FURTHER DETAILS REGARDING MAIN TOPICS OF PROGRAMME No. 01/2020(Item No.1)

ASSISTANT PROFESSOR IN PULMONARY MEDICINE

MEDICAL EDUCATION SERVICE

(Category No.011/2019)

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, pulmonary vasculitis 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

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

Surgical aspects of Pulmonary Medicine

Pre- and post-operative evaluation and management of thoracic surgical patients
hest trauma/trauma related lung dysfunction
Lung transplantation

Interventional pulmonology

- Bronchoscopy
- Thoracoscopy

Infections

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

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

Non-infectious Lung Diseases

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, 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
Drug-induced lung diseases

1. 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

2. Obstructive diseases of the lungs

Asthma including allergic bronchopulmonary 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

3. 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

4. Diseases of the mediastinum

Non-neoplastic disorders
Benign and malignant (primary and secondary) neoplasms and cysts

Disorders of the pleura

Pleural dynamics and effusions
Non-neoplastic and neoplastic pleural diseases
Pneumothorax
Pyothorax and broncho-pleural fistula
Fibrothorax

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

Extrapulmonary manifestations of pulmonary diseases

Sleep-related pulmonary diseases

Polysomnography
Sleep apneas
Other sleep-disordered breathing syndromes

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

Preventive Pulmonology

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

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper