Overview of Anatomy and Physiology

- External respiration
  - Exchange of oxygen and carbon dioxide between the lung and the environment

- Internal respiration
  - Exchange of oxygen and carbon dioxide at the cellular level
Internal Respiration

Overview of Anatomy and Physiology

- Upper respiratory tract
  - Nose
  - Pharynx
  - Larynx
  - Trachea
- Lower respiratory tract
  - Bronchial tree
    - Bronchioles, alveolar ducts, alveoli

Upper Respiratory track
Lower respiratory track

Overview of Anatomy and Physiology

- Mechanics of breathing
  - Thoracic cavity
    - Lungs
      - Visceral pleura and parietal pleura
      - Diaphragm
  - Regulation of respiration
    - Nervous control—medulla oblongata and pons of the brain; chemoreceptors—in the carotid and aorta
Assessment of the Respiratory System

- Shortness of breath, dyspnea, cough
- Labored breathing
- Respiratory distress
- Orthopnea
- Adventitious breath sounds
  - Wheezes
  - Crackles

Laboratory and Diagnostic Examinations

- Chest roentgenogram
- Computed tomography (CT)
- Pulmonary function testing
- Mediastinoscopy
- Laryngoscopy
- Bronchoscopy
- Sputum specimen
- Cytological studies
- Thoracentesis
- Arterial blood gases
- Pulse oximetry
Figure 49-7

Fiberoptic bronchoscope.


Figure 49-8

Thoracentesis.


Figure 49-9

Portable pulse oximeter with spring tension digit probe displays oxygen saturation and pulse rate.

Disorders of the Upper Airway

- Epistaxis
  - Bleeding from the nose
  - Clinical manifestations/assessment
    - Bright red bleeding from one or both nostrils
    - Can lose as much as 1 liter per hour

Disorders of the Upper Airway (continued)

- Epistaxis (continued)
  - Medical management/nursing interventions
    - Sitting position, leaning forward
    - Direct pressure by pinching nose
    - Ice compresses to nose
    - Nasal packing
    - Cautery
    - Balloon tamponade

Disorders of the Upper Airway

- Allergic rhinitis and allergic conjunctivitis
  - Etiology/pathophysiology
    - Antigen/antibody reactions in the nasal membranes, nasopharynx, and conjunctiva due to allergens
Disorders of the Upper Airway

- Allergic rhinitis and allergic conjunctivitis
  
  Medical management/nursing interventions
  
  - Avoid allergen
  - Antihistamines
  - Decongestants
  - Topical or nasal corticosteroids
  - Analgesics
  - Hot packs over facial sinuses

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Respiratory Infections

- Acute rhinitis (common cold)
  
  - Etiology/pathophysiology
    
    - Inflammation of the mucous membranes of the nose and accessory sinuses
    
    - Virus(es)
  
  - Clinical manifestations/assessment
    
    - Thin, serous nasal exudate
    
    - Productive cough
    
    - Sore throat
    
    - Fever
Respiratory Infections

- Laryngitis
  - Etiology/pathophysiology
    - Inflammation of the larynx due to virus or bacteria
    - May cause severe respiratory distress in children under 5 years old
  - Clinical manifestations/assessment
    - Hoarseness
    - Voice loss
    - Scratchy and irritated throat
    - Persistent cough

Disorders of the Lower Airway

- Acute bronchitis
  - Etiology/pathophysiology

Disorders of the Lower Airway (continued)

- Acute bronchitis (continued)
  - Medical management/nursing interventions
    - Cough suppressants
    - Antitussives
    - Antipyretics
    - Bronchodilators
    - Antibiotics
    - Vaporizer
    - Encourage fluids
Disorders of the Lower Airway

- Tuberculosis
  - Etiology/pathophysiology
    - Inhalation of tubercle bacillus (*Mycobacterium tuberculosis*)
  - Presumptive diagnosis
    - Mantoux tuberculin skin test
    - Chest x-ray
    - Acid-fast bacilli smear x 3
  - Confirmed diagnosis
    - Sputum culture; positive for TB bacilli

Disorders of the Lower Airway (continued)

- Tuberculosis
  - Clinical manifestations/assessment
    - Fever
    - Weight loss; weakness
    - Productive cough; *hemoptysis*
    - Chills; night sweats
  - Medical management/nursing interventions
    - Tuberculosis isolation (acid fast bacilli [AFB])
    - Multiple medications to which the organisms are susceptible

Treatment for TB

- Isoniazid and Rifampicin x 6 months
- Rifabutin and Cycloserine given in addition for first two months
- If drug combinations are not taken as directed resistant forms of TB are likely to emerge
Disorders of the Lower Airway

- Pneumonia
  - Etiology/pathophysiology
    - Inflammatory process of the bronchioles and the alveolar spaces due to infection
    - Bacteria, viruses, mycoplasma, fungi, and parasites
  - Clinical manifestations/assessment
    - Productive cough
    - Severe chills; elevated temperature
    - Increased heart rate and respiratory rate
    - Dyspnea

Disorders of the Lower Airway

- Pneumonia (continued)
  - Medical management/nursing interventions
    - Oxygen
    - Chest percussion and postural drainage
    - Encourage to cough and deep-breathe
    - Antibiotics
    - Analgesics
    - Expectorants
    - Bronchodilators
    - Humidifier or nebulizer
Disorders of the Lower Airway

- Lung cancer
  - Etiology/pathophysiology
    - Primary tumor or metastasis
    - Small-cell, non-small-cell, squamous cell, and large-cell carcinoma
  - Clinical manifestations/assessment
    - Hemoptysis
    - Dyspnea; wheezing
    - Fever; chills
    - Pleural effusion

Disorders of the Lower Airway (continued)

- Medical management/nursing interventions
  - Surgery
    - Most are not diagnosed early enough for curative surgical intervention
    - Segmental resection
    - Lobectomy
    - Pneumonectomy
  - Radiation
  - Chemotherapy
Disorders of the Lower Airway

- Pulmonary embolus
  - Etiology/pathophysiology
    - Foreign substance in the pulmonary artery
    - Blood clot, fat, air, or amniotic fluid
  - Clinical manifestations/assessment
    - Sudden, unexplained dyspnea, tachypnea
    - Hemoptysis
    - Chest pain
    - Elevated temperature
    - Increased WBCs

(continued)

- Medical management/nursing interventions
  - Oxygen
  - HOB up 30 degrees
  - Anticoagulants
  - Fibrinolytic agents
Chronic Obstructive Pulmonary Disease (COPD)

- Emphysema
  - Etiology/pathophysiology
    - The bronchi, bronchioles, and alveoli become inflamed as a result of chronic irritation
    - Air becomes trapped in the alveoli during expiration, causing alveolar distention, rupture, and scar tissue
  - Complication
    - Cor pulmonale
    - Right-sided congestive heart failure due to pulmonary hypertension
**Chronic Obstructive Pulmonary Disease (COPD)**

- **Emphysema (continued)**
  - Clinical manifestations/assessment
    - Dyspnea on exertion
    - Sputum
    - Barrel chest
    - Chronic weight loss
    - Emaciation
    - Clubbing of fingers

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**Figure 49-17**

Barrel chest. Note increase in AP diameter.

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**Chronic Obstructive Pulmonary Disease (COPD)**

- **Emphysema (continued)**
  - Medical management/nursing interventions
    - Oxygen (low-flow)
    - Chest physiotherapy
    - Bronchodilators; corticosteroids; antibiotics; diuretics
    - Humidifier
    - Pursed-lip breathing
    - High-protein, high-calorie diet
Chronic Obstructive Pulmonary Disease (COPD)

- Chronic bronchitis
  - Etiology/pathophysiology
    - Hypertrophy of mucous glands causes hypersecretion and alters cilia function
    - Increased airway resistance causes bronchospasm
  - Clinical manifestations/assessment
    - Productive cough
    - Dyspnea
    - Use of accessory muscles to breathe
    - Wheezing

Chronic bronchitis is caused most often by exposure to airborne pollutants such as cigarette smoke.

Tertiary bronchi
Chronic Obstructive Pulmonary Disease (COPD)

- Chronic bronchitis (continued)
  - Medical management/nursing interventions
    - Bronchodilators
    - Mucolytics
    - Antibiotics
    - Oxygen (low-flow)
    - Pursed-lip breathing

- Asthma
  - Etiology/pathophysiology
    - Narrowing of the airways due to various stimuli
    - Extrinsic or intrinsic factors
    - Influenced by secondary factors
    - Antigen-antibody reaction
Asthma (continued)

- Clinical manifestations/assessment
  - Mild asthma
  - Dyspnea on exertion
  - Wheezing
  - Acute asthma attack
  - Tachypnea
  - Expiratory wheezing; productive cough
  - Use of accessory muscles; nasal flaring
  - Cyanosis

Chronic Obstructive Pulmonary Disease (COPD)

- Asthma (continued)
  - Medical management/nursing interventions
    - Maintenance therapy
      - Serevent inhalant, prophylactic
      - Corticosteroid inhalant
      - Avoid allergens
    - Acute or rescue therapy
      - Proventil inhalant; aminophylline IV
      - Corticosteroid and epinephrine oral or subcutaneous
      - Oxygen
Does your child’s *asthma medicine* fit your child?

**PULMICORT RESPULES** is created especially for kids. So you know it fits.

*Is it Asthma*

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**Time for a smoke**

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