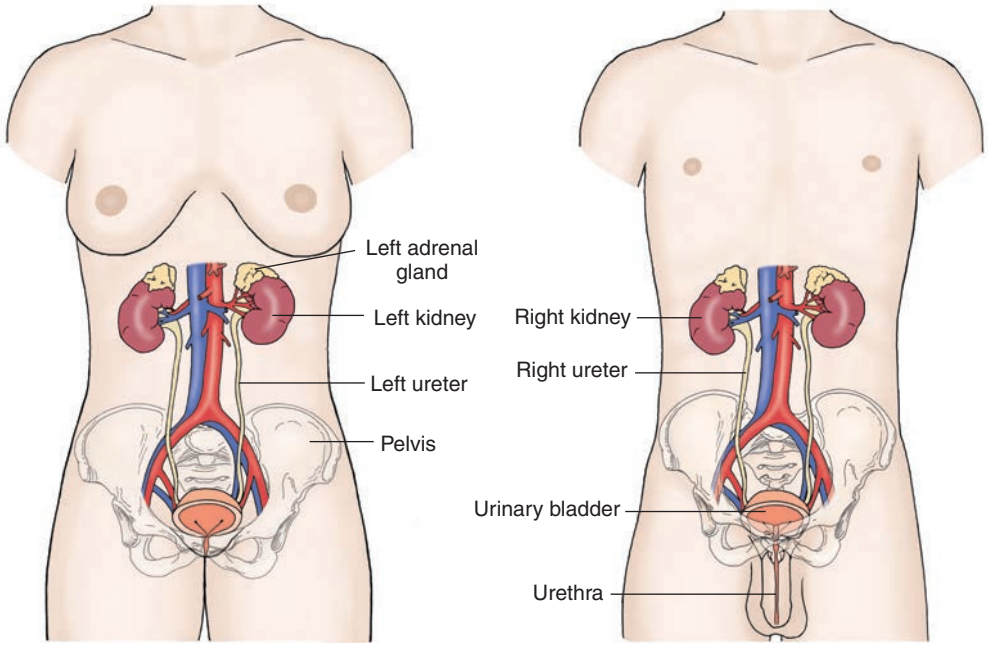

FIGURE 20-3: The urinary system.

via the urethra. This system is closely linked to the reproductive system, especially in men, because the urethra is encased in the penis and acts as a conduit to transfer sperm from the man to the woman during sexual intercourse. The most commonly used medications for treatment of disorders and diseases of the urinary system are diuretics.

Diuretics

Diuretics, commonly referred to as water pills, increase excretion of body fluids from the kidneys. This is necessary in certain medical conditions. The most common conditions for which diuretics are used are hypertension (high blood pressure) and heart failure. If the circulating pressure is too high and/or the heart muscle is not pumping with adequate strength, consequences will include lack of adequate blood flow, damage to tissue, and possible death if these situations remain untreated. Decreasing the amount of circulating volume lessens pressure on the blood vessels. Think of a garden hose. When there is a rapid flow of water (high volume), the pressure is high, but if you turn the hose down (lower the volume), the pressure is reduced to a gentle stream. In addition, if the heart is not pumping adequately, lowering the amount of liquid that it is required to push throughout the body will decrease the effort the heart must exert.

Other medical conditions requiring diuretics include kidney failure when hypertension and edema are present. Kidney stones can be minimized or prevented through the use of diuretics, which limit the amount of calcium excreted in the urine. In addition, glaucoma treatment may include diuretics to decrease the circulating fluid in the body, including the eyes. Diuretics can be categorized into four main areas: loop, thiazide, potassium-sparing, and osmotic. As might be inferred from the name of one of the previous types of diuretics, potassium loss is a serious side-effect of diuretic use and must be considered when prescribing these medications.

Loop Diuretics

The most effective diuretics work in the loop of Henle, located in the nephron (see A Closer Look: The Nephron…Building Block of the Kidney). Not surprisingly, they are called loop diuretics. They mainly are used to treat congestive heart failure by decreasing the volume of blood that the heart must circulate through the body. This effect also decreases the amount of fluid in the lungs and makes breathing easier. In renal insufficiency, it helps the kidneys to produce more urine and thus rids the body of toxins. Examples of loop diuretic drugs include furosemide (Lasix), ethacrynic acid (Edecrin), torsemide (Demadex), and bumetanide (Bumex). These medications are commonly taken orally, but they are also administered by the IV route. Furosemide and bumetanide may be given as an IM injection.