Blood types

There are 4 different blood types: A, B, AB, and O. Genes that you inherit from your parents (1 from your mother and 1 from your father) determine your blood type.

Blood is always being made by the cells inside your bones, so your body can usually replace any blood lost through small cuts or wounds. But when a lot of blood is lost through large wounds, it has to be replaced through a blood transfusion (blood donated by other people). In blood transfusions, the donor and recipient blood types must be compatible. People with type O blood are called universal donors, because they can donate blood to anyone, but they can only receive a transfusion from other people with type O blood.

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| Reading #1: Write a summary in your own words. |

What does blood do?

Blood carries oxygen from the lungs and nutrients from the digestive tract to the body’s cells. It also carries away carbon dioxide and all of the waste products that the body does not need. (The kidneys filter and clean the blood.) Blood also

* Helps keep your body at the right temperature
* Carries hormones to the body’s cells
* Sends antibodies to fight infection

Contains clotting factors to help the blood to clot and the body’s tissues to heal

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| Reading #2: What do you consider is the most important job of blood? Why? |

What is cholesterol?

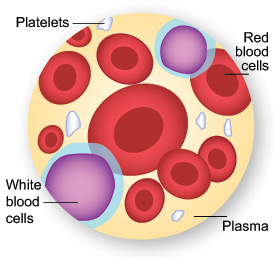
Cholesterol is a fat-like substance called a lipid that is found in all body cells. Your liver makes all of the cholesterol your body needs to form cell membranes and to make certain hormones. Extra cholesterol enters your body when you eat foods that come from animals, like meats, eggs, and dairy products. Although we often blame the cholesterol found in foods that we eat for raising blood cholesterol, the main culprit is actually saturated fat. Foods rich in saturated fat include butter fat in milk products, fat from red meat, and tropical oils such as coconut oil.

Blood cholesterol levels, which tell how much lipid or fat is in the blood, are expressed in milligrams per deciliter (mg/dL). In general, you want to have a cholesterol level below 200 mg/dL. Between 200 mg/dL and 239 mg/dL, your cholesterol level is elevated or borderline-high and should be lowered if you can. With a level of 240 mg/dL or above, your cholesterol level is high, and there is a need for action. For example, changing your [diet](http://www.texasheart.org/HIC/Topics/HSmart/nutriti1.cfm), beginning an [exercise](http://www.texasheart.org/HIC/Topics/HSmart/exercis1.cfm) program, and taking [statins or other cholesterol-lowering medicines](http://www.texasheart.org/HIC/Topics/Meds/cholmed.cfm) are all ways to **lower** your cholesterol level.

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| Reading #7 Based on the foods that you eat in a week, would your cholesterol by high, low or normal? Why? |

What is blood?

Blood is actually a tissue. It is thick because it is made up of a variety of cells, each having a different job. In fact, blood is actually about 80% water and 20% solid.

* **Platelets**, which help the blood to clot. Clotting stops the blood from flowing out of the body when a vein or artery is broken. Platelets are also called thrombocytes.
* **Red blood cells**, which carry oxygen. Of the 3 types of blood cells, red blood cells are the most plentiful. In fact, a healthy adult has about 35 trillion of them. The body creates these cells at a rate of about 2.4 million a second, and they each have a life span of about 120 days. Red blood cells are also called erythrocytes.
* **White blood cells**, which ward off infection. These cells, which come in many shapes and sizes, are vital to the immune system. When the body is fighting off infection, it makes them in ever-increasing numbers. Still, compared to the number of red blood cells in the body, the number of white blood cells is low. Most healthy adults have about 700 times as many red blood cells as white ones. White blood cells are also called leukocytes.

Blood also contains hormones, fats, carbohydrates, proteins, and gases.

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| Reading #3: What do white blood cells do? |

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| |  | | --- | | The circulatory system is the route by which the cells in your body get the oxygen and nutrients they need, but blood is the actual carrier of the oxygen and nutrients. Blood is made mostly of plasma, which is a yellowish liquid that is 90% water. But in addition to the water, plasma contains salts, sugar (glucose), and other substances. And, most important, plasma contains proteins that carry important nutrients to the body’s cells and strengthen the body’s immune system so it can fight off infection.  The average man has between 10 and 12 pints of blood in his body. The average woman has between 8 and 9 pints. To give you an idea of how much blood that is, 8 pints is equal to 1 gallon (think of a gallon of milk). | |

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| Reading #4 Why is plasma in the blood so important? |

**Related terms: blood count, CBC, blood screen**

A complete blood count (CBC) is one of the most common blood tests. It is usually done as part of a routine checkup and can help detect a number of blood disorders, such as anemia, infections, clotting problems, blood cancers, and immune system problems. A CBC test measures many different parts of your blood, including the number of red blood cells, white blood cells, and platelets. It also measures the hemoglobin (iron) levels in your blood and your hematocrit, which is how much space your red blood cells take up in your blood. Another part of a CBC test is the mean corpuscular volume, which is a measure of the average size of your red blood cells. Specific blood tests can be performed to see if there is a problem with your heart, lungs, or blood vessels.

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| Reading #5 What could doctors find with a CBC exam? |

Blood Tests

* Cardiac enzyme tests, which measure the cardiac enzyme levels in the blood. Certain enzymes will be present if the heart muscle (myocardium) has been damaged by a heart attack, because damaged heart cells release these enzymes into the blood. The most common cardiac enzyme that is released is creatine kinase.
* Troponin tests, which measure the amount of troponin (a type of protein) in the blood. Troponin affects how the heart muscle contracts. If there are high levels of troponin in the blood (troponin T or troponin I), there is most likely damage to the heart muscle. The amount of troponin released into the blood correlates with the degree of damage to the heart muscle.
* Arterial blood gas studies, which measure how well the blood is being oxygenated in the lungs.
* Lipoprotein (cholesterol) profile, which measures how much fat or lipid is in the blood.
* Blood cultures, which can be used to determine if there are microorganisms (like the bacteria that causes endocarditis) in the body’s system. After the blood is drawn, it is placed on a culture, which helps the bacteria grow. The bacteria is then analyzed to determine what type it is and what medicines can be used to kill it.
* Blood clotting tests, which measure the blood’s ability to clot. Clotting stops the blood from flowing out of the body when a vein or artery is broken.

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| Reading #6 Which test would you consider to be the most important? Why? |