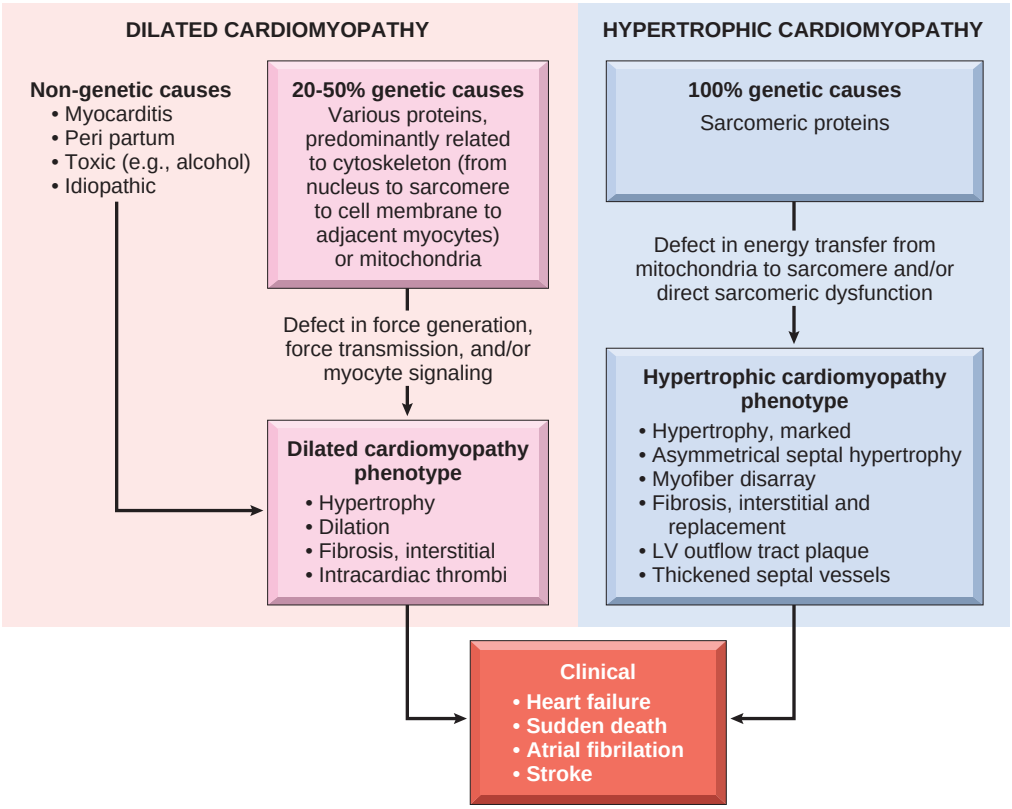

Figure 12-31 Causes and consequences of dilated and hypertrophic cardiomyopathy. Some dilated cardiomyopathies and virtually all hypertrophic cardiomyopathies are genetic in origin. The genetic causes of dilated cardiomyopathy involve mutations in any of a wide range of genes. They encode proteins predominantly of the cytoskeleton, but also the sarcomere, mitochondria, and nuclear envelope. In contrast, all of the mutated genes that cause hypertrophic cardiomyopathy encode proteins of the sarcomere. Although these two forms of cardiomyopathy differ greatly in subcellular basis and morphologic phenotypes, they share a common set of clinical complications. LV, left ventricle.

lesions or emotional duress. Thus, *takotsubo cardiomyopathy* is an entity characterized by left ventricular contractile dysfunction following extreme psychological stress; affected myocardium may be stunned or show multifocal contraction band necrosis. For unclear reasons, the left ventricular apex is most often affected leading to "apical ballooning" that resembles a "takotsubo," Japanese for "fishing pot for trapping octopus" (hence, the name).

The mechanism of catecholamine cardiotoxicity is uncertain, but likely relates either to direct myocyte toxicity due to calcium overload or to focal vasoconstriction in the coronary arterial macro- or microcirculation in the face of an increased heart rate. Similar changes may be encountered in individuals who have recovered from hypotensive episodes or have been resuscitated from a cardiac arrest; in such cases, the damage is a result of ischemia-reperfusion (see earlier) with subsequent inflammation.

MORPHOLOGY

In DCM the heart is usually enlarged, heavy (often weighing two to three times normal), and flabby, due to dilation of all chambers (Fig. 12-32). Mural thrombi are common and may be a source of thromboemboli. There are no primary valvular alterations; if mitral (or tricuspid) regurgitation is present, it results from left (or right) ventricular chamber dilation (*functional regurgitation*). Either the coronary arteries are free of significant narrowing or the obstructions present are insufficient to explain the degree of cardiac dysfunction.

The histologic abnormalities in DCM are nonspecific and usually do not point to a specific etiology. Most muscle cells are hypertrophied with enlarged nuclei, but some are attenuated, stretched, and irregular. Interstitial and endocardial fibrosis of variable degree is present, and small subendocardial scars may replace individual cells or groups of cells, probably reflecting healing of previous ischemic necrosis of myocytes caused by hypertrophy-induced imbalance between perfusion and demand. Moreover, the severity of morphologic changes may not reflect either the degree of dysfunction or the patient's prognosis.

Clinical Features. DCM can occur at any age, including in childhood, but it most commonly affects individuals between the ages of 20 and 50. **It presents with slowly progressive signs and symptoms of CHF including dyspnea, easy fatigability, and poor exertional capacity. At the end stage, ejection fractions are typically less than 25%** (normal = 50% to 65%). Secondary mitral regurgitation and abnormal cardiac rhythms are common, and embolism from intracardiac thrombi can occur. Death usually results from progressive cardiac failure or arrhythmia, and can occur suddenly. Although the annual mortality is high (10% to 50%), some severely affected patients respond well to pharmacologic therapy. Cardiac transplantation is also