

TEST BANK

TEST BANK for Drugs and Behavior 7th Edition

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Chapter 1 Some Basic Pharmacology

CHAPTER SUMMARY

- Drugs can have four different kinds of names: a chemical name, a generic name, at least one trade name, and usually many street names.
- Doses of a drug are usually described in terms of concentration (i.e., mg of drug/kg body weight).
- Dose–response curves (DRCs) are graph curves that show changes in the effect of a drug that are produced by changes in the dose.
- The ED₅₀ (median effective dose) is the dose of a drug that either has a particular effect in 50 percent of the subjects to whom it is given or produces in an individual an effect equivalent to 50 percent of the maximum effect that the drug will have at any dose. The LD₅₀ (median lethal dose) is the dose of a drug that will be lethal to 50 percent of the subjects.
- The safety of a drug can be described by the TI (therapeutic index), which is the LD₅₀ divided by the ED₅₀.
- When comparing two drugs that have the same effect, the drug with the lower ED₅₀ is the more potent. The drug with the greater maximum effect is the more effective.
- All drugs have a number of effects. The effect that the drug is being consumed for is the main or primary effect, and all others are side effects.
- If one drug shifts the DRC of a second drug to the right, the drugs are said to be antagonistic. If the DRC is shifted to the left, the effects are additive. Potentiation or a superadditive effect occurs if the effects of a drug mixture are greater than what might be expected if the effects were simply added together.
- Pharmacokinetics is the study of how drugs move into, around, and out of the body.
- Parenteral administration involves injecting a drug through the skin, using a syringe and a hollow needle. Parenteral injections may be subcutaneous, intramuscular, intraperitoneal, or intravenous. Drugs may also be injected directly into veins through a permanently implanted catheter or into the central nervous system through a permanently implanted cannula.
- Drugs are absorbed from parenteral sites by diffusing into the blood through pores in the walls of capillaries.

- Drugs in the form of gases and/or smoke may be inhaled into the lungs and enter the blood. Drugs that are inhaled reach the brain more quickly than drugs taken by any other route.
- Drugs taken orally must pass through the stomach before they can be absorbed from the small intestine.
- Molecules of drugs that are ionized (i.e., have an electric charge) are not lipid soluble and are absorbed poorly from the digestive system. The rate of absorption of a drug can be altered by changing the pH of the digestive system because this can alter the percentage of ionized molecules.
- The pKa of a drug is the pH at which the molecules of a drug are 50 percent ionized.
- Drugs that are not lipid soluble have difficulty passing through membranes and get into the brain slowly because of the blood–brain barrier. Highly lipid-soluble drugs are sometimes absorbed rapidly into body fat and are released slowly.
- In transdermal administration, drugs are absorbed directly through the skin.
- Factors that affect the distribution of drugs in the body are lipid solubility, the blood–brain barrier, protein binding, and the presence of active and passive transport mechanisms.
- In the kidney, most of the fluid in the blood is released into one end of the nephron. As the fluid passes through, water and nutrients are reabsorbed. Ionized drugs and many drug metabolites are not reabsorbed. They pass through the length of the nephron and are excreted in the urine.
- The liver, the body’s chemical factory, uses the process of metabolism to change drug molecules into metabolites, which may then be eliminated by the kidneys. The liver controls metabolism using enzymes, which act as catalysts to speed up certain chemical reactions.
- First-pass metabolism refers to the metabolism of a drug in the digestive system or liver before it gets into general circulation.
- Enzymes can be stimulated by repeated use of a drug or by other drugs, or they can be depressed by age, other drugs, and some foods.
- Half-life is the time taken for the body to get rid of half of a circulating drug.
- The therapeutic window refers to the range of blood levels of a drug between the lowest therapeutically effective blood level and a level that causes undesirable side effects.

Multiple Choices

1-1. Which of the following drug names can be patented?

- A. trade names.
- B. chemical names.
- C. generic names.
- D. nonproprietary names.
- E. street names.

Bloom’s Taxonomy: Know

1-2. Which type of drug name is also known as the proprietary name?

- A. trade name.
- B. chemical name.
- C. generic name.
- D. the formulation .
- E. street name.

Bloom's Taxonomy: Know

1-3. The drug name "2-3'-dichloro-methphantasticant" is most likely a

- A. trade name.
- B. chemical name.
- C. generic name.
- D. proprietary name.
- E. street name.

Bloom's Taxonomy: Know

1-4. Strictly speaking, the trade name of a drug refers to

- A. the active ingredient in a pill.
- B. the formulation.
- C. the excipients.
- D. the drug company.
- E. the medical classification.

Bloom's Taxonomy: Understand

1-5. When a drug name such as SKF 10,047 is used, the letters refer to

- A. the type of condition the drug is used for.
- B. the chemical formula of the active ingredient.
- C. the government classification of the drug.
- D. the name of the drug company.
- E. none of the above.

Bloom's Taxonomy: Know

1-6. The term "formulation" refers to

- A. the trade name of a medication.
- B. the active ingredient in a medication.
- C. the dose that is recommended.
- D. the combination of excipients and active ingredients in a medication.
- E. the side effects of a medication.

Bloom's Taxonomy: Know

1-7. The effect of a drug is directly related to

- A. the concentration of the drug at its site of action.
- B. the dose of the drug.
- C. the number of pills consumed.

- D. the size of the tablet.
- E. the concentration of the vehicle.

Bloom's Taxonomy: Know

- 1-8. Because the effect of a drug often depends on the concentration at its site of action, drugs are often administered in terms of
- A. mg of drug.
 - B. mg of drug /kg body weight.
 - C. the specific gravity of the drug.
 - D. the molecular weight of the drug.
 - E. the concentration in the vehicle.

Bloom's Taxonomy: Know

- 1-9. The dose scale on a dose response curve is usually in
- A. log units.
 - B. exponents of dose.
 - C. whole numbers.
 - D. multiples of 10.
 - E. percentages of dose.

Bloom's Taxonomy: Know

- 1-10. When dosage comparisons are made between humans and smaller animals like rats and mice
- A. it is not necessary to give higher doses to the rats and mice in terms of mg/Kg.
 - B. it is necessary to give lower doses to the rats and mice in terms of mg/Kg.
 - C. the same dose can be used if it is in terms of mg/Kg.
 - D. smaller animals generally metabolize drugs faster than larger animals.
 - E. smaller animals generally metabolize drugs more slowly than larger animals.

Bloom's Taxonomy: Understand

- 1-11. Dose response curves are often plotted on a log scale because
- A. log scales are least sensitive.
 - B. many physiological effects show up as a straight line when plotted on a log scale.
 - C. it permits greater precision at the high end of the dosage range.
 - D. it permits greater precision at the low end of the dosage range.
 - E. both B. and D.

Bloom's Taxonomy: Know

- 1-12. The generic name is also known as the
- A. proprietary name.
 - B. nonproprietary name .
 - C. chemical name.
 - D. formulation.
 - E. proper name.

Bloom's Taxonomy: Know

1-13. Which of the following is an excipient?

- A. filler.
- B. coloring agent.
- C. binding agent.
- D. coating.
- E. all of the above.

Bloom's Taxonomy: Know

1-14. Drug doses are usually reported in terms of

- A. weight.
- B. volume.
- C. concentration.
- D. density.
- E. mg.

Bloom's Taxonomy: Know

1-15. The ED50 is the

- A. the median lethal dose.
- B. the median effective dose.
- C. the mean lethal dose.
- D. the mean effective dose.
- E. the dose used to treat erectile dysfunction in men over 50.

Bloom's Taxonomy: Know

1-16. The LD1 of a drug is

- A. the dose that will kill 99 percent of subjects.
- B. the dose that will kill 1 percent of subjects.
- C. the dose that will be effective in 99 percent of subjects.
- D. the dose that will be effective in 1 percent of subjects.
- E. none of the above. LD1 is the generic name of a nerve gas.

Bloom's Taxonomy: Know

1-17. If the ED50 of a drug is 36 mg/Kg and the LD50 is 360 mg/Kg, the TI is:

- A. 0.1
- B. 1.0
- C. 10.0
- D. 100.0
- E. none of the above. The TI cannot be determined from these numbers.

Bloom's Taxonomy: Understand

1-18. When comparing the TI of two drugs

- A. the drug with the lower TI is safer.
- B. the drug with the higher TI is safer.
- C. the drug with the lower TI is the most therapeutically useful.

- D. the drug with the higher TI is the least therapeutically useful.
- E. the dose with the higher TI is more potent.

Bloom's Taxonomy: Apply

- 1-19. The dose that kills 50% of the individuals tested is called
- A. the lethal dose.
 - B. the median effective dose.
 - C. the mean lethal dose.
 - D. the median lethal dose.
 - E. the TI.

Bloom's Taxonomy: Know

- 1-20. Drug A and Drug B both suppress appetite to the same extent, but Drug A has an ED50 of 115 mg/kg and Drug B has an ED50 of 50 mg/kg. Therefore,
- A. Drug A is more potent than Drug B.
 - B. Drug A is more effective than Drug B.
 - C. Drug A is less potent than Drug B.
 - D. Drug A is less effective than Drug B.
 - E. There is not enough information to answer this question.

Bloom's Taxonomy: Apply

- 1-21. Drug A and Drug B are both appetite suppressants, but Drug A will cause rats to reduce food consumption by 50% at its most effective dose and Drug B will cause rats to reduce food consumption by 30% at its most effective dose. The ED50 of Drug A and B is the same. Therefore,
- A. Drug A is more potent than Drug B.
 - B. Drug A is more effective than Drug B.
 - C. Drug A is less potent than Drug B.
 - D. Drug A is less effective than Drug B.
 - E. There is not enough information to answer this question.

Bloom's Taxonomy: Apply

- 1-22. A side effect of a drug is an effect that
- A. occurs at the lowest dose.
 - B. a drug is taken for.
 - C. is not wanted.
 - D. causes harm.
 - E. occurs at doses higher than those that cause the main effect.

Bloom's Taxonomy: Know

- 1-23. Antagonism is demonstrated when the effect of one drug is to
- A. change the effectiveness of another drug.
 - B. make another drug more potent.
 - C. reduce the time course of another drug.
 - D. lower the DRC of another drug.

E. shift the DRC of another drug to the right.

Bloom's Taxonomy: Understand

1-24. Which of the following is not a type of drug interaction?

- A. additive effect.
- B. superadditive effect.
- C. antagonism.
- D. super antagonism.
- E. potentiation.

Bloom's Taxonomy: Know

1-25. If the DRC of one drug is shifted to the left by another drug then this indicates

- A. a negative interaction.
- B. a superadditive effect.
- C. an additive effect.
- D. antagonism.
- E. either B. or C.

Bloom's Taxonomy: Know

1-26. If the DRC of one drug is shifted to the right by another drug then this indicates

- A. a negative interaction.
- B. a superadditive effect.
- C. an additive effect.
- D. antagonism.
- E. either B. or C.

Bloom's Taxonomy: Understand

1-27. If you take an aspirin to reduce a fever, which of the following is (are) side effect(s)?

- A. a decrease in blood clotting time.
- B. decreased inflammation.
- C. pain reduction.
- D. none of A., B., and C.
- E. all of A., B., and C.

Bloom's Taxonomy: Know

1-28. Drugs affect the operation of the body

- A. at all tissues that they come in contact with.
- B. by altering the functioning of all organs.
- C. only at specific places called "sites of action."
- D. only at the place where they are administered.
- E. only if administered directly at the site of action.

Bloom's Taxonomy: Know

1-29. Which of the following is a parenteral route of administration?

- A. transdermal.

- B. inhalation.
- C. oral.
- D. subcutaneous.
- E. none of the above.

Bloom's Taxonomy: Know

1-30. The movement of drugs into, around, and out of the body is called

- A. pharmacokinetics.
- B. absorption.
- C. distribution.
- D. excretion.
- E. elimination.

Bloom's Taxonomy: Know

1-31. A vehicle is

- A. what a drug is dissolved in before it can be injected.
- B. the container used to transport a drug.
- C. a container used to store an unstable drug.
- D. a term used to refer to a syringe and needle.
- E. a transport mechanism across a membrane.

Bloom's Taxonomy: Know

1-32. The high concentration of drug at the site of administration is called

- A. a bolus.
- B. a concentration bubble.
- C. a diffusion gradient.
- D. the SOA (source of absorption).
- E. the PMC (point of maximum concentration).

Bloom's Taxonomy: Know

1-33. A subcutaneous injection of a drug is sometimes known as

- A. skinning.
- B. skin popping.
- C. S.C.
- D. a sub-q injection.
- E. all of B., C., and D.

Bloom's Taxonomy: Know

1-34. I.P. injections are more commonly used in

- A. pigeons.
- B. humans.
- C. monkeys.
- D. rats and mice.
- E. none of the above. I.P. injections are no longer commonly used in any species.

Bloom's Taxonomy: Know

- 1-35. Intrathecal and intraventricular administration of a drug are sometimes used to
- A. inject the drug directly into the blood.
 - B. anesthetize an animal.
 - C. treat rabies.
 - D. produce very fast results.
 - E. isolate the site of action of a drug to the CNS.

Bloom's Taxonomy: Understand

- 1-36. Which type of drug is sometimes given as a depot injection?
- A. antidepressant.
 - B. antipsychotic.
 - C. antibacterial.
 - D. hallucinogen.
 - E. nicotine.

Bloom's Taxonomy: Know

- 1-37. A capillary is
- A. a very fine needle used to inject drugs directly into the ventricles.
 - B. another name for a depot injection.
 - C. a tiny blood vessel.
 - D. another name for a suppository.
 - E. only found in the brain.

Bloom's Taxonomy: Know

- 1-38. Drugs administered by inhalation
- A. are not as potent as when they are administered by I.V.
 - B. can never be eliminated in the breath.
 - C. must be volatile gases.
 - D. are delivered to the brain more rapidly than drugs administered by I.V.
 - E. have a longer duration of action than when administered by I.V.

Bloom's Taxonomy: Understand

- 1-39. One reason why gasses are used as general anesthetics is because
- A. they are easily tolerated.
 - B. they tend not to be concentrated in the liver.
 - C. there is significant first pass metabolism of gasses.
 - D. their blood levels are easy to control because they can be exhaled.
 - E. they are the only substances that can cause anesthesia.

Bloom's Taxonomy: Apply

- 1-40. What happens to drugs that are administered intranasally?
- A. they are absorbed through the mucous membranes of the nasal cavity.
 - B. they are inhaled into the lungs and absorbed from there.
 - C. they run down the throat into the stomach.

- D. none of the above.
- E. all of A., B., and C.

Bloom's Taxonomy: Know

- 1-41. When most substances burn in air, a gas is created which blocks the ability of the blood to carry oxygen. This gas is
- A. carbon monoxide.
 - B. carbon dioxide.
 - C. THC.
 - D. dioxin.
 - E. complex hydrocarbons.

Bloom's Taxonomy: Know

- 1-42. The rate at which a drug is absorbed from the digestive system is influenced by which of the following?
- A. pH of the drug.
 - B. pH of the contents of the digestive system.
 - C. food in the stomach.
 - D. none of A., B., and C.
 - E. all of A., B., and C.

Bloom's Taxonomy: Understand

- 1-43. The olive oil partition coefficient is
- A. a measure of pH.
 - B. a measure of pKa.
 - C. a measure of lipid solubility.
 - D. a measure of bioavailability.
 - E. none of the above.

Bloom's Taxonomy: Know

- 1-44. Ion trapping occurs when
- A. the Enterprise's core drive is phase modulated.
 - B. acids and bases become trapped at the side of the membrane that is basic and acidic, respectively.
 - C. the neuron's membrane potential returns to its resting state following an action potential.
 - D. ions become bound to blood proteins.
 - E. none of the above.

Bloom's Taxonomy: Understand

- 1-45. The pKa of a drug is
- A. the pH at which it becomes lipid soluble.
 - B. the pH at which it dissolves in water.
 - C. the pH at which it can pass through a membrane.
 - D. the pH at which half of its molecules are ionized.

E. the pH at which it which it will dissolve in oil.

Bloom's Taxonomy: Know

- 1-46. Because caffeine is a base, we might expect that it would be slowly absorbed from the acidic environment of the digestive system. This is not the case because
- A. caffeine has a pKa lower than the pH of the digestive system.
 - B. caffeine has a pKa higher than the pH of the digestive system.
 - C. caffeine is neither a base nor an acid and does not ionize.
 - D. because of the structure of caffeine, even ionized molecules are lipid soluble.
 - E. none of the above.

Bloom's Taxonomy: Apply

- 1-47. If a drug is 50% ionized in the digestive system, what percent of its molecules will be absorbed, given enough time?
- A. nearly 0%
 - B. 25%
 - C. 50%
 - D. 75%
 - E. almost 100%

Bloom's Taxonomy: Understand

- 1-48. Drugs that are weak acids
- A. tend to become concentrated on the acidic side of a membrane.
 - B. tend to become concentrated on the basic side of a membrane.
 - C. can sometimes dissolve a membrane.
 - D. cannot cross the blood-brain barrier.
 - E. are never well absorbed from the digestive system.

Bloom's Taxonomy: Understand

- 1-49. Special cells that wrap themselves around capillaries in the brain and block the pores make up the
- A. blood-brain barrier.
 - B. the great brain barrier.
 - C. the keratin layer.
 - D. Bowman's Capsule.
 - E. passive transport layer.

Bloom's Taxonomy: Know

- 1-50. Which of the following drugs is readily absorbed transdermally?
- A. caffeine.
 - B. morphine.
 - C. aspirin.
 - D. nicotine.
 - E. endital.

Bloom's Taxonomy: Know

- 1-51. Active transport mechanisms are different from passive transport mechanisms because they
- A. use energy.
 - B. can concentrate molecules against diffusion.
 - C. are located only in the brain.
 - D. are located only in the kidney.
 - E. both A. and B.

Bloom's Taxonomy: Know

- 1-52. Which of the following statements about the placenta is true?
- A. the placenta is the intermediary organ between the fetus and the wall of the uterus.
 - B. the placenta offers significant protection of the fetus by blocking drugs in the mother's blood from entering the blood of the fetus.
 - C. the placenta metabolizes waste products created by the metabolism of the fetus.
 - D. all of the above are true.
 - E. none of the above are true.

Bloom's Taxonomy: Know

- 1-53. Nephrons work by
- A. filtering impurities out of the blood.
 - B. filtering everything out of the blood and reabsorbing what is required by the body.
 - C. metabolizing impurities and toxins.
 - D. changing the structure of drugs and making them less lipid soluble.
 - E. none of the above. Nephrons are found in the brain.

Bloom's Taxonomy: Know

- 1-54. You can increase the ability of the kidneys to excrete barbiturates (weak acids) by
- A. giving a drug that makes the urine more acidic.
 - B. giving a drug that makes the urine more basic.
 - C. giving a drug that makes the blood more acidic.
 - D. giving a drug that makes the blood more acidic.
 - E. none of the above. You cannot change the ability of the kidneys to excrete any drug.

Bloom's Taxonomy: Apply

- 1-55. Metabolism that takes place before a drug is fully absorbed and distributed around the body is called
- A. initial metabolic disposition.
 - B. initial metabolic activity.
 - C. preabsorptive enzymatic activity.
 - D. first pass metabolism.
 - E. none of the above.

Bloom's Taxonomy: Know

- 1-56. Half-life is a measure of

- A. lipid solubility.
- B. tolerance.
- C. metabolic tolerance.
- D. the rate of excretion.
- E. enzyme induction.

Bloom's Taxonomy: Know

1-57. Which of the following routes of administration produces the highest peak blood level of a drug?

- A. I.P.
- B. I.M.
- C. I.V.
- D. S.C.
- E. P.O.

Bloom's Taxonomy: Know

1- 58. Medicines should be given in such a way that the concentration in the blood stays in a range between a level that is too low to be effective and a level so high it will have toxic effects. This range is called the

- A. therapeutic window.
- B. therapeutic index.
- C. median effective dose.
- D. medicinal zone.
- E. therapeutic range.

Bloom's Taxonomy: Understand

1-59. Which of the following drugs is excreted in a way that cannot be described in terms of half-life?

- A. morphine.
- B. barbiturates.
- C. alcohol.
- D. nicotine.
- E. none of the above. All drugs have a half-life.

Bloom's Taxonomy: Know

1-60. Which of the following blocks the enzyme alcohol dehydrogenase?

- A. barbiturate.
- B. alcohol.
- C. nicotine.
- D. disulfiram (Antabuse).
- E. none of the above.

Bloom's Taxonomy: Know

1-61. Cytochrome P4503A4 is a (an)

- A. receptor blocker.
- B. metabolite of alcohol.

- C. inhibitor of enzymes.
- D. enzyme.
- E. ingredient in St. John's wort.

Bloom's Taxonomy: Know

1-62. Which of the following foods can block the metabolism of some drugs, including certain antidepressants and cholesterol-lowering drugs?

- A. egg whites.
- B. aged cheese.
- C. grapefruit.
- D. bananas.
- E. chocolate.

Bloom's Taxonomy: Know

1-63. St. John's wort can stimulate the enzyme that destroys which of the following drugs?

- A. oral contraceptives.
- B. the immunosuppressant cyclosporine.
- C. the tranquilizer alprazolam.
- D. none of A., B., or C.
- E. all of A., B., and C.

Bloom's Taxonomy: Know

1-64. Which of the following can alter the rate of metabolism of some drugs?

- A. age.
- B. species.
- C. use of other drugs.
- D. none of A., B., and C.
- E. all of A., B., and C.

Bloom's Taxonomy: Know

Short Answers

1. Describe three factors that can alter the rate of drug metabolism.

Bloom's Taxonomy: Understand

2. Describe first-pass metabolism and provide two examples of compounds that might change the rate of first-pass metabolism.

Bloom's Taxonomy: Understand

3. Explain Therapeutic Index (TI), use LD50 and ED50 to describe the importance of TI.

Bloom's Taxonomy: Understand

4. Explain why administration of gaseous anesthetics hardly ever leads to an overdose. Compare gases to inhalation of smoke, what is the difference?

Bloom's Taxonomy: Understand

5. A researcher will give rats a dose of 50 mg/kg of a certain drug, however a physician administering the same drug to a human patient will prescribe 5mg/kg. Explain why there is a difference in the dosage?

Bloom's Taxonomy: Apply

6. Imagine that you were a nicotine molecule, follow the route of nicotine from the tobacco to the brain.

Bloom's Taxonomy: Apply

7. If you were to design an experiment in which you had to manipulate the activity of area specific region in the central nervous system, which administration route would you choose? Explain.

Bloom's Taxonomy: Apply

8. If a person suffering from an overdose of heroin is given an antagonistic drug, describe what happens to the ED50 and LD50 of heroin in the dose response curve?

Bloom's Taxonomy: Apply

9. Why does a patient with an overdose of barbiturates benefit from drugs that turn urine more basic?

Bloom's Taxonomy: Apply

10. Why is it important to know ED50 and LD50?

Bloom's Taxonomy: Analyze

11. Explain why it is not safe to take alcohol and sleeping pills at the same time?

Bloom's Taxonomy: Analyze

12. Explain why you would have to be cautious of certain herbal medicines if you are taking prescription medication?

Bloom's Taxonomy: Analyze

13. What is the importance of the placental and blood-brain barriers?

Bloom's Taxonomy: Analyze

14. A new drug compound that is a base is proposed to be marketed as p.o administration, but the pharmacists question the effectiveness. If you were to decide about the permission of sale for this drug, what would you ask from the pharmaceutical company, and why?

Bloom's Taxonomy: Evaluate

15. You see an advertisement that promotes metabolism boosting grapefruit juice to lose weight, and claims that it is beneficial for patients with cardiovascular disease. Explain how you would react on such an add?

Bloom's Taxonomy: Evaluate

Essays

1. Describe pKa value of drugs, and explain why certain drugs cannot be administered orally.
Bloom's Taxonomy: Apply

2. Discuss why animal testing during pre-clinical evaluation of new experimental drugs is invaluable.
Bloom's Taxonomy: Evaluate

3. Explain why Aspirin is recommended to a patient suffering from cardiovascular disease, however if a patient has a comorbid bleeding disorder, Aspirin is not recommended. Why would an over-the-counter pain medicine help with cardiovascular problems?
Bloom's Taxonomy: Apply

4. If you were given Antabuse drug, what would happen if you were to drink alcohol?
Bloom's Taxonomy: Analyze

5. If you were to design a drug that cures depression, and the medicine could be taken orally, what considerations would you need to make regarding the pharmacology of the newly designed drug?
Bloom's Taxonomy: Hypothesize