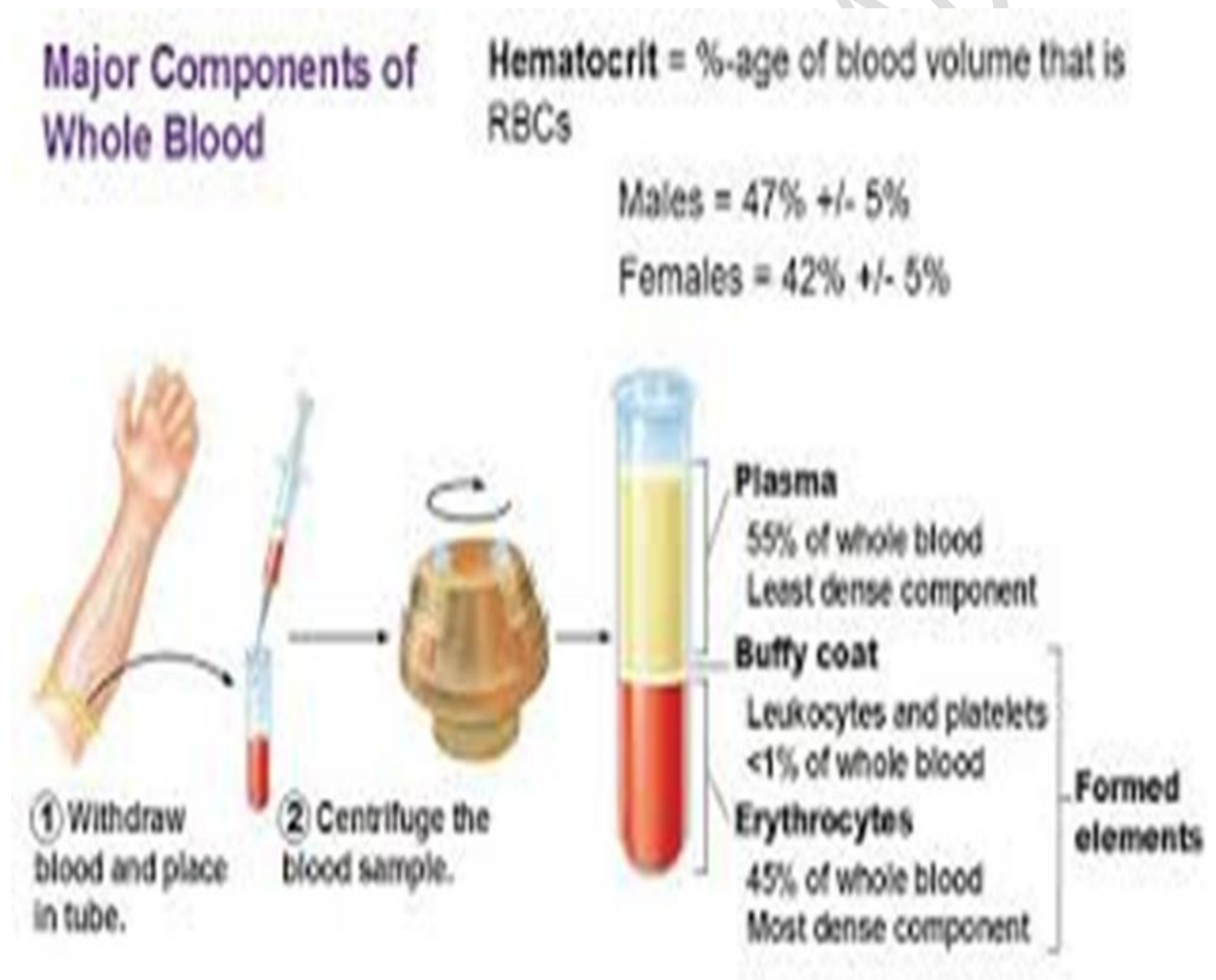


Blood components: The separated parts of whole blood. Separated from one another by conventional blood bank method by centrifugation because of their different specific gravities, different centrifugal force, different time, and different temperature change according to needs.

Type of Blood components:

1. **Cellular components:** RBCs or packed cells, leukocytedepleted red cells, platelets concentrate, platelet apheresis, leukocytes-depleted platelet concentrate
2. **Noncellular plasma components:** Fresh frozen plasma, cryoprecipitate, and cryopoor plasma.



Functions of main Blood Components

1. **RBC:** (Erythrocytes = Red Blood Cells = RBCs) It supplies oxygen to different parts of the body and carries carbon dioxide and other waste products
2. **WBC:** (Leukocytes = White Blood Cells = WBCs) It fights/prevents infections of diseases. White blood cells (WBCs) producing antibodies to develop immunity against infections .
3. **Platelets:** Platelets are produced in the bone marrow. The function of platelets is to prevent bleeding (important for blood clotting).
4. **Plasma:** It is the liquid part of blood, composed of about 92% water, 7% vital proteins and 1% mineral salts, sugars, fats, hormones and vitamins. The plasma also contains three types of proteins, including:
 - ✚ **Albumin** is the most common type of protein in the plasma. It is made by the liver. It carries nutrients and hormones around the body.
 - ✚ **Immunoglobulins** (also known as antibodies) are proteins that recognize foreign organisms that have invaded the body. They destroy these “germs”.
 - ✚ **Clotting Factors** are a group of proteins that help stop bleeding when we are injure.

Benefits and Advantages of Blood Components: Separating blood into its components has many advantages like:-

1. Maximize the yield of products form a single donation.
2. Ability to use optimal product for specific disease.
3. Reducing the exposure of foreign material to the donor to minimum.
4. The required components can give maximum benefit to a patient with minimum risk.
5. Better proper patient management with appropriate deficient parts
6. Reduce risk of transfusion transmitted disease as well adverse reaction of blood transfusion.
7. Cost-effective product, from a unit of whole blood can prepare different types of components and supply according to patients' needs and cost-benefit goes to blood bank.
8. Components have greater shelf life than whole blood.

Production of Blood Components :

Blood which is to be used for component production is collected into special collection system in which 2 or 3 smaller satellite bags are attached to the main collection bag. Blood components are prepared from whole blood in large centrifuges which are refrigerated. The blood can be subjected to a light spin or a heavy spin depending upon components to be produced. For preparation of platelet concentrate, centrifugation is performed at room temperature (20° C to 24° C); for all other blood components, centrifugation is carried out between 1°C and 6°C.

Blood Component	Centrifugation	Storage		Indication
		Temp	Time	
PRBCs	WB Light spin= 2000rpm-20°C - 11min. → PRBCs + PRP	2-6°C	+SAGM 42d	✚ Anemia ✚ Newborn exchange transfusion
PC	PRP heavy spin= 3500rpm-20°C - 11min. → PC + FFP	R.T	3-5 d	✚ Bleeding ✚ Operation if plt. Less than 20000/μl
FFP		18°C → 65°C →	1year 7year	✚ Clotting factor deficiencies ✚ Severe burns
Cryo Cryoprecipitate	1. WB special heavy spin= 3500rpm at 4°C -11min. → RBC + Plasma 2. Plasma → store at -18 °C then thaw at 4 °C then heavy spin at 4°C	30°C	1year	✚ Hemophilia A ✚ Von Willebrand disease