



FIGURE 7.15 Patients suffering from heart failure have enlarged hearts that pump blood with significantly less efficiency than required. In some cases, (a) left ventricle remodeling occurs in response to an ischemic event. The heart expands and its walls become thinner leading to global systolic dysfunction. (b) Reduction in left ventricle compliance can also cause heart failure. Hypertrophy of the heart is followed by expansion of the heart, thinning of the walls of the heart, and a significant decrease in cardiac efficiency. *Source: Reprinted from Ginsberg, F.; Parrillo, J. E. Critical Care Medicine: Principles of Diagnosis and Management in the Adult. Severe Heart Failure, Chapter 30, pages 559–587, copyright 2008, with permission from Elsevier.*

(Figure 7.15). Patients can be asymptomatic at the onset of HF, but eventually develop exercise intolerance that becomes progressively worse until even normal activity (e.g., walking, getting out of bed) becomes a significant challenge. In advanced cases, hospital-supported care is required.

Although the pathology of HF is complex, both surgical and genetic animal models have been developed. As previously discussed, ischemic events promote the development of HF. Myocardial infarction can also be surgically induced by ligation of the coronary artery in a variety of species (rats, dogs, pigs, sheep). As with humans, the damage created by the ischemic