السنة الثالثة – الفصل الأول

الجهاز التنفسي

Respiratory System

(500341)

(4) Credit Hours

Objectives:

By the end of the Respiratory course; the student should be able to :

1. Describe the gross anatomy of organs of the respiratory system including structure, relations, and vascular and nerve supply.
2. Describe the microscopic anatomy of organs of the respiratory system "light microscopic and electron microscopic techniques".
3. The student should understand the embryonic development of organs of the respiratory system including possible congenital malformations.
4. Mechanics of breathing (lung ventilation), lung compliance, airway resistance, ventilation-perfusion relationship, gas exchange and transport, regulation of ventilation, pulmonary function test and brief clinical application to pathophysiology (lung diseases)
5. List diseases that affect the respiratory system, including: pathogenesis, epidemiology, clinical manifestation, and microscopic histological changes.
6. List causes, mode of transmission, and pathogenesis of respiratory tract infections.
7. Describe methods of specimen collection and diagnosis of respiratory tract infections.
8. Mention drugs used in the treatment of diseases that affect the respiratory system.
9. List Signs and symptoms of the respiratory system: their mechanisms and correlation.
10. Take history and perform general examination including the chest (inspection, palpation, percussion, and auscultation).

Content Summary:

Anatomy	10 lectures	6 practical
Physiology	10 lectures	2 practical
Pathology	10 lectures	2 practical
Microbiology	10 lectures	4 practical
Pharmacology	2 lectures	
Clinical Aspects	8 contact hours	
Clinical Examination	8 contact hours	

Gross Anatomy and Histology/Embryology (10 lectures and 6 practical)

1. Development of Respiratory System: nose, larynx and pharynx, trachea, bronchi, lungs.
2. Nasal cavity, paranasal sinuses, nasopharynx: wall, relations, blood and nerve supply, lymphatic drainage.
3. Pterygopalatine fossa, parapharyngeal space.
4. lab gross anatomy: nasal cavity, paranasal sinuses, nasopharynx, ptrerygopalatine fossa, parapharyngeal space
5. Larynx: skeleton, joints, muscles, cavity, nerve and blood supply.
6. Larynx: relations, movement
7. lab gross anatomy: larynx
8. Pleura: pulmonary pleura, parietal pleura, pleural cavity, pleural recesses, nerve and blood supply.
9. Lab gross anatomy: pulmonary pleura, parietal pleura, pleural cavity, pleural recesses
10. Lungs: position, topography, lobes, lobules, bronchial tree, brochopulmona segments nerve and blood supply.

11. Lab gross anatomy: lungs
12. Histology of upper respiratory passages.
13. Lab histology: upper respiratory passages
14. Histology of lower respiratory passages and pleura.
15. Lab histology: lower respiratory passages and pleura
16. Malformation of Respiratory System

Physiology (10 lectures and two practical)

17. Overview of the Respiratory Physiology: Functional Anatomy of the Lung- Alveolar Ventilation- Respiratory Muscles.
18-19. Lung Compliance: Binding between lung and thorax (The Resting Volumes concept)- Elastic properties of the respiratory system- lung and chest compliance curv- Pathological changes in lung compliance (Emphysema & asthma, Fibrosis & RDS)- Surface tensionforces- Influence of surfactant- Role of alveolar interdependency
20. Airway Resistance: The non-elastic resistance- the importance of the radius- distribution of resistance in the respiratory tract- positive and negative pressure breathing Intra-alveolar pressure during inspiration & expiration- Intra-pleural pressure during inspiration & expiration.
21. Ventilation-Perfusion Ratio: normal difference in ventilation & perfusion between the apex & base of the lungs- the PO2-PCO2, V/Q diagram- Hypoxemia resulting from ventilation-perfusion
22. Gas Exchange: the concept of partial pressure- Partial pressures of gases in inspired, alveolar, expired, arterial, interstitial fluid and mixed venous blood- Changes in alveolar composition with hyper- and hypoventilation- Respiratory gas exchange ratio(respiratory quotient)- Diffusion capacity of the lung.
23. Biochemical aspects of hemoglobin structure and function (Biochemistry).
24. Gas Transport: Oxygen transport- Oxygen carrying capacity- Oxygen-Hemoglobin dissociation curve- Dissolved Oxygen Carboxyhemoglobin- Carbon Dioxide Transport
25-26. Control Of Breathing: The respiratory "controller"- Respiratory centers and accessory centers- Medullary dorsal and ventral respiratory groups- Spinal cord integration- Pulmonary receptors- Stretch receptors- Irritant receptors- Other peripheral input- Proprioceptors- Baroreceptors- Peripheral and central chemoreceptors- Ventilatory responses to altered PO2, PCO2, and pH- Ventilation during exercise- Ventilation at high altitude.
27. Pulmonary Function Tests (PFT) And Its Application To Respiratory Physiology- What are the major categories of PFT (e.g. ventilatory & gas analysis)- PTF in Obstructive Pattern and Restrictive Pattern
28. Spirometer and vitalogram (Lung volumes and capacities).

Textbook of medical physiology, by A.C. Guyton and John E, Hall The latest edition "Tenth edition, 2000".

Pathology (10 lectures and 2 practical)

29. Obstructive lung diseases: Chronic Bronchitis and Emphysema
30. Atelectasis (collapse) and Asthma
31. Restrictive lung diseases: Acute restrictive lung diseases ARSD Chronic Restrictive lung diseases- Sarcoidosis- Hypersensitivity Pneumonitis.
32. Pneumoconiosis: Asbestosis- Anthracosis- Silicosis- Sidrosis
33. Vascular lung diseases: Pulmonary thromboembolism- Pulmonary-Hemorrhage- Pulmonary Infarction- Pulmonary Hypertension & Vascular sclerosis- Diffuse pulmonary hemorrhage syndromes
34-35. Pulmonary infections- Bonchiectasis- Pneumonia's- Acute bacterial

Pneumonias- Primary atypical pneumonias- Tuberculosis- Fungal Infections… Opportunistic infections …Lung abscess

36-37. Lung tumors: Bronchogenic carcinoma.Metastatic.. Carcinoma- Caricnoid

38. Pleural lesions: Mesothelioma- Pleural effusion- Pneuohorax- Hemothorax- Chylothorax

39-40. Practical

Microbiology (10 lectures and 4 practical)

41-44. Bacterial infections: Strep. Group A. Strep pneumonia. Haemophilus Influenza. Mycoplasma pneumonia. Chlamydia pneumonia. Chlamvdia psittaci. Mycobacterium tuberculosis. Klebsiella pneumonia. Legionella. Nocardia. Staph. Aureues. Pseudomonas Bacillus.

45-49 Viral infections: Rhinovirus. Adenovirus. Herpes viruses. Small pox virus. Enteroviruses. Measles virus. Influenza virus. Respiratory syncycial virus. Reoviruses. Corona virus. Parainfluenza virus. Cytomegalovirus.

50-51 Fungal infections: Histoplasma. Blastomyces. Paracoccidiodes. Coccidiodes. Cryptococcus Aspergillus. Candida. Pneumocystis carinii.

52. Parasitic infection: Amoebae. Echinococcus. Toxocara. Paragoniums westermani. Taenia solium.

53-54. Practical

Respiratory Pharmacology (2 lecturs)

55-56. Mucolytic agents…Cough suppressants…Bronchodilators.

The student should be able to describe the various mechanisms involved in the action of bronchodilaters, the use of steroids and mast cells stabilizers in the treatment of bronchial asthma, and describe the action and uses of cough suppressants and mucolytic agents.

Clinical Aspects (8 Contact hours including the lecturs, practicals and Seminars)

Clinical Examination (8 contact hours)

57-58 History Taking

59. Physical Examination Of The Respiratory System: Upper respiratory tract Examination: Nasal discharge, redness, patency of each nostril, inspection of nasal mucosa by the speculum bilaterally, examination of para-nasal sinuses for tenderness, examination of the lips teeth, gums, tongue & palate with proper light, examination of tonsils (size, color, petechia) pharynx, palate movement & gag reflex, post nasal drip

60. Inspection of the thorax

Inspection of the anterior chest wall while the patient lying flat for pattern of respiratory movement: rate & rhythm of respiration, abdominal movement with deep inspiration, shape of the thoracic cage, deformity, slopes of ribs, abnormal bulge during expiration, abnormal retraction of the inter-costal spaces during inspiration.

61. Palpation of the inferior thorax:

Examine the trachea for normal position, centralization or deviation using the tip of Rt. Index finger, Identify the location of the apex beat, Palpate the chest wall for any area of tenderness, Assess the chest expansion anteriorly, Check the tectile vocal fremitue using the palm of the hand comparing symmetrical areas bilaterally starting form the lung apices, Palpation of the lateral chest wall bilaterally for TVF.

62. Percussion of the anterior chest wall

Starts percussing both clavicles properly, then move to infraclavicular area down-wards, 5cm apart down to lower costal margin along the mid-clavicular line, Indentifing hepatic, & cardiac dullness then resonance of gastric gases, Precuss the lateral chest wall bilaterally from 4th to 7th inter

costal spaces.

63. Auscultation of the anterior chest wall starting form apex down-ward comparing symmetrical areas bilaterally asking the patient to breath through mouth more deeply, Check for tactile vocal resonance symmetrically over the lungs while he listens to chest wall telling the patient to say (44 in Arabic), Listen to quality & intensity of normal breath sound, Listen to the lateral chest wall symmetrically & bilaterally from above down-wards.

64. Examination of the post. Chest wall

While the patient is sitting with arms crossing comfortably over the Chest, Start inspection of the post. Chest wall as mentioned before, Then palpate the post. Chest wall from supra-clavicular areas down-wards for tenderness, Estimation of chest expansion posteriorly, Quantitative measurement of chest expansion using measuring tap at the level of the nipples, Palpate for the tectile vocal fremitus from supra-clavicular areas down wards symmetrically & bilaterally comparing both sides…Check for the lever of diaphragm using the side of the palm for TVF. From up-ward sown-ward…Then start percussing the supra-clavicular areas bilateally comparing symmetrical areas (5 cm interval) down-ward to Diaphragmatic dullness (form below spine of the scapula to the 11th rib), Check for tidal percussion (Diaphragmatic excursion) in full expiration & inspiration, Listen to the chest wall post. From supra –clavicular areas down ward comparing symmetrical areas while patient breathing deeply from mouth, Perform tectile vocal resonance posteriorly comparing symmetrical areas bilaterally.

Recommended books

1) Sherris. Medical Microbiology: An Introduction to infectious Diseases 4th Edition (or latest edition). Appleton and Lange
2) BASIC PATHOLOGY Robin's (latest edition)
3) Clinical Anatomy by Richard Snell: Last edition, 2003
4) Grants Atlas of Anatomy by Agur:10th edition
5) Basic Histology: Textbook and Atlas by Junqueira et al: 10th edition
6) Langman's Medical Embryology: 8th edition 2000
7) MODERN PHARMACOLOGY with clinical application. By Craig and Stitzel (The latest Edition)
8) Principles of Internal Medicine - Author : Harisson
9) Principle of Surgery - Author : Sabiston