Chapter 02: Pharmacological Principles
Lilley: Pharmacology for Canadian Health Care Practice, 3rd Canadian Edition

MULTIPLE CHOICE

1. A patient is receiving two different drugs, which, at their current dose forms and dosages, are both absorbed into the circulation in identical amounts. Which term best denotes that the drugs have the same absorption rates?
   a. Equivalent
   b. Synergistic
   c. Compatible
   d. Bioequivalent

   ANS: D
   Two drugs absorbed into the circulation at the same amount (in specific dosage forms) have the same bioavailability; thus, they are bioequivalent. "Equivalent" is incorrect because the term "bioavailability" is used to express the extent of drug absorption. "Synergistic" is incorrect because this term refers to two drugs given together whose resulting effect is greater than the sum of the effects of each drug given alone. "Compatible" is incorrect because this term is a general term used to indicate that two substances do not have a chemical reaction when mixed (or given, in the case of drugs) together.

   DIF: Cognitive Level: Comprehension REF: p. 26

2. A patient is receiving medication via intravenous injection. Which information should the nurse provide for patient education?
   a. The medication will cause fewer adverse effects when given intravenously.
   b. The medication will be absorbed slowly into the tissues over time.
   c. The medication's action will begin faster when given intravenously.
   d. Most of the drug is inactivated by the liver before it reaches the target area.

   ANS: C
   Intravenous injections are the fastest route of absorption. The intravenous route does not affect the number of adverse effects, the intravenous route is not a slow route of absorption, and the intravenous route does not cause inactivation of the drug by the liver before it reaches the target area.

   DIF: Cognitive Level: Comprehension REF: p. 32

3. Which is *true* regarding parenteral drugs?
   a. They bypass the first-pass effect.
   b. They decrease blood flow to the stomach.
   c. They are altered by the presence of food in the stomach.
   d. They exert their effects while circulating in the bloodstream.

   ANS: A

Drugs given by the parenteral route bypass the first-pass effect, but they still must be absorbed into cells and tissues before they can exert their effects. Enteral drugs (drugs taken orally), not parenteral drugs, decrease blood flow to the stomach and are altered by the presence of food in the stomach. Parenteral drugs must be absorbed into cells and tissues from the circulation before they can exert their effects; they do not exert their effects while circulating in the bloodstream.

DIF: Cognitive Level: Analysis REF: p. 32

4. A drug's half-life is best defined as
   a. The time it takes for the drug to elicit half its therapeutic response.
   b. The time it takes one-half of the original amount of a drug to reach the target cells.
   c. The time it takes one-half of the original amount of a drug to be removed from the body.
   d. The time it takes one-half of the original amount of a drug to be absorbed into the circulation.

   ANS: C
   A drug's half-life is the time it takes for one-half of the original amount of a drug to be removed from the body. It is a measure of the rate at which drugs are removed from the body. Answers A, B, and D are not correct definitions of a drug's half-life.

   DIF: Cognitive Level: Comprehension REF: p. 36

5. The term "duration of action" is best defined as
   a. The time it takes for the drug to elicit a therapeutic response.
   b. The time it takes a drug to reach its maximum therapeutic response.
   c. The length of time it takes to remove a drug from circulation.
   d. The time during which drug concentration is sufficient to elicit a therapeutic response.

   ANS: D
   Duration of action is the time during which drug concentration is sufficient to elicit a therapeutic response. The time it takes for a drug to elicit a therapeutic response is the drug's "onset of action." The time it takes a drug to reach its maximum therapeutic response is a drug's "peak effect." "The length of time it takes to remove a drug from circulation" defines a drug's elimination and does not correctly define a drug's duration of action.

   DIF: Cognitive Level: Comprehension REF: p. 37

6. A drug interacts with enzymes by
   a. altering cell membrane permeability.
   b. "fooling" a receptor on the cell wall.
   c. enhancing the drug's effectiveness within the cells.
   d. "fooling" the enzyme into binding with it instead of its normal target cell.

   ANS: D

When drugs interact with enzymes, they inhibit the action of a specific enzyme by "fooling" the enzyme into binding to it instead of to its normal target cell. Thus, the target cells are protected from the action of the enzymes to result in a drug effect. The alteration of cell membrane permeability, the "fooling" of a receptor on the cell wall, and the enhancement of the effectiveness of drugs within cells do not occur with selective enzyme interactions.

DIF: Cognitive Level: Comprehension REF: p. 39

7. When administering a new medication to a patient, the nurse reads that it is highly protein bound. Which consequence will result from this protein binding?
   a. Renal excretion will take longer.
   b. The drug will be metabolized quickly.
   c. The duration of action of the medication will be longer.
   d. The duration of action of the medication will be shorter.

   ANS: C
   Drugs that are bound to plasma proteins are characterized by a longer duration of action. Protein binding does not make renal excretion longer and does not increase metabolism of the drug. Protein binding of a drug means that the duration of action is longer, not shorter.

   DIF: Cognitive Level: Application REF: p. 33

8. When monitoring a patient on an insulin drip to reduce blood glucose levels, the nurse notes that the patient's glucose level is extremely low, and the patient is lethargic and difficult to awaken. Which adverse drug reaction is the nurse observing?
   a. An adverse effect
   b. An allergic reaction
   c. An idiosyncratic reaction
   d. A pharmacological reaction

   ANS: D
   A pharmacological reaction is an extension of the drug's normal effects in the body. In this case, the insulin lowered the patient's blood glucose levels too much. An adverse effect is a predictable, well-known adverse drug reaction that results in minor or no changes in patient management. An allergic reaction (also known as a *hypersensitivity reaction*) involves the patient's immune system. An idiosyncratic reaction is unexpected and is defined as a genetically determined abnormal response to normal dosages of a drug.

   DIF: Cognitive Level: Comprehension REF: p. 42

9. A patient is experiencing chest pain and needs to take a sublingual form of nitroglycerin. Where should the nurse tell the patient to place the tablet?
   a. Under the tongue
   b. In the space between the cheek and gum
   c. At the back of the throat, for easy swallowing
   d. On a non-hairy area on the chest

   ANS: A

Drugs taken by the sublingual route are placed under the tongue. Placing the tablet in the space between the cheek and gum is done for the buccal route; placing the tablet at the back of the throat (for easy swallowing) is done in the oral route; and placing the tablet on a non-hairy area on the chest is done in the topical or transdermal route.

DIF: Cognitive Level: Comprehension REF: p. 28

10. The nurse is administering medications to a patient who is in liver failure due to end-stage cirrhosis. The nurse is aware that patients with liver failure are most likely to have problems with which pharmacokinetic phase?
    a. Absorption
    b. Distribution
    c. Metabolism
    d. Excretion

    ANS: C
    The liver is the organ that is most responsible for drug metabolism. Decreased liver function will most affect a drug's metabolism. The absorption of a drug is not affected by liver function, and distribution is not affected by liver function. Excretion is affected only because decreased liver function may not transform drugs into water-soluble substances for elimination via the kidneys, but this is not the best answer to this question.

    DIF: Cognitive Level: Application REF: p. 34