

The average adult human body contains around five liters of blood. Blood is composed of the fluid part called plasma and the cellular components including red blood cells (RBCs), white blood cells (WBCs), and platelets.

Plasma, a mixture of water, sugar, fat, protein, and salts. The main job of the plasma is to transport blood cells throughout body along with nutrients, waste products, antibodies, clotting proteins. **RBCs** contain a special protein called hemoglobin, which helps carry oxygen from the lungs to the rest of the body and then returns carbon dioxide from the body to the lungs. **WBCs** protect the body from infection. The most common type of white blood cell is the neutrophil, which is the "immediate response" cell and accounts for 55 to 70 percent of the total white blood cell count. **Platelets** help the blood clotting process by gathering at the site of an injury, sticking to the lining of the injured blood vessel, and forming a platform on which blood coagulation can occur.

A higher than normal number of platelets can cause unnecessary clotting, which can lead to strokes and heart attacks. Polycythemia (erythrocytosis) is an abnormal elevation of hemoglobin (Hb) in peripheral blood can cause venous and arterial occlusion.

Acute blood loss secondary to trauma, surgical and nonsurgical hemorrhage can be life threatening that require whole blood or RBCs transfusion. Other conditions like thalassaemia and sickle cell disease require recurrent RBCs. Fresh frozen plasma transfusion is needed for control of bleeding due to coagulation defect, for reversal of anticoagulant medications, other medical condition like liver failure, TTP and DIC. Platelet transfusion is indicated to prevent hemorrhage in patients with thrombocytopenia or platelet function defects. Cryoprecipitate prepared from plasma is used in cases of hypofibrinogenemia, which most often occurs in the setting of massive hemorrhage or consumptive coagulopathy.

Despite trials to find alternatives for blood transfusions (like volume expanders, hematopoietic growth factors that cause the bone marrow to make more blood cells as well as researches aiming to get blood substitute), blood donation stay to be the only reliable and effective to save lives and satisfy the medical needs.

Benefits of donating blood; Blood donation activates the bone marrow cells which increases their effectiveness to produce new blood cells. Donation of blood get rid of the excess iron in the body which if high can increase the risk of heart diseases. High levels of iron also cause the oxidation of cholesterol leading to damage of small blood vessels.

blood donation on regular bases decreases the possibility of having heart attacks and brain strokes. Specially people with high platelets count or haemoglobin levels who are advised to donate for less time interval compared to normal people. some studies have shown that regular blood donations associated with pronounced decreases of blood pressure, lower values of some lipid profiles, mental health conditions to get better and the levels of anxiety, depression and fear are lower than those in the general population. people who don't have regular check of their medical condition will benefit from testing their blood for anemia and certain infections like HIV, hepatitis B, hepatitis C and syphilis.

Blood donation does not expose the donor to illness. The instruments used for the blood donation are sterilized and disposable after single use in donation. Blood Donation usually carries no significant side effects, it is common to experience slight dizziness or lightheadedness after blood donation. Redness or swelling may occur in the injection area. If the donor has low iron store, donation can further decrease the iron storage. More significant side effects are less likely to happen.

Several measures are used to ensure that blood donation is safe for the donor and is unlikely to have any negative health effects. These measures include medical history interview and physical examination.

People with heart disease, heart valve conditions, irregular heartbeat, disease of the blood vessels in the brain, heart failure, and certain lung conditions may be excluded from blood donation. Certain blood diseases such as iron deficiency anemia may also lead to exclusion. People with a history of seizures can donate blood, provided they have had no seizures within a certain period of time. Women who are pregnant are not permitted to donate blood during pregnancy and for six weeks after the pregnancy ends. People who have undergone recent surgery are permitted to donate blood when healing is complete and they have resumed full activity. The minimum age for blood donation is 16 or 17 years, depending upon the country. Donors also are excluded if they feel unwell.

Donors undergo a brief physical examination before donation to check for any obvious signs of illness or conditions that would disqualify them from blood donation. Vital signs: pulse, blood pressure, and temperature checked before donation. Individuals with a fever, high blood pressure (generally higher than 180/100), very high or very low heart rate (with the exception of highly conditioned athletes and those on beta blocker medication), or an irregular heartbeat are temporarily not permitted to donate blood. A small blood sample is taken from a fingerstick and tested to check for hemoglobin in the blood. The acceptable Hb is not to be below 12.5 for female and 13 grams for male donors.

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