

The circulatory system

The circulatory system ensures a continuous flow of blood to all body cells, and its function is subject to continual physiological adjustments to maintain an adequate blood supply.

Blood vessels

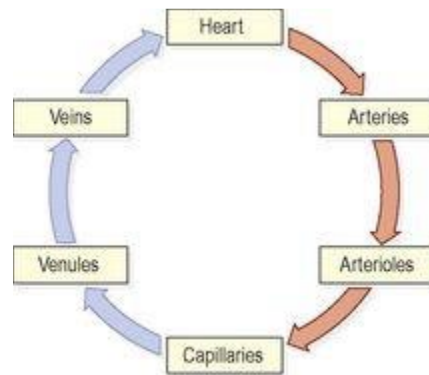


Fig: The relationship between the heart and the different types of blood vessel.

Arteries and arterioles

These are the blood vessels that transport blood away from the heart. They vary considerably in size and their walls consist of three layers of tissue

Capillaries and sinusoids

The smallest arterioles break up into a number of minute vessels called *capillaries*. Capillary walls consist of a single layer of endothelial cells sitting on a very thin basement membrane, through which water and other small molecules can pass. Blood cells and large molecules such as plasma proteins do not normally pass through capillary walls. The capillaries form a vast network of tiny vessels that link the smallest arterioles to the smallest venules.

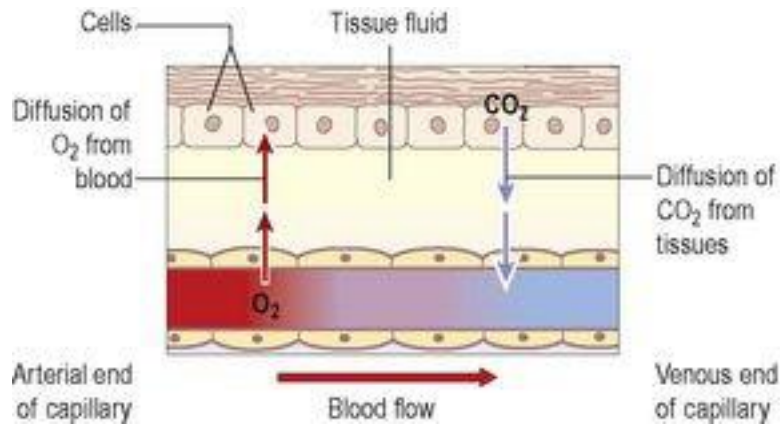
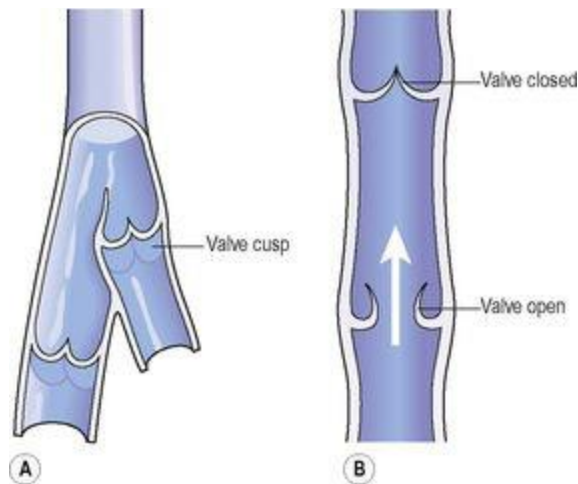


Fig: The exchange of gases in internal respiration.

Veins and venules

Veins are blood vessels that return blood at low pressure to the heart. The walls of the veins are thinner than those of arteries but have the same three layers of tissue. They are thinner because there is less muscle and elastic tissue in the tunica media, because veins carry blood at a lower pressure than arteries



Interior of a vein: A. The valves and cusps. **B.** The direction of blood flow through a valve