chapter **44**

Hematopoietic and Immunostimulant Drugs

Objectives

AFTER STUDYING THIS CHAPTER, THE STUDENT WILL BE ABLE TO:

1. Describe the goals and methods of enhancing hematopoietic and immune functions.
2. Discuss the use of hematopoietic agents in the treatment of anemia and thrombocytopenia.
3. Discuss the use of filgrastim and sargramostim in neutropenia and bone marrow transplantation.
4. Describe the adverse effects and nursing process implications of administering filgrastim and sargramostim.
5. Discuss interferons in terms of clinical uses, adverse effects, and nursing process implications.

Critical Thinking Scenario

Mrs. Reynolds, a 67-year-old who has had chronic renal failure for the last 7 years, is severely anemic. Her physician prescribes epoetin alfa (Epogen) to stimulate red blood cell production. You are responsible for teaching her about the drug, including subcutaneous administration.

Reflect on:

- Review why renal failure causes anemia and how Epogen works to increase red blood cell counts.
- What assessment data should you collect before teaching Mrs. Reynolds self-injection technique?
- How will you evaluate whether the Epogen is working? Consider decreased symptoms of anemia and expected changes in laboratory values.

OVERVIEW

Enhancing a person's own body systems to fight infection and cancer is a concept that continues to evolve. Hematopoietic and immunostimulant drugs (also called biologic response modifiers) are given to restore normal function or increase the ability of the immune system to eliminate potentially harmful invaders. Those available for therapeutic use include colony-stimulating factors (CSF; eg, darbepoetin alfa, epoetin alfa, filgrastim, sargramostim), several interferons, and two interleukins. These drugs, which are the primary focus of this chapter, are described in the following sections and in Drugs at a Glance: Hematopoietic and Immunostimulant Agents.

Bacillus Calmette-Guérin (BCG) vaccine, used in the treatment of bladder cancer, is also discussed. Other drugs with immunostimulant properties are discussed in other chapters. These include traditional immunizing agents (see Chap. 43); levamisole (Ergamisol), which restores functions of macrophages and T cells and is used with fluorouracil in the treatment of intestinal cancer (see Chap. 64); and antiviral drugs used in the treatment of acquired immunodeficiency syndrome (AIDS) (see Chap. 39). Levamisole and antiviral drugs are more accurately called immunorestoratives because they help a compromised immune system regain normal function rather than stimulating "supranormal" function. In AIDS, the human immunodeficiency virus (HIV) causes immune system malfunction, so the antiviral drugs indirectly improve immunologic function.

GENERAL CHARACTERISTICS OF HEMATOPOIETIC AND IMMUNOSTIMULANT DRUGS

1. Most hematopoietic and immunostimulant drugs are facsimiles of natural endogenous protein substances called cytokines (see Chap. 42). Techniques of molecu-

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