

Blood components

Blood is a specialized body fluid . It has four main components : - plasma , red blood cells , white blood cells , and platelets . Blood has many different functions , including : -

1. Transporting oxygen and nutrients to the lungs and tissues
2. Forming blood clots to prevent excess blood loss
3. Carrying cells and antibodies that fight infections .
4. Bringing waste products to the kidneys and liver, which filter and clean the blood
5. Regulating body temperature

The main transfusable blood components include : -

1. Red Blood Cells

Red blood cells contain haemoglobin, which distributes oxygen to body tissues , and carries waste carbon dioxide back to the lungs . Red blood cells are used to treat all kinds of anaemia (where people have low haemoglobin levels) including : -

1. As a result of rheumatoid arthritis or cancer
2. When red cells break down in newborn babies
3. Sickle cell diseases .
4. Red blood cell transfusions replace the heavy blood loss that can occur in an accident , during surgery or in childbirth .

White Blood Cells

White blood cells fight infection and are part of the body's defence system . White cell transfusions may be given to patients suffering from life-threatening infections whose normal defence mechanisms don't seem to be responding to antibiotics .

Platelets

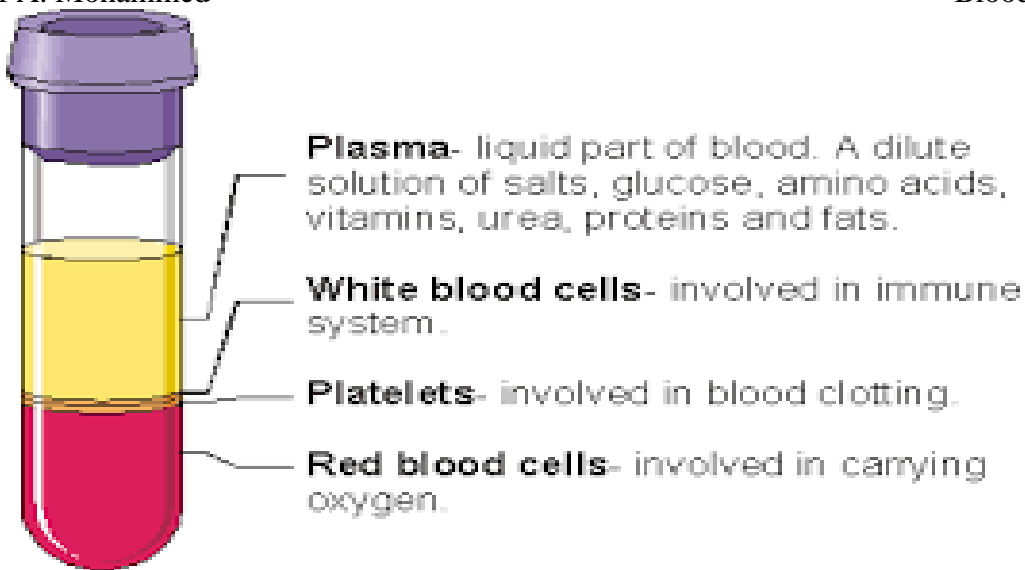
Platelets are crucial in helping blood to clot: they do this by clumping together to stop bleeding after an injury. They can be used : -

1. to treat cases of bone marrow failure
2. following a transplant or chemotherapy treatments
3. to treat leukaemia

Plasma

Plasma is the fluid that carries all blood cells and components . Plasma contains a large number of proteins and substances which are often important ingredients in medical procedures . Plasma includes : -

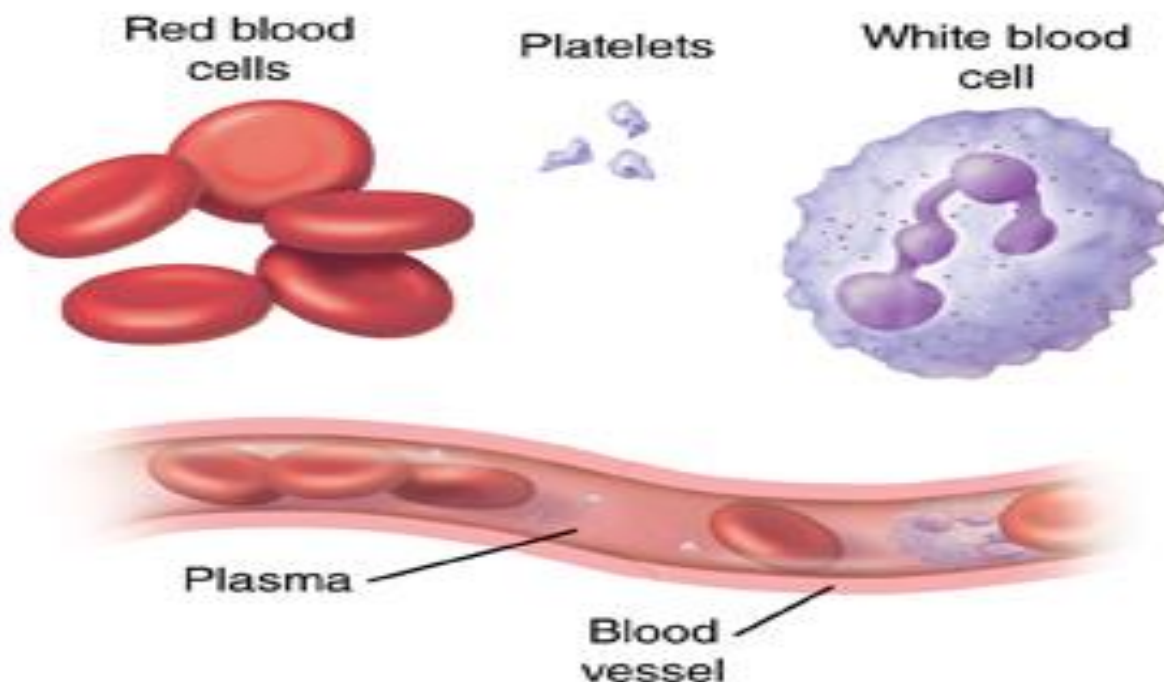
1. Albumin - a protein useful for treating kidney and liver disease .
2. Clotting factors - used to treat types of haemophilia and diseases where blood doesn't clot properly .
3. Immunoglobins - these antibodies help protect against infections .



(*Serum* : the liquid part of coagulated blood or plasma)

Cryoprecipitated AHF

Cryoprecipitated Antihemophilic Factor (Cryo) is a portion of plasma rich in clotting factors, including Factor VIII and fibrinogen . It is prepared by freezing and then slowly thawing the frozen plasma .

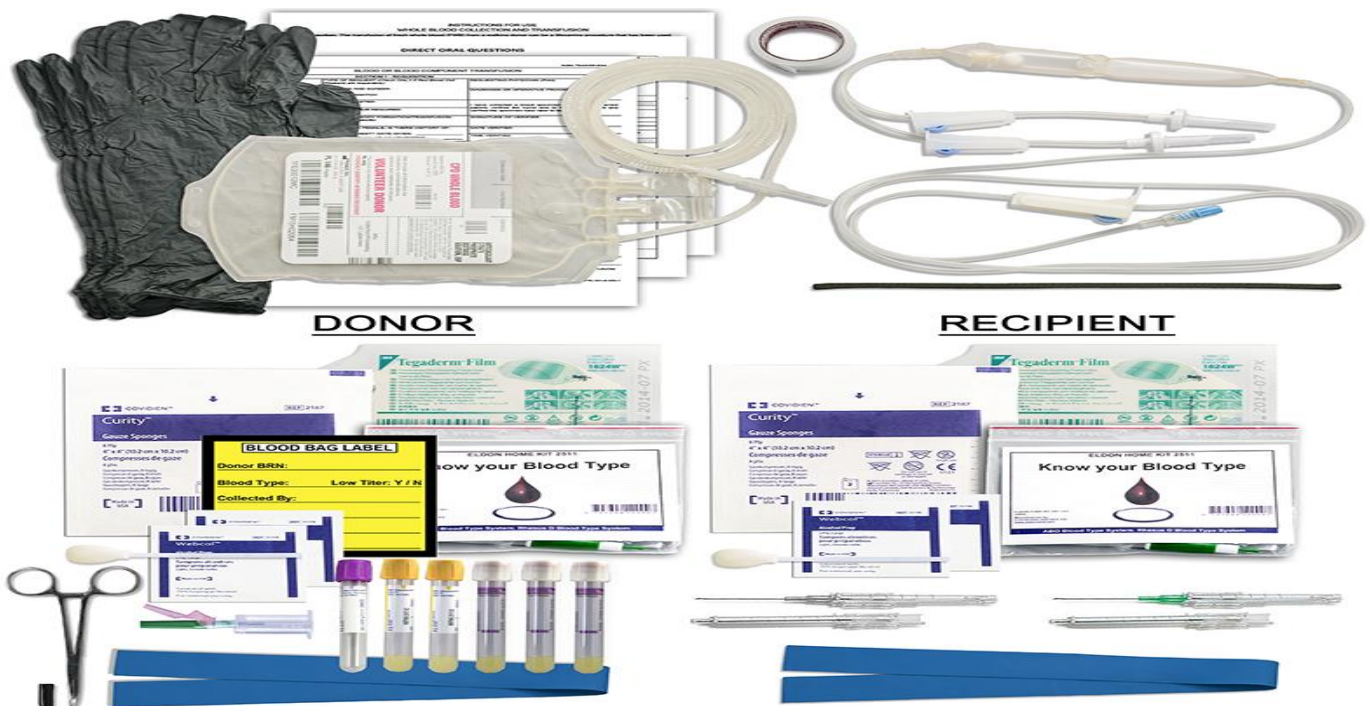


Blood Collection

Blood is to be collected only by trained personnel working under the direction of a qualified licensed physician . Blood collection must be by aseptic methods, using a sterile closed system. If more than one skin puncture is needed, a new container and donor set must be used for each additional venipuncture . Blood must be collected into an FDA-approved container that is pyrogen-free and sterile and contains sufficient anticoagulant for the quantity of blood to be collected. The container label must state the type and amount of anticoagulant and the approximate amount of blood collected .

Whole blood collection

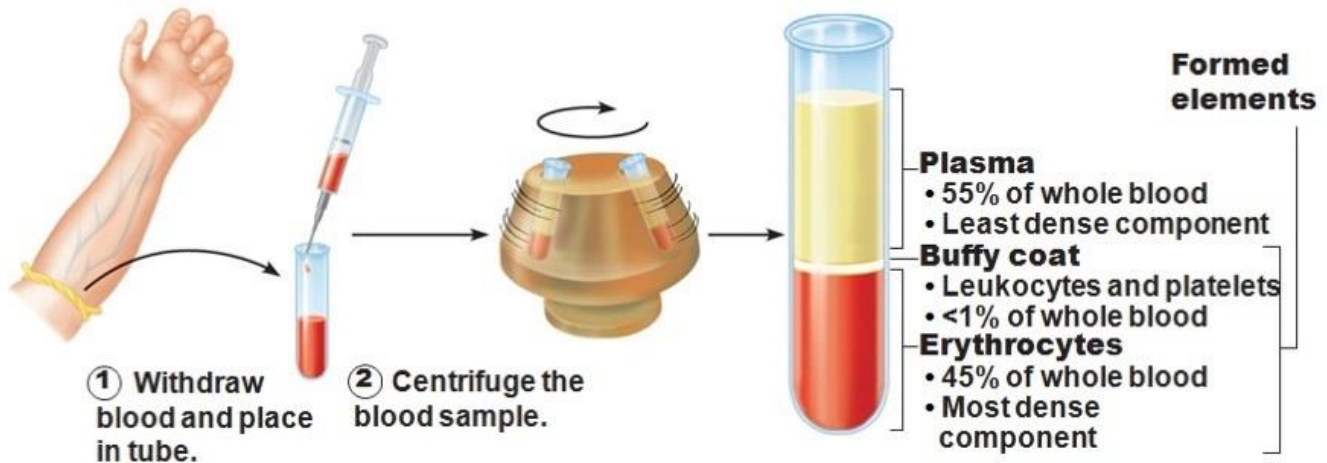
Whole blood donations may be given safely every 12 weeks . The donations are collected into a closed set of sterile blood packs with varying configurations depending on inventory requirements and donation history. Approximately 470 mL of donor blood is collected via aseptic venepuncture into the primary blood pack with the first 30 mL being diverted to sample tubes for laboratory testing . The donation is collected over 5–15 minutes .



The appointment takes around one hour which includes registration , interview , as well as rest and refreshment time after the donation has finished .

Apheresis Blood Collection

Apheresis donor platelets and plasma is collected in a sterile closed system using an automated cell separating machine . This process removes the donor blood , separates and collects the platelets or plasma (depending on the type of donation) and returns the rest of the blood to the donor .



Types of Blood donation

1. **Allogeneic** (also called *homologous*) **donation** is when a donor gives blood for storage at a blood bank for transfusion to an **unknown recipient** .
2. **Directed donation** is when a person, often a **family member** , donates blood for transfusion to a specific individual.
3. **Autologous donation**. When a person has blood stored that will be transfused back to the donor at a later date, usually after surgery.

Blood Donor Recruitment

The donor should not be fasting before donation . If the last meal was taken more than four hours previously, the donor should be given something to eat and drink before donation . Blood flowing into the bag is mixed with anticoagulant in a ratio of 1:7 (anticoagulant : blood) . Total collection volume is from 405-495 mL and usually , a volume of 450 mL blood is donated .

The aim of using selection guidelines for blood donors has two purposes : firstly , to protect donors from potential harm which may occur as a direct result of the donation process; secondly, to protect recipients of blood transfusion from adverse effects , such as transmission of infectious diseases or other medical conditions and unwanted effects caused by medication taken by the donor . The donors are selected according the following important eligibility criteria :

1. General appearance: the prospective donor shall appear to be in good physical and mental health .
2. Age : donors shall be between 18 and 60 years of age .
3. Haemoglobin : Hb shall be not less than 12.5 g / dL for males and 11.5 g / dL for females .
4. Weight : minimum 45 kg .
5. Blood pressure : systolic and diastolic pressures shall be normal (Systolic : 100 -140 mm Hg and diastolic : 60-90 mm Hg is recommended) , without the aid of anti -hypertensive medication .
6. Temperature : oral temperature shall not exceed 37.5o C / 99.5o F.
7. Pulse : pulse shall be between 60 and 100 beats per minute and regular.
8. Donation interval : the interval between blood donations shall be 3 to 4 months .