SCHOOL OF MEDICINE
D.Y. PATIL UNIVERSITY
(established under Section-3 of UGC Act. 1956 vide notification no. F. 9.21/2000. U.3
dated 20.06.2002 of the Govt. of India)

MD PULMONARY MEDICINE
3 YEARS FULL TIME PROGRAMME
CURRICULUM
2016-2017 onwards
PROGRAMME NAME : MD PULMONARY MEDICINE

PROGRAMME OBJECTIVES

At the end of postgraduate training in Respiratory Diseases the Postgraduate shall be able to.
1. Recognize the importance to Respiratory Diseases the health needs of the community.
2. Practice the field of chest medicine ethically and assiduously.
3. Demonstrate the understanding of the basic sciences relevant to the Respiratory Diseases.
4. Diagnose and treat most of the Respiratory disorders on the basis of clinical assessment and properly selected and conducted investigations.
5. Plan and advice measures for the prevention and rehabilitation of the patients suffering from respiratory disease and disability related to those to those diseases.
6. Play an important role in the implementations of National Health Programmes.
7. Demonstrate Competency – research methodology and epidemiology.

PROGRAMME OUTCOME

At the end of the training the student will be able to
Diagnose and treat tuberculosis and common chest diseases and have sufficient knowledge of rare diseases, advances and technologies. He/she will be able to manage medical emergencies and carry out research and undergraduate medical teaching.

PROGRAMME SPECIFIC OUTCOMES

- Diagnose and manage majority of the conditions in the field of chest medicine concerned on the basis of clinical assessment and appropriately select and conduct investigations.
- Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability in the field of Tuberculosis and Chest Diseases
- Obtain relevant skills required for the medical or surgical management of the patient required in Tuberculosis and Chest Diseases
- Practice the field of Tuberculosis and Chest Diseases ethically and in step with the principles of primary health care
- Obtain adequate knowledge in the subjects closely acquainted with the subjects of his post-graduation in Tuberculosis and Chest Diseases
- Identify social, economic, 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.
- Demonstrate empathy and human approach towards patients and their families and exhibit interpersonal behavior in accordance with societal norms and expectations
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.

Duration of the Course
The duration of the courses shall be 3 Academic years (6 Academic terms)
### TEACHING AND EXAMINATION SCHEME

### PROGRAMME STRUCTURE for MD in Pulmonary Medicine

### DURATION OF PROGRAMME -SEMESTERS:

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- The candidate must secure 50% and above in both Theory and Practicals to Pass
- Dissertation
- 1 Poster presentation, 1 paper presentation at national /state conference and 1 research paper should be published or accepted for publication/sent for publication during the period of post graduate studies
Clinical Postings
First year: Department of Respiratory Diseases.
Second year: Respiratory Medicine – 6 Months
General Medicine - 3 Months
ICU - 3 Months

Third Year: Department of Respiratory Diseases
The candidate shall be posted in outpatient and inpatient concurrently, and in emergency including intensive care unit.

Thesis/Dissertations
The candidate shall prepare a dissertation on a particular topic pertaining to the Respiratory Diseases under the supervision of a recognized supervisor and at recognized institution during the period of registration, and submit 4 copies of the dissertation to the Board 6 months before commencement of the theory examination. The dissertation shall be evaluated by 4 Examiners appointed by the Board. The candidate shall be permitted to appear the theory, Practical and viva voce examination only after unanimous approval of the dissertation by the examiners.

Pattern of P.G. Degree Examinations (MD, Tuberculosis and Chest Diseases)
1. Assessment – Candidates will be evaluated by marking system exclusively

2. Pattern for M.D. Theory, Clinical and Viva (Oral) are three heads each candidate should be declared successful on securing at least 50% marks in each head independently.
   · Theory for MD Shall have four papers each paper will have four question in two sections one long and other having two short sub questions in each section.
   All questions will carry equal marks (25 each) i.e. theory 400 marks – 100 each paper – 25 each question.
   · Paper I – Basic Science – anatomy, physiology, pathology, microbiology, pulmonary and
extrapulmonary T.B., public health, surgical aspects.
- Paper II – Non Tubercular pulmonary diseases
- Paper III – Internal Medicine as applied to pulmonary medicine.
- Paper IV – Recent advancement in pulmonary medicine.

3. **Practical examination** will have two head
   Clinical and Oral
   - Clinical – one long and two short cases.
     Long Case – Examination of Patient – 30 minutes (100 marks)
     Evaluation by examiners – 15 minutes
     Short Case – Examination of patient – 20 minutes (100 marks, 50 each)
     Evaluation by examiner – 10 minutes
   - Oral – each candidate will be examined for – 30 minutes. (100 marks)
     2 tables of 50 marks each

Oral Examination include Viva Voce on all components of course content. The candidate will be given case reports, charts sprometry reports, ABG reports, instruments, drugs, gross specimens, X-rays, CT scan images for interpretation and question on these will be asked. The candidate will also be questioned on his dissertation.

**Practical and Clinical Training**
The practical and clinical training involves acquiring the clinical and practical skill and competency in medical emergency management.

**Clinical Skills**
1. Clinical history taking and physical examination ability to analyse symptomatology and physical signs; interpret their significance and arrive at a diagnosis; case-sheet writing and case presentation.
2. Interpretation of the laboratory data including sputum examination macroscopic and microscopic- Gram’s stain, AFB, cytology including malignant cells.
3. Interpretation of the pulmonary function studies, ECG, ECHO, skin tests, blood gas analysis, and
other investigations.
4. Interpretation of chest X-ray, CT scan MRI and ultrasonography.
5. Observation of bronchoendoscopic procedures.
6. Oxygen therapy.
7. Nebulization therapy

Practical Skills
A) Skills to perform diagnostic test
1. Sputum and other body fluid examination with Gram’s stain, ZN stain, and malignant cells.
2. FNAC of lymph nodes, lung and mediastinal masses
3. Evaluation of diagnostic tests.
4. Pulmonary function tests
5. Skin tests: Mantoux test, allergen tests
6. BCG vaccination
7. Sleep laboratory studies
8. Blood gas analysis

B) Therapeutic Procedures
1. Aspiration of pleural, peritoneal and pericardial fluid.
2. Tube thoracostomy including management of pneumothorax.
3. Postural drainage
4. Respiratory muscle exercise.
5. Pleural biopsy.

Medical Emergency Management
1. Management of acute asthma, pneumothorax, hemothorax, acute exacerbation of COPD, hemoptysis.
2. Cardiopulmonary resuscitation
3. Endotracheal intubations
4. Management of acute respiratory failure and ARDS
5. Pulmonary thromboembolism.

Methods of Training and Teaching
The training and teaching programme involves patient management in the Outpatient, inpatient and emergency situations case presentation, grand rounds, didactic lectures, subject
seminars, journal review and interpretation of laboratory data.

**Syllabus**
Each student is required to know and cover the following five domains during the period of training.
1. Theoretical Knowledge
2. Clinical Skills
3. Practical skills
4. Management of Medical Emergencies
5. Preparation of a dissertation

**Unit**
1. **Historical Perspectives**

2. **Lung Functions**

   a. **Anatomy**

   Anatomy of respiratory system Functional design of the lung for gas exchange.
   Respiratory muscles
   Development and growth of the lung
   Bronchopulmonary anatomy
   Blood supply, lymphatics and nerve supply
   Surfactant and associated proteins
   Non-respiratory function of the lungs

   b. **Physiology**

   Pulmonary mechanics
   Respiration and its control ventilation, perfusion, Diffusion Assessment of pulmonary function.
   Blood gas transport
   Inhalation kinetics and its implication in aerosol therapy Aterical blood gases.
   Acid-Base Balance.

   C. **Lungs in different Physiological states**

   Sleep
   Exercise
   Pregnancy
Ageing

d. Lung immunology
Pulmonary defense
Lymphocytes & Macrophages in inflammation
Mast cells and eosinophils
Mechanisms of hypersensitivity reactions

e. Lung injury and repair
Cytokines & Chemokines
Nitric oxide
Inflammatory reactions
Reactions to acute and chronic injury
Pulmonary fibrosis

3. Clinical features
a. Symptomatology: Breathlessness, Cough, Haemoptysis, chest pain
b. Physical signs
c. Dermatological manifestations of lung diseases.
d. Pulmonary-systemic interactions
e. Pulmonary-renal syndrome
f. Pulmonary complications of pancreatitis and liver diseases.
g. Menstruation-related respiratory diseases.

4. Diagnosis procedures
a. Sputum examination
b. Culture
c. Radiographic and imaging students. CT, MRI ultrasonography
d. Pulmonary function studies and their interpretations in determining the disability.
e. Cardiopulmonary exercise testing
f. Blood gas analysis
h. Bronchoscopy, Bronchial lavage, Biopsy.
I. Transthoracic needle aspiration and biopsy
j. Pleural fluid studies
k. Thoracoscopy
l. Pulmonary scintigraphy
m. Pulmonary arteriography
n. Skin test: tuberculin, allergen
o. Bronchoprovocation tests
p. ECG and ECHO studies
q. Mediastinoscopy and VAT
r. **Diagnostic Thoracoscopy/Fluroscopy**
s. **EBUS TBNA**
t. **Electromagnetic navigation in Bronchoscopy Technique**
u. **Role of medical stimulation in Bronchoscopy.**
v. **Allergy testing and Immunotherapy-latest advances.**

**5. Epidemiology**
Epidemiological terms
Epidemiological techniques
Epidemiology of Tuberculosis, pneumoconiosis, Bronchial asthma COPD and lung cancer
National Tuberculosis Control Programme and RNTCP
Research methods and study designs cohort, case control, randomized Clinical trials, observative and cross-sectional studies.
Common statistical methods for analysis of research.
**Revised RNTCP including PMDT**

**6. Development and Genetic abnormalities**

**7. Infection**
· Microbial flora and colonization of the respiratory tract
· Pulmonary clearance of infectious agents
· Approach to the patient with pulmonary infections
· Community acquired pneumonia
- Pneumonias:
  - Gram-positive bacteria
  - Gram-negative bacteria
  - Legionellosis
  - Rickettsial Pneumonia
  - Mycoplasmal Pneumonia
  - Chlamydia Pneumonia
  - Radiation Pneumonia
  - Lipoid pneumonia
  - Varicella Pneumonia
  - Pulmonary meliosis
  - Tuberculosis
  - Primary tuberculosis: Pathogenesis, Clinical features, Tuberculin test.
  - Diagnosis, Milliary, tuberculosis, treatment, BCG vaccination
  - Non-primary tuberculosis: Pathogenesis, clinical features investigation.
  - Complications, antituberculosis drugs, chemotherapy, DOTS, fixed.
  - Dose combinations, drug-resistant tuberculosis Extrapulmonary tuberculosis
  - Lymph-node,
  - abdominal hepatobiliary, neuro, osteoarticular, cutaneous, renal, pericardial,
  - ocular, otologic,
  - endocrine, and genital tuberculosis.

.MDR TB/XDR TB newer treatment

.Newer drugs in TB
  - Non-tuberculosis mycobacterial infections.
  - Opportunistic infections
  - Anaerobic bacterial infections
  - Pulmonary infections in AIDS
  - Pulmonary infections in neutropenia and caner
  - Pneumonia in organ transplant patient
  - Pulmonary infections in patient with primary immune defects.
  - Postoperative pneumonia
  - Hantavirus Pulmonary Syndrome
  - Ventilator-associated pneumonia
  - Pulmonary ehrlichiosis
  - Rhodococcus equi infections
  - Actinomysis
8. Fungal infection
· Histoplasmosis
· Coccidiodomycosis
· Aspergillosis
· Candidiasis
· Cryptococcosis
· Nocardiosis
· Blastomycosis

9. Parasitic pulmonary diseases
· Plueropulmonary amoebiasis
· Malarial lung disease
· Toxoplasmosis
· Pneumocystis pneumonia Nematodes
· Pulmonary dirofilariasis
· Pulmonary echinococcosis
· Schistomiasis
· Paragonimiasis
· Pulmonary eosinophil syndrome

10. Zoonotic pulmonary diseases
· Plague
· Q fever
· Tularemia
· Pasteurellosis
· Rhodococcus pneumonia
· Leptospiral Pneumonia
· Hantavirus pulmonary syndrome
· Acute equine respiratory syndrome

11. Suppuration
· Suppurative pneumonia
· Ling abscess
· Bronchiectasis
· Gangrene of the lung

12. Pleural diseases
· Pleural dynamics and effusion
· Pleurisy and effusion
· Non-neoplastic and neoplastic effusions
· Pulmonary lymphangioleiomyomatosis
· Pneumothorax
· Empyema thoracis
· Bronchopleural fistula and its complications
· Pleural thickening
· Primary pleural tumours
· Malignant mesothelioma

13. Immunology
· Pulmonary hypersensitivity
· Extrinsic allergic alveolitis
· Goodpasture’s syndrome

14. Airflow obstruction
· Air pollution
· Chronic obstructive pulmonary disease
· Chronic cor pulmonale
· Unilateral hyperradiancy of the lung
· Bronchial asthma
· Bronchiolar disease
· Reactive airways dysfunction syndrome
· Small airway disease
· Upper airway obstruction
· Cystic fibrosis
· Bronchiolitis
· Bullous diseases of the lungs

.GOLD 2016
.GINA Guidelines
.Newer drugs in Asthma and COPD

15. Occupational and environmental disorders
· Silicosis
· Coal workers’ pneumonosis
· Asbestos-related lung disease
· Berylliosis
· Hard-metal lung disease
· Byssinosis
· Bagassosis
· Hypersensitivity Pneumonitis
· Industrial bronchitis
· Toxic inhalations
· Air pollution
· High altitude
· Diving injuries
· Thermal lung injury

16. Disorders of Pulmonary Circulation
· Pulmonary hypertension & cor pulmonale
· Pulmonary oedema
· Pulmonary infarction
· Pulmonary embolism
· Pulmonary vasculitis
· Pulmonary arteriovenous malformations
· Cardiac problems in pulmonary Patient
· Pulmonary diseases produced in cardiac patients
· Diffuse alveolar haemorrhage

17. Respiratory failure
· Types
· Hypoxemia and Hypercarbia
· Clinical features, diagnosis & treatment
· Respiratory problems in neuromuscular disorders
· Respiratory failure in patient with obstructive airway disease
· Respiratory distress syndrome of newborn
· Acute respiratory distress syndrome
· Systemic inflammatory response syndrome & multiple organ dysfunction syndrome
· Respiratory failure in the surgical patient.

18. Diseases of undetermined origin
· Sarcoidosis
· Idiopathic pulmonary fibrosis
· Bronchiolitis obliterans organizing pneumonia
· Lungs in collagen vascular diseases
· Pulmonary angiitis and granulomatosis
· Wegener’s granulomatosis
· Pulmonary lymphocytic angiitis and granulomatosis
· Honeycomb lungs
· Histiocytosis
· Pulmonary tuberous sclerosis
· Pulmonary amyloidosis
· Idiopathic pulmonary hemosiderosis
· Pulmonary alveolar proteinosis
· Pulmonary alveolar microlithiasis
· Broncholithasis

19. Sleep and sleep disorders
· Breathing and sleep
· Sleep related respiratory disorders
· Sleep apnoea syndrome
· Obesity hypoventilation syndrome

20. Neoplastic Diseases
· Genetic and molecular changes of human lung cancer
· Cigarette smoking and health
· Bronchogenic carcinoma
· Bronchioloalveolar carcinoma
· Pulmonary metastases
· Solitary pulmonary nodule
· Bronchial adenoma
· Hamartoma, fibroma, lipoma

21. Drug-induced lung disease

22. Hyperventilation syndrome

23. Diseases of the mediastinum
· Anatomy & diagnosis approach
· Congenital cysts & bronchopulmonary foregut anomalies
· Mediastinitis
· Mediastinitis mass
· Nonneoplastic disorders
· Benign & malignant conditions

24. Disorders of diaphragm

25. Disorders of the chest wall
· Neuromuscular diseases of the chest wall
· Spinal and thoracic cage abnormalities

26. Pulmonary manifestations of systemic disease

27. Paediatric influence on adult lung

28. Diving and Lung

29. Management and therapeutic interventions
· Pulmonary pharmacotherapy
· Oxygen therapy
· Cardiorespiratory resuscitation
· Hyperbaric oxygen
· Bronchial hygiene
· Mechanical ventilation: indications, modes complications and weaning
· Respiratory homodynamic Monitoring in acute respiratory failure
· Liquid assisted ventilation
· Principles of critical care
· Inhalation therapy
· Gene therapy
· Pulmonary rehabilitation
· Terminal care in respiratory diseases
· Ethics and withdrawal of life support
· Extracorporel memberane oxygenation

30. Surgical aspects of lung diseases
· Thoracic trauma and trauma related lung dysfunction
· Pre and post-operative evaluation and management of thoracic surgical patient
· Perioperative care in ling resection
· Post-operative pulmonary complications
· Lung transplantation
31. Preventive Pulmonology
· Prevention & control of lung diseases smoking behavior and counseling.
· Patient education in bronchial asthma, tuberculosis, COPD

Updated :-
1. Revised Gold Guidelines of COPD
2. New RNTCP Guidelines Daily NAAT
3. ILD New classification IPF Management
4. New Ventilatory Strategies

32. Medicolegal aspects of lung diseases

Reference Books
7. Victor LD. Clinical Pulmonary Medicine, Boston, Little, Brown. 1992
8. Pande, JN(ed), Respiratory Medicine in tropics, Delhi, Oxford University, 1988
9. Crofton and Douglas’s Respiratory Medicine, 5th edn.
10. Shankar Ps. Chest Medicine, 4th edn, New Delhi, IBH and oxford, 1994
11. Light, RW, Pleural diseases. 4th edn, Baltimore, Williams & Willkins.1995
12. Sharma Sk, Mohan A. Tuberculosis. New Delhi, Japee, 2001
16. Cecil Test Book of Medicine, 21st edn. 2 vols. New Delhi, Harcourt Asia, 2001
17. Harrison’s Text Book of Medicine.
18. API Text Book of Medicine
19. Iseman book on Tuberculosis
20. Felson’s Chest Radiodiagnosis
21. Simons’s Chest Radiodiagnosis
22. Frayser Parev’s Book on Respiratory Diseases
23. Murray and Nadeu & Book on Respiratory Diseases

**Log Book**
A log book should be maintained by the candidate and he/she must get it signed by the teacher immediately after the assignment

**Journals**
1. Clinics in Chest Medicine
2. North American Clinics in Respiratory Medicine
3. Lung India
4. Chest
5. Thorax
6. Indian Journal of Tuberculosis
7. Journal of Critical Care