ODISHA UNIVERSITY OF HEALTH SCIENCES, BHUBANESWAR

PG Curriculum

DM Pulmonary Medicine

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DM CURRICULUM IN "PULMONARY MEDICINE"

Goal

On completing his training the DM resident should be a competent specialist in pulmonary medicine capable of assuming a consultants role in the subspecialty He/she must acquire a working knowledge of the sub specialty including its foundations in the basic sciences and research that will help him/her towards achieving this objective. He/she should be an accomplished professional who practices responsibly while caring for other He/she should be able to teach and train students in the sub specialty.

Requirements/training plan for D.M.

1. **ELIGIBILITY.**

Candidates for admission to the first year DM. Pulmonary Medicine shall be required to have any one of the following qualifications.

1. M.D/ DNB (General Medicine)

2. M.D/ DNB (Respiratory Medicine)

3 M.D/ DNB (Paediatrics)

Recognized by the NMC

2. **DURATION OF THE COURSE:**

The period of certified study and training for the DM. Pulmonary Medicine course shall be three years.

Selection of Candidate will be done through National Eligibility Cum Entrance Test- Super speciality (NEET-SS) conducted by National Board of Examinations in Medical Sciences (NBEMS)

Duration

Three years including internal rotation postings.

2.1.13 Gross and microscopic anatomy of the lungs pulmonary vasculature, chest wall and neuromuscular apparatus, growth and development, lymphatic biology. generation and repair and genetic of lungs diseases and the basic anatomy of the upper airway and brainstem

2.1.1.4. Respiratory physiology

2.1.14.1. Alveolar gas composition

2.1.1.4.2. Ventilation and its control

2.1.1.4.3. Distribution of alveolar ventilation

2.1.1.4.4. Diffusion

2.1.1.4.5. Perfusion and vascular physiology

2.1.1.4.6. Ventilation perfusion relationships.

2.1.1.4.7. Oxygen delivery, utilization and transport

2.1.1.4.8. Carbon dioxide transport

2.1.1.4.9. Acid base balance

2.1.1.4.10. Mechanics of breathing

2.1.1.4 11. Respiratory muscle function

2.1.1.4.12. Respiratory system in sleep

2.1.1.4.13. Respiratory system during exercise

2.1.1.4.14. Aerosols and drug delivery

2.1.1.4.15. Pleural physiology

2.1.1.4.16. Physiology lungs and pregnancy

2.1.1.5. Basic principles of clinical immunology as they apply to respirology

2.1.1.6 Lung Microbiome

2.1.1.7 Basic principles of molecular biology relevant to respirology

2.1.1.8 Mechanisms of action of major pharmacological agents with effects on the respiratory system

2.1.1.9 Broad knowledge of microbiology as it relates to respirology, including normal defense mechanisms

2.1.1.10 Fundamental principles of epidemiology

2.1.1.11 cardiovascular physiology as it applies to respirology and cardiopulmonary interaction as seen in various respiratory disorders.

2.1.1.12. Basic gross and microscopic pathology as applied to clinical disorders of respiratory system

2.1.1.13 Applied basic sciences in Tuberculosis and respiratory diseases

2.1.2. Clinical sciences

2.1.2.1. Pathophysiology: clinical manifestations, differential diagnosis, general approach to prevention, diagnosis and management natural history and prognosis of the following.

2.1.2.1.1. Signs and symptoms dyspnea, cough, snoring hemoptysis: chest pain,cyanosis, adventitious sounds, clubbing:

2.1.2.1.2. Abnormalities of developmental origin or disease arising from prematurity that may have continuing impact in adult life

2.1.2.1.3 Basic principles and clinical practice of tuberculosis including pulmonary and extrapulmonary tuberculosis, drug resistant tuberculosis. MOTT/NTM infections, HIV-TB coinfection etc

2.1.2.1.4 National Tuberculosis Elimination Programme (NTEP) and other national control programs related to pulmonary medicine example Tobacco control program, AIDS control program etc.

2.1.2.2. Airway disease

2.1.2.2.1 Upper airway, including:

2.1.2.2.1.1 Epiglottitis

2.1.2.2.12 Laryngotracheobronchitis

2.1.2.2.1.3. Tracheitis

2.1.2.2.1.4. Foreign bodies

2.1.2.2.2 Lower airway, including:

2.1.2.2.2.1. Asthma

2.1.2.2.2.2. Chronic obstructive pulmonary disease (Chronic bronchitis, emphysema)

2.1.2.2.2.3. Bullous disease

2.1.2.2.2.4 Bronchiectasis

2.1.2.2 2.5. Cystic fibrosis

2.1.2.2.2.6. Bronchiolitis

212227 Dysmotility syndromes

2.1.2.2.2.8 Smoking hazard :Cigarette Vaping: Smoking cessation

2.1.2.4. Pleural disorders:

2.1.2.4.1 Pleural effusions, pneumothorax, pleural plaques and thickening, mesothelioma and other malignancies

2.1.2.5. Mediastinum:

2.1.2.5.1 Mediastinitis, pneumomediastinum, mediastinal mases, vascular abnormalities

2.1.2.6. Neoplastic disorders:

2.1.2.6.1. Lung cancer:

2.1.2.6.1.1 Molecular Biology and targets

2.1.2.6.1.2. Epidemiology of lung cancer

2.1.2.6.1.3. Diagnosis, staging and management

2.1.2.6.2. Metastatic malignant tumor

2.1.2.6.3. Benign lung tumors

2.1.2.7. infectious disease:

2.1.2.7.1 infections of upper and lower respiratory tract

2.1.2.7.2. Infections in the normal host (community acquired and nosocomial) and in the immunocompromised host

2.1.2.7.3. Infections caused by bacteria, viruses, mycoplasma,chlamydia, rickettsias,fungi,protozoons,metazoans,mycobacteria

2.1.2.7.4. Nosocomial pneumonia

2.1.2.7.5. Ventilator associated pneumonia

2.1.2.8. Industrial and environmental disease:

2.1.2.8.1. Inorganic and organic pneumoconiosis

2.1.2.8.2. Air pollution,sick building syndrome and smoking

2.1.2.8.3. Occupational asthma, reactive airways dysfunction syndrome

2.1.2.8.4. Occupational lung disease

2.1.2.8.5. High altitude physiology and clinical disorder, Diving injuries and air embolism.

2.1.2.8.6. Thermal lung injury and acute smoke inhalation

2.1.2.8.7. Lung mechanics and disorder related to special circumstances such as aviation and sports.

2.1.2.8.8 Lung disease and climate changes

2.1.2.9. Complications of aspiration of:

2.1.2.9.1. Gastric contents

2.1.2.9.2. Foreign bodies

2.1.2.9.3. Lipoid material

2.1.2.9.4 Water, including immersion injures

2.1.2.10 Immunologic diseases

2.1.2 10.1 Rhinitis

2.1.2.10.2 Asthma, Allergic bronchopulmonary aspergillosis

2.1.2.10.3 Extrinsic allergic alveolitis

2.1.2.10.4. Eosinophilic lung disease

2.1.2.10.5. Respiratory manifestations of collagen vascular disease

2.1.2.10.6 Pulmonary vasculitis

2.1.2.10.7 Bronchiolitis obliterans organizing pneumonia

2.1.2.11. Lung injury

2.1.2.11.1 Trauma

2.1.2.11.2. Drugs (including recreational and illicit drugs)

2.1.2.11.3. Radiation

2.1.2.11.4 Oxygen

2.1.2.11.5 Thermal

2.1.2.11.6 Barotrauma

2.1.2.12 Restrictive diseases

2.1.2.12.1 Chest wall deformities

2.1.2.12.2 Neuromuscular diseases

2.1.2.12 3. Interstitial lung diseases

2.1.2.12.4 Pleural disorders

2.1.2.13. Pulmonary hemorrhage syndromes

2.1.2 14. Disorders of the pulmonary circulation

2.1.14.1. Pulmonary embolism (thrombo-embolism, fat, air, tumor, amniotic fluid)

2.1.2.14.2 Pulmonary hypertension

2.1.2 14.3 Pulmonary edema

2.1.2.14.4 Cor pulmonale

2.1.2.14.5. Pulmonary arteriovenous malformations, fistulas and other vascular abnormalities

2.1.2. 15. Non cardiogenic pulmonary edema

2.1.2.16. Sleep disorders

2.1.2.16.1 Excessive daytime somnolence

2.1.2.16.2. Sleep disordered breathing

2.1.2 16.3 Hypoventilation syndromes

2.1.2.16.4 Nonrespiratory sleep disorders (restless legs syndrome, periodic limb movement disorder, narcolepsy, parasomnias insomnia)

2.1.2.17. Respiratory manifestations of extra pulmonary disorders

2.1.2.18. Respiratory complications of pregnancy

2.1.2.19. Oxygen therapy

2.1.3 Paediatric Pulmonology

2.1.3.1. Respiratory problems in children

2.1.3.2 Infective pneumonias

2.1.3.3. Childhood tuberculosis

2.1.3.4 Respiratory distress syndrome of the new-born

2.1.3.5 Bronchopulmonary dysplasias

2.1.4 Bioterrorism

2.1.5 Nutrition in pulmonary medicine and critical care

2.2. Demonstrate an understanding of indications, benefit, contraindications, complications and general techniques of the following therapeutic / diagnostic interventions:

2.2.1 Pulmonary rehabilitation

2.2.2 Radiation therapy

2.2.3 Chemotherapy

2.2.4 Respiratory therapy

2.2.5 Physical therapy

2.2.6. Interventional bronchoscopy including endobronchial ultrasound (EBUS) and airway stenting.

2.2.7 Common surgical interventions.

2.2.7.1 Mediastinoscopy

2.2.7.2. Thoracotomy and lung resection

2.2.7.3. Thoracoscopy

2.2.7.4. Surgical management of empyema

2.2.7.5 Lung reduction surgery

2.2.7.6. Lung transplantation

2.2.8. Palliative care

2.2.9 End of life decision making

2.3. Critical Care Medicine

2.3.1 Ventilatory Support

CRAP GRAP

Non Invasive Ventilation

Pressure and Volume ventilators

Traditional and newer modes of ventilation.

Airway pressures and their significance, Respiratory Waveform

Graphics

Barotrauma,

Weaning methods.

2.3.2 Procedural skills:

2.3.2.1. Maintenance of an open airway

2.3.2.2. Tracheal intubation (Oral, Nasal)

2.3.2.3. Cricothyrotomy, tracheostomy, transtracheal catheters

2.3.2.4 Noninvasive ventilation

2.3.2.5 Invasive Mechanical Ventilatory support; Respiratory graphics

2.3.2.6 Prone Ventilation

2.3.2.7 Topical use of respiratory medication (inhalers & nebulizers)

2.3.2.8 Suctioning, chest physiotherapy and incentive spirometry

2.3.2.9 Weaning techniques

2.3.2.10 Flexible bronchoscopy (Diagnostic and therapeutic)

2.3.2.11 EBUS (Diagnostic Procedures)

2.3.2.12 Chest tube insertion, chest drainage systems

2.3.2.13 Bedside pulmonary function tests

2.3.2.14 USG and CT guided procedures

2.3.2.15 Thoracic Ultrasonography

2.3.2.16 Preoperative pulmonary assessment and postoperative pulmonary Complication management

2.3.2.17 Medical thoracoscopy

3. Perform a complete and appropriate assessment of a patient

3.1 Identity and explore issues to be addressed in a patient encounter effectively, including the patient's context and preferences.

3.2 Elicit a history that is relevant, concise and accurate to context and preferences for the purposes of prevention and health promotion, diagnosis and / or management.

3.3 Perform a focused physical examination that is relevant and accurate for the purposes of prevention and health promotion, diagnosis and/or management

3.4 Select medically appropriate investigative methods in a resource-effective and ethical manner.

3.5 Demonstrate effective clinical problem solving and judgment to address patient problems, including interpreting available date and integrating information to generate differential diagnoses and management plans:

3.5.1 Demonstrate proficiency in interpretation of chest radiographs

3.5.2 Recognize common abnormalities on chest computerized axial tomography (CT) scan

3.5.3. Demonstrate proficiency in interpretation of pleural fluid analysis

3.5.4. Demonstrate proficiency in the interpretation of common pulmonary function tests and cardiopulmonary exercise testing, understand the indications, technical aspects and quality assurance issues of such tests.

3.5.5. Demonstrate proficiency in the interpretation of blood gases

3.5.6 Identify common abnormalities and understand basic technical aspects of polysomnography.

4. Demonstrate proficiency in the performance and use of:

4.1. PFT including spirometry, lung volume and diffusion testing, bronchial challenge test. Fractional exhaled nitric oxide (FeNO) and impulse oscillometry etc

4.2. Oxygen delivery systems

4.3 Inhalational devices

4.4. Cardiopulmonary exercise test

5. Demonstrate proficiency and appropriate use of procedural skills, both diagnostic and therapeutic.

5.1 Perform indications, contraindications technical aspects and quality assurance issues and potential complications of the following

5.1.1 Endotracheal intubation (oro and nasotracheal) with a without the use of bronchoscope

5.1.2 Initiation, maintenance and discontinuation of acute and chronic mechanical ventiation (including non-invasive techniques)

5.1.3 Bronchoscopy (including transbronchial biopsy, endobronchial biopsies, bronchoalveolar lavage and bronchoscopic fine needle aspiration)

51.4. Thoracentesis with or without ultrasound guidance

5:1.5. Pleurodesis

5.1.6. Placement of closed intrapleural chest tube

5.1.7. Arterial puncture and cannulation

5.1.8 Venous cannulation for placement of central venous and pulmonary artery catheters

5.1.9 Testing for latent tuberculosis

5.1.10 Ensure appropriate informed consent is obtained for procedures

5.1.11 Document and disseminate information related to procedures performed and their outcomes

5.1.12 Ensure adequate follow-up is arranged for procedures performed.

5.1.13 Percutaneous lung and pleural biopsy.

The resident will also need to have an understanding of research methodology and teaching .They will be encouraged to participate in the departmental research projects.

He will also need to have grounding in medical and research ethics.

MAINTENANCE OF LOG BOOKS:

1. Every DM student shall maintain a record of skills he has acquired during the three years training period certified by the various Head of Departments in which he/she has undergone training
2. The candidate is required to participate in the teaching and training programme of undergraduate, post graduate (MD) students and Certified Respiratory Technician (CRT) Course students
3. In addition, the Head of the Department shall involve their DM students in Seminars, Journal Clubs, Group Discussions and participation in clinical, Clinico Radiological, clinicopathological conferences and death review.
4. Candidates are required to attend at least 2 Regional/National International Conferences and make at least one presentation at any of these conferences during the course on relevant subjects. These should be entered in the Log .Book
5. The Head of the Department / Faculty shall scrutinize the Log Book once in every three months
6. At the end of the course, the candidate should summarize the contents and get the Log Book Certified by the Head of the Department / Faculty
7. The Log book should be submitted at the time of practical Examination for the scrutiny of the Board of Examiners.

Assessment-Formative and Summative as per Institutional Guidelines

SUGESTED READING

Books For DM Pulmonary and Critical Care Medicine

- Mutay Nodel's Textbook Of Respiratory Medicine
- Crofron And Douglas's Respiratory Diseases
- Fishman’s pulmonary Diseases And Disorders
- Textbook of Pulmonary Medicine D.Behera
- Textbook Of Pulmonary And Critical Care Medicine, SK Jindal
- Harrison's Pulmonary And Critical Care Medicine
- Ruppel’sManual of PulmonaryFunction Testing
- West's Respiratory Physiology. The Essentials
- Principles And Practice Of Sleep Medicine, Kryger
- Sleep Medicine Pearls (Pearls Series) Burry, Richard B., Wagner, Mary H
- Fundamentals Of Sleep Medicine Berry, Richard B
- Marino's The Icu Book
- Irwin And Rippe's Intensive Care Medicine
- Advances in Mechanical Ventilation, Neil R. Macintyre

- The Washington Manual Of Critical Care (Lippincott Manual)
- Icu Protocols A Stepwise Approach: Rajesh Chawla, SubhashTodi
- Pilbeam's Mechanical Ventilation Physiological And clinical applications
- Interventional Bronchoscopy A Clinical Guide Atul C. Mehta, Prasoon Jain
- Allas Of Flexible Bronchoscopy,Pallav Shah
- Introduction To Bronchoscopy, Armin Emst
- Thoracoscopy For Pulmonologists A Didactic Approach. Philippe Astout Gianfranco Tassi Jean-Marie Tschopp
- Muller's Imaging Of The Chest Expert Radiology Series
- Chest Sonography, Gebhard Mathis
- The Chest X-Ray: A Systematic Teaching Atlas, Matthias Hofer

Dissertation

The candidate registered for DM would prepare a dissertation after undertaking original investigative (Clinical or experimental) work. The progress of this work, which is an important pre-requisite for completion of DM Course, will be reviewed at monthly meeting of the Department and results published at appropriate time bases on progress of the work. Satisfactory completion of such work is pre-requisite for candidates to appear for DM Examination.

ESSENTIAL PRE-REQUISITES

Essential Pre-requisites for allowing DM Pulmonary Medicine canditate appear for final examination: Internal Examinations are to be satisfied with the following.

1. Properly indexed log book of work done, rotations and internal assessment.
2. One Paper on review of clinical material written in the form of an Article for the Index Journal
3. One Laboratory orientated project written in the form of an Article for an index Journal.

Evaluation of DM (Pulmonary Medicine)

Examination should be held at the end of the course after the pre-requisites are b filled. it should consist of

1. Theoretical papers (4 theory papers of 3 hours each)
2. Paper-1 Basic Pulmonary Medicine.

Paper-II, Non-Tubercular Respiratory Diseases and Tubercular Diseases.

Paper-III, Critical Care Medicines and

Paper-IV, Recent Advances in Pulmonary Medicine.

Practical Examination

(b) Clinical Cases Long Case-2 Short Case-3, Spot Case-8

(c) Practical : Clinical Documents Data and Problem. Histopathology slides. X-ray Plates. Ultrasound Plates CT Scan, MRI, Laboratory Data, Clinical Problems.

(d) Viva-voce

Examination should be held at interval of 6 months.

Examination is to be conducted by 4 examiners 2 Internal and 2 External as per recommendation as per MCI

All the Examiners should be separately and jointed satisfied with the Candidates in all parts of the examination and shall unanimously declare whether the candidates is passed of failed.

List of Journals

- Indian / Tuberculosis
- Chest
- Chest Clinics
- Lung India
- Indian Journal of Chest diseases and allied sciences
- Indian Journal of tuberculosis
- Thorax
- International Journal of TB and Lung Diseases
- American Journal of Respiratory and Critical care medicine
- European Respiratory journal
- European Respiratory review
- The Lancet Respiratory
- British Medical journal
- Journals of Indian medical association
- New England Journal of Medicine
- Journal of association of physicians of India
- Clinics in chest medicine
- American journal of roentgenology
- Cancer
- Cancer research
- Journal of thoracic and cardiovascular surgery
- Respiration
- Current opinion in pulmonary medicine
- Breathe