

- 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
- Overview of Anatomy and Physiology
- Upper respiratory tract
 - Nose
 - Pharynx
 - Larynx
 - Trachea
- Lower respiratory tract
 - Bronchial tree
 - Bronchioles, alveolar ducts, alveoli
- Overview of Anatomy and Physiology
- Mechanics of breathing
 - Thoracic cavity
 - Lungs
 - Visceral pleura and parietal pleura
 - Respiratory movements and ranges
 - Rhythmic movements of the chest walls, ribs, and muscles allow air to be inhaled and exhaled
- Regulation of respiration
 - Nervous control—medulla oblongata and pons of the brain; chemoreceptors—in the carotid and aorta
- Assessment of the Respiratory System
- Subjective data

- Shortness of breath, dyspnea, cough
- Objective data
 - Expression, chest movement, and respirations
 - Respiratory distress, wheezes, or orthopnea
 - Adventitious breath sounds
 - Sibilant wheezes
 - Sonorous wheezes
 - Crackles
 - Pleural friction rubs
- 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
- Figure 49-8

- Figure 49-9
- Disorders of the Upper Airway
- Epistaxis
 - Etiology/pathophysiology
 - Bleeding from the nose
 - Congestion of the nasal membranes leading to capillary rupture
 - Primary or secondary
 - 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
- 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
- Deviated septum and nasal polyps
 - Etiology/pathophysiology
 - Congenital abnormality
 - Injury
 - Nasal septum deviates from the midline and can cause a partial obstruction
 - Nasal polyps are tissue growths usually due to prolonged inflammation

- Disorders of the Upper Airway
- Deviated septum and nasal polyps (*continued*)
 - Clinical manifestations/assessment
 - Stertorous respirations (snoring)
 - Dyspnea
 - Postnasal drip
 - Medical management/nursing interventions
 - Pharmacological management
 - Corticosteroids, antihistamines, antibiotics, analgesics
 - Nasoseptoplasty
 - Nasal polypectomy
- Disorders of the Upper Airway
- Allergic rhinitis and allergic conjunctivitis (hay fever)
 - Etiology/pathophysiology
 - Antigen/antibody reactions in the nasal membranes, nasopharynx, and conjunctiva due to allergens
 - Diagnostic testing
- Disorders of the Upper Airway
- Allergic rhinitis and allergic conjunctivitis (*continued*)
 - Clinical manifestations/assessment
 - Edema
 - Photophobia
 - Excessive tearing
 - Blurring of vision
 - Pruritus
 - Excessive nasal secretions and/or congestion
 - Sneezing

- Cough
 - Headache
- Disorders of the Upper Airway
- Allergic rhinitis and allergic conjunctivitis (*continued*)
 - Diagnostic testing
 - Medical management/nursing interventions
 - Pharmacological management
 - Antihistamines
 - Decongestants
 - Corticosteroids
 - Analgesics
 - Avoid allergen
 - Hot packs over facial sinuses
- Figure 49-3
- Disorders of the Upper Airway
- Obstructive sleep apnea (OSA)
 - Etiology and pathophysiology
 - Characterized by partial or complete upper airway obstruction during sleep
 - Apnea refers to the cessation of spontaneous respirations
 - Hypopnea is the presence of unusually shallow or slow respirations
- Disorders of the Upper Airway
- Obstructive sleep apnea (OSA)
 - Clinical manifestations
 - Frequent awakening at night
 - Insomnia
 - Excessive daytime fatigue
 - Witnessed apneic episodes

- Loud snoring
 - Hypercapnia
 - Personality changes
 - Irritability
- Disorders of the Upper Airway
- Obstructive sleep apnea (continued)
 - Complications
 - Diagnostic tests
 - Medical management/nursing interventions
 - Avoid sedatives
 - Avoid alcoholic beverages
 - Support groups
 - Oral appliances
 - nCPAP
 - Surgery
- Disorders of the Upper Airway
- Upper airway obstruction
 - Etiology and pathophysiology
 - Precipitated by a recent respiratory event
 - Common airway obstructions
 - Choking on food
 - Dentures
 - Aspiration of vomitus or secretions
 - The tongue
- Disorders of the Upper Airway
- Upper airway obstruction (*continued*)
 - Clinical manifestations/assessment
 - Stertorous respirations

- Altered respiratory rate and character; apneic periods
 - Hypoxia; cyanosis
 - Wheezing; stridor
 - Medical management/nursing interventions
 - Open the airway
 - Remove obstruction
 - Artificial airway; tracheostomy
- Disorders of the Upper Airway
- Cancer of the larynx
 - Etiology/pathophysiology
 - Squamous cell carcinoma
 - Heavy smoking and alcohol use
 - Chronic laryngitis
 - Vocal abuse
 - Family history
- Disorders of the Upper Airway
- Cancer of the larynx (*continued*)
 - Clinical manifestations/assessment
 - Progressive or persistent hoarseness
 - Pain radiating to the ear
 - Difficulty swallowing
 - Hemoptysis
 - Medical management/nursing interventions
 - Radiation
 - Surgery
 - Partial or total laryngectomy
 - Radical neck dissection

- 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
- Acute rhinitis (common cold) (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Analgesic
 - Antipyretic
 - Cough suppressant
 - Expectorant
 - Antibiotic (if infection present)
 - No specific treatment
 - Encourage fluids
- Respiratory Infections
- Acute follicular tonsillitis
 - Etiology/pathophysiology
 - Inflammation of the tonsils
 - Bacterial or viral infection
 - Clinical manifestations/assessment
 - Enlarged, tender, cervical lymph nodes

- Sore throat
- Fever; chills
- Enlarged, purulent tonsils
- Elevated WBC
- Respiratory Infections
- Acute follicular tonsillitis (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics; analgesics; antipyretics
 - Warm saline gargles
 - Tonsillectomy and adenoidectomy
 - Postoperative
 - Assess for excessive bleeding
 - Ice-cold liquids—ice cream
 - Ice collar
 - Avoid coughing, sneezing, or vigorous nose blowing
- 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
- Respiratory Infections
- Laryngitis (*continued*)

- Medical management/nursing interventions
 - Pharmacological management
 - Analgesics
 - Antipyretics
 - Antitussives
 - Antibiotics—bacterial
 - Viral—no specific treatment, supportive care
 - Warm or cool mist vaporizer
 - Limit use of voice
- Respiratory Infections
- Pharyngitis
 - Etiology/pathophysiology
 - Inflammation of the pharynx
 - Chronic or acute
 - Frequently accompanies the common cold
 - Viral, most common
 - Bacterial
- Respiratory Infections
- Pharyngitis (*continued*)
 - Clinical manifestations/assessment
 - Dry cough
 - Tender tonsils
 - Enlarged cervical lymph glands
 - Red, sore throat
 - Fever
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics; analgesics; antipyretics
 - Warm or cool mist vaporizer

- Respiratory Infections
- Sinusitis
 - Etiology/pathophysiology
 - Inflammation of the sinuses
 - Usually begins with an upper respiratory infection; viral or bacterial
 - Clinical manifestations/assessment
 - Constant, severe headache
 - Pain and tenderness in involved sinus region
 - Purulent exudate
 - Malaise
 - Fever

- Respiratory Infections

- Sinusitis (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics
 - Analgesics
 - Antihistamines
 - Vasoconstrictor nasal spray (Afrin)
 - Warm mist vaporizer
 - Warm, moist packs
 - Nasal windows

- Disorders of the Lower Airway

- Acute bronchitis
 - Etiology/pathophysiology
 - Inflammation of the trachea and bronchial tree
 - Usually secondary to upper respiratory infection

- Exposure to inhaled irritants
- Clinical manifestations/assessment
 - Productive cough; wheezes
 - Dyspnea; chest pain
 - Low-grade fever
 - Malaise; headache
- Disorders of the Lower Airway
- Acute bronchitis (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Cough suppressants
 - Antitussives
 - Antipyretics
 - Bronchodilators
 - Antibiotics
 - Vaporizer
 - Encourage fluids
- Disorders of the Lower Airway
- Legionnaires' disease
 - Etiology/pathophysiology
 - *Legionella pneumophila*
 - Thrives in water reservoirs
 - Causes life-threatening pneumonia
 - Leads to respiratory failure, renal failure, bacteremic shock, and ultimately death
- Disorders of the Lower Airway
- Legionnaires' disease (*continued*)
 - Clinical manifestations/assessment

- Elevated temperature
 - Headache
 - Nonproductive cough
 - Difficult and rapid respirations
 - Crackles or wheezes
 - Tachycardia
 - Signs of shock
 - Hematuria
- Disorders of the Lower Airway
- Legionnaires' disease (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics
 - Antipyretics
 - Vasopressors
 - Oxygen
 - Mechanical ventilation, if necessary
 - IV therapy
- Disorders of the Lower Airway
- Severe Acute Respiratory Syndrome (SARS)
 - Etiology/pathophysiology
 - Infection caused by coronavirus
 - Spread by close contact between people
 - Airborne
 - May be spread by touching contaminated objects
 - Clinical manifestations/assessment
 - Temperature
 - Headache

- Muscle aches
 - Mild respiratory symptoms
 - Dry cough and SOB
- Disorders of the Lower Airway
- Adult respiratory distress syndrome (*continued*)
 - Diagnostic tests
 - Chest radiograph
 - Serum antibody testing
 - Nasopharyngeal and oropharyngeal swabs
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics
 - Antiviral medications
 - Respiratory isolation
 - Oxygen
- Disorders of the Lower Airway
- Anthrax
 - Etiology/pathophysiology
 - *Bacillus anthracis*
 - Spread by direct contact with bacteria or spores
 - Three types: Cutaneous, GI, inhalational
 - Clinical manifestations/assessment
 - Cold or flu-like symptoms
 - Hemorrhage, tissue necrosis, and lymphedema
 - Medical management
 - Antibiotics
- Disorders of the Lower Airway

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

- Disorders of the Lower Airway

- Tuberculosis (*continued*)
 - 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

- 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
 - Pharmacological management
 - Antibiotics
 - Analgesics
 - Expectorants
 - Bronchodilators
 - Oxygen
 - Chest percussion and postural drainage
 - Encourage to cough and deep-breathe
 - Humidifier or nebulizer
- Disorders of the Lower Airway
- Pleurisy
 - Etiology/pathophysiology
 - Inflammation of the visceral and parietal pleura
 - Bacterial or viral
 - Clinical manifestations/assessment
 - Sharp inspiratory pain
 - Dyspnea
 - Cough
 - Elevated temperature
 - Pleural friction rub
- Disorders of the Lower Airway

- Pleurisy (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Antibiotics
 - Analgesics
 - Antipyretics
 - Oxygen
 - Anesthetic block for intercostal nerves

- Disorders of the Lower Airway

- Pleural effusion/empyema
 - Etiology/pathophysiology
 - Pleural effusion
 - Accumulation of fluid in the pleural space
 - Empyema—infection
 - Clinical manifestations/assessment
 - Dyspnea
 - Air hunger
 - Respiratory distress
 - Fever

- Disorders of the Lower Airway

- Pleural effusion/empyema (*continued*)
 - Medical management/nursing interventions
 - Thoracentesis
 - Chest tube with closed water-seal drainage system
 - Antibiotics
 - Cough and deep-breathe

- Disorders of the Lower Airway

- Atelectasis
 - Etiology/pathophysiology
 - Collapse of lung tissue due to occlusion of air to a portion of the lung
 - Clinical manifestations/assessment
 - Dyspnea; tachypnea
 - Pleural friction rub; crackles
 - Restlessness
 - Elevated temperature
 - Decreased breath sounds

- Disorders of the Lower Airway

- Atelectasis (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Bronchodilators
 - Antibiotics
 - Mucolytic agents
 - Analgesics
 - Cough and deep-breathe
 - Early ambulation
 - Respiratory treatments
 - Incentive spirometry; intermittent positive-pressure breathing (IPPB)
 - Oxygen
 - Chest percussion and postural drainage
 - Chest tube

- Disorders of the Lower Airway

- Pneumothorax
 - Etiology/pathophysiology
 - A collection of air or gas in the pleural space, causing the lung to collapse
 - Clinical manifestations/assessment
 - Decreased breath sounds

- Sudden, sharp chest pain with dyspnea
 - Diaphoresis; tachycardia; tachypnea
 - No chest movement on affected side
 - Sucking chest wound
- Figure 49-13
- Disorders of the Lower Airway
- Pneumothorax (*continued*)
 - Medical management/nursing interventions
 - Chest tube to water-seal drainage system
 - Oxygen
 - Analgesics
 - Encourage fluids
- 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
- Lung cancer (*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 edema
 - Etiology/pathophysiology
 - Accumulation of serous fluid in interstitial tissue and alveoli
 - Clinical manifestations/assessment
 - Dyspnea; cyanosis
 - Tachypnea; tachycardia
 - Pink or blood-tinged, frothy sputum
 - Restlessness; agitation
 - Wheezing; crackles
 - Decreased urinary output; sudden weight gain
- Disorders of the Lower Airway
- Pulmonary edema (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Diuretics
 - Narcotic analgesics
 - Nipride
 - Oxygen
 - Mechanical ventilation, if necessary
 - Strict I&O; daily weight
 - Low-sodium diet
- Disorders of the Lower Airway

- Pulmonary embolism
 - 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

- Disorders of the Lower Airway

- Pulmonary embolism (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Anticoagulants
 - Fibrinolytic agents
 - Oxygen
 - HOB up 30 degrees

- Disorders of the Lower Airway

- Acute respiratory distress syndrome (ARDS)
 - Etiology and pathophysiology
 - Results from direct or indirect pulmonary injury
 - Alveolar capillary membranes are altered resulting increased permeability creating pulmonary edema and hypoxia

- Disorders of the Lower Airway

- Acute respiratory distress syndrome (*continued*)
 - Clinical manifestations

- Respiratory distress
 - Changes in level of consciousness
 - Tachycardia
 - Hypotension
 - Decreased urinary output
- Disorders of the Lower Airway
- Acute respiratory distress syndrome (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Corticosteroids
 - Antibiotics
 - Vasodilators
 - Bronchodilators
 - Mucolytics
 - Diuretics
 - Morphine sulfate
 - Neurologic blocking agents
 - Cardiotonic glycosides (digoxin)
- Disorders of the Lower Airway
- Acute respiratory distress syndrome (*continued*)
 - Medical management/nursing interventions (*continued*)
 - Oxygen
 - Position changes
 - Close assessment of vital signs
- 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
- Figure 49-14
- Emphysema (*continued*)
 - Clinical manifestations/assessment
 - Dyspnea on exertion
 - Sputum
 - Barrel chest
 - Chronic weight loss
 - Emaciation
 - Clubbing of fingers
- Figure 49-16
- Emphysema (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - Bronchodilators; corticosteroids; antibiotics; diuretics
 - Oxygen (low-flow)
 - Chest physiotherapy
 - Humidifier
 - Pursed-lip breathing
 - High-protein, high-calorie diet
- 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 (*continued*)
 - Medical management/nursing interventions
 - Pharmacological management
 - 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
- 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

- Bronchiectasis

- Etiology/pathophysiology
 - Gradual, irreversible process that involves chronic dilation of bronchi resulting in loss of elasticity
- Clinical manifestations/assessment
 - Dyspnea; coughing; wheezes and crackles
 - Cyanosis; clubbing of fingers
 - Fatigue; weakness
 - Loss of appetite

- Bronchiectasis (*continued*)

- Medical management/nursing interventions
 - Pharmacological management
 - Mucolytic agents
 - Antibiotics
 - Bronchodilators
 - Oxygen (low-flow)
 - Chest physiotherapy
 - Hydration
 - Cool mist vaporizer
 - Surgery: Lobectomy

- Nursing Process



Nursing diagnoses

- Airway clearance, ineffective
- Breathing pattern, ineffective
- Gas exchange, impaired
- Anxiety
- Activity intolerance
- Nutrition, imbalanced: less than body requirements