Introduction to Clinical Pharmacology

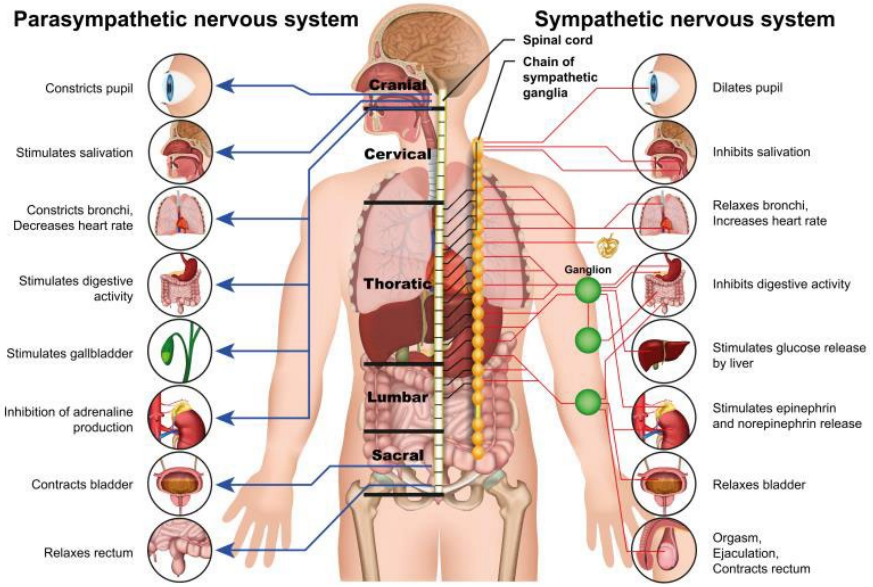
Chapter 26
Cholinergic Blocking Drugs

Learning Objectives

1. Explain the uses, general drug actions, general adverse reactions, contraindications, precautions, and interactions of the cholinergic blocking drugs (also called anticholinergic drugs and cholinergic blockers).
2. Distinguish important preadministration and ongoing assessment activities the nurse should perform on the client taking a cholinergic blocking drug.
3. List nursing diagnoses particular to the client taking a cholinergic blocking drug.
4. Examine ways to promote an optimal response to therapy, how to manage common adverse reactions, and important points to keep in mind when educating clients taking cholinergic blocking drugs.

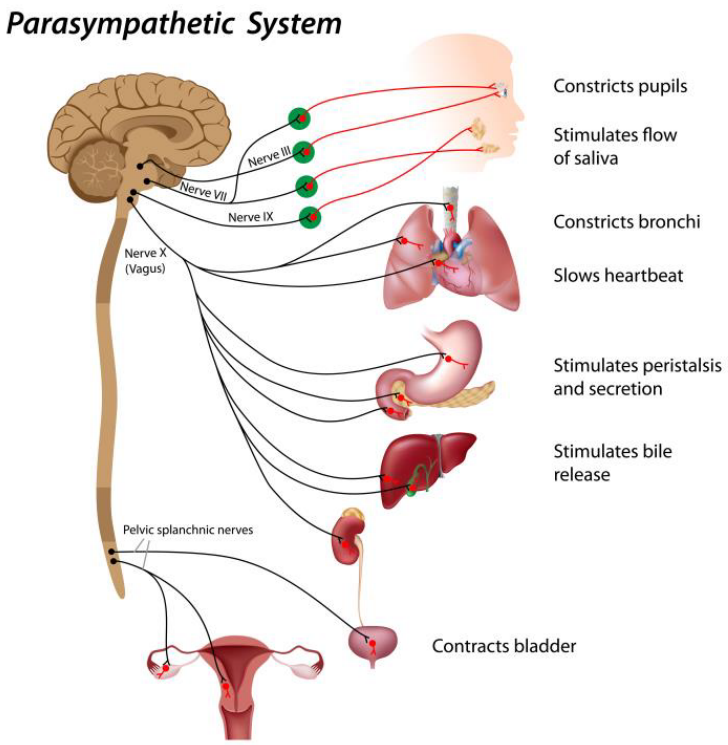
Autonomic Nervous System

- Division of the peripheral nervous system concerned with the functions essential to life of an organism and not consciously controlled (e.g., blood pressure, heart rate, and gastrointestinal activity)
- Divided into two branches:
  - Sympathetic
  - Parasympathetic



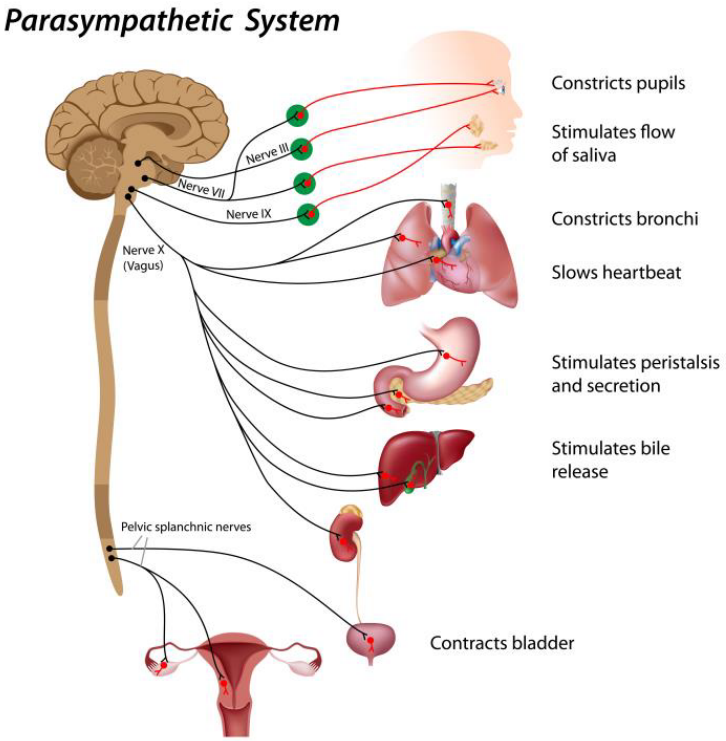
Parasympathetic Nervous System #1

- Blocking the parasympathetic nervous system is like stimulating the sympathetic nervous system
- Acetylcholine (Ach) is the neurotransmitter of the parasympathetic branch of the autonomic nervous system



Parasympathetic Nervous System #2

- Muscarinic receptors: stimulate smooth muscle
- Nicotinic receptors: stimulate skeletal muscle
- Cholinergic blocking drugs are selective and target just one of the types of receptors



Cholinergic Blocking Drugs—Actions

- Block/inhibit the action of acetylcholine (ACh) in the parasympathetic nervous system
- Cholinergic blocking drugs are selective and target just one of the types of receptors
- Can affect many organs and structures of the body if they are nonselective
- Example: scopolamine

Cholinergic Blocking Drugs—Uses

- Maintenance treatment of asthma or COPD
- Ureteral or biliary colic and bladder overactivity
- Pylorospasm and peptic ulcer
- Vagal nerve–induced bradycardia
- Preoperative reduction of oral secretions

Pharmacology in Practice Exercise #1

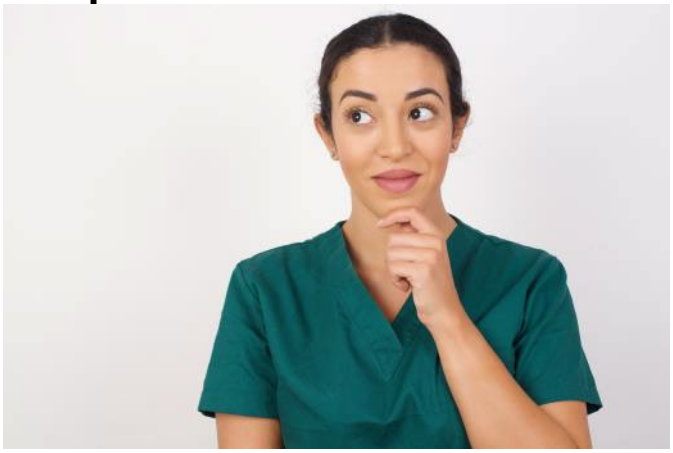
- Oxybutynin, used for the treatment of overactive bladder, exerts its effect by inhibiting the action of which of the following receptors?

  a) Nicotinic receptors

  b) Alpha-adrenergic (α-adrenergic) receptors

  c) Muscarinic receptors

  d) Beta-adrenergic (β-adrenergic) receptors



Cholinergic Blocking Drugs—Adverse Reactions #1

- Gastrointestinal System Reactions:
  - Dry mouth
  - Nausea, vomiting
  - Difficulty swallowing
  - Heartburn
  - Constipation

Cholinergic Blocking Drugs—Adverse Reactions #2

- Central Nervous System Reactions:
  - Headache, flushing, nervousness
  - Drowsiness, weakness, insomnia
  - Nasal congestion
  - Fever

Cholinergic Blocking Drugs—Adverse Reactions #3

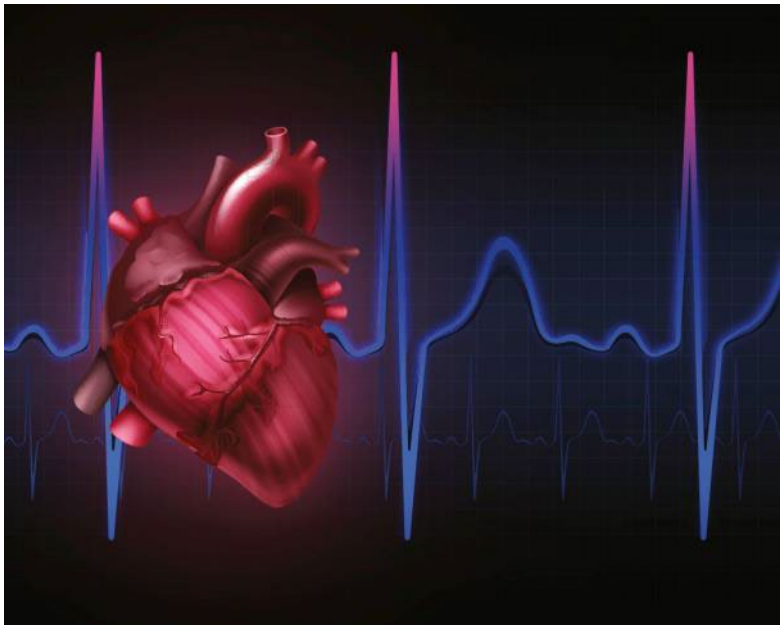
- Visual Reactions:
  - Blurred vision
  - Mydriasis
  - Photophobia
  - Cycloplegia
  - Increased ocular tension

Cholinergic Blocking Drugs—Adverse Reactions #4

- Genitourinary System Reactions:
  - Urinary hesitancy
  - Urinary retention
  - Dysuria

Cholinergic Blocking Drugs—Adverse Reactions #5

- Cardiovascular System Reactions:
  - Palpitations
  - Bradycardia (low doses of atropine)
  - Tachycardia (high doses of atropine)



Cholinergic Blocking Drugs—Adverse Reactions #6

- Other Reactions:
  - Urticaria
  - Decreased sweat production
  - Anaphylactic shock
  - Rash

Cholinergic Blocking Drugs—Contraindications

- Contraindicated in clients with:
  - known hypersensitivity to the drugs
  - glaucoma
  - myasthenia gravis
  - tachyarrhythmia
  - myocardial infarction
  - heart failure (unless bradycardia is present)

Cholinergic Blocking Drugs—Precautions

- Use cautiously in clients with:
  - GI infection
  - Benign prostatic hypertrophy
  - Urinary retention
  - Hyperthyroidism
  - Hepatic or renal disease
  - Hypertension
  - Asthma
  - pregnancy (pregnancy category C) or lactation
  - use cautiously in clients over 65 years old

Cholinergic Blocking Drugs—Interactions

Interacting Drug	Common Use	Effect of Interaction
Antibiotics/ Antifungals	Anti-infective agents	Decreased effectiveness of anti-infective drug
Meperidine, flurazepam, phenothiazines	Preoperative sedation	Increased effect of the cholinergic blocker
Tricyclic antidepressants	Management of depression	Increased effect of the cholinergic blocker
Haloperidol	Antianxiety/ antipsychotic agent	Decreased effectiveness of the antipsychotic drug
Digoxin	Management of cardiac problems	Increased serum levels of digoxin

Pharmacology in Practice Exercise #2

- A client who was prescribed a cholinergic blocking drug is concerned about drug interactions. The client informs the nurse that he is taking the antidepressant Wellbutrin? What antidepressant drug class interacts with cholinergic blockers?

  a) Selective serotonin reuptake inhibitors

  b) Serotonin-norepinephrine reuptake inhibitors

  c) Tricyclics

  d) Monoamine oxidase inhibitor

Nursing Process—Client Receiving a Cholinergic Blocking Drug #1

- **Preadministration Assessment**
- Prior to administration for surgical purposes or ulcer management
- **Objective** Data
  - Vital signs
  - Description of signs such as occult blood in stool for peptic ulcer, visual acuity for glaucoma
  - Measure for weight loss or dehydration

Nursing Process—Client Receiving a Cholinergic Blocking Drug #2

- **Preadministration Assessment (continued)**
- Prior to administration for surgical purposes or ulcer management
- **Subjective** Data
  - History of general health and wellness
  - Pain experience: onset, type, radiation, location, intensity, and duration
  - Client's description of symptoms of the current disorder
  - Remedies attempted before seeking care

Nursing Process—Client Receiving a Cholinergic Blocking Drug #3

- **Ongoing Assessment**
  - Check vital signs; observe for adverse drug reactions; evaluate the symptoms and complaints related to the client's diagnosis
  - Compare ongoing assessment to baseline assessment
  - Document and report any increase in severity of symptoms to primary health care provider immediately

Nursing Process—Client Receiving a Cholinergic Blocking Drug #4

- **Nursing Diagnosis**
  - Impaired Comfort related to xerostomia
  - Constipation related to slowing of peristalsis in GI tract
  - Injury Risk related to dizziness, drowsiness, mental confusion, impaired vision, or heat prostration
  - Ineffective Tissue Perfusion related to impaired heart pumping action

Nursing Process—Client Receiving a Cholinergic Blocking Drug #5

Planning

- Expected client outcomes depend on the reason for administration of the cholinergic blocking drug but may include:
  - Optimal response to therapy
  - Management of adverse drug reactions
  - Confidence in an understanding of the prescribed medication regimen

Nursing Process—Client Receiving a Cholinergic Blocking Drug #6

- **Implementation**
  - Promoting Optimal Response to Therapy
  - Client receiving a preoperative drug:
    - Give at exact time prescribed
    - Instruct the client to void before the drug is given
    - Inform the client that drowsiness and dry mouth will occur within 20 to 30 minutes, that this is normal, and that fluid is not to be taken
    - Instruct the client to remain in bed after administration of preoperative drug; raise side rails

Nursing Process—Client Receiving a Cholinergic Blocking Drug #7

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Impaired Comfort: Xerostomia**
      - Encourage client to take a few sips of water before and while taking an oral drug and to sip water at intervals during meals
      - Encourage client to suck on sugarless hard candy if allowed
      - Check oral cavity daily for soreness or ulcerations

Nursing Process—Client Receiving a Cholinergic Blocking Drug #8

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Constipation**
      - Urge client to increase fluid intake up to 2000 mL daily; eat a diet high in fiber; obtain adequate exercise
      - Reassure client that increasing fluids will minimize adverse reaction
      - Primary health care provider may prescribe a stool softener, if necessary, to prevent constipation

Nursing Process—Client Receiving a Cholinergic Blocking Drug #9

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Injury Risk**
      - Drugs may cause drowsiness, dizziness, blurred vision, photophobia; monitor the client for any disturbance in vision
      - Instruct client to wear sunglasses when going outside even on cloudy days for photophobia; provide semi-dark/dimly lit room

Nursing Process—Client Receiving a Cholinergic Blocking Drug #10

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Injury Risk (continued)**
      - Elderly client should be observed at frequent intervals for excitement; agitation; mental confusion; drowsiness; urinary retention
      - Client should be taught to call for assistance to prevent injury when ambulation is required
      - Mydriasis and cycloplegia may develop; screen time should be limited to reduce the strain on the eyes

Nursing Process—Client Receiving a Cholinergic Blocking Drug #11

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Injury Risk (continued)**
      - Elderly clients are especially at risk for decreased sweating and heat prostration and should be observed frequently for signs of overheating
      - Teach client to avoid going outside on hot, sunny days; use fans to cool the body; sponge the skin with cool water; wear loose-fitting clothing in warm weather
      - Hold dose of drug if heat prostration is suspected

Nursing Process—Client Receiving a Cholinergic Blocking Drug #12

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Ineffective Tissue Perfusion**
      - For the client receiving atropine for third-degree heart block, monitor for change in pulse rate or rhythm; place on cardiac monitor
      - Failure of drug to increase the heart rate must be reported to the primary health care provider immediately

Pharmacology in Practice Exercise #3

- Which of the following interventions should the nurse perform when caring for a client receiving a cholinergic blocking drug and who is experiencing constipation?

  a) Place items against walls to ensure clear path to bathroom

  b) Engage in handwork activities

  c) Monitor food intake to be sure the client is easting fiber-rich foods

  d) Monitor for a change in pulse rate or rhythm

Nursing Process—Client Receiving a Cholinergic Blocking Drug #13

- **Implementation—Educating the** Client and Family
  - Emphasize the importance of uninterrupted drug therapy, even if symptoms have been relieved
  - Teach the client and family about the common adverse reactions and measures to lessen the intensity of adverse reactions
  - Encourage client to discuss adverse reactions with primary health care provider

Nursing Process—Client Receiving a Cholinergic Blocking Drug #14

- **Evaluation**
  - Was the therapeutic effect achieved?
  - Were adverse reactions: identified, reported, and managed?
    - Mucous membranes remain moist
    - Client reports adequate bowel movements
    - No evidence of injury
    - Tissue perfusion is maintained
  - Did client and family express confidence and demonstrate understanding of drug regimen?

Turn and Talk—Case Study #1

- A 74-year-old client presents to the clinic complaining of symptoms of overactive bladder. The physician writes a prescription for tolterodine (Detrol LA) 4 mg every day.

1. What adverse reactions should be included in the nurse's teaching plan for this client?
2. What specific adverse reactions of a cholinergic blocking drug should the nurse monitor for in this client due to them being 74 years old?

Turn and Talk—Case Study #2

- A 74-year-old client presents to the clinic complaining of symptoms of overactive bladder. The physician writes a prescription for tolterodine (Detrol LA) 4 mg every day.

3. A few weeks later the client calls the physician's office complaining of dry mouth symptoms. What should the nurse recommend to the client to reduce the dry mouth discomfort?