threat of severe morbidity or mortality, due to the derangement of critical physiologic and organ system(s). An Intensivist is a specialist who is an expert in the diagnosis and management of all aspects of critical illness.

Purpose of the Residency Programme

The ICM programme aims to produce specialists who are able to provide the total management required by critically ill patients, through administering management modalities appropriate to the patient's problems and needs, deployment and coordination of the Intensive Care Unit (ICU) healthcare team, engaging health care professionals of other disciplines, and the management and organisation of the physical environment.

Admission Requirements

At the point of application for this subspecialty residency programme,

a) Applicants must be either completing or had completed their primary specialties which consist of Advanced Internal Medicine, Anaesthesiology, Cardiology and Respiratory Medicine;

b) Applicants must be employed by employers endorsed by Ministry of Health (MOH);

c) 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; and

d) Applicants must have a letter of undertaking by their prospective ICU Head of Department (HOD) / Director that states that the ICU HOD / Director will employ the applicant upon successful completion of the ICM Residency.

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

a) Have obtained specialist accreditation in one of the primary specialties, or have applied for specialist accreditation in the primary specialties from Specialist Accreditation Board. Applicants must submit:

    i. Proof on the submission of Specialist Accreditation application in the primary specialty before commencement of the residency training in Intensive Care Medicine, followed by;

    ii. A copy of Specialist Accreditation certification in the approved primary specialty no later than 2 months from the exit certified in the primary specialty); and

b) Have a valid Conditional or Full Registration with Singapore Medical Council (SMC).

Selection Procedures

Applicants must apply for the programme through the annual residency intake matching exercise conducted by MOH 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 trainee in the subspecialty 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 Specialists Accreditation Board (SAB).

b) His / Her years of training are assessed to be equivalent to the local training by JCST and / or SAB.

Applicants for subspecialty residency programme may enter residency training at the appropriate year of training as determined by the Programme Director (PD) and RAC. after receiving accreditation in the base specialty by the SAB.

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 12 months (for residents with primary specialty in Anaesthesiology or Respiratory Medicine) or 24 months (for residents with primary specialty in Advanced Internal Medicine or Cardiology).

Maximum candidature: All subspecialty residents must complete the training requirements, requisite examinations and obtain their exit certification from JCST not more than 24 months beyond the usual length of their training programme. The total candidature for Intensive Care Medicine is

- *12 months Intensive Care Medicine residency + 24 months candidature for residents with primary specialty in Anaesthesiology or Respiratory Medicine, or*
- *24 months Intensive Care Medicine residency + 24 months candidature for residents with primary specialty in Advanced Internal Medicine or Cardiology.*

Nomenclature: ICM residents with primary specialty in Advanced Internal Medicine or Cardiology will be denoted by SS1 and SS2 according to their residency year of training. ICM residents with primary specialty in Anaesthesiology or Respiratory Medicine will be denoted by SS2.

"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 Joint Coordinating Committee (JCC)[1] and should depend on the duration away from training and / or the time deemed necessary for remediation in areas of deficiency. The JCC must 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
EPA 1	Leading ICU rounds
EPA 3	Managing the newly admitted ICU patient
EPA 5	Managing care transitions and referrals

Residents must achieve level 5 of the following EPAs by the end of residency training:

	Title
EPA 2	Leading a Family Conference
EPA 4	Performing ICU procedures

Level 1: Be present and observe, but no permission to enact EPA
Level 2: Practice EPA with direct (pro-active) supervision
Level 3: Practice EPA with indirect (re-active) supervision
Level 4: Unsupervised practice allowed (distant oversight)
Level 5: May provide supervision to junior learners

[1] *The JCC is established for Integrated Programmes (IPs) to oversee resident selection, training curriculum, and faculty and resident evaluations.*

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

Residents must demonstrate the ability to:

- Manage the newly admitted ICU patient
- Perform ICU procedures:
    - Airway Management
    - Percutaneous Tracheostomy
    - Invasive Ventilation
    - Non-Invasive Ventilation
    - Chest Tube Insertion
    - Flexible Bronchoscopy
    - Central Venous Cannulation and Vascular Access
    - Renal Replacement Therapy
    - Invasive Haemodynamic Monitoring – for residents prior to July 2025 cohort onwards
    - Non-invasive Continuous Cardiac Output Monitoring – from AY2025 cohorts onwards
    - Point of Care Ultrasound (POCUS) – from AY2025 cohorts onwards
- Manage care transitions and referrals

Residents must demonstrate ability to perform triage, investigation, diagnosis, treatment, and prognostication of critically ill patients with one or more of the following syndromes & their related conditions:

- Circulatory failure, and Acute Coronary Syndrome (ACS) & cardiogenic shock
- Respiratory failure, and Acute Respiratory Distress Syndrome (ARDS)
- Renal failure
- Hepatic failure
- Digestive tract failure, and bowel obstruction & abdominal compartment syndrome
- Neurological failure, and severe stroke, severe traumatic brain injury, raised intracranial pressure, encephalopathy & brain death
- Haematological failure, and Disseminated Intravascular Coagulation (DIC) & cytopenia
- Sepsis, and sepsis-induced multiorgan failure

- Severe trauma, and burns
- Severe poisoning

For each of the syndromes & conditions stated above, residents must be able to perform the following:

- Airway control, resuscitation & stabilisation
- Advanced monitoring
- Pre / post major procedural / operative optimisation
- Organ support
- Extraordinary rescue
- Disease-specific treatment
- Symptom control, inclusive of pain relief & treatment of delirium
- Coordination & prioritisation of multi-disciplinary and multi-specialty inputs
- Rehabilitation
- End-of-life care, inclusive of the ethical and / or legal aspects of withholding or withdrawal of life-sustaining treatment & organ donation
- Support of family

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.

Residents must demonstrate:

- Knowledge of aspects of pathoanatomy, pathophysiology, pathobiochemistry and pathopharmacology of critically ill patients.

3) Systems-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

At the completion of residency, residents must demonstrate current provider and / or instructor status in the following:

i. Basic Cardiac Life Support (BCLS)
ii. Advanced Cardiac Life Support (ACLS)
iii. Intensive care specific courses such as the Fundamentals of Critical Care Support (FCCS) or Basic Assessment and Support in Intensive Care (BASIC)

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 must be given one full working day off per month for attending the National Training Program (NTP). Residents must attend at least 80% of the NTP session in each academic year. *SS1 Residents should still attend, but attendance is not compulsory.*

The training sessions should be held on virtual platforms in the event of a protracted outbreak where face-to-face on-site meetings are disallowed and cross institution movement is restricted.

Learning Methods and Approaches: Clinical Experiences

a) Residents from primary specialty of Advanced Internal Medicine and Cardiology must complete a total of 12 months of the following ICM-relevant rotations in the first year of residency: Anaesthesiology (minimum 3 months of continuous postings)
b) Respiratory Medicine (minimum 3 months of continuous postings)
c) Intensive Care Unit (minimum 3 months, continuously or in multiple shorter postings of at least 1 month each)

<u>All residents must complete 12 months of core ICU rotations in either one of the following combinations:</u>

Possible Combination – 1	Possible Combination - 2
12 months rotation in a Multidisciplinary ICU unit, of which up to 4 months may be spent in Subspecialty ICUs. The 4 months spent in subspecialty ICUs is limited to: • maximum of 2 Medical Type Subspecialty ICU (maximum 1 month rotation each) • maximum of 2 Surgical Type Subspecialty ICU (maximum 1 month rotation each)	6 months rotation in MICU, of which 2 months may be spent in Medical Type Subspecialty ICU: • Maximum of 2 Medical Type Subspecialty ICU (maximum 1 month rotation each) AND 6 months rotation in SICU, of which 2 months may be spent in Surgical Type Subspecialty ICU: • Maximum of 2 Surgical Type Subspecialty ICU (maximum 1 month rotation each)

- *Approved Medical Type Subspecialty ICUs include (not exhaustive): Coronary Care Unit, Neurological ICU*

- *Approved Surgical Type Subspecialty ICUs include (not exhaustive): Burns ICU, Cardiothoracic ICU, Neurosurgical ICU*

- *Definition: The terms "MICU", "SICU" and "Subspecialty ICUs" are defined based on the ICU structure in Singapore hospitals. Multidisciplinary ICUs are defined as ICUs that cater to all critically ill patients in the hospital without categorisation based on surgical vs medical disciplines (e.g. in Australia, New Zealand and Canada).*

In the event of a protracted outbreak or other public health emergency resulting in restriction of cross institution movement, the sequence of rotations should be rearranged to comply with prevailing outbreak measures whereby core postings should be prioritised.

Learning Methods and Approaches: Scholarly/Teaching Activities

Elective Scholarly Activities that are encouraged:

	Name of activity	Brief description: nature of activity, when it is attempted
1.	Clinical Research	Related to the intensive care medicine, encouraged but not mandatory
2.	Quality Improvement Projects	Related to the intensive care medicine, encouraged but not mandatory

Learning Methods and Approaches: Documentation of Learning

Residents must keep a log of their procedural and case experience in the designated Intensive Care Medicine Logbook. There is no minimum requirement for all inflight trainees.

Residents from AY2025 and AY2026 cohort onwards must log the following procedures and cases:

Procedures	**Minimum Numbers to be logged**	
	AY2025 cohort	AY2026 cohort onwards
Airway Management	5	20
Percutaneous Tracheostomy	-	2
Percutaneous Tracheostomy (Simulated Training)	-	2
Invasive Ventilation	-	20
Non-Invasive Ventilation (in any setting)	-	15^
Chest Tube Insertion (Open or Seldinger technique)	-	20^ 10 performed, 10 assisted
Flexible Bronchoscopy	5	5
Central Venous Cannulation and Vascular Access	5	20
Non-invasive Continuous Cardiac Output Monitoring	-	15^
Renal Replacement Therapy	-	20
Point of Care Ultrasound (POCUS)	10	10

^ involvement in patient management

Cases	**Minimum Numbers to be logged**	
	AY2025 cohort	AY2026 cohort onwards
Cardiovascular Diseases	-	20
Respiratory Disorders	-	20
Renal Diseases	-	20
Metabolic Abnormalities	-	20
Neurological Disorders	-	20
Medical Emergencies	-	20
Surgical Emergencies	-	20

Summative Assessments

	Summative assessments	
	Clinical, patient-facing, psychomotor skills etc.	Cognitive, written etc.
SS2	Not Applicable	Viva / Clinical Sections (2 Stations, 0.5 hours each. 15 minutes reading time prior each station) Local MCQ Examination (100 MCQs, 2.5 hours)
SS1	Not Applicable	Not Applicable

S/N	**Learning outcomes**	**Summative assessment components**	
		Component a: MCQ	Component b: Clinical Viva
1	EPA 1: Leading ICU rounds	✓	✓
2	EPA 2: Leading a Family Conference	✓	✓
3	EPA 3: Managing the newly admitted ICU patient	✓	✓
4	EPA 4: Performing ICU procedures	✓	✓
5	EPA 5: Managing care transitions and referrals	✓	✓