

***Residency Program
Doctor of Medicine (MD)
Curriculum (Phase-B)***

Pulmonology



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1. Introduction:

1.1. Overview of the Specialty

The specialty of Pulmonology developed as a sub-specialization of physicians who are predominantly concerned with the care of patients with respiratory disorders. It is a branch of internal medicine concerned with prevention, investigation and therapy and research into diseases involving the respiratory system. Care of patients with respiratory disorders embraces a wide range of clinical activities and respiratory physicians need a broad view of the respiratory needs of individual patients and the communities in which they live including an understanding of any prevailing healthcare inequalities. This requires knowledge of not only the diagnostic and therapeutic modalities available, but also an appreciation of the importance of the epidemiology and potential for prevention of respiratory diseases.

Although pulmonology is generally stereotyped and highly practical skill based medical specialty, with invasive and interventional skills as high-profile components of the workload, competence in other areas of practice such as respiratory clinical pharmacology and respiratory imaging are equally important. Indeed the expert clinical management of patients with respiratory failure, pulmonary hypertension, use of Non-Invasive Ventilation (NIV) as rewarding as the quasi surgical skills demanded of the pulmonary interventionist.

Respiratory physicians generally work as hospital based specialists and need to integrate their work with not only community based primary care colleagues but also other hospital based physicians. e.g. critical care specialist, ENT surgeons, as well as working closely with Thoracic surgeons and anesthesiologists and the imaging specialties, e.g.

radiology and nuclear medicine. Sub-specialization within Pulmonology has become common place with individuals focusing the development of their expertise in areas such as pulmonary intervention, Sleep medicine specialist, respiratory failure and pulmonary hypertension.

1.2. Pulmonology Residency Program

Residents will undertake a three year intensive Phase B training after completion of Phase A training in order to achieve the levels of knowledge, skills and expertise required for clinical practice in the field of respiratory medicine. It is a competency-based program emphasizing on meaningful integration and contextualization. The two years phase A training program is designed to introduce and develop the broad range of core knowledge, skills, attitudes and behaviours required to become a competent physician. The knowledge and skills acquired during Phase A training are further focused and refined during Phase B training, which is a 3 year specialty-specific training in Pulmonology.

The teaching, learning and assessment of the curriculum is facilitated by the provision of comprehensive, educationally oriented supervision and support, which is provided to all trainees across both the phases of the program.

2. Goals and objectives:

2.1. Overall Goals

1. To prepare respiratory physicians who would be able to meet and respond to the changing healthcare needs and expectation of the society.
2. To develop respiratory physicians who possess knowledge, skills and attitudes that will ensure that they are competent to practice respiratory medicine, safely and effectively.

3. To ensure that they have appropriate foundation for lifelong learning and further training in their specialty.
4. To help them develop to be critical thinkers and problem solvers when managing health problems in the community they serve.

2.2. General Objectives:

The educational and training process aims to produce respiratory physicians who:-

- Can address all aspects of the healthcare needs of patients and their families
- Maintain the highest standards appropriate in their professional field
- Are aware of current thinking about ethical and legal issues
- Are able to act as safe independent practitioners whilst recognizing the limitation of their own expertise and are able to recognize their obligation to seek assistance of colleagues where appropriate
- Are aware of the procedures, and able to take appropriate action, when things go wrong, both in their own practice and in that of others
- Will be honest and objective when assessing the performance of those they have supervised and trained
- Can take advantage of information technology to enhance all aspects of patient care
- Can develop management plans for the "Whole patient" and maintain a knowledge in other areas of medicine which impinge on the specialty of Pulmonology.
- Understand that more effective communication between them and their patients can lead to more effective treatment and care

- Apply appropriate knowledge and skill in the diagnosis and management of patients
- Establish a differential diagnosis for patients presenting with medical problems by the appropriate use of the clinical history, examination and investigations
- Are competent to perform the core investigations and procedures required in their specialties.
- Develop clinical practice which is based on an analysis of relevant clinical trials and to have an understanding of their research methodologies
- Are able to apply the knowledge of biological and behavioral sciences in clinical practice
- Are able to identify and take responsibility for their own educational needs and the attainment of these needs
- Have developed the skills of an effective teacher

3. Admission Requirements for Phase B Training:

- A. Residents who has successfully completed Phase A training and passed Phase A Final Examination are eligible for enrolment in the Phase B program.
- B. Candidates with FCPS/MD in Internal Medicine can be enrolled directly into Phase- B of the residency program

4. Phase B Curriculum structure:

The training is designed to develop both the generic and specialty-specific attributes necessary to practice independently as a consultant respiratory physicians. The aim is to train individuals to provide the highest standard of service to patients with respiratory disorders. This includes the development of positive attitudes towards lifelong learning and the ability to adopt to future technological advances and the changing expectations of society.

4.1. Phase B: Pulmonology Specialty Training:

In-depth specialty-specific educational and training program in this phase will make the resident competent and prepare them for the specialty qualification. It will provide educational program covering the specialty of Respiratory Medicine and its subspecialties, Biostatistics, Research Methodology and Medical Education along with rotation specific clinical training.

4.2. Expected outcomes at the completion of the Phase B Program:

Resident of this training program will be equipped to function effectively within the current and emerging professional, medical and societal contexts. At the completion of the training program in Pulmonology, as defined by this curriculum, it is expected that a new Respiratory specialist will have developed the clinical skills and have acquired the theoretical knowledge for competent practice in the field of Pulmonology. It is expected that a new Respiratory specialist will be able to

- Utilize effective communication with patients and their families and with professional colleagues
- Be devoted to live long learning
- Be equipped to manage both acute and chronic respiratory diseases
- Identify the path physiology and manifestations of respiratory diseases and modern therapeutics, which can be applied to patient diagnosis and management
- Apply appropriate skills to perform necessary diagnostic and therapeutic decisions
- Demonstrate a capacity to rationally analyze clinical data and published work

- Demonstrate an understanding of and commitment to the role of research in advancing medical care of respiratory disease
- Develop a commitment to compassionate, ethical professional behavior
- Identify respiratory medicine related health issues of importance to the community and contribute constructively to debate about those issues
- Apply primary and secondary prevention strategies in respiratory disease

5. Teaching and Learning Methods:

The bulk of learning occurs as a result of clinical experiences (experiential learning, on-the-job learning) and self-directed study. The degree of self-directed learning will increase as trainees become more experienced. Teaching and learning occurs using several methods that range from formal didactic lectures to planned clinical experiences. Aspects covered will include knowledge, skills and practices relevant to the discipline in order to achieve specific learning outcomes and competencies. The theoretical part of the curriculum presents the current body of knowledge necessary for practice. This can be imparted using lectures, grand teaching rounds, clinico-pathological meetings, morbidity/mortality review meetings, literature reviews and presentations, journal clubs, self-directed learning, conferences and seminars.

6. Record of Training:

The evidence requires confirming progress through training includes:

- Details of the training rotations, the training plan agreed with weekly timetables and duty rosters; and numbers of practical procedures and outcomes

- Confirmations of attendance at events in the educational program, at departmental and inter-departmental meetings and other educational events.
- Confirmation (certificates) of attendance at subject-based/skills-training/ instructional courses
- A properly completed **logbook** with entries capable of testifying to the training objectives which have been attained and the standard of performance achieved.
- CME activity
- Supervisor's reports on Observed performance (in the workplace): of duties, practical procedures of presentations made and teaching activity; of advising and working with others, of standards of case notes, correspondence and communication with others.

6.1. Logbook:

Residents are requested to maintain a Logbook in which entries of academic/ professional work done during the period of training should be made on daily basis and signed by the supervisor. A completed and duly certified logbook will form a part of the application for appearing in Phase B Final examinations.

7. Research:

Development of research competencies forms an important part of the Residency program curriculum as they are an essential set of skills for effective clinical practice. Undertaking research helps to develop critical thinking and the ability to review medical literature. Every Resident shall carry out work on an assigned research project under the guidance of a recognized supervisor; the project shall be written and submitted in the form of a Thesis/Research Report.

8. Assessment:

The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists for independent practice and lifelong learning and covers cognitive, psychomotor and affective domains. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum. Assessment includes both **Formative Assessment and Summative (Phase final) Examinations.**

8.1. Formative Assessment:

Formative assessment will be conducted throughout the training phases. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (Phase completion exams).

There will be Continuous (day-to-day) and Periodic type of formative assessment.

- **Continuous (day-to-day) formative assessment** in classroom and workplace settings provides guide to a resident's learning and a faculty's teaching / learning strategies to ensure formative lesson / training outcomes.
- **Periodic formative assessment** is quasi-formal and is directed to assessing the outcome of a **block placement or academic module completion.** It is held at the end of Block Placement and Academic Module Completion. The contents of such examinations include **Block Units** of the Training Curriculum and **Academic Module Units** of the Academic Curriculum.

8.1.1. End of Block Assessment (EBA):

End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, structured clinical Assessment (SCA), medical record review, and logbook assessment. Unsatisfactory block training must be satisfactorily completed to be eligible for phase final examination

8.1.2. Formative assessment for Academic modules for Biostatics and Research Methodology and Medical Education to be done in the first nine months of Phase B training. Residents getting unsatisfactory grade must achieve satisfactory grade by appearing the re-evaluation examination to be eligible for the Phase B Final Examination.

8.2. Summative Examination:

Assessment will be done in two broad compartments.

a) Compartment A: Consist of 3 (three) components.

1. Written Examination (Consists of 2 papers).
2. Clinical Examination (One long and four short cases).
3. SCA and Oral (10 stations SCA, Oral one board consisting of 2 examiners).

Every Resident must pass all the 3 components of compartment-A separately. Candidates will be declared failed if he/she fails in one or more component (s) of the examination. He/she then have to appear all the 3 components in the next Phase B Final Examination.

b) Compartment B: Thesis and Thesis defense.

8.2.1. Written Examination:

Two Papers: Contents of written papers listed in Annexure II

Question type and marks:

- Two Papers (Paper I and Paper II); 100 marks each; Time 3 hrs for each paper. Pass marks-60% of total of 2 papers.
- **Each paper will consist of Two Groups:**
- **Group A:**
 - 10 short questions (5 marks each)
 - These will assess the knowledge of different level and its application
- **Group B:**
 - 5 scenario based problem solving questions (10 marks for each).
 - The questions should focus to assess the capability of handling clinical problem independently and comprehensively as a specialist.
 - Suggested format:-
 - A scenario followed by question(s).
 - Questions may include diagnosis, differential diagnosis, investigation plan, treatment, follow up and patient education.

8.2.2. Clinical Examination: Long case and Short case:

- There will be one long case and four short cases.
- i) **Long case: Marks-100**
 - Directly observed
 - Two examiners for each examinee.
 - History taking and examination by the examinee – 30min.
 - Discussion on the case 20 min.(presentation 6min, crossing 6x2min and decision 2min).

- Examiners will not ask any question nor stop the examinee in any way during history taking and physical examinations.
- Discussion should be done preferably as per structured format and proper weightage on different segments of clinical skills.

ii) **Short cases : Marks-100**

- Four in number
- Time 20-30 min. (Time will be equally divided for each short case)
- Crossing should be done with proper weightage on different segment of clinical skills.

iii) **Pass marks: 60% of total of Long and Short Cases****8.2.3. Structured Clinical Assessment (SCA): Marks-100**

- 10 stations : 5 min each

8.2.4. Oral Examination: Marks-100

- One board consisting of 2 examiners.
- 20 minutes (9+9+2).

8.2.5. Pass marks in SCA and Oral: 60% of total (SCA and Oral.)**8.3. Thesis Evaluation:**

- **Marks: Thesis writing-200; Defense-100: Marks for acceptane-60% of total.**
- To be evaluated by 3 (three) evaluators:- 2 subject specialists and one academician preferably involve in research and teaching research methodology.
- Among the subject specialists one should be external.
- Evaluators should be in the rank of Professor/Associate Professor.

- Supervisor will attend the defense as an observer and may interact only when requested by the evaluators.
- Thesis must be submitted to the controller of Exam not later than 27 months of enrolment in Phase-B.
- Thesis must be sent to the evaluators 2 (Two) weeks prior to assessment date.
- Evaluation will cover Thesis writing and its defense.
- For thesis writing evaluator will mark on its structure, content, flow, scientific value, cohesion, etc.
- For defense – Candidate is expected to defend, justify and relate the work and its findings.
- Assessment must be completed in next 3 months.
- Outcome of the assessment shall be in 4 categories – “Accepted”, “Accepted with minor correction”, “Accepted with major correction” and “Not Accepted”.

8.3.1. Description of terms:

- **Accepted:** Assessors will sign the document and resident will bound it and submit to the Controller of Examinations by 10 days of the examination.
- **Accepted with minor correction:** Minor correction shall include small inclusion/exclusion of section; identified missing references, correction of references and typographical and language problem. This should be corrected and submitted within 2 weeks.
- **Accepted with major correction:** Task is completed as per protocol with acceptable method but some re-analysis of result and corresponding discussion are to be modified.
- To be corrected, confirmed by Supervisor and submit within 3 (Three) weeks.
- **Not Accepted:** When work is not done as per protocol or method was faulty or require further inclusion or confirmation of study.

- To complete the suggested deficiencies and reappear in defense examination during its next Phase Final Examination.
- Candidate has to submit his/her thesis and sit for examination and pay usual examination fees for the examination.

8.3.2. Residents must submit and appear Thesis defense at notified date and time. However non- acceptance of the Thesis does not bar the resident in appearing the written, clinical and oral exam.

8.4. Qualifying for MD Degree:

On passing both the compartments, the candidate will be conferred the degree of MD in the respective discipline. If any candidate fails in one compartment he/she will appear in that compartment only in the subsequent Phase-B exam.

9. Supervision and Training Monitoring:

Training should incorporate the principle of gradually increasing responsibility, and provide each trainee with a sufficient scope, volume and variety of experience in a range of settings that include inpatients, outpatients, emergency and intensive care. All elements of work in training rotation must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure. Outpatient and referral supervision must routinely include the opportunity to personally discuss ail cases. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient. Trainees will at all times have a named Supervisor, responsible for overseeing their education.

Supervisors are responsible for supervision of learning throughout the program to ensure patient and / or laboratory safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plans based on the curriculum, undertake appraisal, review progress against the curriculum, give feedback on both formative and summative assessments as well as sign the logbook and portfolio. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times.

The **Course Coordinator** of each department coordinates all training and academic activities of the program in collaboration with the **Course Manager**. The **Course Director** of each faculty directs guides and manages curricular activities under his/ her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisors.

10. Curriculum Implementation, Review and Updating:

Both Supervisors and Residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training program.

Since Pulmonology has historically been rapidly changing specialty the need for review and up-dating of curriculum is evident. The Curriculum is specifically designed to guide an educational process and will continue to be the subject of active re-drafting, to reflect changes in both pulmonology and educational theory and practice. Residents and Supervisors are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation at Residency Course Director. Review will be time tabled to occur annually for any minor changes to the curriculum. The Curriculum will be reviewed with input from the various subspecialties of Pulmonology.

11. Phase B Syllabus:

The educational process in Respiratory Medicine aims to provide basic knowledge, intellectual, clinical and transferable skills to produce competent specialists in Pulmonology. These specialists will be capable of providing specialized care of the highest order to patients with respiratory disorders in the community as well as clinical tertiary centres. They will recognize the health needs of the community and carry out professional obligations ethically and keeping their standards by engaging in continuing medical education. The program also aims to introduce the candidate to the basics of scientific medical research.

Module A.1: Structure and function of the respiratory system

- A.1.1 Anatomy
- A.1.2 Development and ageing of respiratory system
- A.1.3 Physiology
- A.1.4 Pathophysiology
- A.1.5 Microbiology
- A.1.6 Genetics
- A.1.7 Pharmacology
- A.1.8 Pathology
- A.1.9 Immunology and defence mechanisms
- A.1.10 Molecular biology
- A.1.11 Biochemistry

Module B.1: Airway diseases

- B.1.1 Asthma
- B.1.2 Acute bronchitis
- B.1.3 Chronic bronchitis
- B.1.4 COPD (chronic bronchitis and/or emphysema)

- B.1.5 Bronchiolitis
- B.1.6 Bronchiectasis
- B.1.7 Airway stenosis and malacia
- B.1.8 Tracheo-oesophageal fistula
- B.1.9 Upper airway disease
- B.1.10 Vocal cord dysfunction
- B.1.11 Foreign body aspiration
- B.1.12 Gastro-oesophageal reflux

Module B.2: Thoracic tumours

- B.2.1 Lung cancer
- B.2.2 Metastatic pulmonary tumours
- B.2.3 Mesothelioma
- B.2.4 Metastatic and other pleural tumours
- B.2.5 Benign intra-thoracic tumours
- B.2.6 Mediastinal tumours
- B.2.7 Chest wall tumours
- B.2.8 Sarcoma
- B.2.9 Lymphoma

Module B.3: Non-TB respiratory infections

- B.3.1 Upper respiratory tract infections
- B.3.2 Lower respiratory tract infections
- B.3.3 Community-acquired pneumonia (CAP)
- B.3.4 Nosocomial pneumonia
- B.3.5 Pneumonia in the immunocompromised host
- B.3.6 Other pneumonia
- B.3.7 Parapneumonic effusion and empyema
- B.3.8 Lung abscess
- B.3.9 Fungal infection
- B.3.10 Parasitic infection
- B.3.11 Epidemic viral infection

Module B.4: Tuberculosis

- B.4.1 Pulmonary TB
- B.4.2 Extrapulmonary TB
- B.4.3 TB in the immunocompromised host
- B.4.4 Latent tuberculous infection
- B.4.5 Non-tuberculous mycobacterial diseases
- B.4.6 Tuberculosis and HIV

Module B.5: Pulmonary vascular diseases

- B.5.1 Pulmonary embolism
- B.5.2 Primary pulmonary hypertension
- B.5.3 Secondary pulmonary hypertension
- B.5.4 Vasculitis and diffuse pulmonary haemorrhage
- B.5.5 Abnormal a-v communication

Module B.6: Occupational and environmental diseases

- B.6.1 Occupational asthma
- B.6.2 Reactive airway dysfunction syndrome (RADS)
- B.6.3 Pneumoconiosis and asbestos-related disease
- B.6.4 Hypersensitivity pneumonitis
- B.6.5 Dust and toxic gas inhalation disease
- B.6.6 Indoor pollution related disease
- B.6.7 Outdoor pollution related disease
- B.6.8 Smoking-related disease
- B.6.9 High-altitude disease
- B.6.10 Diving-related disease

Module B.7: Diffuse Parenchymal (interstitial) lung diseases (DPLD)

- B.7.1 Sarcoidosis
- B.7.2 Idiopathic interstitial pneumonias including idiopathic pulmonary fibrosis

(IPF), non-specific interstitial pneumonia (NSIP), cryptogenic organising pneumonia (COP), acute interstitial pneumonia (AIP), respiratory bronchiolitis-associated interstitial lung disease (RB-ILD), desquamative interstitial pneumonia (DIP), lymphoid interstitial pneumonia (LIP)

B.7.3 Cryptogenic organising pneumonia (COP) of unknown aetiology/ bronchiolitis obliterans organising pneumonia (BOOP)

Module B.8: Iatrogenic diseases

B.8.1 Drug-induced disease

B.8.2 Complications of invasive procedures

B.8.3 Radiation-induced disease

Module B.9: Acute injury

B.9.1 Inhalation lung injury

B.9.2 Traumatic thoracic injury

Module B.10: Respiratory failure

B.10.1 Acute respiratory distress syndrome

B.10.2 Obstructive lung disease

B.10.3 Neuromuscular disease

B.10.4 Chest wall disease

B.10.5 other restrictive diseases

Module B.11: Pleural diseases

B.11.1 Pleural effusion

B.11.2 Chylothorax

B.11.3 Haemothorax

B.11.4 Fibrothorax

B.11.5 Pneumothorax

Module B.12: Diseases of the chest wall and respiratory muscles including the diaphragm

B.12.1 Chest wall deformities

B.12.2 Neuromuscular disorders

B.12.3 Phrenic nerve palsy

B.12.4 Diaphragmatic hernia

Module B.13: Mediastinal diseases excluding tumours

B.13.1 Mediastinitis

B.13.2 Mediastinal fibrosis

B.13.3 Pneumo-mediastinum

Module B.14: Pleuro-pulmonary manifestations of systemic/extrapulmonary disorders

B.14.1 Collagen vascular disease

B.14.2 Cardiac disease

B.14.3 Abdominal disease

B.14.4 Haematological disease

B.14.5 Obesity

B.14.6. Hyperventilation syndrome

Module B.15: Genetic and developmental disorders

B.15.1 Cystic fibrosis

B.15.2 Primary ciliary dyskinesia

B.15.3 Alpha-1 antitrypsin deficiency

B.15.4 Malformations

Module B.16: Respiratory diseases and pregnancy

B.16.1 Asthma

B.16.2 Cystic fibrosis

B.16.3 Tuberculosis

B.16.4 Sarcoidosis

B.16.5 Restrictive lung diseases

B.16.6 Pregnancy-induced respiratory diseases

Module B.17: Allergic diseases (IgE-mediated)

- B.17.1 Upper airway disease
- B.17.2 Asthma
- B.17.3 Bronchopulmonary aspergillosis
- B.17.4 Anaphylaxis

Module B.18: Eosinophilic lung diseases

- B.18.1 Non-asthmatic eosinophilic bronchitis
- B.18.2 Acute and chronic eosinophilic pneumonia
- B.18.3 Hyper-eosinophilic syndrome
- B.18.4 Churg–Strauss syndrome

Module B.19: Sleep-related disorders

- B.19.1 Obstructive sleep apnoea syndrome
- B.19.2 Central sleep apnoea syndrome
- B.19.3 Obesity hypoventilation syndrome

Module B.20: Immunodeficiency disorders

- B.20.1 Congenital immunodeficiency syndrome
- B.20.2 Acquired immunodeficiency syndrome
- B.20.3 HIV-related disease
- B.20.4 Drug-induced disease
- B.20.5 Graft versus host disease
- B.20.6 Post-transplantation immunodeficiency

Module B.21: Orphan lung diseases

- B.21.1 Langerhans' cell histiocytosis
- B.21.2 Lymphangiomyomatosis (LAM)
- B.21.3 Pulmonary alveolar proteinosis
- B.21.4 Amyloidosis

Module B.22: Paediatric pulmonology

- B.22.1 Asthma
- B.22.2 Respiratory tract infections (ARI)

B.22.3 Tuberculosis

B.22.4 Surfactant deficiency diseases

Module C.1: Symptoms and signs

C.1.1 Dyspnoea

C.1.2 Wheeze

C.1.3 Stridor

C.1.4 Hoarseness

C.1.5 Cough

C.1.6 Sputum production

C.1.7 Chest pain

C.1.8 Haemoptysis

C.1.9 General symptoms of disease including fever, weight loss, oedema, nocturia, and daytime somnolence

C.1.10 Abnormal findings on inspection including cyanosis, abnormal breathing patterns, finger clubbing, chest wall deformities, superior vena cava syndrome and Horner's syndrome

C.1.11 Abnormal findings on palpation and percussion

C.1.12 Abnormal findings on auscultation

Module D.1: Pulmonary function testing

D.1.1 Static and dynamic lung volumes- interpretation and performance

D.1.2 Body plethysmography- interpretation

D.1.3 Gas transfer- interpretation

D.1.4 Blood gas assessment and oximetry/capnography- interpretation and performance

D.1.5 Bronchial provocation testing- interpretation and performance

- D.1.6 Exercise testing including 6 MWT and spiro-ergometry (cardio-pulmonary exercise testing)- interpretation and performance
- D.1.7 Assessment of respiratory mechanics- interpretation
- D.1.8 Compliance measurements- interpretation
- D.1.9 Respiratory muscle assessment- interpretation
- D.1.10 Ventilation-perfusion measurement- interpretation
- D.1.11 Shunt measurement- interpretation
- D.1.12 Sleep studies/POLYSOMNOGRAPHY- interpretation and performance
- D.1.13 Measurement of regulation of ventilation- interpretation

Module D.2: Other procedures

- D.2.1 Blood tests and serology relevant to respiratory medicine
- D.2.2 Analysis of exhaled breath components including NO, CO and breath condensate
- D.2.3 Sputum induction
- D.2.4 Sputum analysis
- D.2.5 Tuberculin skin testing
- D.2.6 Allergy skin testing
- D.2.7 Pleural ultrasound imaging
- D.2.8 Thoracentesis
- D.2.9 Closed pleural needle biopsy
- D.2.10 Pleuroscopy (medical thoracoscopy)
- D.2.11 Flexible bronchoscopy
- D.2.12 Transbronchial lung biopsy
- D.2.13 Transbronchial needle aspiration
- D.2.14 Endobronchial ultrasound
- D.2.15 Broncho-alveolar lavage
- D.2.16 Bronchography
- D.2.17 Rigid bronchoscopy
- D.2.18 Interventional bronchoscopic techniques including fluorescence bronchoscopy,

- brachytherapy, endobronchial radiotherapy, afterloading laser and electrocoagulation
- cryotherapy, photodynamic therapy, airway stents/thermoplasty
- D.2.19 Percutaneous needle biopsy
- D.2.20 Fine needle lymph node aspiration for cytology
- D.2.21 Right heart catheterisation
- D.2.22 Chest X-ray
- D.2.23 Fluoroscopy

Module D.3: Procedures performed collaboratively

- D.3.1 Thoracic imaging (X-ray, CT, MRI)
- D.3.2 Nuclear medicine techniques (pulmonary and bone scan PET)
- D.3.3 Electrocardiogram
- D.3.4 Echocardiogram
- D.3.5 Ultrasound
- D.3.6 Transoesophageal ultrasound
- D.3.7 Oesophageal pH monitoring
- D.3.8 Cytology/histology
- D.3.9 Microbiology testing

Module E.1: Treatment modalities and prevention measures

- E.1.1 Systemic/inhaled drug therapy
- E.1.2 Chemotherapy
- E.1.3 Other systemic anti-tumour therapy
- E.1.4 Immunotherapy including de-/hyposensitisation
- E.1.5 Oxygen therapy
- E.1.6 Ventilatory support (invasive/non-invasive/CPAP)
- E.1.7 Cardiopulmonary resuscitation
- E.1.8 Assessment for anaesthesia/surgery
- E.1.9 Endobronchial therapies

- E.1.10 Intercostal tube drainage
- E.1.11 Pleurodesis
- E.1.12 Home care
- E.1.13 Palliative care
- E.1.14 Pulmonary rehabilitation
- E.1.15 Nutritional interventions
- E.1.16 Surfactant therapy
- E.1.17 Gene therapy
- E.1.18 Principles of stem cell therapy
- E.1.19 Smoking cessation
- E.1.20 Vaccination and infection control
- E.1.21 Other preventative measures

Module F: Core generic abilities

- F.1 Communication including patient education and public awareness
- F.2 Literature appraisal
- F.3 Research
- F.4 Teaching
- F.5 Audit/quality assurance of clinical practice
- F.6 Multidisciplinary teamwork
- F.7 Administration and management
- F.8 Ethics

Module G: Competence in fields shared with other specialties

- G.1 Intensive care
- G.2 High-dependency unit (HDU)
- G.3 Critical Care Medicine (CCM)

Module H: Knowledge of associated fields relevant to adult respiratory medicine

- H.1 Thoracic surgery (including lung transplantation)

- H.2 Radiotherapy
- H.3 Chest physiotherapy
- H.4 Other relevant medical specialties

Module I: Further areas relevant to respiratory medicine

- 1.1 Epidemiology
- 1.2 Statistics
- 1.3 Evidence-based medicine
- 1.4 Quality of life measures
- 1.5 Psychological factors in the development of respiratory disease
- 1.6 Psychological consequences of chronic respiratory disease
- 1.7 Public health issues
- 1.8 Organization of healthcare in Bangladesh (Healthcare delivery system)
- 1.9 Economics of healthcare across the world
- 1.10 Compensation and legal issues in home & abroad