

## 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. 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. What is an aneurysm? Why are they dangerous?
12. Why are the pulmonary and aortic semilunar valves so important?
13. Your friend doesn’t understand what causes a headrush and says they hate getting one. You excitedly say that you have the explanation and the solution. What do you say?
14. Your friend 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. Using examples, explain the purpose served by vasoconstriction and vasodilation.
17. 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.
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. Why can the pulse rate be used to measure the heart rate?
20. What are the two basic causes of heart attacks?
21. How can atherosclerosis result in high blood pressure?
22. Suggest a couple of treatments for a blockage of a coronary artery.
23. What is unusual about the pulmonary arteries and veins?
24. 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?
25. What is the relationship between a high fat diet and heart disease?
26. What is the adaptive value of the fact that arteries are usually located far below the skin?
27. 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?
28. Explain how chronic starvation can lead to edema.
29. 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?
30. 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.
31. What would happen if a blood clot formed in a major artery?
17. Describe the process by which blood clots form.
32. 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?
33. Why would someone with hemophilia have to be careful not to cut themselves? How would injections of clotting proteins help a patient with hemophilia?

34. After arriving at a high altitude ski resort from your home at sea level, you notice that during the first week of skiing you are short of breath and lacking energy. Gradually, these symptoms disappear.

Explain.

14. What would happen if a person with type A blood received a transfusion of type B blood?

15. In some cases, people who know they are going to have surgery several months in advance can have several units of blood removed ahead of time and stored until their surgery. Why would a person do this?

18. Complete the following chart to indicate whether a blood transfusion is possible in each case. In each box, show the antigens present on the donors blood, and the antibodies present in the recipients blood.

Blood type of recipient

	A	B	AB	O
A				
B				
AB				
O				
Blood type of donor				