Introduction to Clinical Pharmacology

Chapter 30
Upper Respiratory System Drugs

Common Conditions of the Upper Respiratory System

- Infections
- Allergic rhinitis
- Coughs
- Common cold
- Congestion

Medication Classes

- Intranasal steroids or antihistamines relieve allergy symptoms
- Decongestants reduce nasal edema
- Antitussives, mucolytics, and expectorants treat accompanying cough

Antihistamines: Actions

- Antihistamines block most, but not all, of the effects of histamine
- First-generation antihistamines bind nonselectively to central and peripheral H_1 receptors and may result in CNS stimulation or depression
- Other first-generation drugs may have additional effects: antipruritic (anti-itching) or antiemetic (antinausea) effects
- Second-generation antihistamines are selective for peripheral H_1 receptors and, as a group, are less sedating

Antihistamines: Uses #1

- Seasonal and perennial allergies
- Allergic and vasomotor rhinitis
- Allergic conjunctivitis
- Mild and uncomplicated angioneurotic edema and urticaria
- Allergic reactions to drugs, blood, or plasma
- Coughs caused by colds or allergy

Antihistamines: Uses #2

- Adjunctive therapy in anaphylactic shock
- Treatment of parkinsonism
- Relief of nausea and vomiting
- Relief of motion sickness
- Sedation
- Adjuncts to analgesics

Antihistamines: Adverse Reactions

- Central nervous system reactions
  - Drowsiness or sedation; disturbed coordination
- Anticholinergic effects (cholinergic blocking)
  - Dryness of mouth, nose, and throat; thickening of bronchial secretions

Antihistamines: Contraindications and Precautions #1

- Contraindicated during pregnancy and lactation
  - First-generation antihistamines: patients with known hypersensitivity to the drugs, newborns, premature infants, nursing mothers, individuals undergoing monoamine oxidase therapy, and in patients with angle-closure glaucoma, stenosing peptic ulcer, symptomatic prostatic hypertrophy, and bladder neck obstruction

Antihistamines: Contraindications and Precautions #2

  - Second-generation antihistamines: patients with known hypersensitivity
  - Cetirizine is contraindicated in patients who are hypersensitive to hydroxyzine
- Used with caution in patients with bronchial asthma, cardiovascular disease, narrow-angle glaucoma, symptomatic prostatic hypertrophy, hypertension, impaired kidney function, peptic ulcer, urinary retention, pyloroduodenal obstruction, and hyperthyroidism

Antihistamines: Interactions

Interactant drug	Effect of Interaction
Rifampin	May reduce the absorption of antihistamine, fexofenadine, for example
Monamine oxidase inhibitors	Increase in anticholinergic and sedative effects of antihistamine
CNS depressants	Possible additive CNS depressant effect
Beta blockers	Risk for increased cardiovascular effects, with diphenhydramine, for example
Aluminum- or magnesium-based antacids	Decreased concentrations of antihistamine in blood, fexofenadine, for example

Decongestants: Actions and Uses

- Actions:
  - Nasal decongestants: sympathomimetic drugs, which produce localized vasoconstriction of the small blood vessels of the nasal membranes

- Uses:
  - Used to treat the congestion associated with the following conditions:
    - Common cold; hay fever; sinusitis; allergic rhinitis; congestion associated with rhinitis

Decongestants: Adverse Reactions and Contraindications

- Use of oral decongestants may result in the following adverse reactions:
  - Tachycardia and other cardiac arrhythmias; nervousness; restlessness; insomnia; blurred vision; nausea; vomiting
- Contradicted:
  - In patients with known hypersensitivity and patients taking monoamine oxidase inhibitors
  - Sustained-released pseudoephedrine is contraindicated in children younger than 12 years of age

Decongestants: Precautions

- Decongestants are used cautiously in patients with:
  - Thyroid disease; diabetes mellitus; cardiovascular disease; prostatic hypertrophy; coronary artery disease; peripheral vascular disease; hypertension; glaucoma
  - Pregnant women should consult with their primary health care provider before using these drugs

Decongestants: Interactions

Interactant drug	Effect of interaction
MAOIs	Severe headache, hypertension, and possibly hypertensive crisis
Beta-adrenergic blocking drugs	Initial hypertension episode followed by bradycardia

Antitussives, Expectorants, and Mucolytics: Actions and Uses

- Expectorants increase the production of respiratory secretions, which in turn appears to decrease the viscosity of the mucus. This helps to raise secretions from the respiratory passages
- Antitussives are used to relieve a nonproductive cough
- Expectorants are used to help bring up respiratory secretions

Antitussives, Expectorants, and Mucolytics: Adverse Reactions

- Lightheadedness
- Dizziness
- Drowsiness or sedation

Nursing Process: Assessment #1

- Preadministration assessment:
  - The assessments the nurse may perform:
    - Assess the involved areas (eyes, nose, and upper and lower respiratory tract) if the patient is receiving an antihistamine for the relief of allergy symptoms
    - If promethazine (Phenergan) is used with an opioid to enhance the effects and reduce the dosage of the opioid, take the patient's blood pressure, pulse, and respiratory rate before giving the drug

Nursing Process: Assessment #2

- Ongoing assessment:
  - Observe the patient for the expected effects of the antihistamine and for adverse reactions
  - Antihistamine is given for a serious situation: assess the patient at frequent intervals until the symptoms appear relieved and for about 24 hours after the incident

Nursing Process: Assessment #3

- Preadministration assessment:
  - Assess the patient's blood pressure, pulse, and congestion before administering the decongestants; assess the lung sounds and bronchial secretions, and note in the patient's records; obtain the history of the use of the products
- Ongoing assessment:
  - Assess the patient's blood pressure, pulse, and congestion; question the patient about attaining therapeutic effects and presence of adverse reactions

Nursing Process: Diagnoses

- **Risk for Injury** related to drowsiness, dizziness, or sedation
- **Ineffective Airway Clearance** related to pooling of or thick secretions
- **Impaired Oral Mucous Membranes** related to dry mouth, nose, and throat

Nursing Process: Planning #1

- The expected outcomes for the patient depend on the reason for administration of the antihistamine but may include:
  - Optimal response to therapy
  - Supporting of patient needs related to managing adverse reactions
  - Understanding of and compliance with the prescribed treatment regimen

Nursing Process: Planning #2

- Expected outcomes for the patients include:
  - Optimal response to therapy
  - Support of patient needs related to the management of adverse reactions
  - Understanding of and compliance with the prescribed treatment regimen

Nursing Process: Implementation #1

- Monitoring and managing patient needs:
  - Impaired oral mucous membranes:
    - Dryness of the mouth, nose, and throat: Offer the patient frequent sips of water or ice chips to relieve the symptoms
  - Risk of injury:
    - Assist the patient with ambulation
    - Place the call light within easy reach and instruct to call before attempting to get out of bed and ambulating

Nursing Process: Implementation #2

- Loratadine or other rapidly disintegrating tablets can be administered with or without water and are placed on the tongue, where the tablet dissolves almost instantly.
- Fexofenadine is not administered within 2 hours of an antacid.
- Chewing benzonatate tablets may result in a local anesthetic effect (oropharyngeal anesthesia) with possible choking as a result.
- Acetylcysteine has a distinctive, disagreeable odor. The medication may smell like “rotten eggs.” Although this odor may be nauseating, the smell dissipates quickly.

Nursing Process: Implementation #3

- Promoting an optimal response to therapy
  - Ineffective breathing pattern:
    - Overuse of topical form: "Rebound" nasal congestion
    - Patient is taught to take the drug exactly as prescribed or discontinue the drug therapy gradually

Nursing Process: Implementation #4

- Educating the patient and family:
  - Review the dosage regimen and possible adverse drug reactions with the patient

Nursing Process: Implementation #5

- Educating the patient and family: The nurse should include the following points in the teaching plan:
  - Use this product as directed by the primary health care provider or on the container label
  - Understand that overuse of topical nasal decongestants can make the symptoms worse, causing rebound congestion
  - If using a spray, do not allow the tip of the container to touch the nasal mucosa and do not share the container with anyone

Nursing Process: Evaluation #1

- Mucous membranes are moist and intact
- No injury is reported
- The patient and family understand the drug regimen

Nursing Process: Evaluation #2

- The patient maintains effective breathing pattern
- The therapeutic effect is achieved
- The patient demonstrates an understanding of and compliance with the drug regimen

Question #1

- Is the following statement true or false?
- Cough, cold, congestion, and allergies are common problems in the upper respiratory system.

Answer to Question #1

- True
- Cough, cold, congestion, and allergies are common problems in the upper respiratory system.

Question #2

- Is the following statement true or false?
- Expectorants or mucolytics are used to reduce inflammation.

Answer to Question #2

- False
- Antihistamines are used to reduce inflammation; decongestants reduce edema and swelling; antitussives are used to eliminate cough. When congestion produces secretions in either the respiratory passages or the lungs, expectorants or mucolytics are used, respectively.