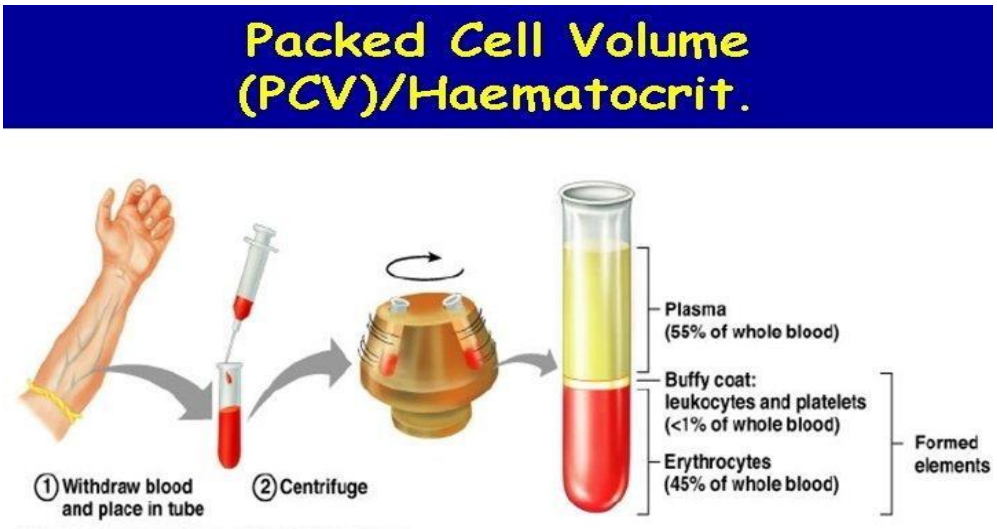
Human physiology
Practical \ Lab 6
BY
Msc . Sarah abdel
al khleq

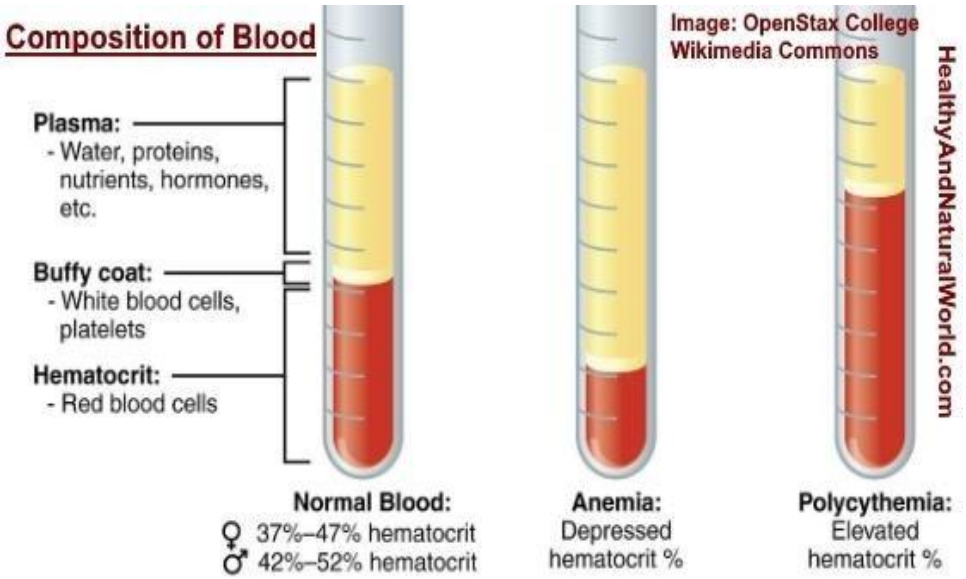


Packed cell volume or Hematocrit (PCV)

Definition:- -The packed cell volume (PCV) can be used as a simple screening test for anemia as a reference method for calibrating automated blood count systems and as a rough practical hematology. A guide to the accuracy of hemoglobin measurements.

The PCV _1000is about three times the Hb expressed in g/l .In conjunction with estimations of HB and RBCs it can be used in the calculation of red cells indices.

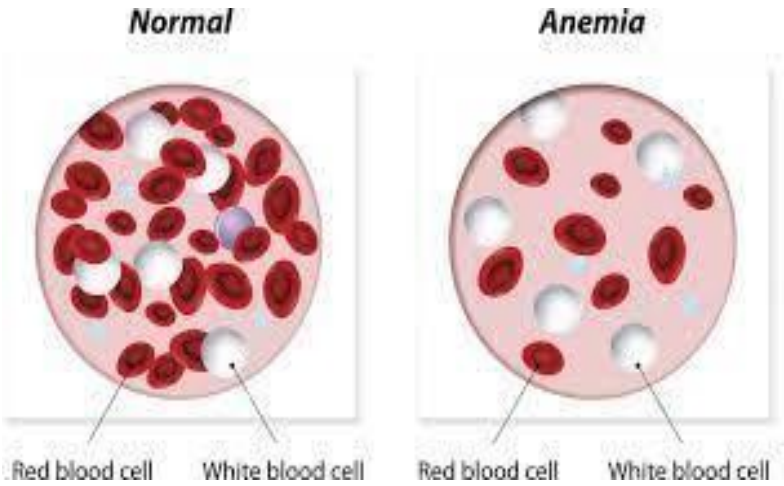
However used in under resourced laboratories may be limited by the need for a specialized centrifuge and a reliable supply of capillary tubes.



Anemia

According to World Health Organization criteria, anemia is defined as blood hemoglobin (Hb) concentration (< 13g\dL). in adult males; Hb(<12g\dL) in adult females. Signs and symptoms of anemia are varied, depending on the level of anemia and the time course over which it developed.

Acute anemia is nearly always due to blood loss or hemolysis. In acute blood loss, hypotension and decreased organ perfusion are the main issues. Symptoms associated with more chronic vary with the age of the person and the adequacy of blood supply to critical organs. Moderate anemia is associated with fatigue, loss of stamina, breathlessness, and tachycardia. The skin and mucous may appear pale.



Symptoms of anemia

Anemia signs and symptoms vary depending on the cause. If the anemia is caused by a chronic disease, the disease can mask them, so that the anemia might be detected by tests for another condition Depending on the causes of your anemia, you might have no symptoms. Signs and symptoms, if they do occur, might include:

-Fatigue •

- Weakness
- Pale or yellowish skin
- Irregular heartbeats
- Shortness of breath
- Dizziness or lightheadedness
- Chest pain
- Cold hands and feet
- Headaches.

Causes of anemia

Anemia occurs when your blood doesn't have enough red blood cells. This can happen if:

- Your body doesn't make enough red blood cells
- Bleeding causes you to lose red blood cells more quickly than they can be replaced
- Your body destroys red blood cells.

Polycythemia

Polycythemia, or erythrocytosis, refers to an increase in the absolute red blood cell (RBC) mass in the body. In practice, this is reflected by an increase in hemoglobin levels,

- hematocrit, over what is considered physiologic for that age and gender.

or-the body makes too many red blood cells, leading to a thickening of the blood. It can be associated with an elevated platelet count and an enlarged spleen.

The standard RBC mass does not usually exceed 36 ml/kg in males and 32 ml/kg in females. The reference ranges for normal hemoglobin levels.

Symptoms of polycythaemia

atients may not have any symptoms or they may have the kind of complaints that are discovered during a routine physical exam, including:

- Headache
- Sweating during the day or night
- Ringing in the ears
- Blurred vision or blind spots
- Dizziness
- Reddish or purplish skin
- Unexpected weight loss
- Problems with bleeding or clotting
- A perennial feeling of fullness
- Itching, especially after taking a shower
- Burning and redness of the hands or feet
- Fatigue
- Bone pain

Diagnosis

In many cases, a routine complete blood count reveals an increase in the red blood cells along with an increase in the white blood cells or platelets. A physician may also recognize certain signs of this disease during an ordinary office visit, including a redness of the complexion or an increase in the size of the spleen.

Common diagnostic tests include:

- **Complete blood count** to check for an increase in the hemoglobin (along with the white blood cells or platelets)
- **Genetic testing** for the JAK2 mutation (positive in 95% of PCV patients)
- **Further blood tests** to look for a low erythropoietin level (a hormone involved in red blood cell production)
- **Bone marrow biopsy** to look for proliferation of precursors to red blood platelets, red blood cells, and white blood cells

What causes polycythaemia?

Polycythaemia can be divided into several different types, depending on the underlying cause. In some cases, an underlying cause can't be identified