

chapter 51

Drug Therapy of Heart Failure

Objectives

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

1. Describe major manifestations of heart failure (HF).
2. Discuss the role of endothelial dysfunction in HF.
3. Differentiate the types of drugs used to treat HF.
4. List characteristics of digoxin in terms of effects on myocardial contractility and cardiac conduction, indications for use, principles of therapy, and nursing process implications.
5. Differentiate therapeutic effects of digoxin in HF and atrial fibrillation.
6. Differentiate digitalizing and maintenance doses of digoxin.
7. Identify therapeutic and excessive serum digoxin levels.
8. Identify clients at risk for development of digoxin toxicity.
9. Discuss interventions to prevent or minimize digoxin toxicity.
10. Explain the roles of potassium chloride, lidocaine, atropine, and digoxin immune fab in the management of digoxin toxicity.
11. Teach clients ways to increase safety and effectiveness of digoxin.
12. Discuss important elements of using digoxin in special populations.

Critical Thinking Scenario

George Sweeney, a 72-year-old retired carpenter, was recently hospitalized with heart failure and started on captopril, an angiotensin-converting enzyme (ACE) inhibitor. You are a staff nurse assigned to his care. He has many questions about his new diagnosis and the captopril.

Reflect on:

- ▶ Physiologically, what happens when the heart fails to pump adequately, and what symptoms are seen in the client?
- ▶ How ACE inhibitors decrease the workload of the heart.
- ▶ What criteria (objective and subjective) will you use to evaluate whether the ACE inhibitor is effectively managing Mr. Sweeney's heart failure?

OVERVIEW

Heart failure (HF), also called congestive heart failure (CHF), is a common condition that occurs when the heart cannot pump enough blood to meet tissue needs for oxygen and nutrients. It may result from impaired myocardial contraction during systole (systolic dysfunction), impaired relaxation and filling of ventricles during diastole (diastolic dysfunction), or a combination of systolic and diastolic dysfunction.

Causes of Heart Failure

At the cellular level, HF stems from dysfunction of contractile myocardial cells and the endothelial cells that line the

heart and blood vessels (see Chap. 50). Vital functions of the endothelium include maintaining equilibrium between vasodilation and vasoconstriction, coagulation and anticoagulation, and cellular growth promotion and inhibition. Endothelial dysfunction allows processes that narrow the blood vessel lumen (eg, buildup of atherosclerotic plaque, growth of cells, inflammation, activation of platelets) and lead to blood clot formation and vasoconstriction that further narrow the blood vessel lumen. These are major factors in coronary artery disease and hypertension, the most common conditions leading to HF.

Other causative factors include hyperthyroidism, excessive intravenous fluids or blood transfusions, and drugs that decrease the force of myocardial contraction (eg, antidysrhythmic drugs) or cause retention of sodium and water (eg, corticosteroids, estrogens, nonsteroidal anti-inflammatory agents). These