

# chapter 55

## Antihypertensive Drugs

### Objectives

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

1. Describe factors that control blood pressure.
2. Define/describe hypertension.
3. Identify clients at risk for development of hypertension and its sequelae.
4. Discuss nonpharmacologic measures to control hypertension.
5. Review the effects of alpha-adrenergic blockers, beta-adrenergic blockers, calcium channel blockers, and diuretics in hypertension.
6. Discuss angiotensin-converting enzyme inhibitors and angiotensin II receptor antagonists in terms of mechanisms of action, indications for use, adverse effects, and nursing process implications.
7. Describe the rationale for using combination drugs in the management of hypertension.
8. Discuss interventions to increase therapeutic effects and minimize adverse effects of antihypertensive drugs.
9. Discuss the use of antihypertensive drugs in special populations.

### Critical Thinking Scenario

Wally Ramos, a 36-year-old man, returns to the clinic for his third blood pressure check. Because his blood pressure is still elevated (178/96), the physician decides to start him on an angiotensin-converting enzyme inhibitor, captopril. He states, "I just can't believe I have high blood pressure. I feel just fine. I have heard stories that these medications have lots of undesirable side effects."

### Reflect on:

- ▶ An appropriate teaching plan discussing hypertension and its effects.
- ▶ An appropriate teaching plan discussing nonpharmacologic strategies to decrease blood pressure.
- ▶ How you will address Mr. Ramos's concerns about potential side effects.
- ▶ Factors that could affect compliance with antihypertensive therapy.

### OVERVIEW

Antihypertensive drugs are used to treat hypertension, a common, chronic disorder affecting an estimated 50 to 60 million adults and an unknown number of children and adolescents in the United States. Hypertension increases risks of myocardial infarction, heart failure, cerebral infarction and hemorrhage, and renal disease. To understand hypertension and antihypertensive drug therapy, it is necessary first to understand the physiologic mechanisms that normally control blood pressure, characteristics of hypertension, and characteristics of antihypertensive drugs.

### REGULATION OF ARTERIAL BLOOD PRESSURE

Arterial blood pressure reflects the force exerted on arterial walls by blood flow. Blood pressure normally stays relatively constant because of homeostatic mechanisms that adjust blood flow to meet tissue needs. The two major determinants of arterial blood pressure are cardiac output (systolic pressure) and peripheral vascular resistance (diastolic pressure).

Cardiac output equals the product of the heart rate and stroke volume ( $CO = HR \times SV$ ). Stroke volume is the amount of blood ejected with each heartbeat (approximately 60 to