For most infants diagnosed with HF, the cause is CHD. Infants are stabilized on medical therapy and then referred for surgical repair. Today many children are being surgically repaired in the neonatal and early infancy stages before the onset of HF symptoms (Margossian, 2008). For children newly diagnosed with HF, the cause may be worsening ventricular function following a previous cardiac repair, cardiomyopathy, arrhythmia, or other conditions. In addition to management of HF, the underlying cause is treated if possible.

Improve Cardiac Function

Three groups of drugs are used to enhance myocardial function in HF: (1) digitalis glycosides (digoxin), which improve contractility, (2) angiotensin-converting enzyme (ACE) inhibitors, which reduce the afterload on the heart and thus make it easier for the heart to pump, and (3) beta-blockers. Myocardial efficiency is improved through administration of digitalis glycosides. The beneficial effects are increased cardiac output, decreased heart size, decreased venous pressure, and relief of edema. In children, digoxin (Lanoxin) is used almost exclusively because of its more rapid onset. Note the dose is calculated in micrograms (1000 mcg = 1 mg). During initiation, the child is monitored by means of an ECG to observe for the desired effects (prolonged PR interval and reduced ventricular rate) and detect side effects, especially dysrhythmias.

Another group of drugs used in the treatment of HF, the ACE inhibitors, inhibit the normal function of the renin/angiotensin system in the kidney. The ACE inhibitors block the conversion of angiotensin I to angiotensin II so that, instead of vasoconstriction, vasodilation occurs. Vasodilation results in decreased pulmonary and systemic vascular resistance, decreased BP, and a reduction in afterload. It also reduces the secretion of aldosterone, which reduces preload by preventing volume expansion from fluid retention and decreases the risk of hypokalemia. Common medications used in children are captopril (Capoten), enalapril (Vasotec), and lisinopril. The principal side effects of ACE inhibitors are hypotension, cough, and renal dysfunction.

Beta-blockers, specifically carvedilol (Coreg), are the newest medications to be added to the treatment of some children with chronic HF. The α- and β-adrenergic receptors are blocked, causing