TOPIC 9 Respiratory Disorders

OBJECTIVES

By the time you finish this topic you should be able to complete the following objectives:

A. Normal respiratory anatomy and function.
   1. Identify the normal respiratory muscles and state their function with regard to ventilation. (Lab)
   2. Distinguish between conducting and respiratory passageways. (Lab)
   3. Identify and describe the structure of the major conducting passageways; trace the flow of air through them. (Lab)
   4. Discuss how the respiratory and digestive systems share some passageways and how others are separated. (Lab)
   5. Identify the membranes and structures associated with the lungs and state the function or description of each. (Lab)
   6. Identify and describe the structure of the major respiratory passageways. (Lab)

B. Normal ventilation, gas exchange and transport
   1. Describe the processes involved in ventilation. (Lab and text)
   2. Describe and define the major lung volumes and capacities; state the normal range of each. (Lab and text)
   3. Measure lung volumes and selected capacities; calculate remaining capacities or volumes based on measured volumes/capacities; compare results to normal. (Lab)
   4. Determine the effect of exercise on ventilation depth and rate. (Lab)
   5. Describe the factors affecting diffusion of gases.
   6. Describe how carbon dioxide and oxygen are transported in the blood.
   7. Describe the normal control of ventilation.

C. Diagnostic tools
   1. Describe the procedure for pulmonary function testing (PFT). (Lab and text)
   2. Describe the procedure for testing arterial blood gases; state the normal values of PaCO₂, PaO₂, bicarbonate and pH. (Lab)
   3. Describe the use of an oximeter. (Lab)
   4. Describe the procedure for bronchoscopy. (Lab and text)
   5. Describe the use of the following in diagnosing pulmonary diseases:
      a. Exercise tolerance testing
      b. Radiography
      c. Bacterial culture of upper respiratory exudates or sputum.

D. Respiratory Disorders
   1. Apply the knowledge of normal function to pathophysiology of respiratory diseases.
   2. Describe the general symptoms and signs of respiratory disease.
   3. Describe the common respiratory patterns.
   4. Describe the pathophysiology and differentiate among the following upper respiratory infections, giving their etiology, diagnostic tests and treatments:
      a. Infectious rhinitis
      b. Sinusitis
      c. Laryngotracheobronchitis (croup)
      d. Influenza
5. Describe the pathophysiology and differentiate among the following lower respiratory diseases, giving their etiology, diagnostic tests and treatments:
   a. Pneumonia including
      1. Lobar pneumonia
      2. Bronchopneumonia
      3. Legionnaire’s disease
   b. Severe acute respiratory syndrome (SARS)
   c. Tuberculosis
   d. Anthrax

6. Differentiate between obstructive and restrictive lung diseases in terms of their effects on lung volumes, especially FEV₁ and FVC.

7. Describe the pathophysiology and differentiate among the following obstructive lung diseases, giving their etiology, diagnostic tests and treatments:
   a. Cystic fibrosis
   b. Lung cancer
   c. Aspiration
   d. Obstructive sleep apnea
   e. Asthma

8. Describe the emergency treatment for aspiration.

9. Describe the pathophysiology and differentiate among the following chronic obstructive pulmonary diseases (COPD), giving their etiology, diagnostic tests and treatments:
   a. Emphysema
   b. Chronic bronchitis

10. Describe the pathophysiology of the restrictive lung disease pneumoconiosis, giving its etiology, diagnostic tests and treatment.

11. Explain why and how abnormalities of the chest wall including bony and muscular changes restrict ventilation.

12. Describe the pathophysiology and differentiate between the following vascular disorders that affect respiration, giving their etiology, diagnostic tests and treatments:
   a. Pulmonary edema
   b. Pulmonary embolus

13. Describe the pathophysiology and differentiate among the following expansion disorders, giving their etiology, diagnostic tests and treatments:
   a. Atelectasis
   b. Pleural effusion
   c. Pneumothorax
   d. Infant respiratory distress syndrome (IRDS)

14. Describe the emergency treatment for pneumothorax.

15. Describe the etiology and changes in blood gases with acute respiratory failure. (Gould & Dyer)