Sample-Test-bank-For-Integrated-Cardiopulmonary-Pharmacology-3rd-Edition-by-Bruce-J.-Colbert.doc

# Answer Key

## Chapter 1
## Multiple Choice

1.      B

Rationale:

Therapeutics is defined as the study of drugs used to cure, treat, and prevent disease. Pharmacotherapy combines the terms "pharmacology" and "therapeutics." Disease management refers to a collective management of all aspects of the patient's disease, not just pharmacotherapy.

2.      C

Rationale:

Although drugs are derived from a variety of sources, such as plant and animal sources, the majority of drugs today are synthetic. It is predicted that in the future many drugs will be genetically bioengineered.

3.      D

Rationale:

CDER is a specialized program (not an agency) within the FDA. The CDC and the NIH are not responsible for drug testing and approval.

4.      D

Rationale:

Phase IV studies, also known as "postmarketing studies," are performed after a drug is already on the market. This phase attempts to see if rare or serious adverse effects that were not detected prior to drug approval have occurred.

5.      C

Rationale:

The PDR and AHFS are sources for drug information and are not involved in establishing or regulating drug standards. The USP's role usually begins after the FDA approves a drug for the market. Once USP standards are established and official, they are enforceable by the FDA.

6.      B

Rationale:

The chemical name describes the structure of the drug and serves as a point of reference to manufacture the drug but is not used to name the drug. The trade or brand name of a drug is used by the original manufacturer to market the drug.


7.      D

Rationale:

ADRs are defined as unintended side effects that can be mild, or severe and life threatening. Hypersensitivity is one example of an ADR. Teratogenicity refers to a drug's potential to damage a fetus in utero when administered to a pregnant woman.

8.      B

Rationale:

The first-pass effect describes drugs that are administered by mouth that go to the liver first and undergo metabolic changes before reaching the systemic circulation.

9.      D

Rationale:

Enteral routes of drug absorption are via the gastrointestinal tract and include oral, sublingual, nasogastric tube, and rectal routes.

10.      A

Rationale:

The first-pass effect explains why a smaller dose of the same drug given via IV produces a similar response to a larger dose given PO. After absorption, a drug given orally must pass through the liver before reaching the systemic circulation. In the liver, the drug undergoes metabolic changes that inactivate some of the drug. Bioavailability measures the amount of drug that was absorbed into the systemic circulation; it can be affected by the route of administration as well as many other factors.

11.      A

Rationale:

Although sublingual and transdermal are convenient and are becoming more popular, they are not the most common. The inhalation route is not the most common and convenient because it requires the use of a device to create and deliver micron-sized aerosol particles to the lungs.

12.      C

Rationale:

Malnourished patients have less serum albumin; therefore, more drug is free within the bloodstream to cause a higher blood level of the active drug, which leads to a greater drug response.

13.      C

Rationale:

Water-soluble drugs have an increased effect in patients with larger water compartments. Additive effect describes the sum of the effects of two drugs given together.

14.      B

Rationale:

The liver's microsomal drug oxidation system, the cytochrome P-450 system, is responsible for metabolizing rifampin. However, the liver enzymes that break down this drug are induced, or increased in activity.

15.      D

Rationale:

Drugs are eliminated after metabolism in feces, urine, or through the skin or pulmonary system. Some drugs are excreted unchanged in the urine.

16.      D

Rationale:

Potency is a term used to describe the amount of drug required to produce a desired response. Whereas affinity refers to the tendency of a drug to combine with a receptor. How a drug is cleared from the body is referred to as elimination.

17.      B

Rationale:

Excretion of drugs through the kidneys is not affected by drug oxidation, which occurs in the process of metabolism of a drug in the liver.

18.      D

Rationale:

Just because a drug is occupying a receptor site does not guarantee that it will produce a therapeutic effect.

19.      C

Rationale:

An agonist activates the receptor and causes a greater response. An antagonist can combine at the receptor site but does not cause activation.

20.      B

Rationale:

Tolerance explains why an increased amount of a drug is needed to produce the same effect because of receptor adaptation. Desensitization is the term used for diminished responsiveness that occurs over time, whereas dependence refers to a physiologic or psychologic need. Therapeutic index is the ratio between the

minimum effective dose and the average maximum tolerated dose. A low therapeutic index would therefore cause more adverse effect.

21.     A

Rationale:

PO refers to the oral route of administration. QID is a medical abbreviation meaning four times daily.

22.     C

Rationale:

Only intravenous injections completely bypass the absorption step because they enter the bloodstream directly.

23.     B

Rationale:

A steady state of drug concentration will occur if a regulated, consistent dosage is given as a continuous infusion rather than an intermittent intravenous dose, which causes peaks and troughs in the drug concentration.

24.     D

Rationale:

Tolerance of a drug occurs due to receptor adaptation, which occurs over time and with repeated use of a particular drug.

25.     D

Rationale:

Treatment for drug overdose may include the administration of emetics, adsorbents and antidotes depending on the type of drug and amount of time after exposure.

## True/False

1.     False

Rationale:

Although herbals have been used for years and were forerunners of many current medications, the FDA considers them dietary supplements.

2.     False

Rationale:

Drug potency refers to an amount of drug required to produce a desired response. If the reaction of two drugs given together causes one drug to have no direct effect but increases the response of the other drug, the interaction is referred to as "potentiation."

3.     True

Rationale:

The inhalation route is a form of topical delivery because the inhaled drug is deposited directly onto the mucous lining of the airways; however, it is absorbed systemically.

4.     True

Rationale:

A bolus dose gives peaks and troughs in drug concentrations.

5.     False

Rationale:

Selectivity for a specific site or receptor makes a drug more useful.

6.     False

Rationale:

Fat-soluble drugs have an increased effect in patients with more fat..

7.     True

Rationale:

Drugs must be water soluble in order to be excreted from the body as urine, feces, or sweat.

8.     False

Rationale:

Liver function does not correlate with the body's ability to metabolize a drug and therefore would not be helpful in determining elimination of the drug through the liver.

9.     True

Rationale:

Emetics are agents used to induce vomiting in the case of an overdose of ingested drugs.

10.     True

Rationale:

Formularies are used by health care systems to list drugs that are available for dispensing in their facility.

FILL-IN-THE-BLANK

1.     anaphylactic shock
2.     inhalation route
3.     bloodstream
4.     tolerance
5.     therapeutic range
6.     generic
7.     depot
8.     rectally
9.     water-soluble
10.     therapeutic range

SHORT ANSWER

1.     An endogenous chemical is one that is produced physiologically, while an exogenous chemical is pharmacologically administered.

2.     Agonists are drugs that activate a specific receptor once they bind, whereas an antagonist does not cause activation but results in very little or no response once it combines with a receptor site. This action of the antagonist is responsible for lessening or blocking another drug's effect.

3.     Patient's with liver disease may experience greater than expected effects from a drug due to an increase in the drug's half-life. Because drugs are metabolized by the liver, if the liver is not capable of breaking down or metabolizing the drug, it is able to remain in the body longer and continue to elicit a response.

4.     The "do not use" list was designed to eliminate medical errors and misinterpretation when using common abbreviations.

5.     Basic safeguards to prevent errors in medication administration include the six "rights." They are described as: making sure you identify the right drug, administer the right dose to the right patient at the right time via the right route, and complete the right documentation.

## Chapter 2
## Multiple Choice

1.     C

Rationale:

To convert from milliliters to liters, move the decimal point three places to the left.

2.     A

Rationale:

To determine the dosage to administer, simply multiply 55 kg by 10 mg (55 kg × 10 mg = 550 mg).

3.     D

Rationale:

Using the factor-label method and example calculation 5 in the textbook, you can convert from feet and inches to centimeters.

4. B

Rationale:

Refer to example calculation 8 in the textbook to set up your calculation and solve for X.

5. B

Rationale:

Using the factor-label method and example calculation 5 in the textbook, you can convert from centimeters to inches.

6. C

Rationale:

When you mix a drug with a diluent such as normal saline, the diluent does not decrease or weaken the amount of drug given to the patient, whether you are using 2 ml or 5 ml. Only the delivery time is increased.

7. A

Rationale:

To determine the percentage strength of 20 mg in a 2 ml solution, you should recognize that it is equivalent to 10 mg in 1 ml, or 1 g in 100 ml, which represents 1%. You can solve this by setting up an equation with the known values and solving for X by cross-multiplying.

8. A

Rationale:

The first step is to convert the patient's weight to kilograms using the factor-label method (88 lb = 40 kg). The next step is to determine the dosage to administer. If the order calls for 0.25 mg/kg, simply multiply 40 kg by 0.25 mg (40 kg × 0.25 mg = 10 mg).

9. B

Rationale:

Using example calculation 8 from the textbook, you can set up this problem with your known values in the following way:

$$\frac{10\,mg}{1\,ml} = \frac{4\,mg}{X}$$

10. C

Rationale:

You convert the patient's weight to kilograms by using the factor-label method, where 2.2 lb = 1 kg.

11. D

Rationale:

You first convert the baby's weight from grams to kilograms (.6 kg) and then use the factor-label method to convert from kilograms to pounds, where 2.2 lb = 1 kg.

12. B

Rationale:

Refer to Table 2–2 to convert from liters to milliliters.

13. D

Rationale:

Using the factor-label method and example calculation 5 in the textbook, you can convert from feet and inches to centimeters.

14. D

Rationale:

A solution is a chemical and physical homogeneous mixture of two or more substances that contains a solute and a solvent.

15. B

Rationale:
A drug solution that consists of the active drug in solid (or powder) form mixed with a liquid solvent is considered a weight/volume solution.

16.    D
Rationale:
The ratio becomes: X = .03 g or 30 mg

$$\frac{1\,g}{100\,ml} = \frac{X\,g}{3\,ml}$$

17.    B
Rationale:
The active ingredient or drug in a solution is referred to as the solute.

18.    C
Rationale:
If 1.5 ml represents a 10% solution and the volume has been doubled to 3 ml, the percentage of the solution is now half the original strength.

19.    A
Rationale:
A 10% solution represents 10 g/100 ml of solution, or 1 g per 10 ml of solution, or 0.1 g per 1 ml of solution. If you know that there is 0.1 g per 1 ml, you can multiply this by 3 ml to find the correct answer (0.3 g, or 300 mg).

20.    D
Rationale:
You first convert the baby's weight from grams to kilograms. Then you determine how many milliliters are needed if the required dosage is 3 ml per kilogram by multiplying 3 by the weight in kg (3 ml × 1.5 kg).

21.    C
Rationale:
Knowing that 6% represents 6 g for every 100 ml, you can calculate the grams needed by using example calculation 11 in the textbook.

22.    A
Rationale:
If you recognize the relationship between the dose on hand and the desired dose, you can eliminate B and C immediately. You can then solve this problem by setting up an equation and cross-multiplying to solve for X.

23.    B
Rationale:
You can solve this problem by setting up an equation and cross-multiplying to solve for X.

24.    A
Rationale:
6 g of active ingredient in 300 ml represents 2 g for every 100 ml, which is a 2% solution.

25.    B
Rationale:
16 gtt is equal to 1 ml.

**True/False**
1.    False
Rationale:
The Joint Commission recommends that a zero be placed before the decimal point (e.g., 0.1 mg) but never after the decimal point by itself (e.g., 1 mg *not* 1.0 mg).

2.    True
Rationale:
The factor-label method, or fraction method, allows you to convert between the English and metric systems.

3.    True
Rationale:

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A solution contains an active drug, which is the solute dissolved in a solvent, such as sterile water or normal saline.

4.      False

Rationale:

If a solute is a powder that is dissolved in a liquid, the resulting solution is termed a weight/volume solution. Weight represents the weight or amount of solute, and volume represents the total amount of solution.

5.      False

Rationale:

The nomogram used to determine body surface area (BSA) combines height and weight in a single measurement to determine a patient's overall body size. If a drug dosage requires a specific number of units per patient weight in kilograms, the factor-label method should be used to convert the patient's weight from the English system to the metric system.

6.      True

Rationale:

The International System is also known as the metric system and is used in health care and by drug manufacturers.

7.      False

Rationale:

To convert from milliliters to liters, the decimal point must be moved three places to the left.

8.      True

Rationale:

Solutes can be either solid particles such as powders or liquids.

9.      False

Rationale:

Weight/volume solutions represent the weight of the solute, which is a solid, dissolved in a liquid solution.

10.      True

Rationale:

Using BSA to determine a patient's overall size is appropriate, especially if the patient is not within his or her ideal body weight due to disease or malnutrition.

FILL-IN-THE-BLANK

1.      meter/liter
2.      2.2
3.      solute
4.      1/200
5.      20
6.      powers of 10
7.      British Imperial System
8.      grams or kilograms
9.      three/right
10.      milliliters (ml)

**SHORT ANSWER**

1.      When using measurements involving cubic centimeters, The Joint Commission recommends using "ml" for milliliter because 1 ml = 1 cc and cc can be misread in a number of ways.

2.      Examples may include conversions used for length (e.g., 1 inch = 2.54 cm), weight (e.g., 2.2 lb = 1 kg), or volume (e.g., 1.06 qt = 1 liter).

3.      If a solid solute is mixed with a solvent, the resulting solution is termed a weight/volume (w/v) solution, where w represents the weight of the solute and v represents the total amount of solution. If a liquid solute is mixed with a solvent, the resulting solution is termed a volume/volume (v/v) solution, where the first v represents the volume of the solution and the second v represents the total amount of solution.

4.      A drug strength can be expressed as a percent solution and as a ratio solution.

5.      You can use a proportion of the dose on hand related to the desired dose to set up an equation and solve for the correct amount. Refer to Figure 2–4, which illustrates the steps in the equation.