Department of Respiratory Medicine Theme based curriculum for AIPHDCET July 2021

Part I: General pulmonary medicine and basic sciences

1. **Anatomy**: lung and thorax
2. **Embryology** :- stages of development, genetic, molecular and cellular basis of development, developmental anomalies.
3. **Physiology**:-
    - Respiratory mechanics including physiological basis of PFT.
    - Blood gas transport, Acid base balances, Arterial blood gas (ABG) analysis.
    - Control of ventilation.
    - Physiological basis of pulmonary surfactant system & alveolar homeostasis.
    - Sleep physiology.
    - Physiology of mechanical ventilation.
    - Patho-physiology of all diseases pertaining to pulmonary medicine.

4. Lung immunology :-

- Pulmonary defense mechanism against infection.
- Lung injury & repair.

5. **Symptom & Signs of Respiratory diseases & Diagnosis**
    - Approach to a patient with respiratory symptoms.
    - Pulmonary – systemic interactions.
    - Radiographic evaluation of the chest.
    - Pulmonary cytopathology.
    - Pulmonary function testing & scintigraphic evaluation of pulmonary diseases.
    - Bronchoscopy/thoracoscopy/Mediastinoscopy & related procedures.
    - Interventional radiology of thorax.
    - Cardio pulmonary exercise testing.
    - Peri-operative respiratory assessment.
    - Impairment & disability due to lung diseases.

Part II: Clinical pulmonary medicine

Tuberculosis

- Epidemiology, pathogenesis, pathophysiology & symptomatology.
- Diagnostic Methods.
- Pulmonary Tuberculosis.
- Extra pulmonary Tuberculosis.
- Non-Tuberculosis Mycobacterium (NTM) and related diseases.
- Tuberculosis & other co- morbidities including HIV.
- Anti-tuberculosis drugs: first and second line.
- Management: General, Medical & Surgical management.
- Complications of tuberculosis.

- Drug resistant tuberculosis: MDR, XDR, XXDR.
- Landmarks studies for DOTS.
- RNTCP, WHO, ISTC, & other international guidelines.
- Recent advances in Diagnosis & Management of tuberculosis.

Obstructive lung diseases

- COPD:- Epidemiology, etiology, pathophysiology, pathogenesis, Diagnostic criteria, differential diagnosis, Clinical course & Management, complications, GOLD guidelines
- Asthma:-Epidemiology, etiology, Types, Pathophysiology, Pathogenesis, Diagnosis, Management, GINA Guidelines, ABPA.
- Other obstructive lung diseases including upper airway obstruction, cystic fibrosis, bronchiolitis, bullous diseases of lung.
- Other smoking related diseases and smoking cessation.

Infectious diseases of lung (excluding T.B.)

- Major pathogens
- Common syndromes
- Pneumonia
- Lung abscess, empyema, aspiration & other anaerobic infection
- Bronchiectasis.
- Acute bronchitis
- Pulmonary injections in special hosts

Course Content for PhD Respiratory Medicine detailed

Part I. General pulmonary medicine and basic sciences

A. Anatomy and Histology of Respiratory System

1. Development and Anatomy of Respiratory System
2. Applied embryology of lungs, mediastinum and diaphragm
3. Developmental anomalies

B. Physiology and Biochemistry

1. Assessment of pulmonary functions
2. Control of ventilation; pulmonary mechanics
3. Ventilation, pulmonary blood flow, gas exchange and transport
4. Non-respiratory metabolic functions of lung
5. Principles of electrocardiography
6. Inhalation kinetics and its implication in aerosol therapy, and sputum induction etc.
7. Acid-base and electrolyte balance
8. Physiology of sleep and its disorders

9. Pulmonary innervation and reflexes
10. Pulmonary defence mechanisms
11. Principles of exercise physiology and testing
12. Physiological changes in pregnancy, high altitude, aging
13. Physiological basis of pulmonary symptoms

C. Microbiology
1. Mycobacterium tuberculosis and other mycobacteria
2. Bacteria causing pulmonary diseases
3. Atypical organisms and respiratory tract infections
4. Anaerobes in pleuropulmonary infections
5. Laboratory diagnosis of non-tubercular infections of respiratory tract
6. Laboratory diagnosis of TB including staining, culture and drug sensitivity testing
7. Virulence and pathogenecity of mycobacteria
8. Respiratory viruses: Viral diseases of the respiratory system and diagnostic methods
9. Respiratory fungi: (i) Classification of fungal diseases of lung: candidiasis, Actinomycosis, Nacardiosis, Aspergillosis, Blastomycosis etc. (ii) Laboratory diagnostic procedures in pulmonary mycosis
10. Opportunistic infections in the immuno-ompromised individuals
11. HIV and AIDS. Virological aspects, immuno-pathogenesis, diagnosis
12. Parasitic lung diseases

D. Pathology
1. Acute and chronic inflammation: Pathogenetic mechanisms in pulmonary diseases
2. Pathology aspects of Tuberculosis
3. Pathology aspects of Pneumonias and bronchopulmonary suppuration
4. Chronic bronchitis and emphysema, asthma, other airway diseases
5. Occupational lung diseases including Pneumoconiosis
6. Interstitial lung diseases including sarcoidosis, connective tissue diseases, pulmonaryvasculitis syndromes, pulmonary eosinphilias
7. Tumours of the lung, mediastinum and pleura

E. Epidemiology
1. Epidemiological terms and their definitions
2. Epidemiological methods
3. Epidemiology of tuberculosis, pneumoconiosis, asthma, lung cancer, COPD and other pulmonary diseases
4. National Tuberculosis Control Programme and RNTCP; Epidemiological aspects of BCG
5. Epidemiological aspects of pollution-related pulmonary diseases
6. Research methodology, statistics and study designs

F. Allergy and Immunology
1. Various mechanisms of hypersensitivity reactions seen in pulmonary diseases
2. Diagnostic tests in allergic diseases of lung - *in vitro* and *in vivo* tests, bronchial provocation test
3. Immunology of tuberculosis, Sarcoidosis and other diseases with an immunological basis of pathogenesis

G. Pharmacology
1. Pharmacology of antimicrobial drugs

2. Pharmacology of antitubercular drugs
3. Pharmacology of antineoplastic and immunosuppressant drugs
4. Bronchodilator and anti-inflammatory drugs used in pulmonary diseases
5. Drugs used in viral, fungal and parasitic infections
6. Other drugs pharmacokinetics and drugs interaction of commonly used drugs in pulmonary diseases
7. Pharmacovigilance

H. Symptom & Signs of Respiratory diseases & Diagnosis

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- Peri-operative respiratory assessment.
- Impairment & disability due to lung diseases

Part II. Clinical Pulmonary Medicine (Infections) including medical emergencies

1. Tuberculosis

1. Aetiopathogenesis
2. Diagnostic methods
3. Differential diagnosis
4. Management of pulmonary tuberculosis; RNTCP, DOTS, and DOTS-Plus; International Standards of TB Care
5. Complications in tuberculosis
6. Tuberculosis in children
7. Geriatric tuberculosis
8. Pleural and pericardial effusion and empyema
9. Mycobacteria other than tuberculosis
10. Extrapulmonary tuberculosis
11. HIV and TB; interactions of antitubercular drugs with antiretrovirals
12. Diabetes mellitus and tuberculosis
13. Management of MDR and XDR tuberculosis
14. Landmarks studies for DOTS

2. Non-tuberculous infections of the lungs

 Approach to a patient with pulmonary infection
 Community-acquired pneumonia
 Hospital-associated pneumonia, ventilator-associated pneumonia
 Unusual and atypical pneumonias including bacterial, viral, fungal and parasitic and ricketsial, anerobic
 Bronchiectasis, lung abscess and other pulmonary suppurations
 Acquired immunodeficiency syndrome and opportunistic infections in immuno-compromised host
 Principles governing use of antibiotics in pulmonary infections

 Other pneumonias and parasitic infections, Zoonosis

Part III: CLINICAL PULMONARY MEDICINE(Non-infectious Lung Diseases) including critical care medicine

1. Immunological disorders

 Immune defence mechanisms of the lung
 Sarcoidosis
 Hypersensitivity pneumonitis and lung involvement
 Eosinophilic pneumonias and tropical eosinophilia
 Pulmonary vasculitides
 Connective tissue diseases involving the respiratory system
 Interstitial lung disease of other etiologies
 Reactions of the interstitial space to injury, drugs
 Occupational and environmental pulmonary diseases

2. Other non-infectious disorders of the lungs and airways

 Aspiration and inhalational (non-occupational) diseases of the lung
 Drug induced pulmonary diseases
 Bullous lung disease
 Uncommon pulmonary diseases (metabolic, immunological, unknown etiology), pulmonary haemorrhagic syndromes
 Other pulmonary diseases of unknown etiology including PLCH, LAM, PAP, alveolar microlithiasis
 Cystic fibrosis and disorders of ciliary motility
 Obesity-related pulmonary disorders
 Upper airways obstruction syndromes
 Occupational lung diseases and pneumoconiosis
 Air-pollution induced diseases, toxic lung and other inhalational injuries
 Health hazards of smoking

3. Pulmonary Circulatory disorders

 Pulmonary hypertension and cor pulmonale
 Pulmonary edema
 Pulmonary thromboembolic diseases and infarction
 Cardiac problems in a pulmonary patient and pulmonary complications produced by cardiac diseases

4. Obstructive diseases of the lungs

 Asthma including allergic broncho-pulmonary aspergillosis, specific allergen immunotherapy and immunomodulation
 Chronic obstructive lung disease and diseases of small airways
Special aspects of management including Long term oxygen therapy, Inhalation therapy and Pulmonary rehabilitation
Latest guidelines of COPD(GOLD), ASTHMA(GINA)

5. Tumors of the lungs

 Comprehensive knowledge of neoplastic and non-neoplastic diseases of lung including epidemiology, natural history, staging, and principles of

treatment (medical, surgical, and radiation)
 Solitary pulmonary nodule

6. Diseases of the mediastinum
 Non-neoplastic disorders
 Benign and malignant (primary and secondary) neoplasms and cysts

7. Disorders of the pleura
 Pleural dynamics and effusions
 Non-neoplastic and neoplastic pleural diseases
 Pneumothorax
 Pyothorax and broncho-pleural fistula
 Fibrothorax

8. Critical Care Pulmonary Medicine
 Management of emergency problems of different pulmonary diseases
 Adult respiratory distress syndrome
 Respiratory failure in the patient with obstructive airway disease
 Respiratory failure in other pulmonary diseases
 Management of sepsis
 Respiratory and haemodynamic monitoring in acute respiratory failure
 Non-invasive and Mechanical ventilation
 Principles of critical care, diagnosis and management of complications; severity of illness scoring systems
 Ethical and end-of-life issues in critical care

9. Extrapulmonary manifestations of pulmonary diseases
10. Sleep-related pulmonary diseases
 Polysomnography
 Sleep apneas
 Other sleep-disordered breathing syndromes

11. Miscellaneous aspects
 Diseases of the diaphragm
 Disorders of chest wall
 Obesity-related pulmonary disorders
 Oxygen therapy
 End-of-life care
 Aerospace Medicine
 Pulmonary problems related to special environments (high altitude, diving, miners)
 Assessment of quality of life using questionnaires
 Health impacts of global warming

12. Preventive Pulmonology
 Principles of smoking cessation and smoking cessation strategies
 Cardiopulmonary rehabilitation
 Preventive aspects of pulmonary diseases
 Vaccination in pulmonary diseases

13. Surgical aspects of Pulmonary Medicine

 Pre- and post-operative evaluation and management of thoracic surgical patients

 Chest trauma/trauma related lung dysfunction

 Lung transplantation