11.1: Chapter 1

Answer Key to Chapter 1 Critical Thinking Activities

You can review additional information regarding these answers in the corresponding section in which the Critical Thinking activities appear.

Critical Thinking Activity Section 1.5a

The biotransformations that take place in the liver are performed by the liver enzymes. Therefore, if the liver is damaged, metabolism and excretion are impacted, resulting in the need for lower dosages to avoid toxicity.

Critical Thinking Activity Section 1.6a

Kidney function is important because drugs and metabolites in the bloodstream are often filtered by the kidney. In the kidney tubules, a portion of the drug undergoes reabsorption back into the bloodstream, and the remainder is excreted in the urine.

Critical Thinking Activity Section 1.7a

Before administering a Beta-1 antagonist such as atenolol, the nurse should assess the patient’s apical pulse and blood pressure to confirm they are within normal range. Atenolol causes a negative inotropic effect by weakening the contraction of the heart and thus, decreases the patient’s blood pressure. It also causes a negative chronotropic effect and decreases the patient’s heart rate.

Critical Thinking Activities Section 1.9

1. Nursing considerations when administering pain medication include efficacy, dose-response based on the dosage
selected, onset, peak, duration, and half-life of the drug. The patient has physical therapy scheduled at 0900, so the nurse should administer acetaminophen now to relieve the pain and evaluate the effectiveness in 60 minutes. The nurse should also plan on reassessing the patient’s pain and potentially administering a second dose of acetaminophen just prior to the physical therapy appointment because the half-life of acetaminophen is two to three hours. Additionally, acetaminophen has a 24-hour dose restriction, so the nurse should calculate how many total milligrams the patient has received over the past 24 hours prior to administering the medication.

2.Insulin is a high-alert medication due to severe side effects that can occur if administered incorrectly. The nurse should check the patient’s blood sugar reading and consider withholding the medication if the patient continues to refuse food over the next few hours to avoid causing hypoglycemia. The provider may also need to be notified of the patient’s change in condition and a change in the medication order may be required.

Critical Thinking Activity Section 1.10

The normal lab values of gentamicin are 5 to 10 mcg/mL (or 10.45 to 20.90 micromol/L), so 30 mcg/ml is too high. This abnormal result could indicate the patient has renal impairment affecting metabolism and excretion of this medication. The doctor and pharmacist should be notified to adjust the next dose of gentamicin before it is administered.

Section 1.12 Lightbulb Moment

1.The nurse should select the rectal route due to the patient’s difficulty swallowing to reduce the risk of aspiration.

2.The initial dose is less than the standard recommended dose based on the Mr. Johnson’s age and the likelihood that his kidney functioning is decreased. Decreased kidney function affects the metabolism and excretion of gentamycin and could result in toxicities if the dose is too high.

3.Sara should wait to administer the medication until the patient’s trough level is drawn. The trough level is required for the provider and the pharmacist to determine if the medication is within the range of the therapeutic window and to avoid the risk of toxicity to the patient.

4.Sam should evaluate the patient’s vital signs, specifically the apical pulse and blood pressure, to be sure they are within normal range for this patient and the parameters prescribed by the provider. Atenolol has negative inotropic, chronotropic, and dromotropic effects. The negative inotropic effect weakens the contraction of the heart and lowers blood pressure. The negative chronotropic effect decreases the heart rate, and a negative dromotropic effect slows the conduction of the electrical charge in the heart. Understanding the effects of this Beta-1 antagonist medication allows Sam to anticipate expected actions of the medication and the patient’s response.

5.Amiodarone is metabolized by the enzymes in the intestines to its active form. Grapefruit juice contains compounds that slow down this process and affect the levels of this medication in the blood. The nurse should educate Julia about this interaction and encourage other beverage choices in the future that do not cause this interaction.

6.The nurse anticipates that hydrocodone/acetaminophen will peak in approximately 1 hour. The patient will likely require another dose of medication for acute, severe pain that accompanies a knee replacement in approximately 4 hours.