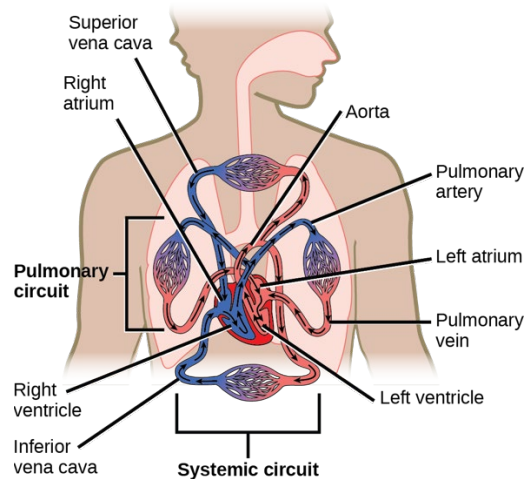


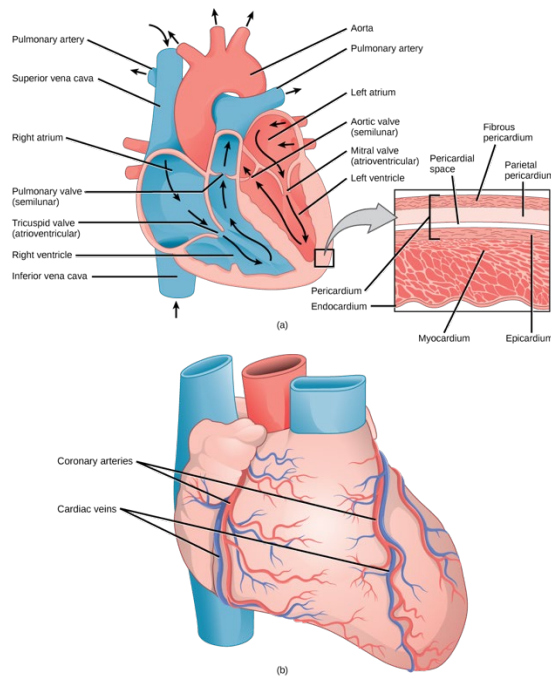
Biology 2eUnit 7: *Animal Structure and Function*Chapter 40: *The Circulatory System***Visual Connection Questions**

1. Which of the following statements about the circulatory system is false?



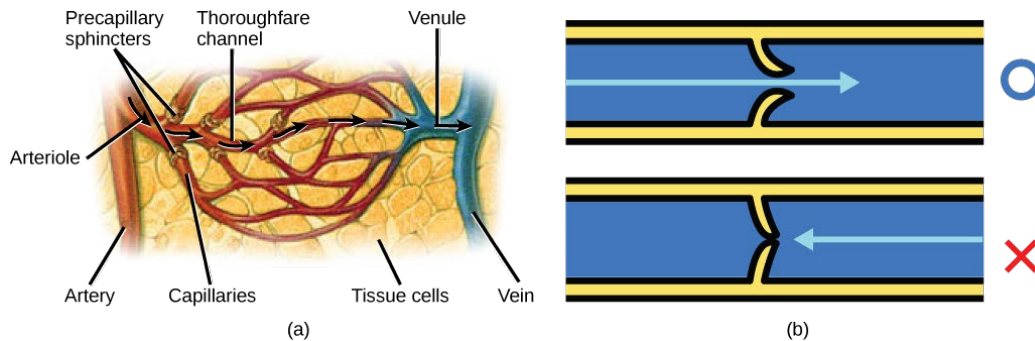
c.

2. Which of the following statements about the heart is false?



b.

3. Varicose veins are veins that become enlarged because the valves no longer close properly, allowing blood to flow backward. Varicose veins are often most prominent on the legs. Why do you think this is the case?



Blood in the legs is farthest away from the heart and has to flow up to reach it.

Review Questions

4. Why are open circulatory systems advantageous to some animals?

a. They use less metabolic energy.

5. Some animals use diffusion instead of a circulatory system. Examples include:

d. None of the above

6. Blood flow that is directed through the lungs and back to the heart is called _____.

c. pulmonary circulation

7. White blood cells:

d. all of the above (can be classified as granulocytes or agranulocytes, defend the body against bacteria and viruses, are also called leucocytes)

8. Platelet plug formation occurs at which point?

c. when platelets are attracted to a site of blood vessel damage

9. In humans, the plasma comprises what percentage of the blood?

b. 55 percent

10. The red blood cells of birds differ from mammalian red blood cells because:

c. they have nuclei

11. The heart's internal pacemaker beats by:

b. the excitation of cardiac muscle cells at the sinoatrial node followed by the atrioventricular node

12. During the systolic phase of the cardiac cycle, the heart is _____.

a. contracting

13. Cardiomyocytes are similar to skeletal muscle because:

d. they are striated

14. How do arteries differ from veins?

a. Arteries have thicker smooth muscle layers to accommodate the changes in pressure from the heart.

15. High blood pressure would be a result of _____.

a. a high cardiac output and high peripheral resistance

Critical Thinking Questions

16. Describe a closed circulatory system.

A closed circulatory system is a closed-loop system, in which blood is not free in a cavity. Blood is separate from the bodily interstitial fluid and contained within blood vessels. In this type of system, blood circulates unidirectionally from the heart around the systemic circulatory route, and then returns to the heart.

17. Describe systemic circulation.

Systemic circulation flows through the systems of the body. The blood flows away from the heart to the brain, liver, kidneys, stomach, and other organs, the limbs, and the muscles of the body; it then returns to the heart.

18. Describe the cause of different blood type groups.

Red blood cells are coated with proteins called antigens made of glycolipids and glycoproteins. When type A and type B blood are mixed, the blood agglutinates because of antibodies in the plasma that bind with the opposing antigen. Type O blood has no antigens. The Rh blood group has either the Rh antigen (Rh+) or no Rh antigen (Rh-).

19. List some of the functions of blood in the body.

Blood is important for regulation of the body's pH, temperature, and osmotic pressure, the circulation of nutrients and removal of wastes, the distribution of hormones from endocrine glands, the elimination of excess heat; it also contains components for the clotting of blood to prevent blood loss. Blood also transports clotting factors and disease-fighting agents.

20. How does the lymphatic system work with blood flow?

Lymph capillaries take fluid from the blood to the lymph nodes. The lymph nodes filter the lymph by percolation through connective tissue filled with white blood cells. The white blood cells remove infectious agents, such as bacteria and viruses, to clean the lymph before it returns to the bloodstream.

21. Describe the cardiac cycle.

The heart receives an electrical signal from the sinoatrial node triggering the cardiac muscle cells in the atria to contract. The signal pauses at the atrioventricular node before spreading to the walls of the ventricles so the blood is pumped through the body. This is the systolic phase. The heart then relaxes in the diastole and fills again with blood.

22. What happens in capillaries?

The capillaries basically exchange materials with their surroundings. Their walls are very thin and are made of one or two layers of cells, where gases, nutrients, and waste are diffused. They are distributed as beds, complex networks that link arteries as well as veins.

23. How does blood pressure change during heavy exercise?

The heart rate increases, which increases the hydrostatic pressure against the artery walls. At the same time, the arterioles dilate in response to the increased exercise, which reduces peripheral resistance.