

Physiology

Practical

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Erythrocyte

- ❖ The major function of erythrocytes, is to transport hemoglobin, which in turn carries oxygen(O_2) and carbon dioxide(CO_2) . Flattened, donut-shaped cell that is concave on both sides This shape gives erythrocytes a large surface area, which is critical to their role in gas exchange.
- ❖ Hemoglobin (HGB) is a pigment with a high affinity (attraction) for oxygen. It is also responsible for the red coloration of RBCs and the blood. hemoglobin molecule can transport four molecules of O_2 , and each RBC contains about 200 million hemoglobin molecules



Heme



Hemoglobin



Erythrocyte

Hematocrit (HCT) : is the volume of packed RBCs that occupies a given volume of whole blood, This is often referred to as the packed cell volume (**PCV**), It is reported usually as a percentage (e.g., 36%).

The hematocrit is generally higher in males than in females due to males typically larger body size and greater muscle and bone mass.

Automated measurement: **Hematocrit (HCT)**

Manual procedure: **packed cell volume (PCV)**



Automated Complete Blood Count (CBC) Test Machine

Anemia

- ❖ Is the reduction in the hemoglobin content of blood that can be caused by a decrease in the RBC count, hemoglobin concentration, and **hematocrit** below the reference value
- ❖ Classical symptoms of anemia are fatigue, weakness, and shortness of breath

Experiment (Packed Cell Volume PCV)

❖ The packed cell volume (PCV) can be used as a simple screening test for anaemia.

Normal range for adults

❖ Males (40–50%)

❖ Females (36–44%)

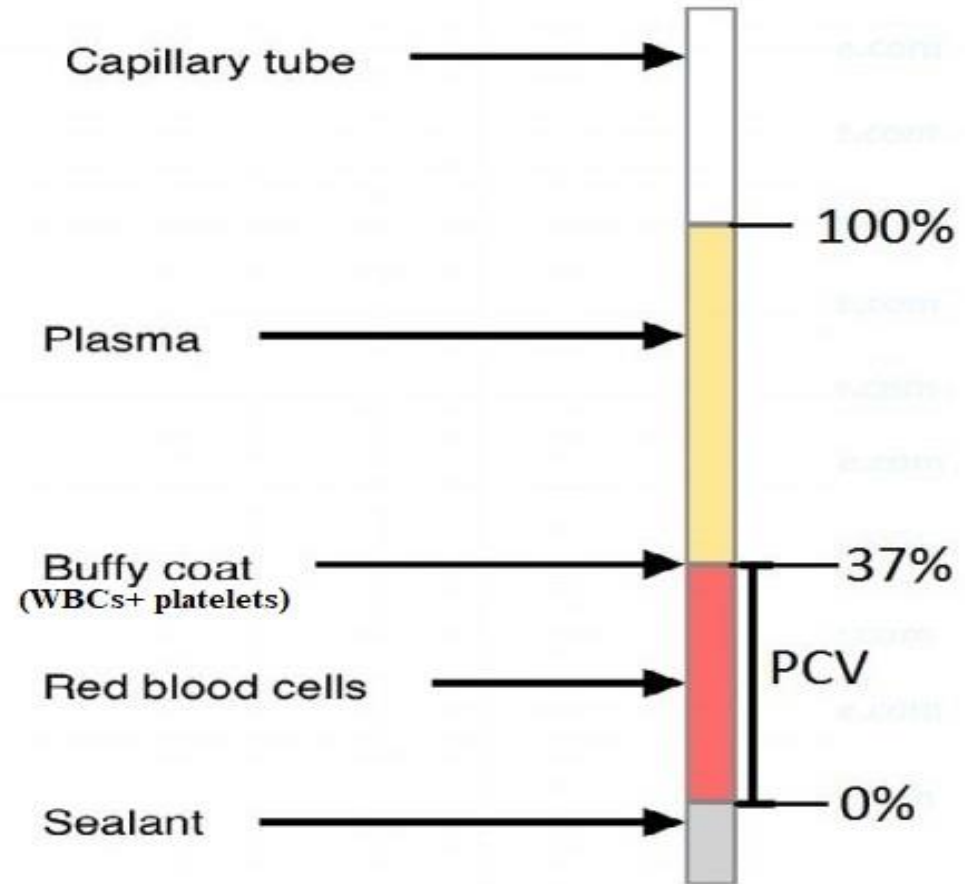
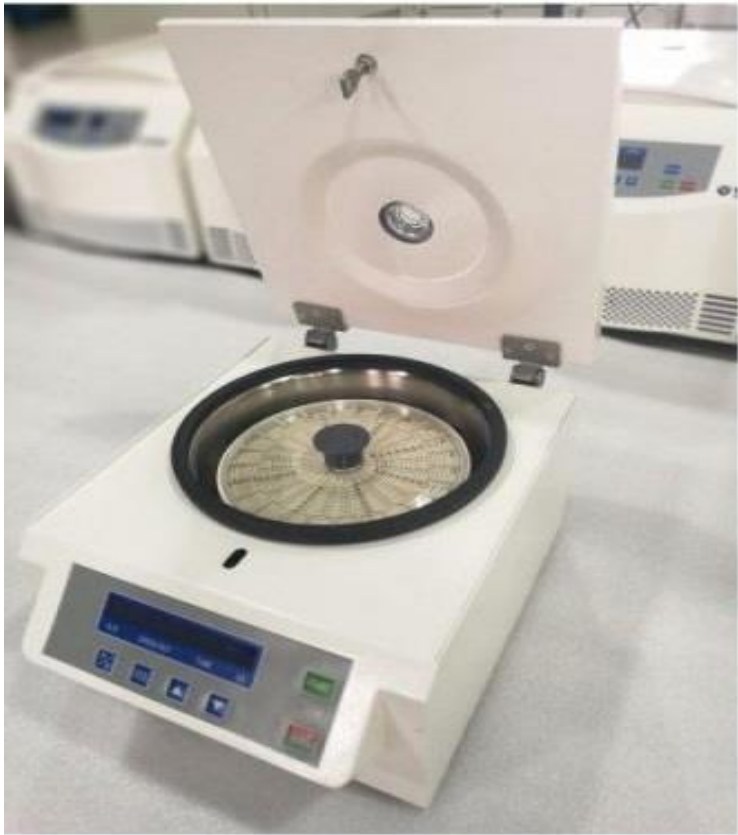
The Materials and Equipments

- ❖ Sterile disposable **lancet** for finger puncture, Cotton or gauze, and 70% alcohol.
- ❖ Capillary tube containing Anticoagulant (Heparin).
- ❖ Clay for Sealing the end of the tube.
- ❖ Centrifuge device (Hematocrit centrifuge).
- ❖ Hematocrit Reader.

PROCEDURE

- ❖ Clean the finger with 70% alcohol and let it to dry.
- ❖ With lancet do the finger puncture and remove the first drop of blood.
- ❖ Place the tip of capillary tube onto drop of blood and repeat until two third of tube is filled.
- ❖ Sealing the end of tube with clay.
- ❖ Centrifuge the tube for 5 minutes and insure that centrifuge is **balanced**.
- ❖ Read the PCV with hematocrit reader.





Q \ Describe the Source of Errors in pcv test ?