

TRANSPORT IN ANIMALS

In animals, particularly vertebrates, transport of materials takes place in a well-defined circulatory system, the components of which are listed below.

1. Transport tissue.
2. Blood as a transport tissue is made up of other elements, namely: white blood cells, red blood cells, and blood platelets. Of these, the red blood cells are involved in transporting respiratory gases like carbon dioxide and oxygen.
3. Pumping organ. The vertebrate heart has chambers (atria and ventricles). These chambers vary in number: two in fishes, three in amphibians and four in mammals (Figure 5.14).

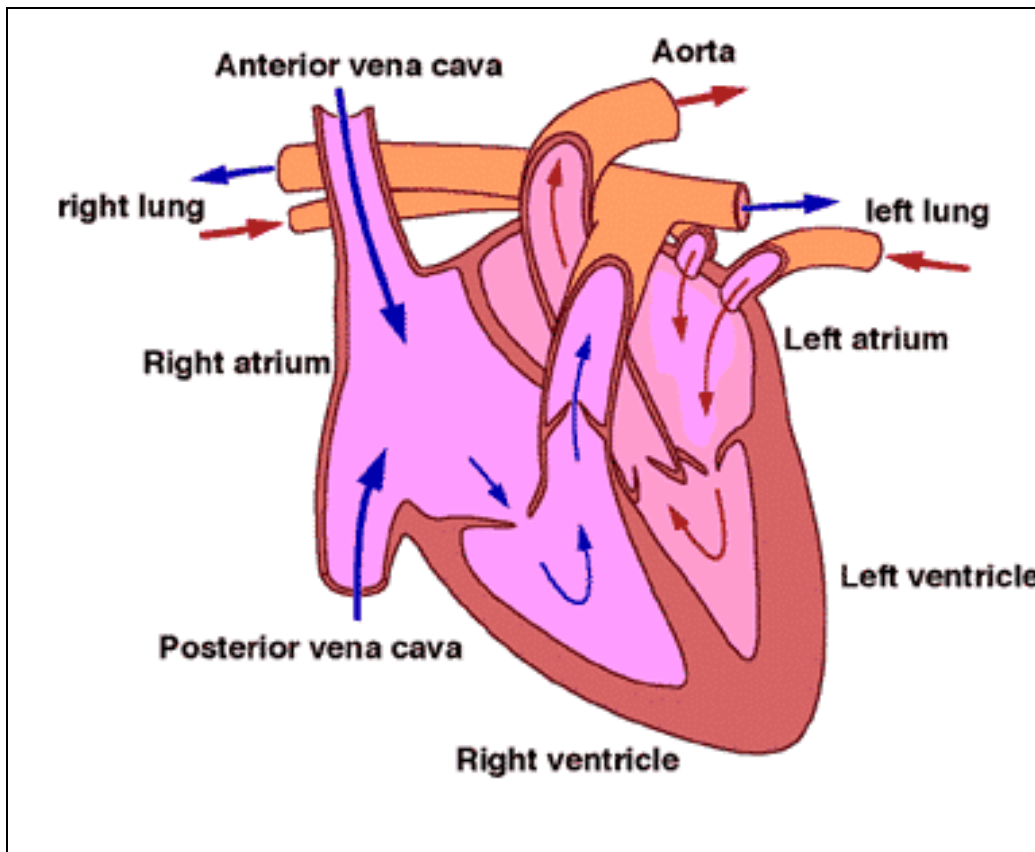


Figure 5.14 A four-chambered heart of a mammal. (NOTE: This figure must be redrawn)

4. Blood vessels (arteries, veins, capillaries). The blood vessels differ in terms of structure and function. An artery carries blood away from the heart to the rest of the body. A vein carries blood back to the heart. A capillary conveys blood between ns. Substances like glucose and oxygen between cells and capillaries (Figure

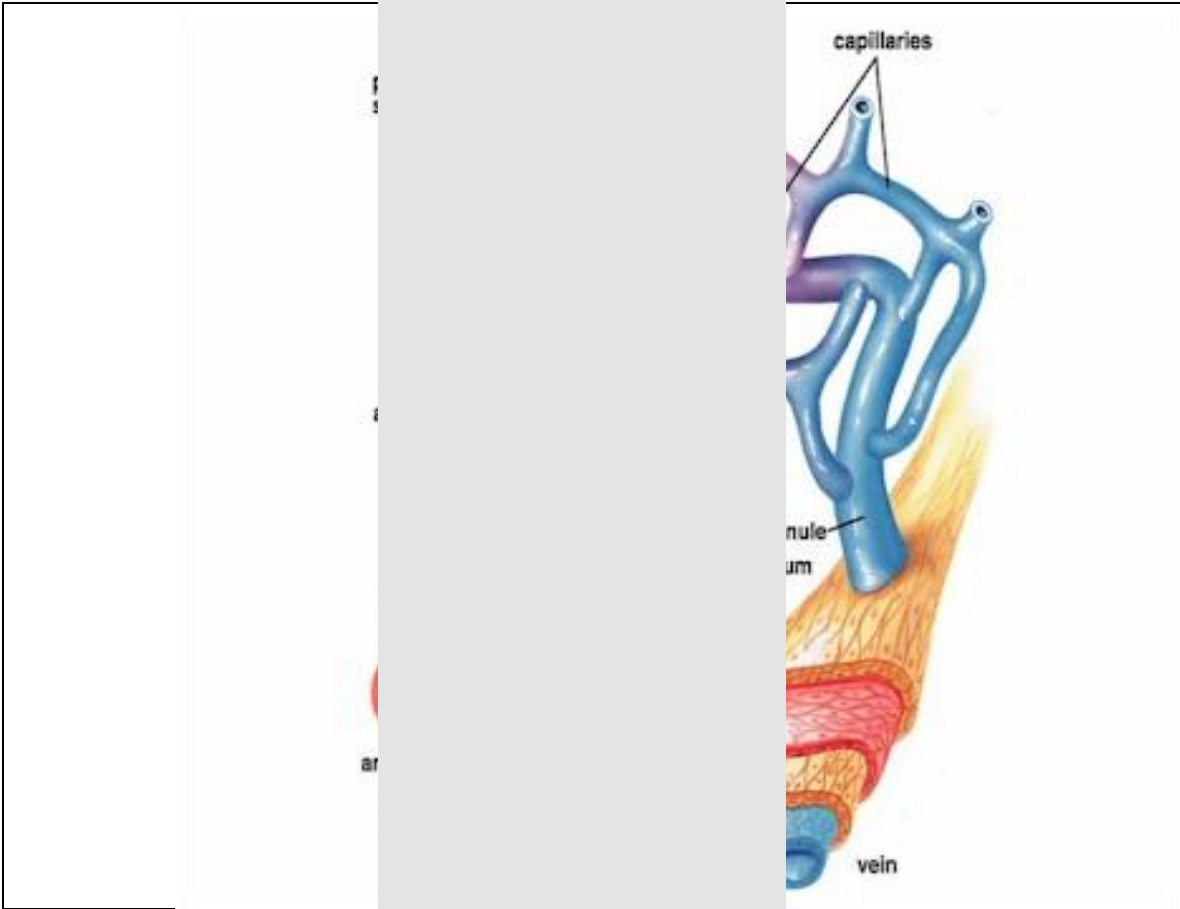


Figure 5.15 Blood vessels (arteries, veins, and capillaries). **NOTE:**

Figure 5.

Among mammals, the heart has 4 chambers: right and left atria, and right and left ventricle. Blood circulates in double loops- one loop is from the heart to the lungs and back to the heart (pulmonary circuit or loop) and the other loop starts from the heart to the various organs of the body and back to the heart (systemic circuit or loop).

In your heart, the right ventricle pumps blood rich in carbon dioxide to the lungs. As the blood passes through the lungs, carbon dioxide is exchanged for oxygen. The oxygen-rich blood then passes through the capillaries surrounding the lungs. The oxygen-rich blood is then pumped back to the left atrium of the heart. You will see that the pathway for oxygen-rich blood is different from that of the carbon dioxide-rich blood. Of course, you need oxygen more than you need carbon dioxide.

Figure 5.18 illustrates the comparison in the heart of amphibians and that of mammals. Frogs and toads are amphibians. They spent a part of their life cycle in water. Look at the ventricle. How many chambers do you see? What about in the mammalian heart?

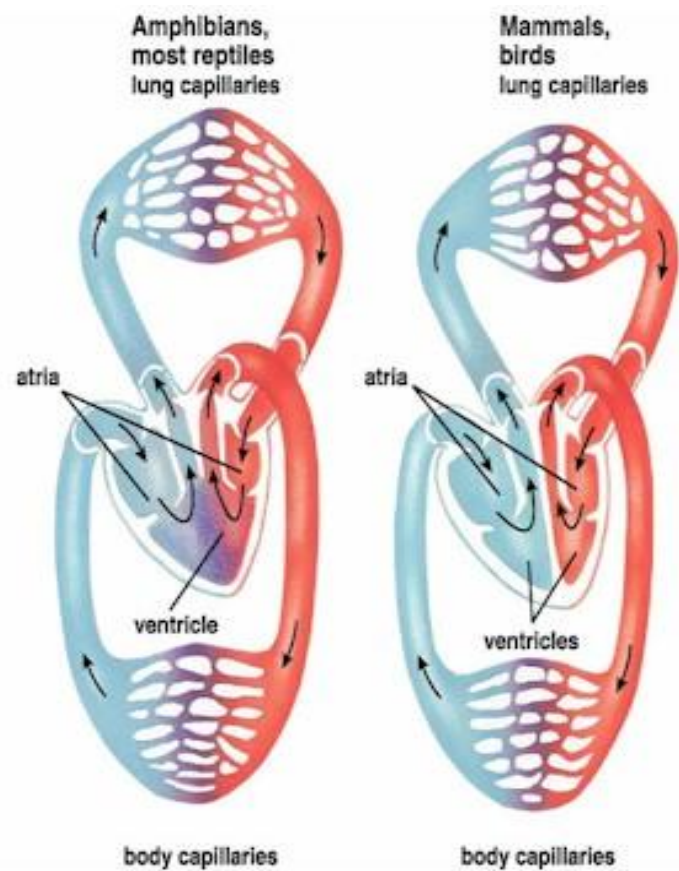


Figure 5.18 Comparison of amphibian and mammalian heart.

Mammals have four chambers, while amphibians possess only three chambers. In amphibians, there is a chamber that is undivided and this is the ventricle. At this site, mixing of oxygen-rich blood and carbon dioxide-rich blood happens. To compensate for the inefficient acquisition of oxygen, amphibians also respire through their skin. In contrast, humans do not need to respire through their skin.