

Circulation and Gas Exchange Concept 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 what happens to result in an increase in your respiratory rate during exercise.
6. 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?
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. a) What causes a pulse?
- b) Why can the pulse rate be used to measure the heart rate?
10. Using examples, explain the purpose served by vasoconstriction and vasodilation.
11. What is unusual about the pulmonary arteries and veins?
12. What function do capillaries serve?
13. Explain how chronic starvation can lead to edema.
14. a) You bump into Joe on the Street at McDonalds and he says he doesn't understand what causes a head rush and complains that he hates getting one. You excitedly say that you have the explanation and the solution. What do you say?
- b) Joe then asks if arteries have those nifty valves also.
15. It is not unheard of for soldiers to faint while standing at attention for a long period of time. Explain.
16. 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?
17. Why are the atrioventricular valves and the semilunar valves so important?
18. 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?
19. 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.
20. 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?
21. What is the adaptive value of the fact that arteries are usually located far below the skin?
22. What are the primary causes of heart attacks?
23. How can atherosclerosis result in high blood pressure?
24. What is the relationship between a high fat diet and heart disease?
25. a) What is an aneurysm?
- b) Why are they dangerous?
26. 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.
27. Why might a person with anemia or a low RBC count feel tired all the time?
28. What would happen if a blood clot formed in a major artery?

29. 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?
30. 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?