

Circulation and Gas Exchange Review Questions

1. What purpose is served by the respiratory system?
2. Why is the respiratory surface for terrestrial organisms inside rather than outside the body?
3. a) Why is a large surface area important for a respiratory surface?
b) How does the human respiratory system achieve a large surface area?
4. Joe on the street stops you and says “Hey, buddy. How do we breathe anyway?” What do you say?
5. Explain how your respiratory rate increases when you are exercising.
6. Why might a person with anemia or a low RBC count feel tired all the time?
7. A friend of yours is a smoker. Use your knowledge of the respiratory system to try to convince them to quit.
8. Why do large, multicellular animals require a circulatory system?
9. What function do capillaries serve?
10. What causes a pulse?
11. a) What is an aneurysm?
b) Why are they dangerous?
12. Why are the atrioventricular valves and the semilunar valves so important?
13. a) Your friend doesn’t understand what causes a head rush and says they hate getting one. You excitedly say that you have the explanation and the solution. What do you say?
b) Your friend then asks if arteries have those nifty valves also.
14. It is not unheard of for soldiers to faint while standing at attention for a long period of time. Explain.
15. Using examples, explain the purpose served by vasoconstriction and vasodilation.
16. You visit the doctor and have your blood pressure measured. It is 150/110. Is this high? Why might the doctor be more concerned with diastolic pressure than with your systolic pressure.
17. The artificial pacemaker is a small battery-powered device that can send small electric impulses to the heart. What is its function and why would one be necessary?
18. Why can the pulse rate be used to measure the heart rate?
19. What are the primary causes of heart attacks?
20. How can atherosclerosis result in high blood pressure?
21. What is unusual about the pulmonary arteries and veins?
22. The breathing control center responds to the level of carbon dioxide in the blood - not the level of oxygen. What consequence would this have for people at high altitude where there is less oxygen?
23. What is the relationship between a high fat diet and heart disease?
24. What is the adaptive value of the fact that arteries are usually located far below the skin?
25. Occasionally, a child is born with an opening in the wall between the right and left ventricles. Explain how such a defect might affect the child?
26. Explain how chronic starvation can lead to edema.
27. Imagine that you are a doctor and that you have diagnosed one of your patients as having high blood pressure. You prescribe a low salt diet. Why?
28. Imagine now that you became bored with the mundane life of a family physician and decided to become an Emergency Medicine Technician. At the scene of a car accident, a victim has lost a great deal of blood and is going into shock. The symptoms you observe are weak and rapid pulse, and falling body temperature. Explain.
29. What would happen if a blood clot formed in a major artery?
30. Aspirin reduces the ability of blood to form clots. Why do you think doctors prescribe aspirin to patients who have had a heart attack or stroke?
31. a) Why would someone with hemophilia have to be careful not to cut themselves?
b) How would injections of clotting proteins help a patient with hemophilia?