SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)
Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade
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Attested CTC

15/2/202

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

CURRICULUM

Doctor of Medicine

.D.)

TUBERCULOSIS & RESPIRATORY DISEASE/ PULMONARYMEDICINE

Sumandeep Vidyapeeth • Deemed to be University •

Smt. B. K. Shah Med. Instt. & Rese. Centre
Dean

urriculum for DTCD (TB & Respiratory Medicine)

Programme outcome : MD

The purpose of MD education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The goal of postgraduate medical education shall be to produce competent specialists and/or Medical teachers.

Programme specific outcome : MD

POS 1. Scholars shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy.

POS 2. Scholars shall have acquired the basic skills in teaching of the medical and paramedical professionals.

POS 3. Practice the specialty concerned ethically and in step with the principles of primary health care.

POS 4. Demonstrate sufficient knowledge of the basic sciences relevant to the concerned specialty**.**

POS 5. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.

COURSE OUTCOME (CO): Each student should obtain proficiency in the following domains during the period of MD training:

1. Theoretical knowledge of different aspects of Pulmonary Medicine including the status in health anddisease.
2. Acquire clinicalskills.
3. Acquire practicalskills.
4. Management of emergencies including intensivecare.
5. Preparation of thesis as per MCIguidelines.
6. Foolowing objectives like patient management in the outpatient, inpatient and emergency situations, case presentations, didactic lectures, seminars, journal reviews, clinico-patholgicalconferencesandmortalityreviewmeetingsandworkinginthe

1. GOAL

The goals of Postgraduate training in Respiratory Diseases is to train MBBS doctor who will fulfill the following:

1.1. Achieve the competency in the field of RespiratoryDiseases
1.2. Can practice at the secondary and tertiary level of the health care delivery system efficiently and effectively, backed by a sound scientific knowledge and skillbase.
1.3. The person must be trained in tuberculosis disorders keeping with the objective of the Nation Health Policy(RNTCP).
1.4. The person shall be abreast with the recent advances and developments in the specialty of chestmedicine.
1.5. The person should be oriented to the principles of research methodologyand epidemiology and must acquire basic skills in teaching thespecialty.
1.6. Exercise empathy and a caring attitude and maintain high ethicalstandards.
1.7. Continue to evince keen interest in continuing medicaleducation
1.8. Be a motivated 'teacher' –to share his knowledge and skills with a colleague or ajunior.
1.9. Shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national healthpolicy.
To prepare the candidate to practice Evidence Based RespiratoryMedicine

2. OBJECTIVES

Upon completion of the evidence based Respiratory Medicine education, the trainee should be able to:

2.1. Demonstrate significance of Evidence Based RespiratoryMedicine
2.2. Demonstrate awareness of epidemiologically-based needs assessments through research and systematic reviews of researchevidence.
2.3. Contribute to the appraisal process.
2.4. Understand quality assurance in the delivery of Respiratorycare.

The Objectives may be considered under the subheadings.

3. Knowledge:

At the end of the course of Respiratory Medicine, the student shall be able to:

3.1. Demonstrate sound knowledge of common respiratory diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm theirdiagnosis
3.2. Demonstrate comprehensive knowledge of various ***evidence based***modes of therapy used in treatment of respiratory diseases; and be acquainted with the most current guidelines for expert management of the respiratoryillnesses.
3.3. Demonstrate detailed knowledge of pulmonary as well as extrapulmonary tuberculosis and to offer a comprehensive plan of management (Including National TB control programme and DOTS)
3.4. Describe the mode of action of commonly used drugs, their doses, side-effect/toxicity, indications and contra-indications andinteractions;
3.5. Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan ofmanagement.

Upon completion of Evidence based Respiratory Medicine education the trainee should be able to describe:

- Evidence based clinical practice including costeffectiveness.
- The development and application of clinical guidelines andstandards.
- The process of risk assessment as relevant to clinicalpractice
- Multi-disciplinary clinical care pathways and appropriate integration of Respiratory Medicine.

4. Skill:

The following list is drawn up with a view to specifying basic minimum skills to be acquired. The student shall be ableto:

4.1. Interview the patients, elicit relevant and correct information and describe the history in chronologicalorder.
4.2. Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders andemergencies
4.3. Perform simple, routine investigative and office procedures required for making the bedside diagnosis, especially sputum collection and examination for etiologic organisms especially Acid Fast Bacilli (AFB), Interpretation of the chest x-ray respiratory function tests; CT scan & MRI scan ofthorax.
4.4. Manage common recognizing need for referral for specialized care, of inappropriateness of therapeuticresponse.
4.5. Utilize critical appraisal skills and be able to apply to researchevidence
4.6. Should be able to perform insertion of I.V. lines, nasogastric tubes, urinary catheters, lumbar punctureetc.
4.7. Teach undergraduates andinterns
4.8. Blood sampling – venous andarterial
4.9. Communication skills with patients, relatives, colleagues and paramedicalstaff
4.10. Ordering laboratory and radiological investigations and interpretation of the report in light of the clinicalpicture
4.11. Proficiency in common ward procedures
4.12. Perform FNAC, Biopsy, Thoracocentesis, Tube thoracostomy, Tracheostomy, Laryngoscopy, Lung biopsy under radiological guidance, drainage ofloculated pleural effusion under radiologicalguidance
4.13. Universal precautions against communicablediseases.
4.14. Insertion of Arterial lines, Central venous lines, endotrachealtubes
4.15. Working knowledge of ventilators and variousmonitors
4.16. Interpretation of Arterial Blood gases and management ofabnormality
4.17. Correction of Electrolytedisturbances
4.18. Cardiopulmonary resuscitation and management of shock and cardio-respiratoryfailure
4.19. Bronchoscopy
4.20. Drainage of cervical coldabscess
4.21. Performance & Interpretation ofspirometry
4.22. Performance & Interpretation of diffusion studies oflung
4.23. Performance & Interpretation of sleep study in subjects suspected to have obstructive sleepapnea.

5. ATTITUDES:

Adopt ethical principles in all Respiratory Medicine practice.

Professional honesty and integrity are to be fostered.

Treatment to be delivered irrespective of social status, caste, creed or region of patient.

Willing to share knowledge and clinical experience with professional colleagues.

Willing to adopt new methods and techniques in Respiratory Medicine from time to time based on scientific research, this is in patient's best interest.

Respect patient's rights and privileges including patient's right to information and right to seek second opinion.

Upon completion of the subject of Respiratory Medicine, the trainee should be able to recognize:

5.1. Importance of maintaining professional standards byEBM.

5.2. The need to constantly appraise and evaluate clinical practice and procedures.

6. COMMUNICATIVE ABILITIES:

6.1. Develop communication skills, in particular, to explain treatment option available in management and to make patient partner in evidence based decisionmaking

6.2. Provide leadership and get the best out of his group in a congenital workingatmosphere.

6.3. Should be able to communicate in simple understandable language to the patient .He should be able to guide and counsel the patient with regard to various treatment modalitiesavailable.

6.4. Develop the ability to communicate with professional colleagues through various media like Internet, e-mail, videoconference, and etc. to render the best possibletreatment.

7. INTEGRATION OF TEACHING

The goal of effective teaching can be obtained through integration with department of Medicine, Surgery, Microbiology, Pathology, Radiology, Pharmacology & PSM. This shall enable the student to be acquainted with diagnosis and management of common/uncommon systemic diseases that may affect the lung or may affect the management of various chest diseases.

8. TEACHING AND TRAINING

8.1 Students will be posted as full time students in the department of Respiratory Disease. They will work in the concerned wards, attend to bedside clinics, participate in group discussions, seminars, Case presentation, grand rounds, didactic lectures, journal review and interpretation of laboratorydata.

8.2 Candidates will have to participate in the Under Graduation teaching to get experience in the methods of teaching medicalstudents.

8.3 To introduce Basic life support (BLS) and Advanced Cardiac Life Support (ACLS) training for all the First year Postgraduate Resident Doctors from academic year 2017-18.

8.4 To introduce New chapter / topic 'Intellectual Property Rights (IPR) foralltheFirstyearPostgraduateResidentDoctorsfromacademicyear2020-2021 of duration of 4hrs (Board of Studies letter no.: SBKS/DEAN/742/2021,dated 05/06/2021 and Vide Notification of Board of Management Resolution Ref no.:SVDU/R/3051-1/2020-21, dated - 29" July 2021)

List of topics :

1. Introduction-ConceptofIntellectualProperty,Historicalviewof Intellectual Property system in India and International Scenario, Evolution of Intellectual Property Laws in India, Legal basis of Intellectual Property Protection, Need for Protecting Intellectual Property, Theories on concept of property - Major IP Laws in India.
2. Types of IPR: Patents, Copyright, Trademark Industrial Designs, TradeSecrets.
3. Patents: Concept of Patent, Criteria of Patentability, Inventions NOT patentable, Process of Obtaining a Patent, Duration of Patents, Rights of Patentee, Limitation of rights, Infringement andEnforcement.
4. Copyrights: Meaning of Copyright, Copyright Vs. Moral rights, Copyrighteligibility,TermofCopyright,RegistrationofCopyright, Infringement andRemedies
5. Trademark: Meaning of Trademark, Criteria for trademark, Procedure for Trademark Registration, Term of protection, Infringement andRemedies.
6. Industrial Designs: Meaning of Industrial Designs, Rights in Industrial Designs: Nature, Acquisition and duration ofrights.
7. Trade Secrets: Meaning of Trade Secrets, Need to protectTrade secrets, Criteria of Protection, Procedure for registration, Infringement.
8. Commercialization of IPR: Traditional IP and Evolving IP, Assignment, Licensing, Cross License, Patent Pool, Negotiations, Defensive Publications, TechnicalDisclosures, Patent Pooling, Patent Trolling, Brand Management, Brand and Pricing Strategies.

8.5 With reference to the Notification vide no. MC!-18(1)12020-Med.1121415, dated 16.09.2020, related to 'Postgraduate Medical Education (Amendment) Regulations 2020'; all the postgraduate students pursuing MD / MS in broad specialties in Sumandeep Vidyapeeth Deemed to be University, as a part of course curriculum, shall undergo a compulsory Residential rotational posting in the 3rd or 4th or Sth semester of the Postgraduate programme, for a duration of three months, in the District Hospitals / District Health System, is confirmed and approved for execution.

(Board of Studies letter no.:SBKS/DEAN/1576/2020,dated 0/10/2021 and Vide Notification of Board of Management Resolution : Ref no. SVDU/R/1271-1/2020-21, dated - 30th December 2020)

To consider and approve the tmpte Students admitted in the 2021-22 batch as per the NMC notifications vide letter F.No. NMC23(1)(25)12021/PG/053909 dated 2211212022 and Clarification issued by NMC vide tetter F. N o. N M C/23 (1) (25) 12021 I Med. I 00 1 866 d ated 1 9 I Ot t 2023 Resolution ' with reference to the NMC notifications vide letter F.No. NMC-23(1)(25)t2o21tpcto53g0g dated 2211212022 and Clarification issued by NMC vide letter F.No.NMC/23(1)(25)t2021/Med./001g66 dated 1910112023. the District Residency Program (DRP) shall be implemented for the students admitted in 2021-22 batch onwards. The said notification and clarification from NMC were considered and passed unanimously.

(BOS-Ref :SBKSMIRC/Dean/Outward No.1158/2022-23, Date of Academic council : 11/02/2023)

The communication from National Medical Commission vide no. NMC-23 (1) (25) / 2021 / PG / 053909, dated 22.12.2022 regarding Implementation of District Residency Programme, and National Medical Commission vide no. NMC-23(1)(25)/2021/Med./001866, dated 19.01.2023 regarding Clarification on implementation of District Residency Programme, is adopted for execution.

(BOM-Ref. No.: SVDU/R/2431-A/2022-23, Date of Academic council : 29/05/2023)

The resolution regarding introduction of Value Added Course on "Role of Uttrasonoqraphv in Emergency Care" for the Postgraduate students of MD Anesthesiotogy,-MD General [i"dijn", MD Respiratory Medicine and MS Generalsurgery programs has been considered "no p"JS"J. ' ' Theoretical Knowledge and Practical Skills contents related to Value Added Gourse on "Role of Ultrasonography in Emergency Care" will be delivered to the PG Students of above mentioned subjects in the form of two days (16 Hours) workshop training by Emergency Medicine department during their Second year of postgraduation. o At the end of course, Certificates will be awarded to all those students, who have compteted the course successfully.

The Public Notice issued by National Medical Commission vide no. NMC-23(1)(10A)/2021- Med./PG, dated 18.01.2023 regarding Relaxation for Postgraduate students (Batch 2020-21) in poster presentation to read one paper at a National / State conference and to present one research paper, which should be published / accepted for publication / sent for publication, during the Postgraduate studies; is considered and adopted for execution. The Postgraduate students of batch 2020-21 are exempted from one out of two requirements (poster presentation and to read a paper at a National / State conference), but the submission of the research paper is mandatory. 4. The proposal of introduction of Value Added Certificate Course titled - Role of Ultrasonography in Emergency Care for the Second year Postgraduate students of Anesthesiology, General Medicine, Respiratory Medicine and General Surgery of 16 hours duration, is considered and ratified for implementation from the Academic year 2023-24.

(BOS-Ref :SBKSMIRC/Dean/Outward No.1158/2022-23, Date of Academic council : 11/02/2023)

(BOM-Ref. No.: SVDU/R/2431-A/2022-23, Date of Academic council : 29/05/2023)

9. SPECIAL ACTIVITIES(COMPULSORY)

9.1. Journal club – Once a month.

- All the post graduate Journal Clubs will be carried out on a prescribed Evidence Based format with emphasis on critical appraisal. A designated teacher/facilitator wills asses every post graduate student for each JC presentation

9.2. PG Discussions/Seminars – once a week + asrequired.

- All PG seminars will have evidence embedded in the presentation and all references relating to the subject matter will be incorporated. AT the end of the seminar all the references will be listed and the seminar will be assessed by the facilitator.

9.3. Case presentation & Discussion – at least once a week in addition to routine ward activities.

9.4. Integrated teaching: - Participation is casediscussions.

9.5In the OPD/ward/ICU every post graduate student will be exposed to at least one encounter of role modeling in which a consultant after raising a relevant query will search for its evidence and demonstrate evidence searching methodologies, its importance and utility to thestudent.

10. DURATION OF THE COURSE

The duration of the courses shall be 2 Academic years (4 Academic terms)

11. CLINICAL POSTINGS

First year: Department of Respiratory Diseases

Second year: ICU - 2 Months
And
Dept. of Respiratory medicine 10 months

The candidate shall be posted in outpatient and inpatient concurrently, and in emergency including intensive care unit.

PATTERN OF D.T.C.D. EXAMINATON

1. **Assessment –** Candidates will be evaluated by marking systemexclusively

2. **Pattern for D.T.C.D. -** Theory, Clinical and Viva (Oral) are three heads each candidate should be declared successful on securing at least 50% marks in each headindependently.

3. **Theory Examination** will have three papers
(Each paper – 100 marks, Total – 300marks)

Paper I – Pulmonary and extra pulmonary tuberculosis
Paper II – Respiratory diseases other than tuberculosis
Paper III – Recent advances and Evidence based management of respiratory Diseases

4. Practical examination – Total 400Marks

I. Clinical – one long and two shortcases.
   a. Long Case (One) – 150marks
   b. Short Case (Two) – 150 marks, 75each

II. Oral (Two tables) – 100 marks, 50each

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

SYLLABUS

TUBERCULOSIS

1. History
2. Epidemiology
3. Themycobacteria
4. Pathology
5. Susceptibility factors in pulmonarytuberculosis
6. Laboratorydiagnosis
7. Tuberculintest
8. Roentgenographic manifestations of pulmonarytuberculosis
9. Differentialdiagnosis
10. Clinicalmanifestation
11. Pulmonary tuberculosis
12. Lower lung fieldtuberculosis
13. Endobronchialtuberculosis
14. Tuberculosis pleuraleffusion
15. Silicotuberculosis
16. Abdominaltuberculosis
17. Granulomatoushepatitis
18. Neurologicaltuberculosis
19. Tuberculosis and theheart
20. Skeletaltuberculosis
21. Cutaneoustuberculosis
22. Lymph nodetuberculosis
23. Tuberculosis inotorhinolaryngology
24. Ocular tuberculosis
25. Tuberculosis inpregnancy
26. Female genitaltuberculosis
27. Genitourinarytuberculosis
28. Tuberculosis in chronic renalfailure
29. Disseminated / milliarytuberculosis
30. Complication of pulmonarytuberculosis
31. Haematological manifestations oftuberculosis
32. Adrenocortical reserve intuberculosis
33. Endocrine implications oftuberculosis
34. Tuberculosis andcancer
35. Tuberculosis andHIV
36. Tuberculosis inchildren
37. Surgical aspect of childhoodtuberculosis
38. Tuberculosis inelderly
39. Atypical mycobacterialinfection
40. Drug Resistanttuberculosis
41. Current and future treatment oftuberculosis
42. Tuberculosis and acute lunginjury
43. Surgery for pleuro-pulmonary tuberculosis
44. Nutrition andtuberculosis
45. RNTCP

RESPIRATORY DISEASES

1. **HistoricalPerspectives**

2. **Development of thelungs**
   a. Development of the airways andvessels
   b. Cellular development oflung
   c. Post nataldevelopment

3. **Structure of the respiratory tract**
   Anatomy
   a. Anatomy of respiratory system
   b. Bronchopulmonaryanatomy
   c. Functional design of the lung for gasexchange.
   d. Respiratorymuscles
   e. Blood supply, lymphatics and nervesupply
   f. Surfactant and associatedproteins
   g. Non-respiratory function of thelungs

4. **Lung Functions**
   Physiology
   a. Pulmonary mechanics
   b. Respiration and itscontrol
   c. Ventilation, perfusion,Diffusion
   d. Assessment of pulmonaryfunction.
   e. Blood gastransport
   f. Inhalation kinetics and its implication in aerosoltherapy
   g. Aterial bloodgases.
   h. Acid-BaseBalance.

5. **Lungs in different Physiologicalstates**
   a. Sleep
   b. Exercise
   c. HighAltitude
   d. Pregnancy
   e. Ageing

6. **Lungimmunology**
   a. Lungdefense
   b. Lymphocytes & Macrophages ininflammation
   c. Mast cells andeosinophils
   d. Mechanisms of hypersensitivityreactions

7. **Lung injury andrepair**
   a. Cytokines &Chemokines
   b. Nitricoxide
   c. Inflammatoryreactions
   d. Reactions to acute and chroniciniury
   e. Pulmonaryfibrosis

8. ClinicalAspect

a. Symptomatology: Breathlessness, Cough, Haemoptysis, chestpain
b. Physicalsigns
c. Dermatological manifestations of lungdiseases.
d. Pulmonary-systemicinteractions

9. DiagnosticImaging

a. ChestRadiography
b. CT, MRI, Ultrasonography, Echocardiography
c. LungScintigraphy
d. Pulmonary Angiography
e. BariumStudy
f. Fluoroscopy

10. Diagnosisprocedures

a. Pulmonary functiontesting
b. Cardiopulmonary exercisetesting
c. Blood gasanalysis
d. Bronchoscopy, Bronchial lavage,Biopsy.
e. Transthoracic needle aspiration andbiopsy
f. Pleural fluid aspiration, Pleuralbiopsy
g. TranstrachealAspiration
h. Thoracoscopy,Mediastinoscopy
i. Skin test: tuberculin,allergen
j. Bronchoprovocationtests

11. Epidemiology

a. Epidemiologicalterms
b. Epidemiologicaltechniques
c. Epidemiology of tuberculosis and other respiratorydiseases
d. National Tuberculosis Control Programme andRNTCP
e. Research methods and study designs cohort, case control, randomized Clinical trials, observative and cross-sectionalstudies.
f. Common statistical methods for analysis ofresearch.

12. Development and Geneticabnormalities

a. Dimorphiclung
b. Tracheal agenesis Trachealstenosis
c. Tracheomalacia
d. Vascular ringanomalies
e. Bronchialcvst
f. Agenesis of thelung
g. Congenital lobaremphysema
h. Cystic adenomatoidmalformation
i. Bronchopulmonarysequestration
j. Azygos lobe
k.Horse shoelung
l. Scimitarsyndrome
m. Diaphragmatichernia
n. Congenital eventration of thediaphragm
o. Primary ciliarydyskinesia

13. Evidence Based Respiratory Medicine

- ***a. Introduction To Evidence-Based Decision Making***
- ***b. AssessingEvidence***
- ***c. Implementing Evidence- Based Decision In ClinicalPractice***

14. Infection

a. Microbial flora and colonization of the respiratorytract
b. Pulmonary clearance of infectiousagents
c. Approach to the patient with pulmonaryinfections
d. Community acquired pneumonia
e. Pneumonias:
   - Gram-positivebacteria
   - Gram-negativebacteria
f. Legionellosis
g. RickettsialPneumonia
h. MyscoplasmalPneumonia
i. Chlamydia Pneumonia
j. RadiationPneumonia
k. Lipoidpneumonia
l. VaricellaPneumonia
m. Pulmonarymelidosis
n. Opportunisticinfections
o. Anaerobic bacterialinfections
p. Pulmonary infections inAIDS
q. Pulmonary infections in neutropenia andcaner
r. Pneumonia in organ transplantpatient
s. Pulmonary infections in patient with primary immunedefects.
t. Postoperativepneumonia
u. Hantavirus PulmonarySyndrome
v. Ventilator-associatedpneumonia
w. Pulmonary ehrlichiosis
x. Rhodcoccus equi infections
y. Actinomysis

15. Fungalinfection

a. Histoplasmosis
b. Coccidioidomycosis

16. Parasitic pulmonarydiseases

a. Plueropulmonaryamoebiasis
b. Malarial lungdisease
c. Toxoplasmosis
d. Pnemumocystis pneumoniaNematodes
e. Pulmonary dirofilarais
f. Pulmonaryechinococcosis
g. Schistomiasis
h. Paragonimiasis
i. Pulmonary eosinophilsyndrome

17. Zoonotic pulmonarydiseases

a. Plague
b. Qfever
c. Tularemia
d. Pasteurellosis
e. Rhodococcuspneumonia
f. LeptospiralPneumonia
g. Hantavirus pulmonarysyndrome
h. Acute equine respiratorysyndrome

18. Suppuration

a. Suppurativepneumonia
b. Lungabscess
c. Bronchiectasis
d. Gangrene of thelung

19. Pleuraldiseases

a. Pleural dynamics andeffusion
b. Pleurisy andeffusion
c. Non-neoplastic and neoplasticeffusions
d. Pneumothorax
e. Empyemathoracis
f. Bronchopleural fistula and itscomplications
g. Pleuralthickening
h. Primary pleuraltumours
i. Malignantmesothelioma

20. Immunology

a. Pulmonary hypersensitivity
b. Extrinsic allergicalveolitis
c. Goodpasture'ssyndrome

21. Airflowobstruction

a. Chronic obstructive pulmonarydisease
b. Chronic corpulmonale
c. Unilateral hyperradiancy of thelung
d. Broinchialasthma
e. Bronchiolardisease
f. Reactive airways dysfunctionsyndrome
g. Small airwaydisease
h. Upper airwayobstruction
i. Cysticfibrosis
j. Bronchiolitis
k.Bullous diseases of the lungs

22. Occupational and environmentaldisorders

a. Silicosis
b. Coal workers'pneumonosis
c. Asbestos-related lungdisease
d. Berylliosis
e. Hard-metal lungdisease
f. Byssinosis
g. Bagassosis
h. HypersensitivityPneumonitis
i. Industrialbronchitis
j. Toxicinhalations
k. Airpollution
l. Highaltitude
m. Divinginjuries
n. Thermal lunginjury

23. Disorders of PulmonaryCirculation

a. Pulmonary hypertension & cor pulmonable
b. Pulmonary oedema
c. Pulmonaryinfarction
d. Pulmonary embolism
e. Pulmonary vasculitis
f. Pulmonary arteriovenousmalformations
g. Cardiac problems in pulmonary Patient
h. Pulmonary diseases produced in cardiacpatients
i. Diffuse alveolarhaemorrhage

24. Respiratoryfailure

a. Types
b. Hypoxemia and Hypercarbia
c. Clinical features, diagnosis &treatment
d. Respiratory problems in neuromusculardisorders
e. Respiratory failure in patient with obstructive airwaydisease
f. Respiratory distress syndrome ofnewborn
g. Acute respiratory distresssyndrome
h. Systemic inflammatory response syndrome & multiple organ dysfunction Syndrome
i. Respiratory failure in the surgicalpatient.

25. Diseases of undeterminedorigin

a. Sarcoidosis
b. Idiopathic pulmonaryfibrosis
c. Bronchiolitis obliterans organizingpneumonia
d. Lungs in collagen vasculardiseases
e. Pulmonary angiitis andgranulomatosis
f. Wegener'sgranulomatosis
g. Pulmonary lymphocytic angiitis andgranulomatosis
h. Honeycomb lungs
i. Histiocytosis
j. Pulmonary tuberoussclerosis
k. Pulmonaryamyloidosis
l. Idiopathic pulmonaryhemosiderosis
m. Pulmonary alveolar proteinosis
n. Pulmonary alveolar microlithiasis

26. Sleep and sleepdisorders

a. Breathing andsleep
b. Sleep related respiratorydisorders
c. Sleep apnoeasyndrome
d. Obesity hypoventilationsyndrome

27. NeoplasticDiseases

a. Genetic and molecular changes of human lungcancer
b. Cigarette smoking andhealth
c. Bronchogeniccarcinoma
d. Bronchioloalveolarcarcinoma
e. Pulmonary metastases
f. Solitary pulmonarynodule
g. Bronchialadenoma
h. Hamartoma, fibroma, lipoma

28. Drug-induced lungdisease

29. Hyperventilationsyndrome

30. Diseases of themediastinum

a. Anatomy & diagnosis approach
b. Congenital cysts & bronchppulmonary foregutanomalies
c. Mediastinitis
d. Mediastinitismass
e. Nonneoplasticdisorders
f. Benign & malignantconditions

31. Disorders ofdiaphragm

32. Disorders of the chestwall

a. Neuromuscular diseases of the chestwall
b. Spinal and thoracic cageabnormalities

33. Pulmonary manifestations of systemicdisease

34. Paediatric influence on adultlung

35. Diving andLung

36. Management and therapeuticinterventions

a. Pulmonarypharmacotherapy
b. Oxygentherapy
c. Cardiorespiretoryresuscitation
d. Hyperbaricoxygen
e. Bronchialhygiene
f. Mechanical ventilation: indications, modes complications andweaning
g. Respiratory homodynamic Monitoring in acute respiratoryfailure
h. Liquid assistedventilation
i. Principles of criticalcare
j. Inhalationtherapy
k.Gene therapy
l. Pulmonaryrehabilitation
m. Terminal care in respiratorydiseases
n. Ethics and withdrawal of lifesupport

37. Surgical aspects of lungdiseases

a. Thoracic trauma and trauma related lungdysfunction
b. Pre and post-operative evaluation and management of thoracic surgical patient
c. Perioperative care in lingresection
d. Post-operative pulmonarycomplications
e. Lungtransplantation

39. PreventivePulmonology

a. Prevention & control of lung diseases smoking behavior andcounseling.
b. Patient education in bronchial asthma, tuberculosis,,COPD

40. Medicolegal aspects of lungdiseases

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16. Cecil Test Book of Medicine, 21st edn. 2 vols. New Delhi, Harcourt Asia,2001
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23. Murray and Nadal's Book on RespiratoryDiseases

JOURNALS

1. Clinics in ChestMedicine
2. North American Clinics in RespiratoryMedicine
3. LungIndia
4. Chest
5. Thorax
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7. Journal of CriticalCare
8. Indian journal of critical caremedicine
9. Indian journal of chest diseases & alliedscience
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LOG BOOK

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Academic work quota in two years

1. ***Seminars-5 (Incorporation of recent evidences as per the hierarchy of evidences in seminar)***
2. ***Journal club-5 (Formulation of clinical question to critical appraisal of evidence and decision making as per the principles of Evidence Based Decision Making in journal club)***
3. ***Case presentation-10 (diagnosis/treatment plan to be supported with higher level of evidences)***
4. ***Poster/paper presentation in speciality conference-1***
5. ***Shortresearch-1***
6. ***Publication in peer review journal-1***

Curriculum for MD (TB & Respiratory Medicine)

12. GOAL

The goals of Postgraduate training in Respiratory Diseases is to train MBBS doctor who will fulfill the following:

12.1. Achieve the competency in the field of RespiratoryDiseases

12.2. Can practice at the secondary and tertiary level of the health care delivery system efficiently and effectively, backed by a sound scientific knowledge and skillbase.

12.3. The person must be trained in tuberculosis disorders keeping with the objective of the Nation Health Policy(RNTCP).

12.4. The person shall be abreast with the recent advances and developments in the specialty of chestmedicine.

12.5. The person should be oriented to the principles of research methodologyand epidemiology and must acquire basic skills in teaching thespecialty.

12.6. Exercise empathy and a caring attitude and maintain high ethicalstandards.

12.7. Continue to evince keen interest in continuing medicaleducation

12.8. Be a motivated 'teacher' –to share his knowledge and skills with a colleague or ajunior.

12.9. Shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national healthpolicy.

To prepare the candidate to practice Evidence Based RespiratoryMedicine

13. OBJECTIVES

Upon completion of the evidence based Respiratory Medicine education, the trainee should be able to:

13.1. Demonstrate significance of Evidence Based RespiratoryMedicine

13.2. Demonstrate awareness of epidemiologically-based needs assessments through research and systematic reviews of researchevidence.

13.3. Contribute to the appraisal process.

13.4. Understand quality assurance in the delivery of Respiratorycare.

The Objectives may be considered under the subheadings.

14. Knowledge:

At the end of the course of Respiratory Medicine, the student shall be able to:

14.1. Demonstrate sound knowledge of common respiratory diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm theirdiagnosis

14.2. Demonstrate comprehensive knowledge of various ***evidence based***modes of therapy used in treatment of respiratory diseases; and be acquainted with the most current guidelines for expert management of the respiratoryillnesses.

14.3. Demonstrate detailed knowledge of pulmonary as well as extrapulmonary tuberculosis and to offer a comprehensive plan of management (Including National TB control programme and DOTS)

14.4. Describe the mode of action of commonly used drugs, their doses, side-effect/toxicity, indications and contra-indications andinteractions;

14.5. Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan ofmanagement.

Upon completion of Evidence based Respiratory Medicine education the trainee should be able to describe:

- Evidence based clinical practice including costeffectiveness.
- The development and application of clinical guidelines andstandards.
- The process of risk assessment as relevant to clinicalpractice
- Multi-disciplinary clinical care pathways and appropriate integration of Respiratory Medicine.

15. Skill:

The following list is drawn up with a view to specifying basic minimum skills to be acquired. The student shall be ableto:

15.1. Interview the patients, elicit relevant and correct information and describe the history in chronologicalorder.
15.2. Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders andemergencies
15.3. Perform simple, routine investigative and office procedures required for making the bedside diagnosis, especially sputum collection and examination for etiologic organisms especially Acid Fast Bacilli (AFB), Interpretation of the chest x-ray respiratory function tests; CT scan & MRI scan ofthorax.
15.4. Manage common recognizing need for referral for specialized care, of inappropriateness of therapeuticresponse.
15.5. Utilize critical appraisal skills and be able to apply to researchevidence
15.6. Should be able to perform insertion of I.V. lines, nasogastric tubes, urinary catheters, lumbar punctureetc.
15.7. Teach undergraduates andinterns.
15.8. Blood sampling – venous andarterial.
15.9. Communication skills with patients, relatives, colleagues and paramedicalstaff.
15.10. Ordering laboratory and radiological investigations and interpretation of the report in light of the clinicalpicture.
15.11. Proficiency in common ward procedures.
15.12. Perform FNAC, Biopsy, Thoracocentesis , Tube thoracostomy, Tracheostomy, Laryngoscopy, Lung biopsy under radiological guidance, drainage ofloculated pleural effusion under radiologicalguidance.
15.13. Universal precautions against communicablediseases.
15.14. Insertion of Arterial lines, Central venous lines, endotrachealtubes
15.15. Working knowledge of ventilators and variousmonitors
15.16. Interpretation of Arterial Blood gases and management ofabnormality
15.17. Correction of Electrolytedisturbances
15.18. Cardiopulmonary resuscitation and management of shock and cardio-respiratoryfailure
15.19. Bronchoscopy
15.20. Drainage of cervical coldabscess
15.21. Performance & Interpretation ofspirometry
15.22. Performance & Interpretation of diffusion studies oflung
15.23. Performance & Interpretation of sleep study in subjects suspected to have obstructive sleepapnea

16. ATTITUDES:

Adopt ethical principles in all Respiratory Medicine practice.
Professional honesty and integrity are to be fostered.
Treatment to be delivered irrespective of social status, caste, creed or region of patient.
Willing to share knowledge and clinical experience with professional colleagues.
Willing to adopt new methods and techniques in Respiratory Medicine from time to time based on scientific research, this is in patient's best interest.
Respect patient's rights and privileges including patient's right to information and right to seek second opinion.

Upon completion of the subject of Respiratory Medicine, the trainee should be able to recognize:

16.1. Importance of maintaining professional standards byEBM.

16.2. The need to constantly appraise and evaluate clinical practice and procedures.

17. COMMUNICATIVE ABILITIES:

17.1. Develop communication skills, in particular, to explain treatment option available in management and to make patient partner in evidence based decisionmaking

17.2. Provide leadership and get the best out of his group in a congenital workingatmosphere.

17.3. Should be able to communicate in simple understandable language to the patient .He should be able to guide and counsel the patient with regard to various treatment modalitiesavailable.

17.4. Develop the ability to communicate with professional colleagues through various media like Internet, e-mail, videoconference, and etc. to render the best possibletreatment.

18. INTEGRATION OF TEACHING

The goal of effective teaching can be obtained through integration with department of Medicine, Surgery, Microbiology, Pathology, Radiology, Pharmacology & PSM. This shall enable the student to be acquainted with diagnosis and management of common/uncommon systemic diseases that may affect the lung or may affect the management of various chest diseases.

19. TEACHING AND TRAINING

19.1 Students will be posted as full time students in the departments of Respiratory Disease. They will work in the concerned wards, attend to bedside clinics, participate in group discussions, seminars, Case presentation, grand rounds, didactic lectures, journal review and interpretation of laboratorydata.

19.2 Candidates will have to participate in the Under Graduation teaching to get experience in the methods of teaching medicalstudents.

20. SPECIAL ACTIVITIES(COMPULSORY)

20.1. Journal club – Once a month.

- All the post graduate Journal Clubs will be carried out on a prescribed Evidence Based format with emphasis on critical appraisal. A designated teacher/facilitator wills asses every post graduate student for each JC presentation

20.2. PG Discussions/Seminars – once a week + asrequired.

- All PG seminars will have evidence embedded in the presentation and all references relating to the subject matter will be incorporated. AT the end of the seminar all the references will be listed and the seminar will be assessed by the facilitator.

20.3. Case presentation & Discussion – at least once a week in addition to routine ward activities.

20.4. Integrated teaching: - Participation is casediscussions.

20.5In the OPD/ward/ICU every post graduate student will be exposed to at least one encounter of role modeling in which a consultant after raising a relevant query will search for its evidence and demonstrate evidence searching methodologies, its importance and utility to thestudent.

21. DURATION OF THE COURSE

The duration of the courses shall be 3 Academic years (6 Academic terms)

22. CLINICAL POSTINGS

First year: Department of Respiratory Diseases

Second year: General Medicine – 3 Months
ICU - 2 Months
Radiology – 1 month

Third Year: Department of Respiratory Diseases

The candidate shall be posted in outpatient and inpatient concurrently, and in emergency including intensive care unit.

PATTERN OF MD EXAMINATON

1. **Assessment –** Candidates will be evaluated by marking systemexclusively

2. **Pattern for MD -** Theory, Clinical and Viva (Oral) are three heads eachcandidate should be declared successful on securing at least 50% marks in each head independently.

3. **Theory Examination** will have four papers
(Each paper – 100 marks, Total – 400marks)
Paper I – Anatomy and physiology of respiratory system
Paper II – Pulmonary and extra pulmonary tuberculosis
Paper III – Respiratory diseases other than tuberculosis
Paper IV - Recent advances and Evidence based management of respiratory Diseases

4. Practical examination – Total 600Marks

III. Clinical – one long and two shortcases.
   c. Long Case (One) – 200marks
   d. Short Case (Two) – 200 marks, 100each

IV. Oral (Two tables) – 200 marks, 100each

Oral Examination include Viva Voce on all components of course content. The candidate will be given case reports, charts, spirometry reports, ABG reports, PSG 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 hisdissertation.

SYLLABUS

TUBERCULOSIS

46. History
47. Epidemiology
48. Themycobacteria
49. Pathology
50. Susceptibility factors in pulmonarytuberculosis
51. Laboratorydiagnosis
52. Tuberculintest
53. Roentgenographic manifestations of pulmonarytuberculosis
54. Differentialdiagnosis
55. Clinicalmanifestation
56. Pulmonary tuberculosis
57. Lower lung fieldtuberculosis
58. Endobronchialtuberculosis
59. Tuberculosis pleuraleffusion
60. Silicotuberculosis
61. Abdominaltuberculosis
62. Granulomatoushepatitis

63. Neurologicaltuberculosis
64. Tuberculosis and theheart
65. Skeletaltuberculosis
66. Cutaneoustuberculosis
67. Lymph nodetuberculosis
68. Tuberculosis inotorhinolaryngology
69. Ocular tuberculosis
70. Tuberculosis inpregnancy
71. Female genitaltuberculosis
72. Genitourinarytuberculosis
73. Tuberculosis in chronic renalfailure
74. Disseminated / milliarytuberculosis
75. Complication of pulmonarytuberculosis
76. Haematological manifestations oftuberculosis
77. Adrenocortical reserve intuberculosis
78. Endocrine implications oftuberculosis
79. Tuberculosis andcancer
80. Tuberculosis andHIV
81. Tuberculosis inchildren
82. Surgical aspect of childhoodtuberculosis
83. Tuberculosis inelderly
84. Atypical mycobacterialinfection
85. Drug Resistanttuberculosis
86. Current and future treatment oftuberculosis
87. Tuberculosis and acute lunginjury
88. Surgery for pleuro-pulmonary tuberculosis
89. Nutrition andtuberculosis
90. RNTCP

RESPIRATORY DISEASES

2. Historical Perspectives

2. Development of thelungs

d. Development of the airways andvessels
e. Cellular development oflung
f. Post nataldevelopment

3. Structure of the respiratory tract

Anatomy

h. Anatomy of respiratory system
i. Bronchopulmonaryanatomy
j. Functional design of the lung for gas exchange.
k.Respiratorymuscles
l. Blood supply, lymphatics and nervesupply
m. Surfactant and associatedproteins
n. Non-respiratory function of thelungs

4. ung Functions

Physiology

i. Pulmonary mechanics
j. Respiration and itscontrol
k. Ventilation, perfusion,Diffusion
l. Assessment of pulmonaryfunction.
m. Blood gastransport
n. Inhalation kinetics and its implication in aerosoltherapy
o. Aterial bloodgases.
p. Acid-BaseBalance.

5. Lungs in different Physiologicalstates

f. Sleep
g. Exercise
h. HighAltitude
i. Pregnancy
j. Ageing

6. Lungimmunology

e. Lungdefense
f. Lymphocytes & Macrophages ininflammation
g. Mast cells andeosinophils
h. Mechanisms of hypersensitivityreactions

7. Lung injury andrepair

f. Cytokines &Chemokines
g. Nitricoxide
h. Inflammatoryreactions
i. Reactions to acute and chronicinjury
j. Pulmonaryfibrosis

8. ClinicalAspect

e. Symptomatology: Breathlessness, Cough, Haemoptysis, chestpain
f. Physicalsigns
g. Dermatological manifestations of lungdiseases.
h. Pulmonary-systemicinteractions

9. DiagnosticImaging

g. ChestRadiography
h. CT, MRI, Ultrasonography, Echocardiography
i. LungScintigraphy
j. Pulmonary Angiography
k.Barium Study
l. Fluoroscopy

10. Diagnosisprocedures

k.Pulmonary function testing
l. Cardiopulmonary exercisetesting
m. Blood gasanalysis
n. Bronchoscopy, Bronchial lavage,Biopsy.
o. Transthoracic needle aspiration andbiopsy
p. Pleural fluid aspiration, Pleuralbiopsy
q. TranstrachealAspiration
r. Thoracoscopy,Mediastinoscopy
s. Skin test: tuberculin,allergen
t. Bronchoprovocationtests

11. Epidemiology

g. Epidemiologicalterms
h. Epidemiologicaltechniques
i. Epidemiology of tuberculosis and other respiratorydiseases
j. National Tuberculosis Control Programme andRNTCP
k.Research methods and study designs cohort, case control, randomized Clinical trials, observative and cross-sectional studies.
l. Common statistical methods for analysis ofresearch.

12. Development and Geneticabnormalities

p. Dimorphiclung
q. Tracheal agenesis Trachealstenosis
r. Tracheomalacia
s.Vascular ringanomalies
t. Bronchialcvst
u. Agenesis of the lung
v.Congenital lobaremphysema
w. Cystic adenomatoidmalformation
x. Bronchopulmonarysequestration
y. Azygos lobe
z.Horse shoelung
aa. Scimitar syndrome
bb. Diaphragmatichernia
cc. Congenital eventration of the diaphragm
dd. Primary ciliary dyskinesia.

13. Evidence Based Respiratory Medicine

d. Introduction To Evidence-Based Decision Making
e. AssessingEvidence
f. Implementing Evidence- Based Decision In ClinicalPractice

14. Infection

z.Microbial flora and colonization of the respiratory tract
aa. Pulmonary clearance of infectious agents
bb. Approach to the patient with pulmonary infections
cc. Community acquiredpneumonia
dd. Pneumonias:
- Gram-positivebacteria
- Gram-negative bacteria

ee. Legionellosis
ff. Rickettsial Pneumonia
gg. MyscoplasmalPneumonia
hh. ChlamydiaPneumonia
ii. RadiationPneumonia
jj. Lipoidpneumonia
kk. Varicella Pneumonia
ll. Pulmonarymelidosis
mm. Opportunistic infections
nn. Anaerobic bacterialinfections
oo. Pulmonary infections inAIDS
pp. Pulmonary infections in neutropenia andcaner
qq. Pneumonia in organ transplantpatient
rr. Pulmonary infections in patient with primary immunedefects.
ss. Postoperativepneumonia
tt. Hantavirus Pulmonary Syndrome
uu. Ventilator-associated pneumonia
vv. Pulmonary ehrlichiosis
ww. Rhodcoccus equiinfections
xx. Actinomysis

15. Fungalinfection

h. Histoplasmosis
i. Coccidioidomycosis
j. Aspergillosis
k.Candidiasis
l. Cryptococcosis
m. Nocardiosis
n. Blastomycosis

16. Parasitic pulmonarydiseases

j. Plueropulmonary amoebiasis
k.Malarial lung disease
l. Toxoplasmosis
m. Pnemumocystis pneumoniaNematodes
n. Pulmonary dirofilarais
o. Pulmonaryechinococcosis
p. Schistomiasis
q. Paragonimiasis
r. Pulmonary eosinophilsyndrome

17. oonotic pulmonarydiseases

i. Plague
j. Qfever
k. Tularemia
l. Pasteurellosis
m. Rhodococcuspneumonia
n. LeptospiralPneumonia
o. Hantavirus pulmonarysyndrome
p. Acute equine respiratorysyndrome

18. Suppuration

e. Suppurativepneumonia
f. Lungabscess
g. Bronchiectasis
h. Gangrene of thelung

19. Pleuraldiseases

j. Pleural dynamics and effusion
k.Pleurisy and effusion
l. Non-neoplastic and neoplasticeffusions
m. Pneumothorax
n. Empyemathoracis
o. Bronchopleural fistula and itscomplications
p. Pleuralthickening
q. Primary pleuraltumours
r. Malignantmesothelioma

20. Immunology

d. Pulmonary hypersensitivity
e. Extrinsic allergicalveolitis
f. Goodpasture'ssyndrome

21. Airflowobstruction

l. Chronic obstructive pulmonarydisease
m. Chronic corpulmonale
n. Unilateral hyperradiancy of thelung
o. Broinchialasthma
p. Bronchiolardisease
q. Reactive airways dysfunctionsyndrome
r. Small airway disease
s.Upper airwayobstruction
t. Cysticfibrosis
u. Bronchiolitis
v.Bullous diseases of thelungs

22. Occupational and environmentaldisorders

o. Silicosis
p. Coal workers'pneumonosis
q. Asbestos-related lungdisease
r. Berylliosis
s.Hard-metal lung disease
t. Byssinosis
u. Bagassosis
v.HypersensitivityPneumonitis
w. Industrialbronchitis
x. Toxic inhalations
y.Air pollution
z. High altitude
aa. Diving injuries
bb. Thermal lung injury

23. Disorders of PulmonaryCirculation

j. Pulmonary hypertension & cor pulmonable
k.Pulmonary oedema
l. Pulmonaryinfarction
m. Pulmonaryembolism
n. Pulmonaryvasculitis
o. Pulmonary arteriovenousmalformations
p. Cardiac problems in pulmonary Patient
q. Pulmonary diseases produced in cardiacpatients
r. Diffuse alveolarhaemorrhage

24. Respiratoryfailure

j. Types
k.Hypoxemia and Hypercarbia
l. Clinical features, diagnosis &treatment
m. Respiratory problems in neuromusculardisorders
n. Respiratory failure in patient with obstructive airwaydisease
o. Respiratory distress syndrome ofnewborn
p. Acute respiratory distresssyndrome
q. Systemic inflammatory response syndrome & multiple organ dysfunction Syndrome
r. Respiratory failure in the surgicalpatient.

25. Diseases of undeterminedorigin

o. Sarcoidosis
p. Idiopathic pulmonaryfibrosis
q. Bronchiolitis obliterans organizingpneumonia
r. Lungs in collagen vascular diseases
s.Pulmonary angiitis andgranulomatosis
t. Wegener'sgranulomatosis
u. Pulmonary lymphocytic angiitis andgranulomatosis
v.Honeycomb lungs
w. Histiocytosis
x. Pulmonary tuberoussclerosis
y.Pulmonaryamyloidosis
z. Idiopathic pulmonary hemosiderosis
aa. Pulmonary alveolar proteinosis
bb. Pulmonary alveolar microlithiasis

26. Sleep and sleepdisorders

e. Breathing andsleep
f. Sleep related respiratorydisorders
g. Sleep apnoeasyndrome
h. Obesity hypoventilationsyndrome

27. NeoplasticDiseases

i. Genetic and molecular changes of human lungcancer
j. Cigarette smoking andhealth
k. Bronchogeniccarcinoma
l. Bronchioloalveolarcarcinoma
m. Pulmonary metastases
n. Solitary pulmonarynodule
o. Bronchialadenoma
p. Hamartoma, fibroma, lipoma

28. Drug-induced lungdisease

29. Hyperventilationsyndrome

30. Diseases of themediastinum

g. Anatomy & diagnosis approach
h. Congenital cysts & bronchppulmonary foregutanomalies
i. Mediastinitis
j. Mediastinitis mass
k.Nonneoplasticdisorders
l. Benign & malignantconditions

31. Disorders ofdiaphragm

32. Disorders of the chestwall

c.Neuromuscular diseases of the chest wall
d. Spinal and thoracic cage abnormalities

33. Pulmonary manifestations of systemicdisease

34. Paediatric influence on adultlung

35. Diving andLung

36. Management and therapeuticinterventions

o. Pulmonary pharmacotherapy
p. Oxygentherapy
q. Cardiorespiretoryresuscitation
r. Hyperbaric oxygen
s.Bronchialhygiene
t. Mechanical ventilation: indications, modes complications andweaning
u. Respiratory homodynamic Monitoring in acute respiratoryfailure
v.Liquid assisted ventilation
w. Principles of criticalcare
x. Inhalation therapy
y.Gene therapy
z. Pulmonaryrehabilitation
aa. Terminal care in respiratory diseases
bb. Ethics and withdrawal of life support

37. Surgical aspects of lungdiseases

f. Thoracic trauma and trauma related lungdysfunction
g. Pre and post-operative evaluation and management of thoracic surgical patient
h. Perioperative care in lingresection
i. Post-operative pulmonarycomplications
j. Lungtransplantation

39. PreventivePulmonology

c. Prevention & control of lung diseases smoking behavior andcounseling.
d. Patient education in bronchial asthma, tuberculosis,,COPD

40. Medicolegal aspects of lungdiseases

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3. ***Case presentation - 15 (diagnosis/treatment plan to be supported with higher level of evidences)***

4. ***Poster/paper presentation in speciality conference -2***

5. ***Dissertation***

6. ***Short research -1***

7. ***Publication in peer review journal -1***