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When you have to be right

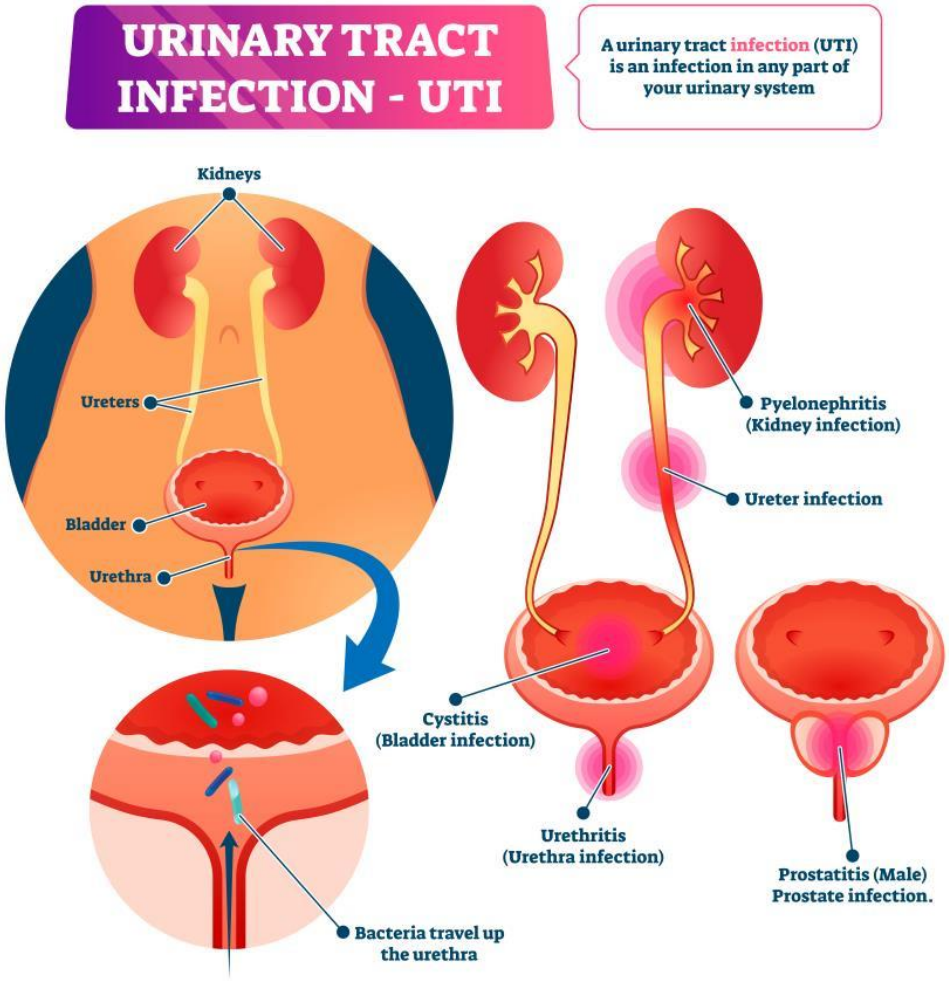
Introduction to Clinical Pharmacology

Chapter 46
Urinary Tract Anti-Infectives and Other Urinary Drugs

Learning Objectives

1. Explain the uses, general drug actions, adverse reactions, contraindications, precautions, and interactions of the drugs used to treat infections and symptoms associated with urinary tract infections.
2. Distinguish important preadministration and ongoing assessment activities the nurse should perform with the client taking a drug for a urinary tract infection.
3. List nursing diagnoses particular to a client taking a drug for a urinary tract infection.
4. Examine ways to promote an optimal response to therapy, how to manage adverse reactions, and important points to keep in mind when educating clients about the use of drugs to treat urinary tract infections.

Urinary Tract Infections



Urinary Tract Infections Signs and Symptoms

- Signs and Symptoms of UTI (bladder):

- Urgency
- Frequency
- Pressure
- Burning pain during urination
- Pain caused by spasm in the region of the bladder and suprapubic area
- In a chronic infection, the urethra, prostate, and kidney can also be affected

Urinary Anti-Infectives—Actions and Uses

- UTIs are the most common infection in the long-term care setting; caused by pathogenic microorganisms in one or more structures of the urinary system
- The overuse of anti-infectives has created resistance to antibacterial medications
- Action: anti-infectives used to treat UTIs have a rapid excretion rate and have a high concentration in the urine; interfere with bacterial multiplication in the urine
    - Nitrofurantoin—bacteriostatic (slows the multiplication of bacteria) and bactericidal (destroys bacteria) depending on the concentration of the drug in the urine
    - Phenazopyridine—topical analgesic effect on lining of urinary tract

Urinary Anti-Infectives—Adverse Reactions #1

- Most Common Adverse Reactions—Gastrointestinal System:
  - Anorexia
  - Nausea
  - Vomiting
  - Diarrhea
  - Abdominal pain
  - Stomatitis

Urinary Anti-Infectives—Adverse Reactions #2

- Other General Adverse Reactions:
  - Drowsiness
  - Dizziness
  - Headache
  - Blurred vision
  - Weakness
  - Peripheral neuropathy

Urinary Anti-Infectives—Adverse Reactions #3

- Other General Adverse Reactions (continued):
  - Burning with urination and bladder irritation
  - Acute and chronic pulmonary reactions (nitrofurantoin)
  - Discoloration of urine (phenazopyridine)

Urinary Anti-Infectives—Contraindications

- Contraindicated in clients with:
  - known hypersensitivity to the drugs
  - pregnancy (pregnancy category C)
  - lactation

Urinary Anti-Infectives—Precautions

- Use cautiously in clients with:
  - pregnancy (pregnancy category B) (nitrofurantoin)
  - renal or hepatic impairment
  - allergy to tartrazine (methenamine)
  - gout
  - cerebral arteriosclerosis, diabetes, or a glucose-6-phosphate dehydrogenase (G6PD) deficiency

Pharmacology in Practice Exercise

A nurse receives an order to begin methenamine drug therapy. For which of the following client conditions is the use of this drug contraindicated?

a) Cerebral arteriosclerosis

b) Asthma

c) Allergy to tartrazine

d) Chronic gout

Urinary Anti-Infectives—Interactions

Interacting Drug	Common Use	Effect of Interaction
Sulfamethoxazole		
Oral anticoagulants	Prevent blood clots	Increased risk of bleeding
Nitrofurantoin		
Magnesium trisilicate or magaldrate	Relieve gastric upset	Decreased absorption of anti-infective
Anticholinergics	Relieve bladder spasm/discomfort	Delay in gastric emptying, thereby increasing absorption of nitrofurantoin

Urinary Anti-Infectives—Interactions (continued)

Interacting Drug	Common Use	Effect of Interaction
Fosfomycin		
Metoclopramide	Relieve gastric upset	Lowers plasma concentration and urinary tract excretion of fosfomycin

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #1

- **Preadministration Assessment**
- **Objective** Data
  - Description of signs of the infection (i.e., redness or distention of bladder)
  - Description of urine (i.e., color, odor, concentration or lack of clarity
  - Vital signs
  - Dipstick testing for infection, blood, or protein
  - Residual urine measurement
  - Lab tests: Renal and hepatic function tests, CBC, urinalysis

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #2

- **Preadministration Assessment (continued)**
- **Subjective** Data
  - Current symptoms of the infection (i.e., complaints of frequency, itching, pain)
  - Confusion in the elderly
  - Allergy history/drug allergies

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #3

- **Ongoing Assessment**
  - Monitor vital signs every 4 hours or as ordered by the primary healthcare provider
  - Specifically monitor for rise in body temperature
  - Monitor client's response to therapy daily
  - Monitor client for reduction in symptoms identified in preadministration assessment
  - Periodic urinalysis and urine culture and sensitivity tests

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #4

- **Nursing Diagnosis**
  - Increased Urinary Frequency related to discomfort of urinary tract infection
  - Altered Breathing Pattern related to adverse reaction to drug

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #5

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

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #6

- **Implementation**
  - Promoting Optimal Response to Therapy
    - Give urinary tract anti-infectives with food to prevent GI upset especially nitrofurantoin
    - Administer fosfomycin immediately after dissolving it in water
    - Administer pentosan after meals to prevent GI upset
    - Instruct clients to only use phenazopyridine for a maximum of 2 days if taking with and antibacterial drug to treat a UTI

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #7

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Increased Urinary Frequency**
      - Encourage client to drink at least 2000 mL of fluid daily to dilute urine and decrease pain on voiding
      - Offer fluids, preferably water, at hourly intervals especially in older clients
      - Monitor fluid intake and urine output
      - Contact the provider if urinary output is low

Pharmacology in Practice Exercise #1

A nurse is caring for an older client receiving an anti-infective for the treatment of urinary problems. The client refuses to increase fluid intake, fearful of incontinence. What intervention should the nurse plan for the care of the client?

a) Increase the client's intake of fluids forcefully

b) Stop administering the drug and call the primary healthcare provider

c) Develop a schedule to offer the client fluids

d) Administer the drug to the client with warm water

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #8

- **Implementation**
  - Monitoring and Managing Client Needs
    - **Altered Breathing Pattern**
      - Monitor for signs and symptoms of acute pulmonary reaction:
        - Dyspnea, chest pain, cough, fever, chills
      - If signs of pulmonary reaction occur, withhold dose and contact the provider
      - Monitor for signs of chronic pulmonary reaction if client is on prolonged therapy
        - Nonproductive cough or malaise

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #9

- **Implementation—Educating th**e Client and Family
- **Anti-infectives:**
  - Explain the importance of taking the drug at prescribed time intervals and as directed and to complete the entire course of therapy
  - Explain the possible adverse effects and necessary interventions required
  - Emphasize the importance of avoiding alcoholic beverages and nonprescription drugs

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #10

- **Implementation—Educating the** Client and Family
- **Anti-infectives (continued)**
  - Explain the importance of taking nitrofurantoin and nalidixic acid with food or milk
  - Explain the importance of avoiding excessive intake of citrus products, milk, and milk products when taking methenamine

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #11

- **Implementation—Educating the** Client and Family
- **Anti-infectives (continued)**
  - Emphasize the importance of taking fosfomycin immediately after mixing and along with food
  - Inform the client that phenazopyridine must be taken after meals and may cause a reddish-orange discoloration of urine and tears; may stain clothing or contact lenses

Pharmacology in Practice Exercise #2

A nurse advises clients taking phenazopyridine that their urine may become discolored and stain clothing. Which of the following colors might it become?

a) Orange

b) Blue

c) Purple

d) Green

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #12

- **Implementation—Educating the** Client and Family
- **Preventing and Treating UTIs—Teach the Client:**
  - About UTIs and causes of UTIs
  - How, when, why, and how long to take the prescribed medication
  - How to wipe after urinating to avoid UTIs
  - Preventative measures: showers, loose-fitting clothing, voiding after sex, proper feminine hygiene during menstruation

Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #13

- **Implementation—Educating the** Client and Family
- **Preventing and Treating UTIs—Teach the Client (continued):**
  - To increase fluid intake and avoid drinking fluids or eating foods that irritate the bladder (i.e., coffee, tea, alcohol)
  - To consider using vitamin C supplements and cranberry juice to maintain acidity of urine

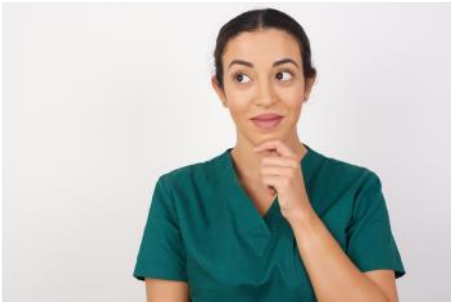
Nursing Process—Client Receiving a Urinary Tract Anti-Infective or Other Urinary Tract Drug #14

- **Evaluation**
  - Was the therapeutic effect achieved and bladder symptoms relieved?
  - Were adverse reactions: identified, reported, and managed?
    - Urinary elimination occurs without incident
    - Adequate breathing pattern is maintained
  - Did client and family express confidence and demonstrate understanding of drug regimen?

Turn and Talk—Case Study #1

A client presents to the physician's office with complaints of dysuria, oliguria, and increased frequency of voiding. After examining the client and interpreting the urinalysis, the physician diagnoses the client with a urinary tract infection. The physician gives the client a prescription for nitrofurantoin (Macrobid) 50 mg for 7 days.

1. Before leaving the office, what adverse reactions should the nurse discuss with the client?
2. What nonpharmacologic measures should the nurse discuss with the client?



Turn and Talk—Case Study #2

A client presents to the physician's office with complaints of dysuria, oliguria, and increased frequency of voiding. After examining the client and interpreting the urinalysis, the physician diagnoses the client with a urinary tract infection. The physician gives the client a prescription for nitrofurantoin (Macrobid) 50 mg for 7 days.

3. The client asks the nurse about the use of cranberry juice to treat the urinary tract infection, having heard from a friend that cranberry juice was good for urinary tract infections. What should the nurse say?