

Study Sheet C

THE CIRCULATORY SYSTEM – THE BLOOD VESSELS

Blood circulation in the human body takes place in a closed system. In this system, blood which is pumped out from the heart is restricted to blood vessels, whereas in an open system the blood flows freely into spaces around body tissues. In the human, blood is carried in three main types of vessels. Those taking blood **away** from the heart are called **arteries**; those taking blood **towards** the heart are called **veins**. In other words, arteries distribute the blood; veins collect it. The third type, called capillaries, connects the arteries to the veins.

Because of the elasticity of their thick muscular walls, arteries bulge with each heartbeat. We therefore say that they have a definite pulse. Like the branches of a tree, arteries split into successively smaller and smaller vessels. The smallest arteries are called arterioles, and they are the arteries that connect to capillaries. The arteries carrying oxygen-poor (blue) blood from the right ventricle to the lungs are the pulmonary arteries. They are the only arteries that carry oxygen-poor blood. The pulmonary arteries are part of pulmonary circulation. All other arteries carry oxygen-rich (red) blood in systemic circulation.

The aorta, which carries blood away from the left ventricle, is the largest blood vessel in the body. Upon leaving the left ventricle it starts upward then curves back down behind the heart. As it continues down along the spine, it furnishes branches to many different organs. Two branches, called the subclavian arteries, supply blood to the arms. Two other branches, the carotid arteries, supply blood to the head region and brain. At the lower end of the body cavity the aorta branches and supplies blood to the legs through the femoral arteries.

Two branches of the aorta, called coronary arteries, leave the aorta near the heart. These two arteries furnish nourishment to the heart itself. They form part of the so-called coronary circulation. These two arteries can be seen near the outside wall of the heart.

Arterioles, the smallest arteries, subdivide into microscopic tubes called capillaries. The walls of capillaries are only one cell thick. It is through the extremely thin capillary walls that oxygen is exchanged for carbon dioxide and food is exchanged for waste.

As capillaries begin carrying blood back to the heart, they join together into larger vessels called venules or small veins. The venules then join together into larger vessels called veins. Veins carry blood back to the heart. The largest vein that is nearest the heart is called the vena cava. The blood returning to

the heart from the legs returns to the right atrium from the inferior vena cava, and from the head and arms in the superior vena cava.

Some veins contain valves for maintaining the flow of blood in the proper direction. No similar structure is found in arteries. On the other hand, veins lack a pulse and have thinner walls than arteries.

The veins carrying blood back to the heart from the lungs back to the left atrium are the pulmonary veins. They are the only veins that carry oxygen-rich (red) blood. All the other veins carry oxygen-poor (blue) blood. The veins carrying blood towards the heart from the head are called the jugular veins. The jugular vein connects with the superior vena cava along with the veins from the arms. The iliac veins from the leg region connect with many veins that connect with other internal organs like the stomach, liver, etc. and link to the inferior vena cava.

Questions

1. Small arteries are called _____.
2. The only artery that carries oxygen-poor (blue) blood is the _____ artery.
3. The _____ is the largest blood vessel in the body.
4. The actual exchange of gases occurs in the tiniest blood vessels, the _____.
5. Since blood remains within the blood vessels in humans, the system is called a _____ system.
6. Blood vessels carrying blood towards the heart are called _____.
7. The _____ veins carry blood from the head to the heart.

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