पल्मोनरी एण्ड क्रिटिकल केयर मेडिसिन विभाग

द्वितीय तल, शताब्दी चिकित्सालय फेज– 2

किंग जार्ज चिकित्सा विश्वविद्यालय, उ0 प्र0, लखनऊ – 226003

पत्रांक: 193 / पी0सी0सी0एम0 / 2021 दिनांक– 06.08.2021

सेवा में

फैकल्टी इंचार्ज,
आई0टी0सेल,
किंग जार्ज चिकित्सा विश्वविद्यालय,
लखनऊ।

OFFICE OF THE DEAN
Ref. No 9771
Dt. 07.08.21
K.G. Medical University, U.P. Lucknow

महोदय

आपको अवगत कराना है कि मार्च– अप्रैल 2022 में चिकित्सा विश्वविद्यालय का राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद (NAAC) द्वारा निरीक्षण हेतु राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद (NAAC) में आवेदन किया जाना प्रस्तावित है।

इसी क्रम में अवगत कराना है कि राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद के निर्देशानुसार निम्नलिखित बिन्दुओं पर सूचना चिकित्सा विश्वविद्यालय के वेबसाइट पर अपलोड किये जाने हेतु विभाग से सूचना चाही गयी है।

उपरोक्त बिन्दुओं पर चाही गयी सूचना विश्वविद्यालय की वेबसाइट पर अपलोड किये जाने हेतु प्रेषित।

धन्यवाद।

भवदीय,

डा0 वेद प्रकाश,
विभागाध्यक्ष

प्रतिलिपि:

1. इन एकेडमिक्स, के0जी0एम0यू0, उ0प्र0, लखनऊ।

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10/8/21.

King George's Medical University, UP, Lucknow

DM (PULMONARY MEDICINE) CURRICULUM

Department of Pulmonary & Critical Care Medicine

Second Floor, Shatabdi Phase-2,
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Contents

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LEARNING OUTCOMES

Goals:- The goals of the DM program would be to prepare candidates so as he/she.

1. Recognizes the health needs of patients having pulmonary complaints and carries out professional obligations in keeping with principles of National Health Policy and professional ethics.
2. Has acquired the competencies pertaining to Pulmonary and Critical Care Medicine that are required to be practiced in the community and at all levels of health care system. Has acquired skills in effectively communicating with the patient, family and the community.
3. Is aware of the contemporary advances and developments in medical sciences as related to Pulmonary and Critical Care Medicine.
4. Is oriented to principles of research methodology and epidemiology and should be able to analysis published research literature properly.
5. Has acquired skills in educating medical and paramedical professionals.

Objective:- At the end of the Pulmonary Medicine course, the student should be able to:

1. Recognize the key importance of pulmonary medicine in the context of the health priority of the country.
2. Practice the specialty of Pulmonary Medicine in keeping with the principles of professional ethics.
3. Identify social, economic, environmental, biological and emotional determinants of patient and provide diagnostic, therapeutic, rehabilitative, preventive and promotive measures to provide holistic care to the patient.
4. To diagnose illnesses based detailed history, full physical examination, relevant investigation and proper interpretation of imaging & laboratory results.
5. To perform specialized procedures for diagnosis & management of Pulmonary, Critical Care & sleep disorders.
6. Plan and deliver comprehensive treatment for illness using principles of rational drug therapy.
7. To provide adequate resuscitation and care of critically ill patients in respiratory intensive care unit, critical care unit and high dependency unit.
8. Plan pulmonary rehabilitation of patients suffering from chronic illness. Manage respiratory emergencies efficiently.
9. Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation.
10. Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.

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11. Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.

12. Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence - based Medicine.

13. To train into basic statistical methods.

14. Adopt preventive measures at individual and community level against the common preventable lung diseases.

15. Train as a teacher in the specialty.

SYLLABUS:

1. Basic Sciences

1.1 Anatomy of the 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.

1.2 Physiology and biochemistry

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

1.3 Microbiology

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

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i) Human immunodeficiency virus.
j) Respiratory fungi- including classification and laboratory diagnosis.
k) Opportunistic infections of the lung.
l) Parasitic infections of the lung.

1.4 Pathology

a) Acute and chronic inflammation.
b) Tuberculosis.
c) Pneumonia and bronchopulmonary suppuration.
d) Asthma.
e) Emphysema and chronic bronchitis.
f) Occupational lung diseases and pneumoconiosis.
g) Interstitial lung diseases.
h) Tumors of the lung, mediastinum and pleura.
i) Various mechanisms of hypersensitivity reactions in respiratory diseases.
j) Immunological and pathological tests in allergic diseases of the lung.

1.5 Epidemiology

a) Epidemiological terms and their definitions.
b) Epidemiological techniques of surveys.
c) Epidemiology of tuberculosis, pneumoconiosis, asthma, COPD and lung cancer.
d) National Tuberculosis Elimination Programme.
e) Programmatic Management of drug resistant TB.
f) Prevention of Tuberculosis.
g) Research methods and study designs.

1.6 Pharmacology

a) Antimicrobial drugs.
b) Antitubercular drugs.
c) Antineoplastic drugs.
d) Anti-inflammatory drugs.
e) COPD drugs
f) Anti-asthma drugs.
g) Drugs used in viral, fungal and parasitic infections.
h) Pharmacokinetic and drugs interaction for commonly used drugs in respiratory diseases

2. Clinical Sciences

2.1 Evaluation and interpretation of following signs and symptoms:-

a. Dyspnea
b. Wheeze
c. Chest pain
d. Cough
e. Sputum production

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f. Stridor
g. Hoarseness of voice
h. Haemoptysis
i. Snoring
j. Daytime somnolence
k. General symptoms of diseases including fever, weight loss, edema, nocturia
l. General examination findings:- anemia, cyanosis, clubbing, lymphadenopathy

2.2 Pathophysiology, clinical menifestations, diagnosis, managemnt & prognosis of the following diseases:-

2.2.1 Airway disease:

a. Sinusitis & Epiglottitis
b. Laryngotracheobronchitis
c. Tracheitis
d. Foreign bodies
e. Asthma
f. Chronic obstructive pulmonary disease (chronic bronchitis, emphysema)
g. Bullous Lung diseases
h. Bronchiectasis
i. Cystic fibrosis
j. Bronchiolitis
k. Dysmotility Syndromes

2.2.2 Pleural disorders:

a. Pleural effusions
b. Empyema
c. Pneumothorax
d. Pleural plaques and thickening
e. Mesothelioma and other Pleural malignancies

2.2.3 Mediastinum:

a. Mediastinitis
b. Pneumomediastinum
c. Mediastinal Masses
d. Vascular Abnormalities

2.2.4 Neoplastic disorders:

a. Pathogenesis
b. Approach to the patient with Pulmonary nodules
c. Pathology of Bronchogenic Carcinoma
d. Clinical evaluation and diagnosis
e. Natural history

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f. Genetic and Molecular changes
g. Prospects for a Personalized Pharmacological Approach to treatment
h. Epidemiology of the lung cancer
i. Clinical evaluation, diagnosis & staging of lung cancer
j. Treatment of non-small cell lung cancer: Surgery
k. Treatment of Non-Small cell lung cancer: Chemotherapy
l. Small Cell Lung Cancer: Diagnosis,Treatment, and natural history.
m. Primary lung tumors other than Bronchogenic Carcinoma: Benign and Malignant.
n. Extrapulmonary Syndromes associated with Lung Tumors
o. Metastatic Pulmonary tumours: The role of Surgical Resection
p. Mesothelioma
q. Metastatic & Other pleural tumours
r. Benign intrathoracic tumours
s. Mediastinal tumours
t. Chest wall tumours
u. Sarcoma

2.2.5. Infectious diseases:

Non Tubercular Infectious Diseases of the Lungs

a. Pulmonary clearance of Infectious agents
b. Approach to the patient with Pulmonary Infection
c. Pulmonary Infection in Immunocompromised hosts
d. Microbial Virulence factors in Pulmonary Infections
e. Principles of Antibiotic Use and the Selection of Empiric therapy for Pneumonia
f. HIV, AIDS and pulmonary disorders
g. Upper Respiratory Infections
h. Lower respiratory infections
i. Community acquired pneumonia
j. Nosocomial pneumonia
k. Pneumonia in the immunocompromised host
l. Other pneumonias
m. Parapneumonic effusion & Empyema
n. Lung abscess
o. Fungal infections
p. Parasitic infections
q. Epidemic Viral infections
r. Others infections

Tuberculosis

a. Pulmonary TB
b. Extrapulmonary TB
c. TB in the immunocompromised host
d. Latent TB infections
e. Non tuberculous mycobacterial diseases

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f. Drug resistant Tuberculosis
g. Tuberculosis control programme, including Programmatic management of drug resistant Tuberculosis (PMDT).

2.2.6 Industrial and environmental disease:

a. Inorganic and organic pneumoconiosis
b. Air pollution, sick building syndrome, and smoking
c. Occupational asthma, reactive airways dysfunction syndrome
d. Occupational lung diseases.
e. High altitude physiology and clinical disorder, Diving injuries and air embolism, thermal lung injury and acute smoke inhalation
f. Lung mechanics and disorder related to special circumstances such as aviation and sports.
g. Disability evaluation and compensation

2.2.7. Complications of aspiration:-

a. Gastric Contents
b. Foreign bodies
c. Lipoid material
d. Water, including immersion injuries

2.2.8. Immunologic Diseases:

a. Rhinitis
b. Asthma, Allergic bronchopulmonary aspergillosis
c. Extrinsic allergic alveolitis
d. Eosinophilic lung disease
e. Respiratory manifestations of collagen vascular disease
f. Pulmonary vasculitis
g. Bronchiolitis obliterans organizing pneumonia

2.2.9. Lung injury:

a. Trauma
b. Drugs (including recreational and illicit drugs)
c. Oxygen
d. Thermal
e. Barotrauma

2.2.10. Restrictive lung diseases:

a. Chest wall deformities
b. Neuromuscular diseases

2.2.11. Diffuse Parenchymal (interstitial) Lung Diseases:

a. Sarcoidosis.
b. Hypersensitivity pneumonitis.

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c. Eosinophilic lung diseases.
d. Drug induced pulmonary diseases.
e. Idiopathic Interstitial pneumonias including Idiopathic Pulmonary Fibrosis (IPF)
f. NSIP,COP, AIP, RB-ILD, DIP, LIP.
g. ILD associated with CTDs.
h. Interstitial lung diseases specific to Infancy
i. Pulmonary haemorrhage syndromes

2.2.12. Disorders of the pulmonary circulation:

a. Pulmonary embolism (thrombo-embolism, fat, air, tumor, amniotic fluid)
b. Pulmonary hypertension
c. Pulmonary edema
d. Cor pulmonale
e. Pulmonary arteriovenous malformations, fistulas and other vascular abnormalities.
f. Hepato-pulmonary and hepato-renal syndrome
g. Vasculitis

2.2.13. Sleep disorders:

a. Sleep disordered breathing
b. Hypoventilation syndromes
c. Non-respiratory sleep disorders (restless legs syndrome, periodic limb movement disorder, narcolepsy, parasomnias insomnia)

2.2.14. Respiratory manifestations of extra pulmonary disorders.

2.2.15. Respiratory complications of pregnancy.

2.2.16. Oxygen therapy and various inhalational devices.

2.2.17. Newer Emerging Pulmonary Diseases.

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

3.1 Pulmonary rehabilitation.
3.2 Radiation therapy.
3.3 Chemotherapy.
3.4 Respiratory therapy.
3.5 Physical therapy.
3.6 Interventional bronchoscopy including endoronchial ultrasound (EBUS), foreign body removal, tumor debulking and airway stenting.
3.7 Common surgical intervention:-
a. Mediastinoscopy.
b. Thoracotomy and lung resection.
c. Thoracoscopy.
d. Surgical management of empyema.
e. Lung Reduction surgery.
f. Lung transplantation.

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3.8 Palliative care.

3.9 End of life decision making.

4. CRITICAL CARE MEDICINE

4.1 Hemodynamic and respiratory monitoring.

4.2 Respiratory failure : pathogenesis, causes, diagnosis and management.

4.3 Sepsis.

4.4 Resuscitation of the critically ill including multiple organ failure.

4.5 Principles of mechanical ventilation:-

a. Non-invasive ventilation
b. Invasive ventilation
c. Newer modes of ventilation
d. Weaning
e. Weaning failure
f. Home based NIV and long term oxygen therapy.

4.6 Infection control in intensive care unit.

4.7 VAP Prevention bundle.

4.8 Comprehensive care of the comatose.

4.9 Nutrition in critically ill patients.

4.10 Management of pain and sedation in intensive care unit.

4.11 Management of emergencies pertaining to cardiology, neurology, nephrology, gastroenterology and other medical emergencies encountered in the intensive care unit.

4.12 Ethics and palliative care in ICU settings.

4.13 Organization of intensive care setting.

4.14 Procedural skills:

a. Maintenance of an open airway
b. Tracheal intubation (oral, nasal)
c. Cricothyrotomy, tracheostomy, transtracheal catheters
d. Noninvasive ventilations
e. Invasive mechanical Ventilatory support; Respiratory graphics
f. Prone ventilation
g. Topical use of respiratory medication (inhalers & nebulizer)
h. Suctioning, chest physiotherapy and incentive spirometry.
i. weaning techniques
j. Flexible bronchoscopy (Diagnostic and therapeutic)
k. Chest tube insertion, chest drainage systems
l. USG and CT guided procedures
m. Bedside pulmonary function tests.
n. Thoracic Ultrasonography
o. Preperative pulmonary assessment and postosperative pulmonary complication management.

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5. **Paediatric pulmonology**
   - 5.1 Respiratory problems in children.
   - 5.2 Infective pneumonia.
   - 5.3 Pediatric tuberculosis.
   - 5.4 Congenital malformations.
   - 5.5 Bronchial asthma.
   - 5.6 Cystic fibrosis.

6 **Pulmonary radiology and imaging.**
   - 6.1 Chest x ray.
   - 6.2 Floroscopy.
   - 6.3 CT Thorax.
   - 6.4 Pulmonary angiography.
   - 6.5 MRI Thorax.
   - 6.6 Ultrasonography of thorax.
   - 6.7 Echocardiography.
   - 6.8 PET Scan.
   - 6.9 Ventilation-perfusion scans.

7 **Practical skills.**

7.1 Microbiological
   - a. Sputum smear staining – Gram's and ZN staining.
   - b. Mantoux testing.
   - c. BCG vaccine.
   - d. Skin sensitivity tests.

7.2 Pulmonary function tests
   - a. Spirometry.
   - b. Bronchoprovocation test.
   - c. Diffusion studies.
   - d. Impulse oscillometry.
   - e. Lung volume studies.
   - f. Cardiopulmonary exercise testing.

7.3 Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic:-

   a. Endotracheal intubation (oro and nasotracheal) with and without the use of bronchoscope.
   b. Initiation, maintenance and discountinuation of acute and chronic mechanical ventilation (including non-invasive techniques).
   c. Bronchoscopy (including trans bronchial biopsy, endobronchial biopsies, Bronchoalveolar lavage and bronchoscopic fine needle aspiration).
   d. Thoracentesis with or without ultrasound guidance.
   e. Pericardiocentasis.
   f. Ascitic tap.

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g. Pleurodesis.
h. Placement of closed intrapleural chest tube.
i. Arterial puncture and cannulation.
j. Arterial blood gas analysis.
k. Venous cannulation for placement of central venous and pulmonary artery catheters.
l. Fine needle aspiration of lymph nodes, lung and mediastinal masses.
m. Percutaneous lung and pleural biopsy.
n. Document and disseminate information related to procedures performed and their outcomes.
o. Ensure adequate follow-up is arranged for procedures performed.

7.4 **Medical emergency management**
a. Cardiopulmonary resuscitation.
b. Acute respiratory failure.
c. Acute severe asthma.
d. Pneumothorax.
e. Haemoptysis.
f. Acute pulmonary embolism.

8 **Ethical, legal, economic and other related issues involved in pulmonary and critical care management.**
8.1 Triage of patients.
8.2 Withholding and withdrawing of mechanical ventilation and other life supports.
8.3 Legal consent.
8.4 Brain death certification.
8.5 Organ donation.

9 **Research and clinical epidemiology.**
9.1 Research methodology and study designs (observational, analytical and experimental study).
9.2 Common statistical methods for analysis of research.
9.3 Sources of bias.
9.4 Basic Course in Biomedical Research (BCBR).

10 **Perform a complete and appropriate assessment of a patient:-**
10.1 Identify and explore issues to be addressed in a patient encounter effectively, including the patient's context and preference.
10.2 Elicit a history that is relevant, concise and accurate to context and preference for the purpose of prevention and health promotion, diagnosis and/or management.
10.3 Perform a focused physical examination that is relevant and accurate for the purpose of prevention and health promotion, diagnosis and /or management.
10.4 Select medically appropriate investigative method in a resource effective and ethical manner.
10.5 Demonstrate proficiency in interpretation of chest radiographs.
10.6 Recognize common abnormalities on chest computerized axial tomography (CT) scan.
10.7 Demonstrate proficiency in interpretation pleural fluid analysis.

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

10.9 Demonstrate proficiency in the inspiration of blood gas.

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

TEACHING AND LEARNING METHODS:

Learning in Superspeciality degree course shall essentially be autonomous and self-directed. The teaching and training course will be conducted for a period of 03 years. It will consist of the following:-

Mode of training Frequency

1. Clinical Case Presentation One per week.
2. Seminar One per week.
3. Journal Club One per week.
4. Teaching Rounds- Two per week.
5. Clinico-radiological conference One per month.
6. Clinic-pathological conference One per month.
7. Mortality-morbidity discussion One per month.
8. Institutional level CME As per institute's schedule.
9. Grand rounds One per fortnight.
10. Inter departmental clinical meets One per Quarter.
11. One guided thesis.
12. An effort shall be made to develop integrated teaching with other department as decided by the Head of the Department.
13. Faculty Lecture- Intra/Inter departmental-one per month.
14. Any other academic activities as decided by the Head of the Department.

INTERDISCIPLINARY TRAININGS:

The resident would be required an interdisciplinary trainings in addition, he/she will spend some time in rotations through allied specialities (Pathology, Radiology, Cardiology, Nephrology, etc).

Extramural rotations (Institutions outside the primary centre) or rotation of affiliated centers for a maximum period of 3 months will be possible during after the 1st year of training.

ASSESSMENT METHODS:

Internal assessment: The assessment will be based on day to day performance, along with formal tests and skill assessments. The assessments will be regularly forwarded to Dean.

Formative assessment: Formative assessment shall be done on the basis of academic activities like journal clubs, seminars, house tests, thesis or any other institutional criteria.

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Summative assessment: At the end of DM program, the students will undergo theory and practical examinations. Whole syllabus will be divided into 04 theory papers (100 marks each) followed by practical exam.

Paper I: Basic sciences and pathology as applied to Pulmonary, Critical Care & Sleep Medicine.

Paper II-Practice of Pulmonary disorders including Tuberculosis & Sleep Medicine.

Paper III- Practice of Critical Care Medicine.

Paper IV: Recent advances in Pulmonary, Critical Care & Sleep Medicine.

Practical / Clinical & Viva examination - 600 marks

Practical/Clinical –

- Long case- (Two) 150 marks each (Where history taking, general examination and systemic (Chest) examination, approach to a case and Management shall be assessed.)
- ICU case- (One) 150 marks.
- Table Viva Including Radiology, Spotters-150 marks)

Total weight age of final result: Theory assessment (40 %) + Practical examination (60 %).

* Any change can be incorporated and finalized as per university rules.

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