

Respiratory Medicine Senior Residency

TRAINING GUIDE

(A) INTRODUCTION

A. Definition and Scope of Specialty

The medical specialty of respiratory medicine (pulmonary disease) focuses on the etiology, diagnosis, prevention, and treatment of diseases affecting the lungs and related organs.

B. Duration of Education

The educational program in respiratory medicine (pulmonary disease) must be 36 months in length, of which 24 months will be ACGME-I accredited and the last 12 months will be JCST accredited.

(B) PROGRAMME OVERVIEW

The programme consists of 2 parts. The initial 3 years of training will be in Internal Medicine (R1 to R3).

The second period of 3 years would be spent in the Respiratory Medicine Senior Residency programme (R4 to R6). Residents who are certified by their respective Programme Director (PD) and acquired the necessary competence specified for a R3 resident will be considered for promotion into Respiratory Medicine senior residency program.

The Respiratory Medicine senior residency program is a 36 months program of which:

- a) 24 months (R4 and R5) will be ACGME-I accredited and
- b) Last 12 months (R6) will be JCST accredited.

Compulsory posting (R4 – R6) includes:

- 6 months postings in General Medicine/Geriatric Medicine posting across the 3 years of senior residency (2 months per year)
- 2 months postings in Tuberculosis Control Unit (TBCU) done in R5/R6

Note: Senior residents doing their 2 months of TBCU postings will be allowed up to 2 sessions (1 session = half day) off to return to their respective clinic sessions or for specialty training requirements (e.g. bronchoscopy etc.)

(C) TRAINING REQUIREMENTS at R4 – R6

1. Program Personnel and Resources

A. Resources

I. Facilities

- a) A pulmonary function testing laboratory must be available.
- b) A bronchoscopy suite, including appropriate space and staffing for pulmonary procedures, must be available.
- c) Critical care, post-operative care, and respiratory care services must be available.

II. Laboratory and Imaging Services

The following must be available at the primary clinical site:

- a) a supporting laboratory to provide complete and prompt laboratory evaluation;
- b) timely bedside imaging services for patients in the critical care units;
- c) computed tomography (CT) imaging, including CT angiography; and,
- d) nuclear medicine imaging capacity and ultrasonography.

III. Other Support Services

The following must be available:

- a) imaging services, such as positron emission tomography (PET) scan and magnetic resonance imaging (MRI);
- b) a laboratory for sleep-related breathing disorders;
- c) pathology services, including exfoliate cytology;
- d) a thoracic surgery service; and,
- e) other services, including anaesthesiology, immunology, laboratory medicine, microbiology, occupational medicine, physical medicine and rehabilitation, otolaryngology, and radiology.

IV. Patient Population

There must be an average daily census of at least five patients per senior resident during assignments to critical care units.

2. Senior Resident Appointment

A. Eligibility Criteria

Prior to appointment in the program, senior residents should have completed an Accreditation Council for Graduate Medical Education International (ACGME-I)-accredited core specialty program in internal medicine.

3. Specialty-specific Educational Program

A. Regularly Scheduled Didactic Sessions

- I. Senior residents must acquire knowledge regarding monitoring and supervising special services, including:
 - a) pulmonary function laboratories, to include quality control, quality assurance and proficiency standards;
 - b) respiratory care techniques and services; and,
 - c) respiratory care units.
- II. Senior residents must be given opportunities to assume continuing responsibility for both acutely – and chronically-ill patients, in order to learn both the natural history of respiratory medicine (pulmonary disease), and the effectiveness of therapeutic programs.
- III. Senior residents must acquire knowledge in the evaluation and management of patients with genetic and developmental disorders of the respiratory system.
- IV. Senior residents should have formal instruction about genetic and developmental disorders of the respiratory system, including cystic fibrosis.

B. Clinical Experiences

- I. A minimum of 33 months of clinical experience:
 - a. Minimum 21 months spent in non-critical care respiratory medicine (pulmonary disease) rotations which includes compulsory 2 months in TBCU posting done in R5/R6;
 - b. A minimum of 3 months and a maximum of 6 months must be spent in the medical intensive care unit (MICU)
 - c. Compulsory 6 months General Medicine and/or Geriatric Medicine posting (2 months per year)
- II. The remaining 3 months are for electives which can be non-clinical.
- III. Senior Residents may opt for **only** one of the following 3 electives:
 - a. A minimum of 1 month and a maximum 3 months of protected time in respiratory/critical care research*, innovation or quality improvement project – During the period, the senior residents are required to continue their clinics. Topics will be reviewed by the Programme Directors (PDs) and subject to approval by RAC.
 - b. A minimum of 1 month and a maximum 3 months of protected time in clinical rotation in respiratory related sub-specialties*. For topics that require long period of follow-up, the RAC is agreeable to allow the senior residents to continue the

follow-ups. Posting in special interest areas are subject to approval by the Head of Departments and PDs of the respective Sponsoring Institutions.

***List of pre-approved elective postings:**

1. Interventional pulmonology: includes bronchoscopy/ pleuroscopy and rigid bronchoscopy
2. Sleep medicine
3. Asthma and Allergy
4. ILD / LAM/ Sarcoidosis
5. Pleural disease/ Thoracic Ultrasound
6. COPD/ Pulmonary Rehabilitation
7. Respiratory Infections, Bronchiectasis
8. Chronic ventilation (including NIV)
9. Pulmonary physiology & pulmonary function testing
10. Occupational lung disease

For any electives outside of this list will subject to approval by RAC.

c. A minimum of 1 month and a maximum 3 months of Intensive Care Unit

Any remaining time will be spent in General Respiratory Medicine clinical rotations.

****Note:** The maximum number of months that a Senior Resident can spend in ICU postings, under the General Respiratory training, is 6 months across the 3 years of senior residency traineeship. If a senior resident opt for Option C (ICU posting) as elective, the senior resident may spend up till a maximum of 9 months in ICU postings.*

- IV. Each senior resident should, on average, be responsible for no more than eight-to-12 patients during each half-day ambulatory session.
- V. Senior residents must have clinical experience in the evaluation and management of patients in pulmonary rehabilitation.
- VI. Senior residents must have clinical experience in tobacco prevention and cessation counselling.
- VII. Senior residents must have clinical experience in examining and recognizing the histologic changes of lung tissue, becoming familiar with pulmonary cytologic changes, and identifying infectious agents.
- VIII. Senior residents are strongly suggested to have a structured continuity ambulatory clinic experience that exposes them to the breadth and depth of respiratory medicine (pulmonary disease). If provided:
 - a) this experience should average one half-day each week throughout the 24 months of accredited education;
 - b) this experience must include an appropriate distribution of patients of each gender and a diversity of ages;
 - c) each senior resident should, on average, be responsible for four-to-eight patients during each half-day session; and,

- d) the continuing patient care experience should not be interrupted by more than one month, excluding a senior resident's vacation.

IX. Procedures and Technical Skills

- a) Each senior resident must perform a minimum of 110 flexible fiber-optic bronchoscopy procedures, including those with endobronchial and a minimum of 20 transbronchial biopsies and transbronchial needle aspiration.
- b) Direct supervision of procedures performed by each senior resident must occur until proficiency has been acquired and documented by the program director.
- c) Faculty members must teach and supervise the senior residents in the performance and interpretation of procedures, and this must be documented in each senior resident's record, including outcomes (performed/reported/assisted/observed) of procedures, diagnoses, and supervisor(s).
- d) Senior residents must participate in training using simulation.

- X. Senior residents must have experience in the role of a respiratory medicine (pulmonary disease) consultant in both the inpatient and ambulatory settings.

4. ACGME-I Competencies

A. Patient Care

Senior residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Senior residents must demonstrate competence in:

- I. the practice of health promotion, disease prevention, diagnosis, care, and treatment of patients of each gender, from adolescence to old age, during health and all stages of illness;
- II. prevention, evaluation, and management of patients with:
 - a) acute lung injury, including inhalation and trauma;
 - b) circulatory failure;
 - c) diffuse interstitial lung disease;
 - d) disorders of the pleura and the mediastinum;
 - e) iatrogenic respiratory diseases, including drug-induced disease;
 - f) obstructive lung diseases, including asthma, bronchiectasis, bronchitis, and emphysema;
 - g) occupational and environmental lung diseases;
 - h) pulmonary embolism and pulmonary embolic disease;
 - i) pulmonary infections, including tuberculous, fungal infections, atypical mycobacterial infections, and those infections in the immunocompromised host (e.g., human immunodeficiency virus (HIV)-related infections);
 - j) primary and metastatic pulmonary malignancy;
 - k) pulmonary manifestations of systemic diseases, including collagen vascular disease and diseases that are primary in other organs;

- l) pulmonary vascular disease, including primary and secondary pulmonary hypertension and the vasculitis and pulmonary hemorrhage syndromes;
- m) respiratory failure, including acute respiratory distress syndrome, acute and chronic respiratory failure in obstructive lung diseases, and neuromuscular respiratory drive disorders;
- n) sarcoidosis; and,
- o) sleep-disordered breathing.

III. interpreting data derived from various bedside devices commonly employed to monitor patients, as well as data from laboratory studies related to sputum, bronchopulmonary secretions, and pleural fluid;

IV. procedural and technical skills, including:

- a) airway management;
- b) diagnostic and therapeutic procedures, to include thoracentesis, endotracheal intubation, and related procedures;
- c) emergency cardioversion;
- d) flexible fiber-optic bronchoscopy procedures, to include those with endobronchial and transbronchial biopsies and transbronchial needle aspiration;
- e) insertion of arterial and central venous catheters;
- f) operation of bedside hemodynamic monitoring systems;
- g) participation in a multidisciplinary team approach in the management of pulmonary malignancies and complicated asthma;
- h) pulmonary function tests to assess respiratory mechanics and gas exchange, to include spirometry, flow volume studies, lung volumes, diffusing capacity, arterial blood gas analysis, exercise studies, and interpretation of the results of bronchoprovocation testing using methacholine or histamine;
- i) use of a variety of positive pressure ventilator modes, to include:
 - 1) initiation and maintenance of ventilator support;
 - 2) respiratory care techniques; and,
 - 3) withdrawal of mechanical ventilator support.
- j) use of chest tubes and drainage systems;
- k) use of reservoir masks and continuous positive airway pressure masks for delivery of supplemental oxygen, humidifiers, nebulizers, and incentive spirometry;
- l) use of transcutaneous pacemakers; and,
- m) use of ultrasound techniques to perform thoracentesis and place intravascular and intracavitary tubes and catheters.

B. Medical Knowledge

Senior residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Senior residents must demonstrate knowledge of:

- I. the scientific method of problem solving and evidence-based decision making;

- II. indications, contraindications, limitations, complications, techniques, and interpretation of results of those diagnostic and therapeutic procedures integral to the discipline, including the appropriate indication for and use of screening tests and procedures;
- III. imaging techniques commonly employed in the evaluation of patients with respiratory (pulmonary disease) or critical illness, including the use of ultrasound, radiography and CT of the chest, and PET scan changes for assessing pulmonary neoplasms;
- IV. the basic sciences, with particular emphasis on:
 - a) genetics and molecular biology as they relate to respiratory medicine (pulmonary disease);
 - b) developmental biology;
 - c) pulmonary physiology and pathophysiology in systemic diseases; and,
 - d) biochemistry and physiology, including cell and molecular biology and immunology, as they relate to respiratory medicine (pulmonary disease).
- V. indications, complications, and outcomes of lung transplantation;
- VI. recognition and management of the critically-ill from disasters, including those disasters caused by chemical and biological agents;
- VII. insertion of pulmonary artery balloon flotation catheters;
- VIII. the psychosocial and emotional effects of critical illness on patients and their families; and,
- IX. the ethical, economic and legal aspects of critical illness.

C. Practice-based Learning and Improvement

Senior residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.

D. Interpersonal and Communication Skills

Senior residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

E. Professionalism

Senior residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

F. Systems-based Practice

Senior residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Senior residents are expected to:

- a) acquire skills required to organize, administer, and direct a critical care unit; and,
- b) acquire the skills required to organize, administer, and direct a respiratory therapy section.

Adapted from ACGME-International Advanced Specialty Program Requirements for Graduate Medical Education in Respiratory Medicine (Internal Medicine Pulmonary Disease)

5. National Training Programme (NTP) Session

Senior residents are required to attend structured NTP sessions that will be conducted on Tuesdays (for R4 & R5) and Fridays (for R6) and all senior residents are expected to attain a minimum of 70% attendance.

6. Resident Competencies:

The training programme aims to achieve the desired outcomes in the 6 key competencies of patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and system-based practice.

Senior residents are expected to fulfil the 6 key competencies during each year of their residency training as per below table:

Key Competencies / Year of Training	R4	R5	R6
1. Patient Care	6 months postings in General Medicine/Geriatric Medicine posting across the 3 years of senior residency (2 months per year)		
	To achieve 70% attendance for the structured NTP sessions		
	Minimum 50% of ACGME competencies and 50% of RAC mandated procedures.	To complete and perform satisfactorily in 2 months of TBCU and chosen electives (where applicable).	
100% of ACGME competencies and 100% of RAC mandated procedures.		-	
2. Medical Knowledge	Minimum 50% of ACGME competencies.	To be 100% competent in TBCU, General Respiratory Medicine and chosen electives (where applicable).	
		100% of ACGME competencies.	-

Key Competencies / Year of Training	R4	R5	R6
3. Practice-based Learning and Improvement	Be able to appraise the clinical papers and utilize scientific evidence to their patients' health problems under supervision.	To be 100% competent in TBCU, General Respiratory Medicine and chosen electives (where applicable).	
		Be able to appraise the clinical papers and utilize scientific evidence to their patients' health problems independently.	-
4. Interpersonal and Communication Skills	Be able to lead a ward round under supervision.	To be able to monitor and counsel TBCU patients, General Respiratory Medicine patients and patients in chosen electives (where applicable).	
		Be able to lead a ward round independently.	-
5. Professionalism	Be able to lead a ward round under supervision.	To be able to monitor and counsel TBCU patients, General Respiratory Medicine patients and patients in chosen electives (where applicable).	
		Be able to lead a ward round independently.	-
6. Systems-based Practice	Initiate a Quality Improvement Project.	To understand infectious control and be 100% competent in all areas for TBCU, General Respiratory Medicine and chosen electives (where applicable).	
		Complete a Quality Improvement Project.	-

(D) LOG OF OPERATIVE / CLINICAL EXPERIENCE

All senior residents must to keep a log of their operative / clinical experience cases and procedures in a hardcopy logbook.

(E) ASSESSMENT AND EXAMINATIONS

I. Supervisors Assessment

The supervisor's evaluation of the senior residents should be performed at the end of every rotation using the designated form and then submitted to the RAC for review.

II. Feedback

Senior residents should perform a yearly evaluation of teaching faculty and the training programme using the designated forms. These forms must be submitted to the RAC and kept absolutely confidential.

III. Examinations

The following table summarizes the various assessments required across the years of residency training:

R1 – R3	R4	R5	R6
As per Internal Medicine (IM) Residency Program	In-Training Examination (ITE) for senior residents in Respiratory Medicine	In-Training Examination (ITE) for senior residents in Respiratory Medicine *MRCP (UK) Specialty Certificate Examination	Exit Examination for senior residents in Respiratory Medicine

Exit Examination Format

<u>Examination Format</u> <u>For intakes before AY2023</u>	<u>Examination Format</u> <u>For intakes from AY2023 onwards</u>
1. Local MCQ (single best answer format) – 20 questions (Total duration: 30 minutes)	1. MRCP (UK) Specialty Certificate Examination (SCE) in Respiratory Medicine* – 200 questions (Total duration: 6 hours)
2. Viva Voce – 3 stations covering the following topics (10 minutes each) (Total duration: 30 minutes)	2. Viva Voce – 5 stations covering the following topics (12 minutes each) (Total duration: 60 minutes)
a) Diagnostic b) Therapeutic c) Basic Sciences/Physiology d) Critical Care Medicine e) Sleep Medicine f) Latest Journal Read	a) Data interpretation b) ICU c) Respiratory Medicine (for 3 stations)

Timeline of implemented change:

	(AY2022) July 2022 to June 2023	(AY2023) July 2023 to June 2024	(AY2024) July 2024 to June 2025	(AY2025) July 2025 to June 2026
AY2022 Intake	SR1	SR2	SR3 Exit exam: Current Format, i.e., 3-station viva and/or 20 MCQ, depending on which one he/she failed (Apr/May 2025)	2nd Attempt: Re-attempt current exit exam format in Oct/Nov 2025 3rd Attempt: Attempt new exam format in Apr/May 2026 (i.e., 5-station viva and/or SCE, depending on which one he/she failed)
AY2023 Intake		SR1 Announcement of new exit examination format	SR2 SCE	SR3 Exit examination: New Format (Apr/May 2026)

*The MRCP (UK) Specialty Certificate Examination in Respiratory Medicine will apply to AY2023 intake onwards and should only be taken during the Respiratory Medicine senior residency training period (i.e. from SR2 onwards).

Important note :

- Senior residents and prospective senior residents should not attempt the SCE before the stipulated Residency Year.
 - If the senior resident attempts the MRCP(UK) SCE and passes before SR2, the RAC will not recognise the examination results and RAC reserves the right to request the senior residents to take another equivalent exam. If such situation arises, RAC will review it on a case-by-case basis.
- Senior residents are required to pass the MRCP(UK) SCE before they are eligible to sit for the exit examination.

At the end of the 36 months program and upon satisfactory completion of the Respiratory Medicine senior residency training, the senior resident must pass the MRCP (UK) Specialty Certificate Examination in Respiratory Medicine* and exit examination.

All senior residents are required to attend the Medical Ethics, Professionalism and Health Law course before they can be certified exit from the specialty residency training.

(F) CHANGES IN TRAINEESHIP PERIOD AND WITHDRAWAL OF TRAINEESHIP

I. Changes in Training Period

Residency should be continuous. If a training programme is interrupted for any reason whatsoever, the RAC may at its discretion, require the resident to undergo a further period of training in addition to the minimum requirements of the programme or terminate the residency altogether. All residents are required to conform to the residency training plan as approved by the RAC. Overseas attachment during Senior Residency training is not permitted with the exception of Radiation Oncology and Neurosurgery (*refer to JCST Circular 114/14*).

II. Leave Of Absence

All residents are to comply with the prevailing MOH policy on Leave of Absence.

III. Overseas Postings

Overseas attachment during Senior Residency training is not permitted with the exception of Radiation Oncology and Neurosurgery (*refer to JCST Circular 114/14*).