Chapter 48
Care of the Patient with a Respiratory Disorder

Respiration
- External respiration: breathing
- Internal respiration: exchange of oxygen and carbon dioxide at the cellular level

The Respiratory System
- Upper respiratory tract
  - Nose
  - Pharynx
  - Larynx
  - Trachea
- Lower respiratory tract
  - Bronchial tree
Transportation of Oxygen and Carbon Dioxide in the Body

- Oxygen (O₂) enters the body via the lungs
- O₂ binds to Hgb in the alveoli
- O₂ is delivered to cells where it is exchanged for carbon dioxide (CO₂)
- CO₂ is carried back to the lungs where it is exhaled

Respiration Regulation

- Nervous control
  - Chemoreceptors regulate breathing level and rate according to amount of CO₂ in the blood

Signs and Symptoms of Hypoxia

- Cyanosis
- Gray skin
- Pale skin
- Decreased O₂ saturation
- Confusion
- Irritability
Lung Sounds
- Sonorous wheezes (formerly known as wheezes)
- Sibilant wheezes (formerly known as rhonchi)
- Crackles
- Pleural friction rub

Diagnostic Examinations
- Chest X-ray
  - Provides visualization of the lungs, ribs, clavicles, humeri, scapulae, vertebrae, heart, and major thoracic vessels
  - Nursing interventions include providing education about the procedure
- Spiral CT
  - Much more rapid scanning than CT
  - Nursing interventions include assessing allergies and providing patient education

Diagnostic Examinations cont’d
- Pulmonary angiography
  - Uses a radiographic contrast material injected into the pulmonary arteries to permit visualization of the pulmonary vasculature
  - Nursing interventions include
    - Providing patient education
    - Assessing allergies
    - Assessing labs and renal function
    - Postprocedure, providing recovery care
- Ventilation-perfusion scan (V/Q scan)
  - The pulmonary vasculature is outlined and photographed using a radioisotope
  - Nursing interventions include providing patient education
Diagnostic Examinations cont’d

- Pulmonary function testing
  - Include various procedures to obtain information on lung volume, ventilation, pulmonary spirometry, and gas exchange
  - Nursing interventions include providing patient education
- Mediastinoscopy
  - A surgical endoscopic procedure that allows for visualization of the structures of the mediastinum
  - Nursing interventions include providing patient education and performing postoperative care

Diagnostic Examinations cont’d

- Laryngoscopy
  - Allows direct or indirect visualization of the larynx
  - Nursing interventions include monitoring the patient’s airway and providing patient education
- Bronchoscopy
  - Performed by passing a bronchoscope into the trachea and bronchi
  - Nursing interventions include monitoring airway, providing conscious sedation, and providing patient education

Diagnostic Examinations cont’d

- Sputum specimen
  - Allows sputum to be tested for culture and sensitivity
  - The nurse should obtain specimen with the first productive cough of the morning
Arterial Blood Gases

- Partial pressure of oxygen (PaO$_2$) and arterial oxygen saturation (SaO$_2$) provide a measurement of pulmonary function.
- PaO$_2$ represents the amount of oxygen dissolved in the plasma.
- SaO$_2$ is the percentage of hemoglobin binding sites that have oxygen bound to them.

Upper Airway Disorders

- Epistaxis
- Deviated septum and nasal polyps
- Allergic rhinitis
- Obstructive sleep apnea
- Upper airway obstruction
- Cancer of the larynx

Epistaxis

- A nosebleed
- May be primary or secondary
- May be treated by holding pressure, applying epinephrine, or inserting one of various forms of packing
- Nursing interventions include holding pressure, applying medications, or assisting to insert packing.
Deviated Septum

- The septum deviates from midline
- Assess the septum for deviation
- Nursing interventions are aimed at ensuring airway patency

Allergic Rhinitis

- Occurs usually with seasonal allergies in response to contact with an allergen
- The patient should be assessed for signs and symptoms associated with “allergies”
  - Cough, sore throat, congested sinuses, full ears
- Treatment includes antiallergy medications, cough suppressants and nasal decongestants

Obstructive Sleep Apnea

- Characterized by partial or complete upper airway obstruction during sleep, causing apnea and hypopnea
- Clinical manifestations of sleep apnea include frequent awakening at night, insomnia, excessive daytime sleepiness, and witnessed apneic episodes
- Sleep apnea is usually diagnosed through a sleep study
- Mild sleep apnea may respond to lifestyle modifications
- Moderate to severe sleep apnea may require CPAP
- The nurse provides patient education and assists with sleep studies
Upper Airway Obstruction

- Characterized by stertorous respirations, wheezing, and altered rate and character of respirations
- Patient may use the universal symbol for choking
- May require the Heimlich maneuver or abdominal thrusts
- Manual removal may be required
- The nurse should provide abdominal thrusts and monitor patient’s airway

Cancer of the Larynx

- Incidence appears to be correlated with tobacco use
- Progressive and persistent hoarseness is an early sign
- Later the patient may feel a lump in the throat and will have enlarged lymph nodes

Cancer of the Larynx cont’d

- Diagnosed via CT, PET scan, MRI, or direct visualization
- Treated with radiation, chemotherapy or surgery
The Laryngectomy Patient

Nursing Interventions for the Laryngectomy Patient

- Airway maintenance
- Thorough assessments
- Monitor I&O
- Assist with nutrition
- Develop communication strategies with patient
- Prevent infection

Disorders of the Lower Airway

- Bronchitis
- Tuberculosis
- Pneumonia
- Pleural effusion
- Empyema
- Pneumothorax
- Lung cancer
- Pulmonary edema

Bronchitis

- Inflammation of the bronchial tract
- Usually presents with cough, dyspnea, sore chest, and fever
- Medical management is aimed at treating infection and controlling further complications
- Treatment also includes cough suppressants, antipyretics and bronchodilators
Bronchitis cont’d

Nursing Interventions
- Promote rest
- Use a humidifier
- Promote adequate fluid intake
- Promote activity as tolerated
- Promote healing

Tuberculosis
- A chronic pulmonary and extrapulmonary (outside of the lung) infectious disease acquired by inhalation of a dried droplet nucleus containing a tubercle bacillus
- Most commonly affects the respiratory system, but other parts of the body may be involved as well
- TB is prevalent among those with HIV infection
- Hospitals are an increased risk setting for TB transmission

Tuberculosis cont’d

Pathophysiology
- TB bacteria invade the lung
- Macrophages attack the bacteria and wall them off
- These walled-off tiny capsules are called tubercles
- Nonmultiplying tubercle bacilli can survive for as long as 50 years
- Most people who become infected with TB do not develop active TB
- However, if they become immunosuppressed, they will likely become actively infected
Tuberculosis cont’d

Clinical Manifestations
- Insidious onset
- Fever
- Weight loss
- Weakness
- Productive cough
- Night sweats
- Hemoptysis

Diagnostic Exams
- TB skin test (PPD)
- Two-step TB skin test
- Chest X-ray
- Sputum analysis

Medical Management
- Medications
- Isolation
Tuberculosis cont’d

Nursing Interventions
● If the patient is suspected of having TB, place him or her in isolation
● Provide patient education for prevention of spread of disease
  ➢ Cover mouth when coughing
  ➢ Place used tissues in trash
  ➢ Do not cough or sneeze in hand
  ➢ Wash hands frequently
● Prevent further infection
● Prevent complications
● Promote adequate respiration

Pneumonia
● An inflammatory process of the respiratory bronchioles and the alveolar spaces that is caused by an infection
● Sometimes caused by oversedation, inadequate ventilation, or aspiration
● More common in infants and older adults
● High-risk people
  ➢ Respiratory defense mechanisms are damaged or altered
  ➢ Those with a disease affecting antibody response
  ➢ Alcoholics
  ➢ Those at risk of aspiration
  ➢ People with delayed white blood cell response to infection
  ➢ Diabetics

Pneumonia cont’d

Clinical Manifestations
● Productive cough
● Chills
● Fever
● Tachycardia
● Tachypnea
● Sore chest
● Soreness in chest when coughing
Pneumonia cont’d

Assessment
• Assess duration of cough
• Assess onset
• Assess fever
• Monitor vital signs
• Assess areas of soreness in the chest

Pneumonia cont’d

Medical Management
• Medications
• Chest physiotherapy
• Incentive spirometry
• Postural drainage

Pneumonia cont’d

Nursing Interventions
• Conserve energy
• Place patient in high Fowler’s
• Assist the patient to expectorate secretions
  ➢ Increase fluid intake
  ➢ Positioning
  ➢ Suctioning
  ➢ Bronchodilators
  ➢ Mucolytics
  ➢ Expectorants
• Provide small frequent meals
Pleural Effusion

- Accumulation of fluid in the pleural space
- If the fluid becomes infected this is referred to as an empyema
- Usually associated with a disease state
- The patient usually complains of air hunger and dyspnea
- Assess respiratory effort and breath sounds
- Diagnosed with chest radiography
- Thoracentesis is required to remove fluid from the pleural space
- Nursing interventions are aimed at promoting rest, nutrition, and adequate breathing

Pneumothorax

- A collection of air or gas in the pleural space
- Diagnosed with chest x-ray
- ABGs show abnormalities
- The patient may complain of shortness of breath, chest pain, or air hunger
- Decompression is usually completed via a chest tube
- Nursing interventions are aimed at treating pain, promoting oxygenation, assisting in procedures, and providing patient education

Lung Cancer

- Approximately 87% of lung cancers are related to smoking
- Lung cancer is an insidious process
- Few early symptoms occur
- Later symptoms include weight loss, fatigue, hemoptysis, fever, and chills
Lung Cancer cont’d

Diagnostic Exams
- CT
- PET scan
- MRI
- Sputum specimen
- Mediastinoscopy

Lung Cancer cont’d

Medical Management
- Surgery
- Radiation
- Chemotherapy

Lung Cancer cont’d

Nursing Interventions
- Emotional support
- Postsurgical interventions
- Facilitate recovery
- Encourage the use of incentive spirometry
- Encourage exercising the legs and feet
- Administer supplemental oxygen
- Monitor oxygen saturation levels
- If a patient has chest tubes to water-seal drainage, assess for patency, and record the amount, color, and consistency of drainage
- Carefully assess lung sounds and record findings
- Assess vital signs frequently
- Administer medications
Pulmonary Edema

- An accumulation of serous fluid in interstitial lung tissue and alveoli
- Symptoms typically include labored respirations, pink frothy sputum, and tachycardia
- The patient may also exhibit confusion or irritability
- Diagnosed through chest X-ray
- Treatment is aimed at increased urinary output
- Nursing interventions are aimed at promoting adequate respiration and treating edema

Pulmonary Embolism

- Caused by the passage of a foreign substance into the pulmonary artery or its branches, with resulting obstruction of the blood supply to lung tissue
- Risk factors include
  - Recent thrombophlebitis
  - DVT
  - Recent surgery
  - Immobility
  - Venous stasis
  - Dysrhythmias of the heart
- The most common clinical manifestation is acute, unexplained dyspnea
- Chest pain is also a common finding

Pulmonary Embolism cont’d

- Assessment is aimed at identifying risk factors, assessing for dyspnea and pleuritic pain
- Diagnostic tests include chest X-ray, CT scan, V/Q scan, ABG analysis, and D-dimer
- Treatment includes thrombolytics, anticoagulants, and umbrella filters
- Nursing interventions are aimed at promoting oxygenation, controlling pain, and preventing further complications
Chronic Obstructive Pulmonary Disease (COPD)

- Emphysema
- Chronic bronchitis
- Asthma

Emphysema

- Characterized by changes in the alveolar walls and capillaries
- An abnormal permanent enlargement of the alveoli distal to the terminal bronchioles
- Air becomes trapped in the alveoli during expiration
- This leads to a decrease in O₂ and an increase in CO₂ in the blood
- This process is worsened by smoking

Emphysema cont’d

Clinical Manifestations

- Dyspnea on exertion
- Excessive sputum
- Barrel chest appearance
- Weight loss
Emphysema cont’d

Diagnostic Exams
● CXR
● PFTs
● Lab values
● ABGs

Medical Management
● Bronchodilators
● Chest physiotherapy
● Home oxygen
● Low-flow oxygen
  ➢ The hypoxic drive
● Diuretics
● Antibiotics
● Rehab

Chronic Bronchitis
● Characterized by a recurrent or chronic productive cough for a minimum of 3 months a year for at least 2 years
● Caused by physical or chemical irritants and recurrent lung infections
● Smoking is the leading cause of chronic bronchitis
● Workers chronically exposed to pollutants are at high risk for chronic bronchitis
Chronic Bronchitis cont’d

Clinical Manifestations
- Productive cough
- Dyspnea
- Use of accessory muscles to breathe

Chronic Bronchitis cont’d

Medical Management
- Bronchodilators
- Corticosteroids
- Antibiotics

Chronic Bronchitis and Emphysema

Nursing Interventions
- Increase fluid intake to thin secretions
- Administer medications as prescribed
- Provide information about smoking cessation
- Provide small frequent meals
- Promote oxygenation
- Promote rest
Asthma

- Involves episodic increased tracheal and bronchial responsiveness to various stimuli, resulting in widespread narrowing of the airways
- Classified as intrinsic or extrinsic
- Most commonly characterized by dyspnea on exhalation and expiratory wheezes
- Status asthmaticus is a severe, unrelenting, life-threatening attack that fails to respond to usual treatment and places the patient at risk for respiratory failure
  - This is a medical emergency and should be treated as such

Asthma cont’d

Assessment and Diagnostic Exams

- Subjective
  - Anxiety
  - Suffocation
  - Restlessness
  - Cough
- Objective
  - Increased blood pressure
  - Tachypnea
  - Tachycardia
- Diagnosis by symptom assessment, ABGs, and PFTs

Asthma cont’d

Medical Management

- Maintenance therapy
- Acute therapy
Asthma cont’d

Nursing Interventions

- Promote oxygenation
- Provide patient education
- Administer medications as ordered

Nursing Diagnoses for Respiratory Patients

- Ineffective airway clearance
- Ineffective breathing pattern
- Impaired gas exchange
- Anxiety
- Activity intolerance
- Imbalanced nutrition: less than body requirements