Chapter 3 Pharmacodynamic Principles

Case Study
As the athletic trainer working at a Division III university, Susan is meeting with a women’s golf team member. Patricia injured her back during a tournament last weekend and was instructed by the physician to take Nalfon, an anti-inflammatory drug, 4 times per day. Patricia reports that she doesn’t feel the medication helps her much, but she also admits that she usually remembers to take the drug only in the morning and has taken it 4 times per day only once over the past several days. What should Susan do in this situation?

Answer: Poor patient adherence is a major problem with medication use. In this case, the athlete has been prescribed a medication that needs to be taken 4 times per day. Multiple-times-per-day dosing is associated with poor patient adherence. In this case, talking to the physician about an alternative anti-inflammatory drug that could be taken less frequently would be appropriate. Also, remember that education about the medication and the importance of taking it improves adherence. The athletic trainer can encourage the athlete to take the medication as prescribed to get the maximum benefit from it.

Exam Questions
1. Which of the following is the best description of pharmacogenetics?
   a. Drug-induced DNA damage.
   b. The study of how genetic differences affect drug response.
   c. The study of how genetic differences affect disease incidence.
   d. The use of medications in geriatric patients.

2. Elderly patients have an increased risk of experiencing adverse effects from medications because of:
   a. Increased albumin concentration and therefore increased protein binding.
   b. Increased gastrointestinal motility and therefore increased time for drug absorption
   c. Reduced kidney function and therefore decreased drug excretion.
   d. Reduced body fat and therefore decreased volume of distribution.

3. A drug that binds to a receptor and blocks its activation is known as a(n):
   a. Agonist.
   b. Antagonist.
   c. Second messenger.
   d. Idiosyncratic drug.

4. An athlete required an increase in the dose of one of his medications because of a diminished response from continued use of the drug. This phenomenon is known as:
   a. Tolerance.
   b. Physiologic antagonism.
   c. Synergistic effect.
   d. Placebo effect.

5. The drug concentration will reach steady-state after approximately ____ half-lives of the drug.
   a. 1 to 2.
   b. 4 to 5.
6. The most common causes of drug allergies are:
   a. Anticoagulants, nonsteroidal anti-inflammatory drugs (NSAIDs), and morphine.
   b. Monoamine oxidase inhibitors (MAOIs), β-lactam antibiotics, and statins.
   c. β-blockers, NSAIDs, and bronchodilators.
   d. β-lactam antibiotics, NSAIDs, and sulfonamides.

7. A combination of 2 drugs is used in the treatment of a disease. This combination produces a greater effect than would be predicted by adding the effects of the individual drugs. This combination produces a(n):
   a. Additive effect.
   b. Antagonistic effect.
   c. Monogenic effect.
   d. Synergistic effect.

8. A drug interaction occurs where Drug A inhibits the metabolism of Drug B. What effect will this interaction have on the concentration and pharmacologic effects of Drug B?
   a. The concentration of Drug B will increase, leading to a potential increase in the pharmacologic effects of the drug.
   b. The concentration of Drug B will decrease, leading to a potential increase in the pharmacologic effects of the drug.
   c. The concentration of Drug B will increase, leading to a potential decrease in the pharmacologic effects of the drug.
   d. The concentration of Drug B will decrease, leading to a potential decrease in the pharmacologic effects of the drug.

9. Which of the following statements regarding therapeutic index (TI) is correct?
   a. The larger the TI, the less safe the medication.
   b. The larger the TI, the more safe the medication.
   c. The TI is a measure of drug effectiveness but not drug safety.
   d. The TI is used to measure the degree of risk from an idiosyncratic adverse drug reaction.

10. For a medication that is excreted by the kidneys, the _____ should be measured as a marker of kidney function.
    a. Blood level of alanine aminotransferase.
    b. Serum albumin level.
    c. Creatinine clearance.
    d. Activity of cytochrome P450 enzymes.