

Al-Zahraa(A.S.) University for Women
College of Health and Medical
Techniques
Department of Radiological Techniques



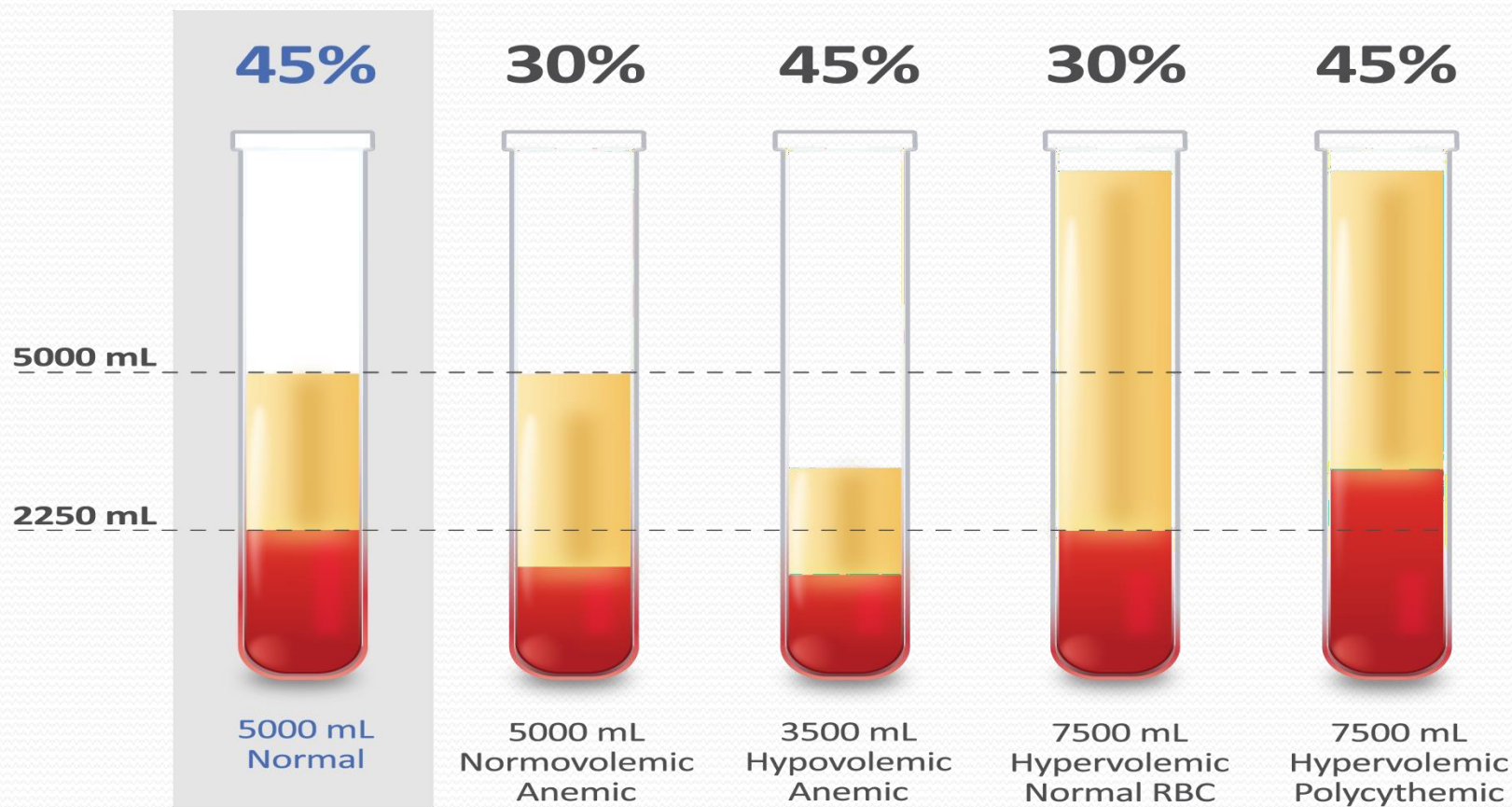
كلية التقنيات الصحية والطبية
HEALTH AND MEDICAL TECHNICAL COLLEGE



Practical Physiology
Asst. Lect. Duaa Raad

Hematocrit (Ht or HCT) or Packed cell Volume (PCV)

- ✓ packed cell volume (PCV) is the proportion of blood volume that is occupied by red blood cells.
- ✓ The increase in PCV value means increase the number of red blood cells



Hematocrit: % of RBC to TBV

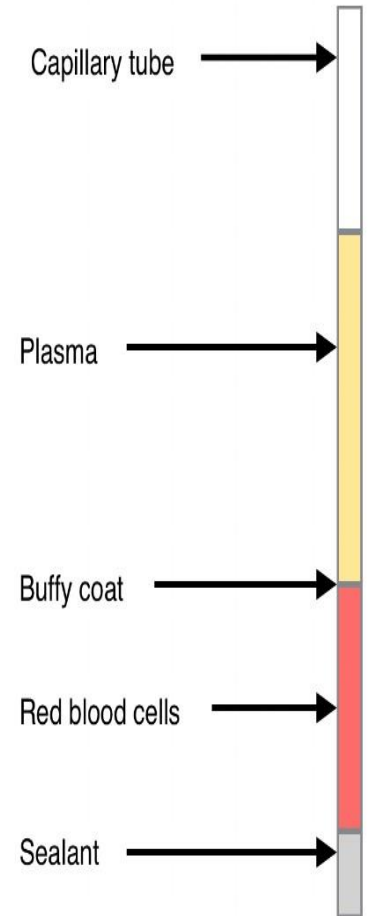
Hemoglobin: 1/3 of Hematocrit

Plasma

Red Blood Cells

In a centrifuge blood is separated into three layer including:

- 1 -The mass of the erythrocytes at the bottom which is referred to as **packed corpuscles volume (P.C.V.)**
- 2-White or gray layer of leukocytes and thrombocytes immediately above the red corpuscles mass that referred to as **the buffy coat**.
- 3-The blood **plasma**.



Decreased PCV

- A decreased PCV reflects a low number of circulating red blood cells and is an indicator of a decrease in the oxygen-carrying capacity or of over hydration.
- Examples of conditions causing a low hematocrit (anemia) include
 - bleeding
 - Hemolysis
 - pregnancy.

PCV Test Normal Range

- **The values of the PCV test normal range are:**
- **Between 35% - 48%**
- **Low PCV in blood test results is less than 30%, and High PCV is more than 50%**

Increased PCV

- A increased PCV may reflect an absolute increase in the number of erythrocytes, or a decrease in plasma volume, in conditions such as
- Severe dehydration – e.g. in case of burns, diarrhea or excessive use of diuretics
- Erythrocytosis – excessive red blood cell production

Apparatus and reagent

- Microhematocrit centrifuge.
- Whole blood in heparin or EDTA tube
- Microhaematocrit (capillary) tubes
- Plasticine clay
- Microhaematocrit reader



Procedures

1.Fill hematocrit tube to about three-fourth of its length

EDTABy sample



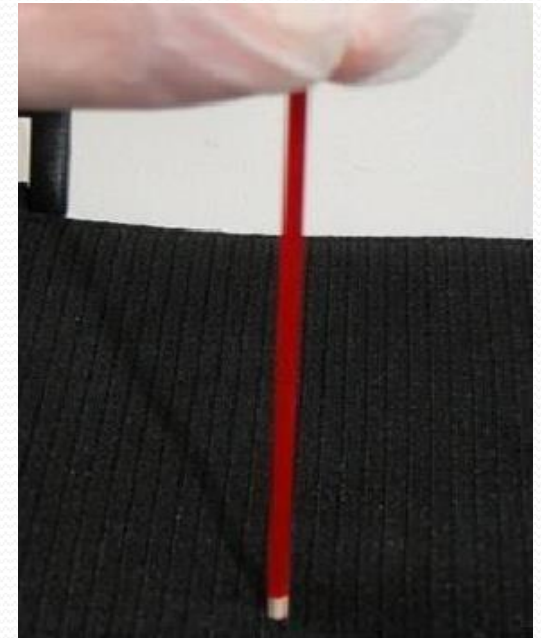
Or by lancet



2. Place hematocrit tube the "non-blood" end of the tube and push the opposite end into a clay sealant 3-4 times (clay length about 1 cm)



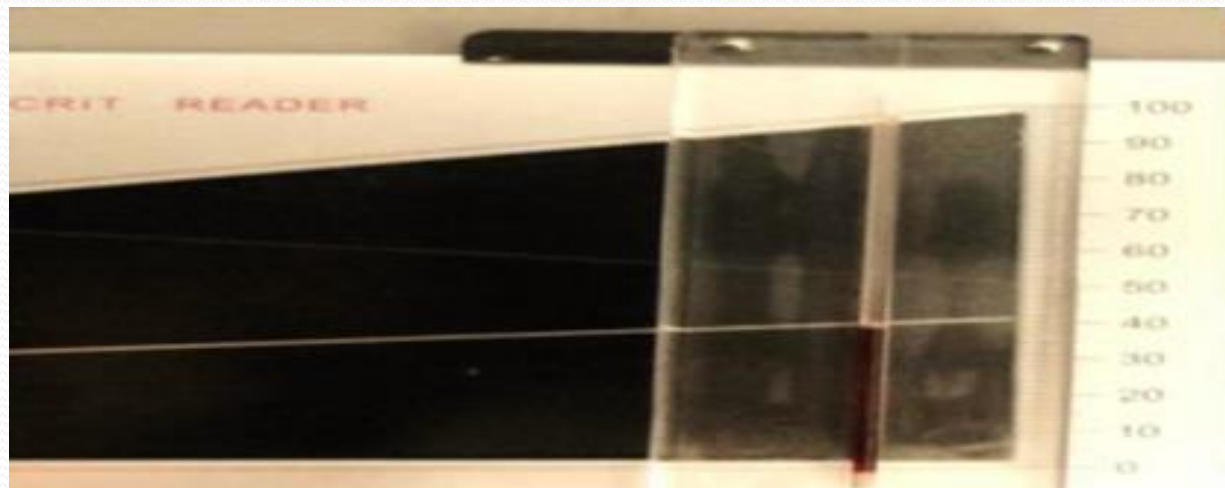
3. Check there is a sufficient plasticine .plug



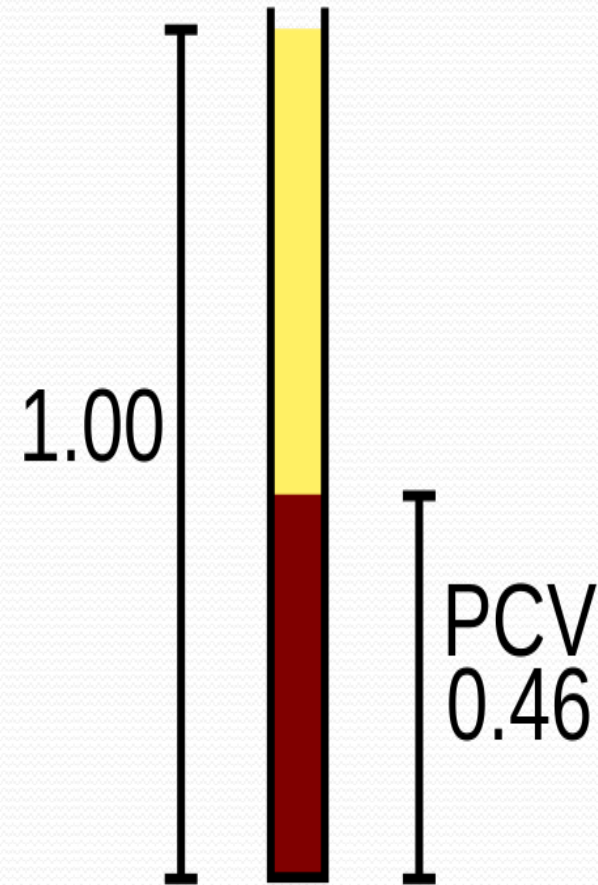
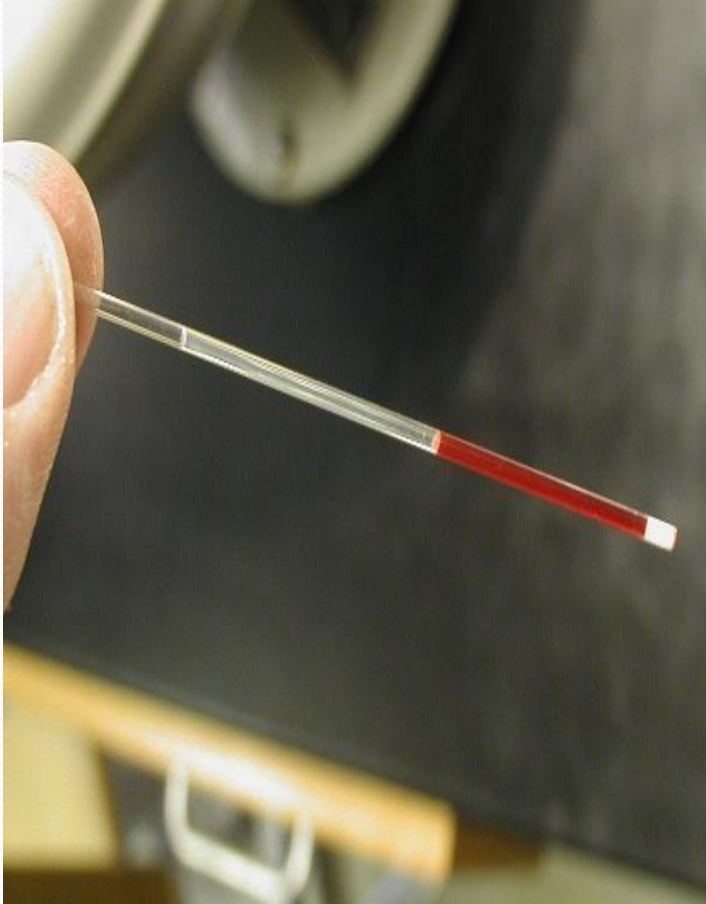
4. Fill 2 tubes and place them opposite each other in the centrifuge. This is to balance the centrifuge; every tube must have another tube opposite it. Place the plasticine plug end of the tube against the rubber (outer) edge to stop the contents spilling out when spun (3 minutes at 15,000; 5 minutes at 10,000).



- Place the capillary tube onto the haematocrit reader. Adjust the tube on the slide so that the top of the plasma is level with the bottom line (0%).
- Move the slider to the top of the plasma fraction is level with the topline) .(100%)
- Use the adjuster on the left to align the middle line with the top of the red cells. Read the PCV from the right hand side scale.



Whole blood form after centrifugation



<https://youtu.be/4UGtTyk148M?si=SVivhEs1iRz8Dabd>