# *Abrams' Clinical Drug Therapy - Rationales for Nursing Practice 13th edition Frandsen Solutions Manual*

SKU: 9781975222321-SOLUTIONS

# Suggested Answers to Assignments, Chapter 2, Basic Concepts and Processes

| Written Assignments | Learning Objective(s) |
|---|---|
| 1. Students' answers should include the following:<br>• Drugs must reach and interact with or cross the cell membrane to stimulate or inhibit cellular function. Most drugs are given to affect body cells that are distant from the sites of administration, causing systemic effects. To move through the body and reach their sites of action, metabolism, and excretion, drug molecules must cross numerous cell membranes. | 1 |
| 2. Students' answers should include the following:<br>• Routes for absorption—oral, topical, intravenous, subcutaneous, intramuscular<br>• Distribution via the bloodstream<br>• Sites of metabolism—kidney and liver are primary<br>• Sites of excretion—kidneys and gastrointestinal tract | 2 |
| 3. Students' answers should include the following:<br>Like the physiologic substances that normally regulate cell functions, most drugs exert their effects by chemically binding with receptors at the cellular level. Most receptors are proteins located on the surfaces of cell membranes or within cells. Specific receptors include the following:<br>• Enzymes involved in essential metabolic or regulatory processes<br>• Proteins involved in transport<br>• Structural processes<br>• Nucleic acids involved in cellular protein synthesis, reproduction, and other metabolic activities | 5 |
| 4. Students' answers should include the following:<br>• Adverse drug effects in the cardiovascular system include abnormal heart rate and rhythm, abnormal blood pressure—either too high or too low.<br>• Adverse drug effects in the respiratory system include bronchospasm.<br>• Adverse drug effects in the central nervous system include nervousness, tremor, and decreased level of consciousness.<br>• Adverse drug effects in the gastrointestinal system include GI upset, | 9 |



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| Written Assignments | Learning Objective(s) |
|---|---|
| nausea, vomiting, and diarrhea.<br>• Adverse drug effects in the integumentary system include urticaria and pruritus. | |

| Group Assignments | Learning Objective(s) |
|---|---|
| 1. Students' answers should include the following:<br>• **Pharmacokinetics** involves drug movement through the body to reach sites of action, metabolism, and excretion. Specific processes are absorption, distribution, metabolism, and excretion.<br>○ **Absorption:** process that occurs from the time a drug enters the body to the time it enters the bloodstream to be circulated.<br>○ **Distribution:** transport of drug molecules within the body; after a drug is injected or absorbed into the bloodstream, it is carried by the blood and tissue fluids to its sites of action, metabolism, and excretion.<br>○ Metabolism, or **biotransformation**, is the method by which drugs are inactivated or biotransformed by the body.<br>○ **Excretion:** elimination of a drug from the body; effective excretion requires adequate functioning of the circulatory system and of the organs of excretion (kidneys, bowel, lungs, and skin).<br>• Intravenous routes are typically quickest due to pharmacokinetic absorption, and distribution time is decreased compared to by mouth/gastrointestinal route. | 2 |
| 2. Students' answers should include the following:<br>• A **serum drug level** is a laboratory measurement of the amount of a drug in the blood at a particular time. It reflects dosage, absorption, bioavailability, half-life, and the rates of metabolism and excretion.<br>• In clinical practice, measuring serum drug levels is useful in several circumstances.<br>○ When drugs with a narrow margin of safety are given, because their therapeutic doses are close to their toxic doses (e.g., digoxin, aminoglycoside antibiotics, lithium)<br>○ To document the serum drug levels associated with particular drug dosages, therapeutic effects, or possible adverse effects | 4 |

| Group Assignments | Learning Objective(s) |
|---|---|
| ○ To monitor unexpected responses to a drug dose such as decreased therapeutic effects or increased adverse effects<br>○ When a drug overdose is suspected | |
| 3. Students' answers should include the following:<br>• Drug-related variables that affect drug action include dosage, route of administration, and drug–diet and drug–drug interactions.<br>• Patient-related variables that affect drug action include age, body weight, genetic and ethnic characteristics, sex, preexisting conditions, and psychological factors. | 8 |

| Clinical Assignments | Learning Objective(s) |
|---|---|
| 1. Students' answers should include the following:<br>• **Agonists** are drugs that produce effects similar to those produced by naturally occurring hormones, neurotransmitters, and other substances. Agonists enhance each medication on the list.<br>• **Antagonists** are drugs that inhibit cell function by occupying receptor sites. Antagonists inhibit each medication on the list. | 6 |
| 2. Students' answers should include the following:<br>• Medications with opposing actions or synergistic actions should be highlighted that include the following:<br>• Interactions that can increase the therapeutic or adverse effects of drugs include the following:<br>○ Additive effects, which occur when two drugs with similar pharmacologic actions are taken<br>○ Synergism, which occurs when two drugs with different sites or mechanisms of action produce greater effects when taken together<br>○ Interference by one drug with the metabolism of a second drug, which may result in intensified effects of the second drug<br>○ Displacement (i.e., a drug with a strong attraction to protein-binding sites may displace a less tightly bound drug) of one drug from plasma protein-binding sites by a second drug, which increases the effects of the displaced drug. This increase occurs because the displaced drug, freed from its bound form, becomes | 7 |

| Clinical Assignments | Learning Objective(s) |
|---|---|
| pharmacologically active. The overall effect is the same as taking a larger dose of the displaced drug.<br>• Interactions in which drug effects are decreased include the following:<br>  ○ An **antidote** drug, which can be given to relieve, prevent, or counteract the toxic effects of another drug<br>  ○ Decreased intestinal absorption of oral drugs, which occurs when drugs combine to produce nonabsorbable compounds<br>  ○ Activation of drug-metabolizing enzymes in the liver, which increases the metabolism rate of any drug metabolized mainly by that group of enzymes and therefore decreases the drug's effects | |

| Web Assignments | Learning Objective(s) |
|---|---|
| 1. Students' answers should include the following:<br>• Induce vomiting, charcoal administration, and airway/breathing/circulation supportive measures | 10 |
| 2. Students' answers should include the following:<br>• Antidote is given to antagonize the toxic effect of another drug. | 11 |

# Suggested Answers to Discussion Topics, Chapter 2, Basic Concepts and Processes

| Suggested Answers to Discussion Topics | Learning Objective(s) |
|---|---|
| 1a. Students' answers should include the following:<br>• Cardiovascular disorders may decrease blood flow to sites of administration or metabolism.<br>• Gastrointestinal disorders may interfere with absorption of medication.<br>• Hepatic and kidney disorders may interfere with metabolism.<br>• Thyroid disorder can interfere with metabolism.<br>1b. Students' answers should include the following:<br>• Additive effects<br>• Synergism<br>• Interference<br>• Displacement | 3, 6, 7, 8, 9 |
| 2a. Students' answers should include the following:<br>• The drug may not be completely absorbed.<br>• How is the drug metabolized? The liver has the potential of not being able to clear the medication from the body due to the patient's drinking.<br>• The patient's nutritional state should be assessed; the rate of drug metabolism is reduced in a malnourished patient.<br>2b. Students' answers should include the following:<br>• The patient may need more medication.<br>• Look for a medication with a synergistic effect.<br>• Change the route of the medication. | 2, 6 |
| 3a. Students' answers should include the following:<br>• Potentially high level of medication: Check the serum level.<br>• The half-life of the medication.<br>• The patient is an older adult. | 8, 11 |

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| Suggested Answers to Discussion Topics | Learning Objective(s) |
|---|---|
| • Consider the possibility of inaccurate dosing by the patient especially in confused patients.<br>• Assess liver and kidney function.<br>3b. Students' answers should include the following:<br>• Rapid assessment of vital signs and level of consciousness<br>• Support the airway<br>• Administration of an antidote if available<br>• Electrocardiogram<br>• An intravenous line<br>• CPR, if needed | |

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