Case Study
You are on a road trip with the university’s women’s track and field team. You notice that Pam, the team’s 21-year-old sprinter who competes in the 100-m and 4x100-m relay, has a number of tablets she is taking with her meal. You are surprised because you recall from Pam’s history form that the only medication she listed was her rescue inhaler and her long-acting medication for her asthma, a contraceptive, and occasional acetaminophen for headache. After the meal, you speak with her to ask her what she is taking so you can update her history form. Pam says that she is just taking herbal supplements, which she has taken since high school when her parents suggested she use them to maintain good health. She states that she is taking the same ones her parents started her on: St. John’s wort, ginseng, gingko biloba, and echinacea. You realize that the side effects of some of these herbal supplements are deleterious for Pam and explain to her that these supplements may be interacting with her current prescription medications as well as contributing to her headaches. Which of these herbal supplements should she not be taking and why? What are the potential side effects of each of the supplements she is taking?

Answer: The use of St. John’s wort is complicated by many drug interactions. St. John’s wort increases the activity of drug-metabolizing enzymes and therefore reduces the blood level of other drugs, including oral contraceptives. Because Pam is taking an oral contraceptive, she should not be taking St. John’s wort as well. This combination can result in a reduced blood level of the oral contraceptive and possible unexpected pregnancy. Aside from the drug interaction potential, St. John’s wort is relatively well tolerated. Gastrointestinal (GI) upset is the most common adverse effect. This herbal can also cause photosensitivity, and because Pam is on the track and field team and will spend time training and competing outdoors, the exposure to sunlight and risk of photosensitivity is a concern. Pam should be advised to stop taking the St. John’s wort. Headache is a possible adverse effect of ginseng. You should determine if she is experiencing any other adverse effects related to this herbal, including GI upset, difficulty sleeping, irritability, and increased blood pressure. The ginkgo biloba can also cause headache and GI upset. Echinacea can cause nausea, vomiting, and diarrhea. You should also remember that Echinacea can cause allergic reactions in patients who are allergic to members of the daisy family.

Exam Questions
1. Which dietary supplement has been reported to decrease total cholesterol and triglycerides?
   a. Echinacea.
   b. Garlic.
   c. Black cohosh.
   d. Saw palmetto.

2. Which herbal product is commonly found in energy drinks?
   a. Ginseng.
   b. Valerian.
   c. Feverfew.
   d. Black cohosh.
3. An athlete is experiencing symptoms of migraine headaches and would like to use a herbal product to reduce the frequency of her headaches. Which herbal product would this athlete benefit from?
   a. Taurine.
   b. Valerian.
   c. St. John’s wort.
   d. Feverfew.

4. Which of the following statements is correct regarding creatine?
   a. Creatine ethyl ester is the preferred creatine supplement.
   b. **Weight gain is an adverse effect associated with creatine.**
   c. Creatine inhibits protein degradation and therefore prevents muscle injury.
   d. Creatine caused insulin resistance in animal studies and therefore may increase blood glucose.

5. Which herbal supplements should be avoided by an athlete who is also taking an oral contraceptive?
   a. Feverfew and valerian.
   b. Black cohosh and ginkgo biloba.
   c. Valerian and St. John’s wort.
   d. **St. John’s wort and black cohosh.**

6. Which herbal supplement is used as a sleep aid?
   a. Ginseng.
   b. **Valerian.**
   c. Garlic.
   d. St. John’s wort.

7. An athlete has an allergy to ragweed. Because of this allergy, what herbal supplement should the athlete avoid?
   a. Ginkgo biloba.
   b. Black cohosh.
   c. Valerian.
   d. **Echinacea.**

8. Black cohosh has been used for the relief of symptoms of
   a. Benign prostatic hyperplasia.
   b. Migraine headaches.
   c. **Menopause.**
   d. Depression.

9. Treatment of intermittent claudication is a purported use of:
   a. Ginkgo biloba.
   b. Ginseng.
   c. Garlic.
   d. Guarana.
10. Allicin is an active ingredient in which herbal product?
   a. Echinacea.
   b. **Garlic.**
   c. Leucine.
   d. Saw palmetto.