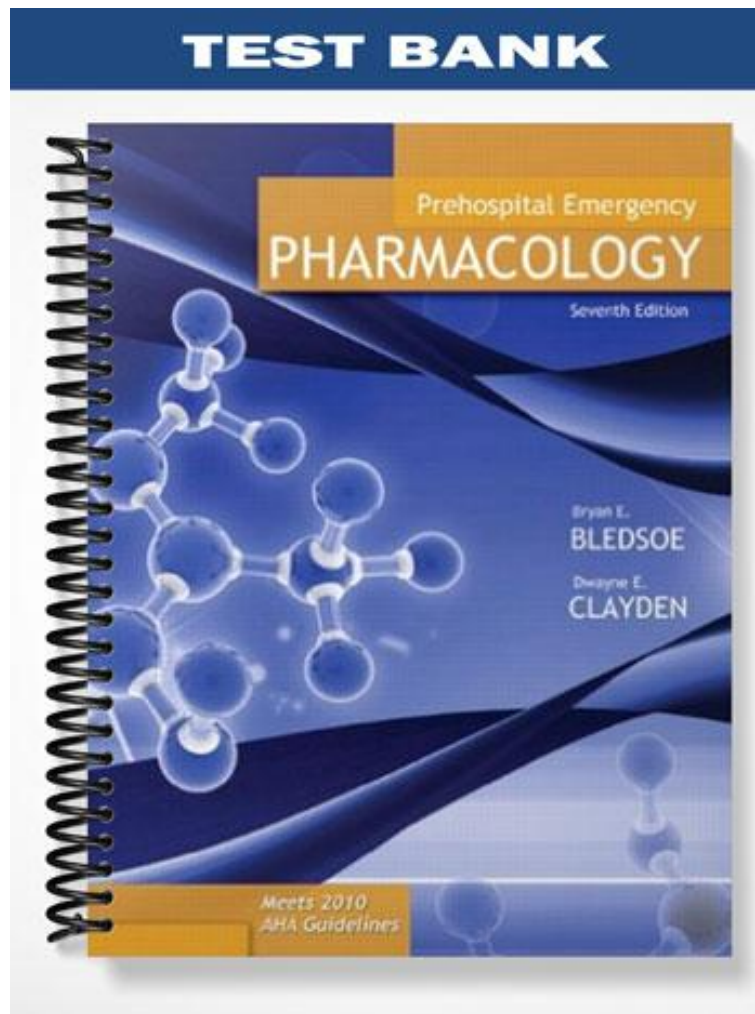


TEST BANK



Prehospital Emergency

PHARMACOLOGY

Seventh Edition

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Meets 2010
AHA Guidelines

Chapter 2**Commented [IP1]:** This chapter has 20 questions

1. Two major divisions of pharmacology are:
 - a. Pharmacokinetics and pharmacodynamics
 - b. Pharmacognosy and biotransformation
 - c. Active transport and diffusion
 - d. Biotransformation and elimination

Answer: ~~Aa~~

Rationale: a. ~~pharmacokinetics-Pharmacokinetics~~ and pharmacodynamics are the ~~2-two~~ major divisions of pharmacology.

b. ~~pharmacognosy-Pharmacognosy~~ refers to the broad study of natural and synthetic drugs and biotransformation is a function of pharmacokinetics.

c. ~~active-Active~~ transport and diffusion explain how a ~~drug-medication~~ moves.

d. ~~biotransformation-Biotransformation~~ and elimination is a function of pharmacokinetics.

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2. Which of the following factors is ~~not-NOT~~ a component of pharmacokinetics?
 - a. Absorption
 - b. Distribution
 - c. Biotransformation
 - d. Binding

Answer: d

Rationale: a. ~~explains-Explains~~ the movement of a ~~drug-medication~~ into the system.

b. ~~distribution-Distribution~~ is how the ~~drug-medication~~ travels to target tissues or organs.

c. ~~biotransformation-Biotransformation~~ is how a ~~drug-medication~~ is broken down in the system.

d. ~~binding-Binding~~ is a component of pharmacodynamics.

Commented [IP2]: Change to medication?**Commented [IP3]:** medication**Commented [IP4]:** medication

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3. ~~Drug~~ A requires the use of adenosine triphosphate (ATP) in order to move into the cellular membrane. -This type of diffusion is known as:
- Elimination
 - Active transport
 - Facilitated
 - Osmosis

Answer: b

Rationale: a. ~~elimination~~-Elimination is the removal of a drug from the body.
b. ~~active~~-Active transport involves the use of energy, such as ATP to move a substance through a membrane that otherwise would not be able to penetrate.
c. ~~facilitated~~-Facilitated diffusion requires the use of a helper protein (such as insulin with glucose) to cause a change in the cellular membrane allowing entry of the substance.
d. ~~osmosis~~-Osmosis is a passive process involving the movement of water.

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4. Glucose in the bloodstream is a large molecule that cannot readily enter a cell unless it binds with insulin. -This ~~best~~-BEST describes:
- Osmosis
 - Diffusion
 - Carrier-mediated diffusion
 - Absorption

Answer: c

Rationale: a. ~~osmosis~~-Osmosis involves the movement of solvent, normally water.
b. ~~diffusion~~-Diffusion is a general term related to the movement of substances and involves both active and passive forms, of which carrier-mediated diffusion is included.
c. ~~carrier~~-Carrier-mediated diffusion most correctly explains the process described.
d. ~~absorption~~-Absorption encompasses a medications progress from its pharmaceutical dosage form to a biologically available substance that can then pass through or across tissues.

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5. The term _____ describes the movement of molecules across a membrane down a pressure gradient from an area of higher pressure to an area of lower pressure normally resulting from hydrostatic forces.
- Filtration
 - Carrier-mediated diffusion
 - Active transport
 - Osmosis

Answer: a

Rationale: a. ~~filtration~~ Filtration is correct.

b. ~~carrier~~ Carrier-mediated diffusion occurs when a protein is involved in binding and causing change in membrane shape to allow diffusion.

c. ~~active~~ Active transport involves the use of energy to cause diffusion.

d. ~~osmosis~~ Osmosis is the movement of water from an area of low solute concentration to an area of high solute concentration.

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6. _____ describes the movement of a medication from the site of application into the body and into the extracellular compartment.
- Diffusion
 - Osmosis
 - Absorption
 - Elimination

Answer: c

Rationale: a. ~~diffusion~~ Diffusion is the movement of a substance across a membrane.

b. ~~osmosis~~ Osmosis is the movement of water from an area of low solute concentration to an area of high solute concentration.

c. ~~absorption~~ Absorption encompasses a medication's progress from its pharmaceutical dosage form to a biologically available substance that can then pass through or across tissues.

d. ~~elimination~~-Elimination refers to removal of a substance from the body.

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7. A medication that is acidic in nature when ingested orally will:
- Bypass the stomach and be absorbed slowly in the small intestine
 - Be neutralized quickly upon entering the stomach
 - Not enter the bloodstream, but will be eliminated in the gastrointestinal tract
 - Be rapidly absorbed across the stomach membrane

Answer: d

Rationale: a. ~~acidic~~-Acidic medications, such as ~~Aspirin~~aspirin, tend to be rapidly absorbed in the stomach because of the acidic environment. -The small intestine environment is alkaline and will neutralize excessive hydrogen ions.

Commented [IP6]: generic name should be lowercase.

b. ~~see~~-See rationale for a.

c. ~~see~~-See rationale for a.

d. ~~correct~~-Correct-~~answer~~.

Commented [IP7]: delete word answer to be consistent

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8. Which of the following forms of absorption is generally the slowest due to the decreased vascular supply?
- Subcutaneous
 - Intramuscular
 - Intravenous
 - Subllingual

Answer: a

Rationale: a. ~~the~~-The subcutaneous layer of the skin is composed of dense fatty tissue that has poor vascular supply and slow absorption of medications.

b. ~~museles~~-Muscles generally have very good blood supply promoting absorption.

Commented [IP8]: delete hyphen?

- c. ~~intravenous~~ Intravenous injection provides the most rapid (and common) route of absorption.
- d. ~~the~~ The sublingual area is highly vascular resulting in rapid absorption.

Commented [IP9]: hyphen?

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9. _____ ~~best~~ BEST describes the process in which a medication is transported from the site of absorption to the site of action.
- Active transport
 - Diffusion
 - Distribution
 - Elimination

Answer: c

- Rationale: a. ~~active~~ Active transport involves the movement of a substance across the cellular membrane utilizing an energy source.
- b. ~~diffusion~~ Diffusion describes movement across the cellular membrane and can be an active or passive process.
- c. ~~distribution~~ Distribution is the process whereby a medication is transported from the site of absorption to the site of action.
- d. ~~elimination~~ Elimination is removal of a substance from the body.

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10. You are treating a patient who suffers from renal disease and decreased perfusion of the kidneys. -What effect will this have on the distribution of a drug that normally acts on kidneys, such as the diuretic medication Lasix?
- The drug will be present in increased concentrations at the kidneys resulting in toxicity.
 - The drug will be poorly delivered to the kidneys due to a decreased perfusion and will not produce the desired results.
 - As the kidneys are a primary organ of elimination, the effects of the drug will be unchanged.

- d. The drug will most likely be metabolized by the liver resulting in the same effects systemically.

Answer: b

Rationale: a. ~~decreased~~ **Decreased** renal blood flow results in poor delivery of the medication to the kidney.

b. ~~correct~~ **Correct**.

c. ~~the~~ **The** decreased blood flow to the kidney will prevent the drug from producing the desired results.

d. ~~if~~ **If** a drug is meant for a specific organ of tissue, it must reach the site in order to be effective.

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11. While researching the ~~drug~~ **Amiodarone** ~~amiodarone~~, you read that the drug is considered to be highly protein bound upon entering the body. ~~Knowing this, you can deduce that:~~

- The drug is largely ineffective when administered by intravenous route
- The drug's half-life will be relatively short due to the rapid elimination of the free, or unbound, percentage
- Much of the drug remains active in the bloodstream and only a small percentage is bound in tissues
- The drug remains bound to proteins but will slowly release the active component when necessary resulting in a long half-life

Answer: d

Rationale: a. ~~when~~ **When** administered in therapeutic dosages, intravenous routes provides the most rapid, effective dose.

b. ~~the~~ **The** drug will have a long ~~half~~ **half**-life as the bound component will slowly release as the free or unbound active component is metabolized.

c. ~~when~~ **When** the drug is highly protein bound, much of the drug will be stored in protein reservoirs. ~~Only a small amount remains in the bloodstream as an active metabolite.~~

Commented [IP10]: use of word drug, instead of medication throughout question **ok**.

Commented [IP11]: generic name lowercase

d. ~~correct~~Correct.

~~page~~Page 31

12. The blood-brain barrier is a preventive barrier that prevents ~~most~~MOST _____ medications from reaching the brain.

- a. Lipid-soluble
- b. Water-soluble
- c. Non-ionized, unbound
- d. Barbiturate

Answer: b

Rationale: a. ~~lipid~~Lipid-soluble medications readily pass the blood-brain barrier.

b. ~~water~~Water-soluble medications cannot permeate the blood-brain barrier.

c. ~~a~~A non-ionized, unbound medication can pass the blood-brain barrier.

d. ~~a~~A barbiturate is an example of a non-ionized, unbound drug.

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13. The process by which a ~~drug~~medication passing through the liver may be partially or completely inactivate many medications is known as:

- a. First-pass effect
- b. ~~Proe~~drug effect
- c. Protein reservoir binding
- d. Plasma binding effect

Answer: a

Rationale: a. ~~correct~~Correct.

b. ~~a~~A ~~pro~~drug is an inactive pre-cursor of a drug prior to conversion to an active metabolite.

c. ~~protein~~Protein reservoir binding occurs when a portion of a drug is bound to proteins but may be released for us at a later time.

d. ~~plasma~~Plasma binding occurs with proteins as described above in answer c.

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Commented [IP13]: hyphen? Correct as is

Commented [IP14]: hyphen?

Commented [IP15]: hyphen

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14. A medication's half-life refers to the:

- a. Concentration of a drug
- b. Dose required to be therapeutic
- c. Time required for the total dose of a medication to be decreased by one-half
- d. Removal of a medication from the body

Answer: c

Rationale: a. ~~concentration~~ Concentration refers to the amount of drug available.

b. ~~the~~ The therapeutic index is the difference between minimal therapeutic dose and toxic level of dose.

c. ~~correct~~ Correct.

d. ~~this~~ This defines the process of elimination.

Commented [IP16]: change to medication? no

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15. The _____ is the length of time that a medication concentration is sufficient in the blood to produce a therapeutic response.

- a. Half-life
- b. Duration of action
- c. Efficacy
- d. Affinity

Answer: b

Rationale: a. ~~half~~ Half-life is the time required for one-half of the dose of a medication to be removed from the body.

b. ~~correct~~ Correct.

c. ~~efficacy~~ Efficacy is the ability of a drug to produce the expected response.

d. ~~affinity~~ Affinity is the force of attraction between a drug and its receptor site.

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16. Which of the following is the ~~most~~MOST common way that medications exert their actions?

- a. Receptor site binding.
- b. Changing the physical properties of a cell.
- c. Chemically combining with another chemical.
- d. Altering the normal metabolic pathway.

Answer: a

Rationale: a. ~~correct~~Correct.

b. ~~while~~While all answers listed are ways in which a drug may exert its actions, receptor site binding is the most common.

c. ~~while~~While all answers listed are ways in which a drug may exert its actions, receptor site binding is the most common.

d. ~~while~~While all answers listed are ways in which a drug may exert its actions, receptor site binding is the most common.

Commented [IP17]: Same sentence

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17. A medication such as nalbuphine binds with a specific receptor site causing an expected effect, but blocks another medication from triggering the receptor. -This is known as a/an:

- a. Agonist
- b. Antagonist
- c. Agonist-antagonist
- d. Beta blocker

Answer: c

Rationale: a. ~~an~~An agonist binds to a specific receptor causing a desired response.

b. ~~an~~An antagonist blocks a receptor site, but does not produce the expected result.

c. ~~correct~~Correct.

d. ~~a~~A beta blocker is an example of an antagonistic effect.

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18. _____ is the relative amount of a medication required to produce a desired response.
- Antagonism
 - Efficacy
 - Therapeutic threshold
 - Potency

Answer: d

Rationale: a. ~~an~~ An antagonism produces a blocking effect at a receptor site.
b. ~~efficacy~~ Efficacy is the power of a medication to produce a therapeutic effect.
c. ~~therapeutic~~ Therapeutic threshold is the minimum concentration of a medication required to cause a desired response.
d. ~~correct~~ Correct.

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19. If a drug exceeds its therapeutic index, the drug will:
- Cause the desired response
 - Be toxic to the patient
 - Not have any effect on the patient
 - Be present in the minimal level and may not cause the desired response

Answer: b

Rationale: a. ~~for~~ For a drug to cause a desired response, it must remain within the therapeutic index.
b. ~~the~~ The difference between the minimum effective concentration and the toxic level is the therapeutic index.
c. ~~if~~ If a drug exceeds the therapeutic index, it will be toxic to the patient.
d. ~~the~~ The minimal dose required is known as the minimum effective concentration.

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20. Which of the following statements is ~~true~~ TRUE regarding medication administration to the children and elderly?
- a. ~~Liver and kidney functions in both populations is~~ Liver and kidney functions in both populations are altered leaving both susceptible to altered medication responses.
 - b. Doses need to be significantly higher in both populations to produce the desired effect due to decreased liver functions.
 - c. Both populations should be treated the same as all patients as the therapeutic index does not change.
 - d. Pediatric patients have well- developed livers, while elderly patients suffer from decreased liver function.

Answer: a

Rationale: a. ~~correct~~ Correct.

- b. ~~doses~~ Doses need to be altered accordingly to the appropriate population being treated.
- c. ~~while~~ While the therapeutic index may the change, the patient's ability to metabolize or excrete the medication will affect how much drug may be available.
- d. ~~the~~ The infant population does not have well| developed renal and hepatic function.

Commented [IP18]: Hyphen? yes