Upper and Lower Respiratory Disorders

Upper Respiratory Infection (URI)

URI
- Common cold
  - Etiology: rhinovirus
  - Affects nasopharyngeal tract
- Rhinitis
  - Inflammation of nasal mucous membranes
  - Acute or Allergic
- Sinusitis
  - Inflammation of mucous membranes of sinuses
- Acute pharyngitis
  - Inflammation of throat

Common Cold
- Contagious period
  - 1-4 days before onset of symptoms
  - During first 3-5 days of cold
- Transmission
  - Touching contaminated surfaces then touching nose or mouth
  - Viral droplets from sneezing
- Symptoms
  - Nasal congestion, nasal discharge, cough, increased mucosal secretions
- Treatment
  - OTC meds for comfort & symptom relief
  - Antibiotics if prolonged and accompanied by purulent yellow/green discharge

URI Inflammation
- Allergic Rhinitis
  - Symptoms
    - Sneezing, rhinorrhea, nasal congestion
  - Treatment
    - Remove allergen, antihistamine
- Sinusitis
  - Symptoms
    - Congestion, pain, dizziness, post nasal drainage
  - Treatment
    - Decongestant, acetaminophen, fluids, irrigation, antibiotics
- Acute pharyngitis
Symptoms
- Difficulty swallowing, pain, pharyngeal/laryngeal edema

Treatment
- Gargle, lozenges, fluid, acetaminophen
- Antibiotics with bacterial infection

Antihistamines
- H₁-blockers (antagonists)
  - First-generation antihistamines
    - Diphenhydramine (Benadryl)
  - Second-generation antihistamines
    - Cetirizine (Zyrtec), fexofenadine (Allegra), loratadine (Claritin)
    - BENEFIT = Nonsedating; little to no effect on sedation
- Diphenhydramine (Benadryl)
  - 1st generation
  - Action
    - Reduces nasopharyngeal secretions, itching, sneezing
    - Anticholinergic activity
    - Competes with histamine for receptor sites preventing a histamine response (allergic reaction)
  - Contraindications
    - Narrow-angle glaucoma, urinary retention, BPH
  - Administration
    - Oral, IM, IV
  - Interactions
    - CNS depression
    - Increased CNS depression with alcohol and other CNS depressant medications
  - Side effects
    - Anticholinergic
      - Dry mucous membranes
      - Urinary retention
      - Constipation
    - Drowsiness, dizziness

Nursing Interventions
- Obtain list of environmental exposures, drugs, recent foods eaten
- Avoid operating motor vehicles/machinery
- Avoid alcohol and other CNS depressants
- Use sugarless candy, gum, and ice chips for temporary relief of mouth dryness
- Discuss use of other OTC “cold remedies” with health care provider prior to use

Second-generation antihistamines
- Treatment for seasonal allergic rhinitis
- Reduces symptoms of nasopharyngeal secretions, itching, sneezing
Administration is Oral
- Available “OTC”
- Differences
  - Less sedation
  - Fewer anticholinergic effects

**Decongestants (Sympathomimetics)**
- Nasal congestion
  - Dilation of nasal blood vessels
    - Due to infection, inflammation, allergy
  - Transudation of fluid into tissue spaces
    - Leads to swelling nasal cavity
- Nasal decongestants
  - Stimulate alpha1 adrenergic receptors
    - Produces nasal vascular vasoconstriction
    - Shrinks nasal mucous membranes
    - Reduces nasal secretion
- Pseudoephedrine (Sudafed), oxymetazoline (Afrin), naphazoline (Allerest)
  - Administration
    - Nasal spray, nasal drops, tablet, capsule, liquid
  - Nasal versus Oral
    - Oral results in systemic effect
  - Frequent use =
    - Potential drug tolerance
    - Rebound nasal congestion
  - *Not recommended longer than five days*
- Side Effects
  - May decrease effect of beta-blockers
  - May increase HTN
  - Tachycardia, palpitations, dysrhythmias
    - May increase with caffeine or other stimulants
  - May increase or cause nervousness, restlessness, or jittery feelings
  - Hyperglycemia
  - Caution: Patients with history of hypertension, cardiac disease, hyperthyroidism, diabetes mellitus

**Intranasal Glucocorticoids (Nasal Steroids)**
- Fluticasone (Flonase), triamcinolone (Nasacort), beclomethasone (Vanceril)
- Action
- Anti-inflammatory
- Indications/Use
- Treat allergic rhinitis
• May be used alone or in combination with H₁ antihistamines
• Should not be used longer than 30 days to avoid systemic effects

Antitussives
• Dextromethorphan (Benylin)
  o Action
    ▪ Suppress cough reflex by acting on cough center in the medulla
    ▪ Reduce viscosity of tenacious secretions
  o Use
    ▪ Non-narcotic or combined with narcotic (codeine)
    ▪ Nonproductive, irritating cough
    ▪ Enhance symptom relief when combined with other agents
  o Side effects
    ▪ Drowsiness, dizziness, nausea

Expectorants
• Guaifenesin (Robitussin)
  o Action
    ▪ Loosen bronchial secretions by reducing surface tension of secretions
  o Use
    ▪ Dry, nonproductive cough
  o Side effects
    ▪ Drowsiness, nausea
  o Special note: Hydration is best natural expectorant

Lower Respiratory Disorders
• Two Major Categories
  o 1. Restrictive lung disease
  o 2. Chronic obstructive pulmonary disorder (COPD)

Chronic Obstructive Pulmonary Disease (COPD)
• Pathophysiologic changes
  o Airway obstruction with increased airway resistance to airflow
• Major disorders
  o Asthma
  o Chronic bronchitis
  o Bronchiectasis
  o Emphysema
• Etiology
  o Cigarette smoking – #1
  o Chronic lung infections
  o Allergens, pollutants
  o Lack of alpha₁-antitrypsin protein
• Characteristic symptoms
  o Dyspnea, wheezing, coughing
  o Excess mucus secretions, airway obstruction
  o Inflammation, bronchospasm
  o Permanent irreversible damage to the lung tissue and/or alveoli

**Bronchodilators**

• Sympathomimetics
  o Epinephrine (Adrenaline), Racemic Epinephrine (Given as a nebulizer)
    ▪ Action
      • First line treatment in severe acute asthma attack or anaphylaxis, given subQ, nebulizer
      • Promotes bronchodilation
      • Increases airway patency
    ▪ Side effects
      • Palpitations, dizziness, nervousness, tremors, tachycardia, dysrhythmias, hypertension

• Selective beta₂-adrenergic agonists
  o Albuterol (Proventil), Salmetrol (Serevent), Terbutaline (Brethine), Metaproterenol (Alupent)
    ▪ Action: relaxes smooth muscle of bronchi
      • Rapid onset and long duration
      • Administration: inhalation
      • Side effects: tremors, restlessness, anxiety, irritability, headaches, nervousness, tachycardia, angina, palpitations, dysrhythmias

• Anticholinergics
  o Ipratropium bromide (Atrovent), ipratropium bromide & albuterol (Combivent)
    ▪ Action: dilates bronchioles
      • Atrovent – lowers side effects
      • Combivent – increases duration of action and effect
    ▪ Administration: inhalation
    ▪ Caution
      • Anticholinergic contraindications

• Methylxanthine (Xanthine) derivatives
  o Aminophylline (Somophyllin), theophylline (Theo-Dur), caffeine
    ▪ Action: relaxes smooth muscle of bronchi
    ▪ Promotes bronchodilation
    ▪ Use:
      • Oral theophylline for chronic stable asthma
      • Intravenous aminophylline for asthma exacerbations
    ▪ Therapeutic range: 10-20 mcg/ml (toxicity greater than 20)
- Dosing adjustments, raise for:
  - Smokers
  - Children

- Common Side effects
  - Tachycardia, palpitations, dysrhythmias
  - Nervousness, irritability, insomnia

- Avoid
  - Caffeine or chocolate

- Major Contraindications
  - Cardiac or seizure disorders
  - Special Note: Use of this medication has declined!

- Administration
  - Nebulized air
    - Air versus oxygen
  - Metered-dose inhaler (MDI)
  - Dry powdered inhaler (DPI)
    - Advair & Spiriva

- Teaching
  - Care and use of equipment
  - Oral Care

**Leukotriene Receptor Antagonists**
- Montelukast (Singulair)
  - Action
    - Reduce inflammation
    - Decrease bronchoconstriction
  - Use
    - Prophylactic/maintenance for chronic asthma
  - Dosing
    - Evening or bedtime
  - Side effects
    - Fever, sore throat, cough, nasal congestion
    - GI distress

**Glucocorticoids (Steroids)**
- Glucocorticoids
  - Administration = MDI, oral, IV
    - MDI: Beclomethasone (beclovent)
      - Preferred over oral
    - Tablet: prednisone
    - IV: hydrocortisone (Solu-Cortef)
Action & Indication
- Anti-inflammatory
- Synergistic effect with beta2 agonist
  - Advair (fluticasone & salmeterol)
- Asthma unresponsive to bronchodilator therapy

Side effects
- Throat irritation, hoarseness, fungal infections
- Hyperglycemia

Mucolytics
- Acetylcysteine (Mucomyst)
  Action/Indications
  - Liquefy and loosen thick mucus secretions
  - Antidote for acetaminophen overdose
  - Renal protection pre-angiography contrast
  Administration
  - Nebulizer for respiratory Tx
  - Administer 5 minutes after a bronchodilator
  - Should not be mixed with other drugs
  Side Effects
  - Nausea, vomiting (give with food/soft drink)

Oxygen Therapy
- Colorless, odorless, tasteless gas
- Indication
  - Maintain/restore necessary blood oxygen levels
- Side Effects
  - \( O_2 \) toxicity, \( CO_2 \) narcosis, infection, absorption atelectasis
- Nursing Interventions
  - Assure right delivery system
  - Assure “No smoking”
  - Analyze SpO\(_2\), ABG’s
  - Clean and care for equipment
  - Teach clients “Effective coughing” techniques
  - Perform ordered therapies such as: chest physiotherapy, postural drainage, or percussion therapy
  - Teach client about medication therapy and need for compliance

Generalized Nursing Care
- Evaluate respiratory status and vital signs
- Evaluate signs and symptoms related to disease process or medication side effects
- Teach patient rationale for compliance
• Teach patient difference between long-term control and short-term response
• Teach patient to check with physician before using OTC medications and how to read labels
• Teach patient correct use of inhalation devices and care of equipment