

Chapter 19, The Circulatory System: Heart

“Apply What You Know” Answers

- p. 712—If the fibrous skeleton becomes calcified, the soft flexible (yet strong) regions where calcification takes place become rigid and inflexible, thereby leading to potential damage to valves, myocardium, and the conduction system of the heart.
- p. 724—The presence of such myocardial bridges would lead to premature ventricular contractions because they bypass the delaying influence of the AV node.
- p. 724—In a neuron, the falling phase of the action potential is caused by K^+ outflow and occurs abruptly. In a cardiac myocyte, there is a plateau in the action potential that results from an inflow of Ca^{2+} and temporary impermeability to K^+ .
- p. 729—Valvular stenosis reduces cardiac output because the valvular orifice is narrowed and less blood flows through it. Because of reduced cardiac output, organs on the systemic circuit receive less perfusion. Among other effects, a person’s physical stamina is compromised because the muscles are not as well supplied with oxygen.
- p. 736—In the initial state, the cardiac output is $(70 \text{ mL/beat})(70 \text{ beats/min}) = 4,900 \text{ mL/min}$. To maintain this output with a stroke volume of 50 mL would require a heart rate of $(4,900 \text{ mL/min})/(50 \text{ mL/beat}) = 98 \text{ beats/min}$.