



**AMRITA**  
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**PROGRAM**  
**DM PULMONARY**  
**MEDICINE**

(Revised with effect from 2016-2017 onwards)

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# INTRODUCTION

Amrita Institute of Medical Sciences and Research Center (AIMS) was conceived in the year 1998 as a center of excellence, which would endeavour to develop patterns of teaching in undergraduate, postgraduate and medical education in as many branches as possible and attempt to produce specialists in several disciplines of medicine.

The Institute serves as an apex referral center for whole of Kerala state and south Indian states. The institute has the largest number of medical and surgical specialties. The faculty team is composed of distinguished personalities hailing from all over India and abroad and is renowned for academic and clinical excellence. Department of Pulmonary and Critical Care Medicine of AIMS started functioning from the inception of the Institute in 1998. It serves as a unique referral center for all types of respiratory diseases. It has all the modern amenities for investigations and treatment of diverse and complicated respiratory diseases. It serves as the center of excellence for all types of diagnostic and interventional strategies. It is equipped with specialized services like spirometers, DLCO machine, cardiopulmonary exercise testing, video bronchoscopy, video-assisted thoracoscopy, VQ scanning and sleep lab. The critical care unit has all modern facilities with latest invasive and non-invasive ventilators with the best monitoring systems. The department also caters to diverse allergic diseases including allergy skin testing and sublingual immunotherapy. The diagnostic facilities available in AIMS are par in excellence compared to any other national/international institutes. It has to be highlighted that the departments of microbiology, pathology and radiology has all sophisticated investigative facilities. To quote a few examples are the Cyto centrifuge, cell block technique, BACTEC AFB culture, pulmonary/bronchial artery angiogram, MDCT etc.. Bronchial artery embolisation, image guided intercostal tube drainage (pig tail) are some of unique techniques performed in consortium with the radiology department. The department is also equipped with facilities for whole lung lavage (WLL), an extremely challenging procedure for managing pulmonary alveolar proteinosis. The first successful WLL in Kerala was conducted in 2005 in Amrita. COPD Rehabilitation, chest physiotherapy and counselling for smoking cessation and asthma education form part of the routine management of most of patients attending the department. The department also conducts quit tobacco clinic. The department also ensures full-fledged support of oncology (medical, surgical and radiation), thoracic surgery and palliative care for various neoplastic and non-neoplastic respiratory diseases.

## **NEED AND SCOPE OF DM (POST DOCTORAL) COURSE IN PULMONARY MEDICINE AND CRITICAL CARE**

Lung disease is a major cause of morbidity and mortality all over the world. Tuberculosis, which primarily involves the lungs, is reported in 1.3 to 2.5 percent of general population, The recent threat of Acquired Immuno Deficiency Syndrome (AIDS) has further aggravated the tuberculosis problem, globally and is a major problem in our country.

Besides tuberculosis, there is a heavy burden of non-tuberculous lung diseases and respiratory emergencies. Diseases such as bronchial asthma, chronic bronchitis, respiratory infections, lung cancer and others, account for about 70 percent for the lung diseases seen in any large hospital in India. Asthma alone may affect 5-7 percent of adults & about 10 percent of children. Occurrence of occupational and environmental hazards has also increased. The Bhopal gas tragedy is only one example of such disasters. Respiratory failure secondary to infections, road accidents and other trauma, poisoning and intoxication, medical disorders, and several other conditions, may account for a heavy mortality. Tobacco-smoking, a widely prevalent habit, is the major cause of many lung diseases in India, responsible for 7 to 13 million patients of chronic obstructive pulmonary disease (COPD) and 0.11 to 0.21 million COPD deaths.

When compared to any other specialties, there has been an explosive expansion of research and techniques in investigation and management of respiratory diseases. In future, it is expected that there would be a revolutionary change in the management of respiratory disease. Majority of respiratory disease are now identified to have multidisciplinary application (associated co-morbid diseases, systemic manifestations of respiratory diseases and pulmonary manifestations of systemic diseases) and the post graduate courses (Diploma & MD) is inadequate to cover these aspects during the specified time periods. More over, internationally the specialty of Pulmonary Medicine is identified as a post MD super-specialty course. The existing Diploma and MD courses were started when tuberculosis and other infectious diseases formed the major share of respiratory diseases. Now the scenario has totally changed and non-infectious diseases form the major thrust in this field.

Critical care medicine is managed by pulmonary physicians in majority of the international and many national institutes. has been included in pulmonary programmes in several developed countries. More and more ICUs are being established all over the country. There are several other specialities such as cardiology and cardiothoracic surgery, aviation and space medicine, sports-medicine, environmental and industrial medicine, where a liaison with pulmonary physicians is essential. Thus there is a great need of comprehensive training of physicians in pulmonary medicine and critical care similar to the postdoctoral fellowship programmes of the developed countries. The existing

training programmes (diploma and MD courses) are not fully capacitated to deal with the emerging changes in this field. In order to incorporate all new and emerging information and new technologies it is imperative to initiate postdoctoral programmes in Pulmonary Medicine urgently.

### **Program Outcomes**

PO1 Recognise the importance of pulmonary and critical care in the context of the health needs of the community and the national priorities in the health sector

PO2 Practice pulmonary and critical care ethically and in accordance with the principles of primary health care.

PO3 Demonstrate sufficient understanding of basic sciences in pulmonary and Critical Care Medicine appropriate to the level of postdoctoral training.

PO4 Identify social, economical, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.

PO5 Describe Lung malignancies and their management including prevention.

PO6 Diagnose and manage pulmonary and critical care disease on the basis of clinical assessment, and appropriately selected and conducted investigations.

PO7 Plan and advice measures for the prevention and rehabilitation of patients suffering from respiratory diseases and disability.

PO8 Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.

PO9 lay the assigned role in the implementation of National Tuberculosis and other health programmes effectively and responsibility.

PO10 Organize and supervise the chosen/ assigned health care services demonstrating adequate managerial skills in the field situation.

PO11 Develop skills as a self-directed learner, recognize continuing educational needs: select and use appropriate learning resources.

### **Program Specific Outcomes**

PSO1 Diagnose and manage independently Common medical and lung diseases. including Tuberculosis

PSO2 Resuscitate the critically ill and provide respiratory support.

PSO3 Diagnose and manage independently medical emergencies specially those involving the respiratory system.

PSO4 adopt preventive measures at individual and community level against the commonly prevalent preventable medical and lung diseases.

## **OBJECTIVES**

At the end of the training, a postdoctoral fellow should be able to act as a consultant in pulmonary and critical care medicine.

### **Primary Objectives**

He/She should be able to:

- i) Diagnose and manage independently:
  - a) Common medical and lung diseases. including Tuberculosis
  - b) Pulmonary problems of specialized nature related to other medical and surgical disciplines, occupation, industry, environment, high-altitude, aviation, under-water conditions and drowning.
- ii) Resuscitate the critically ill and provide respiratory support.
- iii) Diagnose and manage independently medical emergencies specially those involving the respiratory system.
- iv) Adopt preventive measures at individual and community level against the commonly prevalent preventable medical and lung diseases.

### **Secondary objectives**

He/ She should be able to perform and interpret:

- i) Various bedside procedures required in medical management of patients.
- ii) Specialized procedures for diagnosis and management of lung diseases such as fiberoptic bronchoscopy, lung and pleural biopsies, thoracentesis, thoracostomy and image guided interventions.
- iii) Comprehensive lung function studies including spirometry, Co diffusion capacity
- iv) Allergy and bronchoprovocation tests.

In addition, he/she should be able to interpret:

- i) Radiographic and other scanning images.
- ii) Specialized investigations of allied nature such cardiac catheterization, other endoscopies, body scans and angiographic procedures
- iii) Histological and cytological specimens of lung diseases

### **Tertiary objectives**

- i) Set up a pulmonary division as an independent unit.
- ii) Carry out and help in conduct of research in pulmonary and medical sciences, communicate the results of such research at medical meetings and report in medical journals.

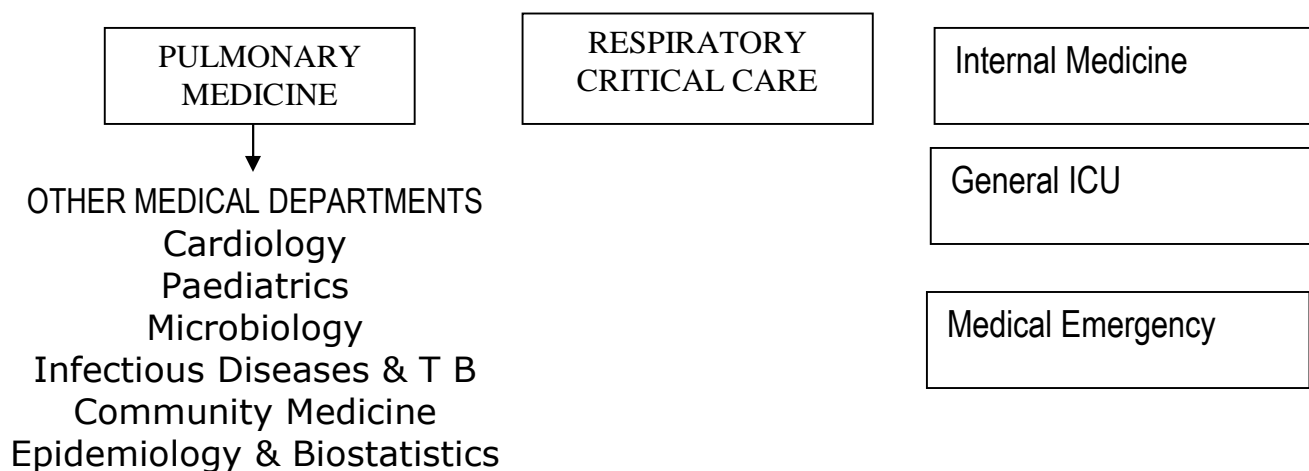
- iii) Guide research projects of students and critically evaluate the results of other investigators.

## SYLLABUS

A comprehensive programme designed to fulfill the objectives has been planned in the DM course (fig.1)

Figure 1

### PULMONARY AND CRITICAL CARE MEDICINE



Each DM student is required to possess a comprehensive knowledge of the basic and clinical sciences related to pulmonary medicine and critical care, and clinical skills in diagnosing respiratory and other medical disorders. He/She should have personally performed a sufficient number of both invasive and non-invasive procedures for diagnosis and treatment (such as bronchoendoscopic examination and assisted ventilation): and manage acute respiratory emergencies. He /she should also possess sufficient knowledge and experience in research methodology and development.

# 1. THEORY OF PULMONARY MEDICINE

## 1.1 Basic Sciences

### 1.1.1 Anatomy Respiratory System

- (a) Anatomy and histology of respiratory system including airways, pleura, chest wall, lungs and mediastinum.
- (b) Applied embryology of lungs, mediastinum and diaphragm
- (c) Developmental anomalies

### 1.1.2 Physiology and Biochemistry

- (a) Assessment of pulmonary functions
- (b) Control of ventilation
- (c) Pulmonary mechanics
- (d) Ventilation, pulmonary blood flow, gas exchange and transport: respiratory reflexes including cough reflex: lung defenses including respiratory surfactant
- (e) Exercise physiology and testing.
- (f) Non-respiratory functions of lung.
- (g) Inhalation kinetics and its implication in aerosol therapy, and sputum induction.
- (h) Acid-base and electrolyte balance
- (i) Physiology of sleep and the sleep disorders
- (j) Pathophysiology of respiratory disorders

### 1.1.3 Microbiology

- (a) Mycobacterium tuberculosis and other mycobacteria
- (b) Laboratory diagnosis of tuberculosis (including staining, culture and immunological techniques) Recent advances in the diagnosis of Tuberculosis like Molecular methods.
- (c) Virulence and pathogenicity of mycobacteria
- (d) Bacteria causing respiratory diseases
- (e) Mycoplasma and respiratory tract infections
- (f) Anaerobes in pleuropulmonary infections
- (g) Laboratory diagnosis of non tuberculosis infections of respiratory tract
- (h) Respiratory viruses



- (i) Human immunodeficiency virus
- (j) Respiratory fungi:
  - i. Classification of fungal diseases of lung: Candidiasis. Actinomycosis, Nocardiosis, Aspergillosis, Blastomycosis etc.
  - ii. Laboratory diagnostic procedures in respiratory mycoses
- (k) Opportunistic infections in the immunosuppressed host
- (l) Respiratory parasitic infections

#### 1.1.4. Pathology

- (a) Acute and chronic inflammation
- (b) Tuberculosis
- (c) Pneumonias and bronchopulmonary suppuration
- (d) Chronic bronchitis and emphysema, asthma
- (e) Occupational lung diseases and pneumoconiosis
- (f) Interstitial Lung Diseases
- (g) Tumours of the lung, mediastinum and pleura
- (h) Various mechanisms of hypersensitivity reactions in respiratory diseases
- (i) Immunological and pathological tests in Allergic diseases of lung – in vitro and in vivo tests, bronchial provocation test
- (j) Immunology of Tuberculosis.

#### 1.1.4 Epidemiology

- (a) Epidemiological terms and their definitions
- (b) Epidemiological techniques of surveys
- (c) Epidemiology of tuberculosis, pneumoconiosis, asthma, COLD and lung cancer
- (d) National Tuberculosis Control Programme and the Revised NTCP
- (e) BCG and prevention of TB
- (f) Research methods and study designs

#### 1.1.5 Pharmacology

- (a) Antimicrobial drugs
- (b) Antitubercular drugs
- (c) Antineoplastic drugs
- (d) Corticosteroids and other anti inflammatory drugs.

- (e) Anti- asthma drugs
- (f) Drugs used in microbial, viral, fungal and parasitic infections
- (g) Pharmacokinetics and drugs interaction for commonly used drugs in respiratory diseases

## 1.2 Clinical Sciences

### 1.2.1 Infections

#### 1.2.1.1 Tuberculosis

- (a) Aetiopathogenesis
- (b) Diagnostic methods of TB & M.D.R. TB.
- (c) Differential diagnosis
- (d) Management of pulmonary tuberculosis including drug resistant TB
- (e) Complications in tuberculosis
- (f) Tuberculosis in children
- (g) Geriatric tuberculosis
- (h) Pleural and pericardial effusion and empyema
- (i) Mycobacterial other than tubercular infections
- (j) Extra pulmonary tuberculosis
- (k) HIV and tuberculosis
- (l) HIV & MDR TB

#### 1.2.1.2 Non- Tuberculous infections of the lungs

- (a) Upper respiratory tract infections
- (b) Approach to a patient with pulmonary infection.
- (c) Community acquired pneumonias
- (d) Nosocomial pneumonias
- (e) Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic
- (f) Bronchiectasis and lung abscess
- (g) Acquired immunodeficiency syndrome and opportunistic infections in an immuno-compromised host.
- (h) Bronchitis and bronchiolitis

### 1.2.2 Non- infectious Lung Diseases

#### 1.2.2.1 Interstitial Lung Disorders

- (a) Immune defense mechanisms of the lung
- (b) Sarcoidosis
- (c) Hypersensitivity pneumonias
- (d) Lung involvement in connective tissue disorders
- (e) Eosinophilic pneumonias and tropical eosinophilia
- (f) Pulmonary vasculitides
- (g) Reactions of the interstitial space to injury
- (h) Pulmonary fibrosis
- (i) Occupational pulmonary diseases
- (j) Interstitial diseases of other aetiologies
- (k) Drug induced pulmonary diseases
- (l) Aspiration and inhalational (non-occupational) diseases of the lung

#### 1.2.2.2 Pulmonary Circulatory disorders

- (a) Pulmonary edema
- (b) Pulmonary hypertension and cor pulmonale
- (c) Pulmonary thromboembolic diseases
- (d) Cardiac problems in a pulmonary patient and pulmonary diseases produced by cardiac diseases

#### 1.2.2.3. Obstructive diseases of the lungs

- (a) Asthma
- (b) Chronic obstructive lung disease
- (c) Pulmonary rehabilitation

#### 1.2.2.4 Cancer of the lungs

- (a) Epidemiology, pathology, natural history, clinical picture and staging of the carcinoma of lungs and other tumors
- (b) Approach to the diagnosis of a pulmonary nodule.
- (c) Medical management and surgical treatment of lung cancer.
- (d) Radiation therapy in the management of carcinoma lung
- (e) Paraneoplastic syndromes

#### 1.2.2.5 Diseases of the mediastinum

- (a) Benign and malignant tumors
- (b) Non-neoplastic disorders

#### 1.2.2.6 Disorders of the pleura

- (a) Pleural dynamics and effusions
- (b) Non-neoplastic and neoplastic pleural diseases
- (c) Pneumothorax
- (d) Pyothorax and broncho-pleural fistula and its complications.

#### 1.2.2.7 Sleep related breathing disorders

#### 1.2.2.8 Obesity hypoventilation diseases

#### 1.2.2.9 High altitude problems

#### 1.2.2.10 Drug induced disorders

#### 1.2.2.11 Disorders of the diaphragm

#### 1.2.2.12 Tobacco smoking

#### 1.2.2.13 Respiratory failure

- (a) Acute Respiratory Distress Syndrome: pathology, pathogenesis diagnosis and management
- (b) Respiratory failure in a patient with obstructive airway disease.
- (c) Respiratory muscle fatigue.
- (d) Respiratory and haemodynamic monitoring in acute respiratory failure
- (e) Mechanical ventilation (indications, modes, complications and weaning)

#### 1.2.2.14 Comprehensive Critical Care

#### 1.2.2.15 Respiratory Care

- (a) Oxygen therapy
- (b) Inhalational therapy
- (c) Bronchial hygiene

#### 1.2.2.16 Environmental problems ( Both outdoor and Indoor).

#### 1.2.3 Surgical aspects of Chest medicine

- (a) Pre and post-op evaluation and management of thoracic surgical patients.
- (b) Postoperative pulmonary complications
- (c) Chest trauma/trauma related lung dysfunction

#### 1.2.4. Investigative / Therapeutic procedures

- (a) Pulmonary function tests and their interpretation in determining the disability

- (b) Spirometry, compliance, airway resistance, lung volume, pulmonary diffusion
- (c) Bronchoscopy, thoracoscopy and other endoscopic procedures
- (d) Chest Imaging- x-ray chest, ultrasound, CT. bronchography
- (e) Blood gas analysis
- (f) Cardiopulmonary exercise testing
- (g) Bronchoprovocation tests
- (h) Pulmonary angiography
- (i) ECG and ECHO

#### 1.2.5. Research and Clinical Epidemiology

- (a) Research methodology and study design (cohort, case control, randomized clinical trials. Observational and cross sectional studies.
- (b) Common statistical methods for analysis of research
- (c) Sources of bias

#### 1.2.6 Critical care and Assisted Ventilation

- (a) Respiratory Failure: Pathogenesis, causes, diagnosis and management
- (b) Sepsis
- (c) Resuscitation of the critically ill including
- (d) Cardiopulmonary mechanics
- (e) Ventilatory principals, application, assessment and monitoring
- (f) Multiple organ support systems
- (g) Ventilatory care and support: Nutritional support; Infection control; complications
- (h) Weaning from mechanical ventilation
- (i) Comprehensive care of the comatose
- (j) ICU designing and control

#### 1.2.7 Paediatric pulmonology

- (a) Respiratory problems in children
- (b) Infective pneumonias
- (c) Childhood tuberculosis
- (d) Respiratory distress syndrome of the newborn
- (e) Bronchopulmonary dysplasias

- (f) Congenital malformations
- (g) Bronchial asthma
- (h) Cystic fibrosis
- (i) Special management problems in children

#### 1.2.8 Pulmonary Radiology and Imaging

- (a) Interpretation of plain radiography, contrast studies, CT scan M.R.I and ultrasound examination of thorax.
- (b) Interpretation of ventilation/ perfusion and other scintillation scans

#### 1.2.9 Respiratory rehabilitation

#### 1.2.10. Ethical, legal economic and other related issues involved in respiratory and critical care

- (a) Prioritization of care
- (b) Withholding and withdrawing mechanical ventilation
- (c) Legal consent
- (d) Brain death-certification
- (e) Palliative care and other End of life Issues

### **2. CLINICAL SKILLS**

- (a) Clinical history taking and examination: ability to analyse different clinical symptoms and signs: interpret their significance and reach a diagnosis
- (b) Interpretation of laboratory data
- (c) Interpretation of pulmonary function tests, ECG, ECHO and other investigations
- (d) Interpretation of chest roentgenography
- (e) Pulmonary histopathology and cytology
- (f) Oxygen therapy
- (g) Nebulization therapy
- (h) Mechanical ventilation- indications and applications

### **3. PRACTICAL SKILLS**

#### 3.1 Microbiological

- (a) Sputum smear staining: Gram's and AFB staining
- (b) Mantoux testing
- (c) BCG vaccination

(d) Skin sensitivity tests

### 3.2 Pulmonary Function Tests

(a) Spirometry

(b) Bronchoprovocation tests

(c) Body plethysmography

(d) Respiratory sleep monitoring

(e) Exercise testing.

### 3.3 Diagnostic procedures

3.3.1 Fine needle biopsy of lymph nodes, lung and mediastinal masses

3.3.2 Biopsy of pleural and lung masses

3.3.3 Fiberoptic bronchoendoscopic examination and related procedures including bronchial and transbronchial lung biopsy, bronchoalveolar lavage and fine needle aspiration (At least 50 procedures)

### 3.4 Therapeutic Procedures / Interventions

3.4.1 Aspiration of pleural and pericardial effusion

3.4.2 Tube thoracostomy

3.4.3 Respiratory muscle exercising

3.4.4 Medical emergency management

3.4.4.1 Cardiopulmonary resuscitation

3.4.4.2 Management of acute emergencies

(a) Acute respiratory failure

(b) Acute asthma

(c) Pneumothorax

(d) Haemoptysis

(e) Pulmonary thromboembolism

(f) Multiple organ failure

3.4.5 Mechanical Ventilation: On hand training in providing both short and long term mechanical ventilatory support

3.4.5.1 Invasive

(a) Endotracheal intubation

(b) Ventilatory settings

(c) Care and maintenance

(d) Monitoring

(e) Weaning

3.4.5.2 Non-invasive ventilation including domiciliary respiratory support.

## ADMISSION

### 1. Eligibility

- a) M.D (or its equivalent degree recognized by the Medical Council of India) in General Medicine/Paediatrics/ Tuberculosis and Chest/Respiratory Diseases /Pulmonary Medicine/Thoracic Medicine.
- b) Admission will be made on the basis of competitive entrance test

### STRUCTURE

1. Duration of the course: Three years
2. Training: Besides the Pulmonary Medicine department, the teaching/training will be imparted in the departments of Medicine and other specialties especially for the critical care training. The broad schedule of period of training (months) is given below:

	1 <sup>st</sup> year year	2 <sup>nd</sup> /3 <sup>rd</sup>
i. Pulmonary clinical services	2	6
ii Emergency & consultation duty	2	2
iii Respiratory laboratory	2	2
iv Critical Care	3	6
v Clinical Medicine/ Medical ICU	3	4
vi Other departments		
Cardiology		1.5
Paediatrics		1
Microbiology		.5
vii Elective duty		1

3. Dissertation/ Thesis: The students are required to conduct and write a research project on a subject in a pulmonary/ critical care medicine or a related topic, duly approved by the Institute. The dissertation will be required to be submitted at the end of the two years.

The chief guide is required from amongst the department faculty. The co-guide/s may belong to any department of the Institute.



The dissertation shall be examined and approved by two external examiners. In case of rejection, a revised/new dissertation will be required before the degree is awarded. Alternatively, a research paper published/ accepted for publication during the period of the training shall be considered as equivalent.

4. Research Methodology Course.

5. Presentations at CPCs, Clinical Conferences, Seminars, Journal Clubs and other meetings.

## **TEACHING METHODOLOGY**

It consists of outpatient and inpatient bedside discussions ward rounds and case demonstrations. Journal clubs, seminars and symposia, clinical meetings and joint conferences with other departments. An average programme is given below:

### **a. Joint programme with other departments**

- |   |            |
|---|------------|
| i. Student's clinico-pathological Conferences (CPC) | 1 per week |
| ii. Student's clinical meeting                      | 1 per week |
| iii. Staff CPC                                      | 1 per week |
| iv. Staff clinical meeting                          | 1 per week |
| v. Mortality review meeting                         | 1 per week |
| vi. Radiology round                                 | 1 per week |
| vii. Pulmonary Histo-cyto-pathology round           | 1 per week |

### **b. Departmental**

- |                                 |            |
|---------------------------------|------------|
| viii. Teaching rounds           | 2 per week |
| ix DM Journal Club              | 1 per week |
| x. DM Seminar (Basic Sciences ) | 1 per week |
| xi. DM bedside                  | 1 per week |

### **c. Research methodology** **20-28 hours**

# COURSES:

## **Paper - I Basic Sciences (Course Code: DMPU1)**

CO1: Diffusion and diffusion capacity

CO2: Bronchopulmonary Anatomy.

CO3: Pathophysiology of Pleural Fluid Formation

CO4: Pulmonary circulation.

CO5: Lymphatics of lung.

### Basic Sciences

#### Anatomy Respiratory System

Anatomy and histology of respiratory system including airways, pleura, chest wall, lungs and mediastinum.

Applied embryology of lungs, mediastinum and diaphragm

Developmental anomalies

#### Physiology and Biochemistry

Assessment of pulmonary functions

Control of ventilation

#### Pulmonary mechanics

Ventilation, pulmonary blood flow, gas exchange and transport: respiratory reflexes including cough reflex: lung defenses including respiratory surfactant

Exercise physiology and testing.

Non-respiratory functions of lung.

Inhalation kinetics and its implication in aerosol therapy, and sputum induction.

Acid-base and electrolyte balance

Physiology of sleep and the sleep disorders

Pathophysiology of respiratory disorders

Microbiology

Mycobacterium tuberculosis and other mycobacteria

Laboratory diagnosis of tuberculosis (including staining, culture and immunological techniques) Recent advances in the diagnosis of Tuberculosis like Molecular methods.

Virulence and pathogenicity of mycobacteria

Bacteria causing respiratory diseases

Mycoplasma and respiratory tract infections

Anaerobes in pleuropulmonary infections

Laboratory diagnosis of non tuberculosis infections of respiratory tract

Respiratory viruses

Human immunodeficiency virus

Respiratory fungi:

- i. Classification of fungal diseases of lung: Candidiasis, Actinomycosis, Nocardiosis, Aspergillosis, Blastomycosis etc.
- ii. Laboratory diagnostic procedures in respiratory mycoses

Opportunistic infections in the immunosuppressed host

Respiratory parasitic infections

Pathology

Acute and chronic inflammation

Tuberculosis

Pneumonias and bronchopulmonary suppuration

Chronic bronchitis and emphysema, asthma

Occupational lung diseases and pneumoconiosis

Interstitial Lung Diseases

Tumours of the lung, mediastinum and pleura

Various mechanisms of hypersensitivity reactions in respiratory diseases

Immunological and pathological tests in Allergic diseases of lung – in vitro and in vivo tests, bronchial provocation test

Immunology of Tuberculosis.

## **Paper - II Non Tuberculous Chest Diseases (Course Code: DMPU2)**

CO1: Types of Respiratory failure

CO2: Asthma in Pregnancy

CO3: Mechanism and Clinical Features of Bronchiectasis

CO4: Biomarkers of Sepsis

CO5: Management of IPF

Non- Tuberculous infections of the lungs

Upper respiratory tract infections

Approach to a patient with pulmonary infection.

Community acquired pneumonias

Nosocomial pneumonias

Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic

Bronchiectasis and lung abscess

Acquired immunodeficiency syndrome and opportunistic infections in an immuno-compromised host.

Bronchitis and bronchiolitis

Atypical pneumonias

Non- infectious Lung Diseases

Interstitial Lung Disorders

Immune defense mechanisms of the lung

Sarcoidosis

Cystic Fibrosis

Hypersensitivity pneumonias

Lung involvement in connective tissue disorders

Eosinophilic pneumonias and tropical eosinophilia

Pulmonary vasculitides

Reactions of the interstitial space to injury

Pulmonary fibrosis

Shrinking Lung Syndrome

Occupational pulmonary diseases

Interstitial diseases of other aetiologies

Drug induced pulmonary diseases

Aspiration and inhalational (non-occupational) diseases of the lung

Pulmonary Circulatory disorders

Pulmonary edema

Pulmonary hypertension and cor pulmonale

Pulmonary thromboembolic diseases

Cardiac problems in a pulmonary patient and pulmonary diseases produced by cardiac diseases

Obstructive diseases of the lungs

Asthma

Chronic obstructive lung disease

Pulmonary rehabilitation

Cancer of the lungs

Epidemiology, pathology, natural history, clinical picture and staging of the carcinoma of lungs and other tumors

Approach to the diagnosis of a pulmonary nodule.

Medical management and surgical treatment of lung cancer.

Radiation therapy in the management of carcinoma lung

Paraneoplastic syndromes

Diseases of the mediastinum

Benign and malignant tumors

Non-neoplastic disorders

Disorders of the pleura

Pleural dynamics and effusions

Non-neoplastic and neoplastic pleural diseases

Pneumothorax

Pyothorax and broncho-pleural fistula and its complications.

**Paper - III Tuberculosis and Related Disorders (Course Code: DMPU3)**

CO1: HIV & TB

CO2: To identify MDR suspects

CO3: Abdominal TB

CO4: Non Tubercular Mycobacteria

CO5: TB Meningitis.

Aetiopathogenesis

Diagnostic methods of TB & M.D.R. TB.

Differential diagnosis

Management of pulmonary tuberculosis including drug resistant TB

Complications in tuberculosis

Tuberculosis in children

Geriatric tuberculosis

Nutrition in Tuberculosis patients

Pleural and pericardial effusion and empyema

Management of Extremely Drug Resistant TB (XDR-TB)

Mycobacterial other than tubercular infections

Principles of Isolation of Pulmonary TB patients

Extra pulmonary tuberculosis

HIV and tuberculosis

HIV & MDR TB

**Paper - IV Recent advances (Course Code: DMPU4)**

CO1: Difficult to Treat Asthma

CO2: Newer Inhalers in COPD

CO3: Pulmonary Function Test

CO4: Genetics in Lung Cance

CO5: Endo bronchial Ultrasound.

Knowledge about latest treatment modalities , Upcoming EBUS treatment , and knowledge about latest clinical research journals

**Soft Skills (Course Code: DMPU5) Elective.**

CO1 :Medical Ethics

CO2: Ability to function as the member of a team

CO3: Ability to organise public health programs

CO4: Acquisition of skills in administration of a department.

The teaching sessions for the course are not compulsory. There will be no written assessment for the soft skills course. The candidate will be subjected to 360 degree evaluation throughout the program.

# EVALUATION

1. **Internal assessment:** The student is assessed at the end of a posting, or after every 3 months

The assessment is based on day to day performance and a formal test. It is regularly forwarded to the Dean. At the end, the assessment is pooled and counts towards 20% of the marks of the final examination.

## 2. Final examination

### i. Theory papers

- a. Physiology and pathology as applied to pulmonary Medicine and Critical Care
- b. Other basic sciences related to Pulmonary Medicine and Critical Care
- c. Practice of Pulmonary Medicine and Critical Care

### ii. Practical Examination

There are 4 examiners (Internal = External = 2) for the practical examination.

	Marks out of
	100
* clinical cases – Three	60
* radiographs and scans	15
* Problem solving (Lung function tests, blood gases, epidemiology etc)	10
* General viva	15
<i>Total weightage of the final result</i>	<i>100</i>
i. Internal assessment	20%
ii Theory/papers	20%
iii Practical examination	60%



## **EDUCATIONAL RESOURCES available in department library/ Amrita library**

### **A. Text Books**

1. Harrison's Principles of medicine Ed. Petersdorf (Mcgraw Hill)
2. Cecil Loeb, Text book of medicine Ed. Wyngaarden smith (Igaku-Sheim,Saunders)
3. Crofton & Douglas's Respiratory diseases Ed. Seaton et al (Oxford)
4. Pulmonary diseases & disorders by Fishman (Mc Graw Hill)
5. Text book on pulmonary disease by Fraser & Pare
6. Asthma by Clarke et al
7. Bronchoscopy by Stardding
8. Text book of Tuberculosis (TB Asso of India)
9. Lung diseases in the Tropics ed. OM P. Sharma Marcel Dekker)
10. The Normal Lung by Murray (Saunders)
11. Pulmonary Function Testing by Clausen (Academic Press)
12. Respiratory Physiology by J.B. West (Williams & William)
13. Physiology of Respiration by J.H. Comroe (Year book Med Pub)
14. Respiratory Function in disease by Bates et al (Saunders)
15. Other text books and Monographs including those from India.

### **B. Journals and Annual Reviews**

#### **Indian**

1. Journal of Association of Physicians of India
2. Indian Journal of Medical Research
3. National Medical Journal of India
4. Indian journal of Tuberculosis
5. Indian journal of Chest diseases and Allied Sciences
6. Lung India
7. Chest (India Edition)
8. Bulletin of PGI Chandigargh
9. Pulmonary and Critical care Bulletin (PGI Chandigargh)
10. Drug Bulletin (PGI Chandigargh)
11. Pulmon

#### **International**

1. Recent Advances' series
2. British Medical Journal

3. Lancet
4. New England Journal of Medicine
5. Annals of Internal Medicine
6. Chest
7. American Journal of Respiratory and Critical Care Medicine
8. Thorax
9. European Respiratory Journal
10. Tubercle and Lung disease
11. Respiration
12. Critical Care Medicine
13. Respiratory Physiology
14. Journal of Applied Physiology
15. Nature
16. Science
17. Seminars in Respiratory Medicine
18. Journal of Asthma
19. Clinics in Chest Medicine
20. Clinics in Critical Care

# AMRITA VISWAVIDYAPEETHAM UNIVERSITY

## DM PULMONARY MEDICINE FINAL EXAMINATION JULY 2013

Time :3hrs

Maximum Marks – 100

Date:.....

### PAPER I – BASIC SCIENCES

#### Instructions:-

- Draw labeled diagrams / flow chart wherever necessary
- **Do not** write anything on the question paper other than the Hall Ticket Number on the top left.
  
- **All questions carry equal marks**

Write short notes on:

1. Closing volume of lung
2. Pulmonary cystic adenomatoid malformation
3. Dynamic hyperinflation of lung and its clinical relevance
4. Cardiopulmonary exercise testing and its utility in pulmonary practice.
5. Laryngopharyngeal reflux and its clinical relevance
6. MRSA
7. Lymphatic circulation in thoracic cavity and its clinical application
8. Low spiral CT in Thoracic Medicine
9. Pulmonary function tests / Interpretation
10. Omalizumab

**AMRITA VISWAVIDYAPEETHAM UNIVERSITY**

**DM PULMONARY MEDICINE FINAL EXAMINATION JULY 2013**

Time : 3 Hrs

Maximum Marks – 100

Date:.....

**PAPER II – NON – TUBERCULOUS CHEST DISEASES**

**Instructions:-**

- Draw labeled diagrams / flow chart wherever necessary
- **Do not** write anything on the question paper other than the Hall Ticket Number on the top left.

Q.1. Define Pulmonary Hypertension. How will you classify? Discuss the management strategy. [5+10+10=25 marks]

Q.2. Outline the biomarkers in COPD. Name the co – morbidities. Briefly discuss the surgical interventions in COPD management. [5+5+15=25 marks]

Q.3. Write short notes on:

- a) Smoking related disorders
- b) Non invasive ventilation
- c) Alveolar Proteinosis
- d) Systemic ill effects of sleep apnoea
- e) Pneumonia severity index

[10 marks each = 50]

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**PAPER III– [ TUBERCULOSIS &RELATED DISORDERS**

**Instructions:-**

- Draw labeled diagrams / flow chart wherever necessary
- **Do not** write anything on the question paper other than the Hall Ticket Number on the top left.

Q.1. Draw a diagram / table depicting the pattern of pulmonary tuberculosis.  
Outline the present status of RNTCP – merits and demerits

[10+15=25 marks]

Q.2. Describe the diagnostic tests of Tuberculosis. Comment on the merits and demerits.

[10+15=25 marks]

3. Write short notes on:

- a) Silicotuberculosis
- b) HIV and Tuberculosis
- c) Newer anti tuberculosis drugs
- d) Uncommon clinical profile of tuberculosis

e) Tuberculous empyema [10 marks each = 50 marks]

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Time : 3 Hrs

Maximum Marks – 100

Date:.....

**PAPER IV– [ TUBERCULOSIS &RELATED DISORDERS**

**Instructions:-**

- Draw labeled diagrams / flow chart wherever necessary
  - **Do not** write anything on the question paper other than the Hall Ticket Number on the top left.
  
  - **All questions carry equal marks**
1. Severity scores in critical care unit.
  2. Procalcitonin guided antimicrobial therapy in pulmonary and critical care infections
  3. Role of steroids in H1N1 influenza associated ARDS
  4. Role of Vitamin D in thoracic medicine
  5. Non culture based diagnostic tests for invasive pulmonary aspergillus infections
  6. Technique and role of extracorporeal membrane oxygenation in ARDS
  7. Current status of targeted therapy in lung cancer
  8. Bedaquiline
  9. CAPACITY trial in idiopathic Pulmonary Fibrosis
  10. Recent trends in immunotherapy of Tuberculosis