MYOCARDIAL INFARCTION, STROKE, AND CLOTTING

Myocardial infarction (MI) or heart attack, stroke, and clots all cause damage when blood flow is impeded to the chest, brain, or lungs. Chest pain can be a symptom of a total lack of oxygen, called **anoxia,** or significantly reduced oxygen, called **hypoxia,** in the heart muscle (myocardium). The lack or reduction of oxygen prevents the tissues of the heart from receiving enough nourishment, and this can lead to tissue injury or **ischemia** or even death, referred to as an **infarction.** The classic signs of MI are chest pain, sweating, pale skin, and **cyanosis** (a bluish tint to the skin), particularly around the mouth. Chest pain can also be caused by noncardiovascular conditions, including broken ribs, gastrointestinal (GI) disorders, anxiety, or injured skeletal muscles (A Closer Look 16.1).

A CLOSER LOOK 16.1: Heart Attacks and Women

Women tend to have atypical symptoms, such as upper back or shoulder pain, lightheadedness, and unusual fatigue that lasts for several days. These atypical symptoms make rapid diagnosis more difficult. Health-care professionals and the public are becoming more educated about these atypical symptoms to help with quick diagnosis and treatment in women.

A stroke or **cerebrovascular accident (CVA)** occurs when the brain is deprived of oxygen and blood flow for several minutes. CVAs are a major cause of death and disability. MIs are caused by ischemia of heart muscle; CVAs are caused by ischemia of the brain. For this reason, medications that prevent ischemia can be prescribed to prevent stroke as well as MI.

CARDIOVASCULAR MEDICATIONS

Cardiovascular medications function in a few basic ways. Certain medications, such as atropine, increase the heart rate. Others, such as diltiazem (Cardizem) or verapamil (Calan), slow the heart rate. Drugs such as digoxin (Lanoxin) make the heart function more efficiently. Other medications, such as propafenone (Rythmol) and sotalol (Betapace), make it less irritable. In addition, drugs may be given to make the environment in which the heart functions less hostile. For example, if the heart is having a difficult time pumping, a backup of fluid may occur, leading to breathing problems. In this instance, administration of a diuretic such as furosemide (Lasix) decreases the amount of fluid that the heart must circulate through the body. This reduces the workload of the heart (see the Master the Essentials table for descriptions of the most common cardiovascular system drugs).

Antianginal Medications

Angina pectoris is chest pain caused by a lack of oxygen and nutrients in the heart tissue. As discussed earlier, ischemia (damage) occurs, and if continued, infarction, or the death of heart tissue, will ensue. Antianginal drugs decrease angina pectoris by dilating arteries and veins. An example is nitroglycerin (Nitrolingual, Nitroquick, Nitrostat, Nitro-Bid, Nitro-Dur), which can be administered via different routes such as sublingual, buccal, spray, or IV, depending on the patient's circumstances. The most common route is sublingual. The patient places a tablet or sprays the medication under the tongue at home when chest pain begins, with instructions to repeat the procedure every 5 minutes, for a maximum of three times. If pain continues, the patient should call emergency medical services (EMS) so that he or she can be evaluated for a possible MI.

A transdermal patch such as nitroglycerin topical (Nitro-Bid or Nitrol Appli-Kit) may also be used for prevention of angina pectoris. This patch is used daily as maintenance to prevent tissue ischemia and infarction. Angina can be treated with more than just medicine (Fast Tip 16.1). Nitroglycerin is also given in IV form by EMS or in the hospital setting for acute chest pain.