

What is Blood

Blood is a liquid that circulates throughout the body, carrying oxygen and nutrients to every cell, and carrying away waste products. Blood plays a central role in the body's defense against intruders. It is pumped by the heart, through a network of miles of blood vessels, to every part of the body. The average adult body contains about 10 pints of blood. There are four main components of blood: red blood cells, white blood cells, plasma and platelets. In addition, blood contains various nutrients and minerals.

Blood Types

Although blood is made of the same basic elements, not all blood is alike. In fact, there are eight common red blood cell types, which are determined by the presence or absence of certain antigens. Since some antigens can trigger a patient's immune system to attack the transfused blood cells, safe therapy with blood depends on careful blood typing and cross-matching.

The Origins of Blood

Blood is produced in the bone marrow, a jellylike substance inside the bones. In adults, the spine, ribs, and pelvis are the primary bones that make blood. As the blood cells develop from the stem cells in the marrow, they seep into the blood that passes through the bones and on into the bloodstream.

The different blood cells have different life spans — red blood cells last about 120 days in the bloodstream; platelets about ten days; and the various kinds of white blood cells can last from days to years.

The body has feedback systems that tell it when to make new blood cells. For example, if bodily oxygen levels are low, the kidneys produce a hormone called erythropoietin, which stimulates the stem cells in the marrow to produce more red blood cells.

How Blood Travels

Blood moves in two large, continuous circles through a network of blood vessels. The 'right circuit' moves blood from the right side of the heart through the lungs back to the heart (left side). The 'left circuit' moves blood from the heart to the rest of the body and then back to the heart. There are different types of blood vessels: arteries, capillaries, and veins.

Arteries carry blood away from the heart. They branch out into smaller arteries, which connect to capillaries. The capillaries are very narrow — only one cell wide. Inside the capillaries, the red blood cells release oxygen, which passes through the thin capillary walls and into the surrounding tissue. The tissue releases waste products, like carbon dioxide, which passes through the thin capillary walls into the blood. Blood returns to the heart in the veins. Veins contain one-way valves to keep low-pressure blood flowing toward the heart, even against the pull of gravity. Because the blood in veins contains so little oxygen, it appears bluish in comparison to the bright red of oxygenated blood.