Department of Anesthesia Techniques

Title of the lecture:-

Hematology

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The 1st stage

Hematology:

Can be defined as the scientific study of blood and the tissues that make it .

There are main field in laboratory diagnostic for hematology:

1- Routine hematology (ex . full blood examinations , morphology)

2-Coagulation-test

3-Blood bank

4-Special test (performed only when required)

Blood

Is the red fluid that circulates in our blood vessels, i.e. veins and arteries.

The main function of blood is to act as the body's transport system, but it also has a major role in the body's defense against infection.

Blood consist of cells and plasma (proteins, sugars, water) .

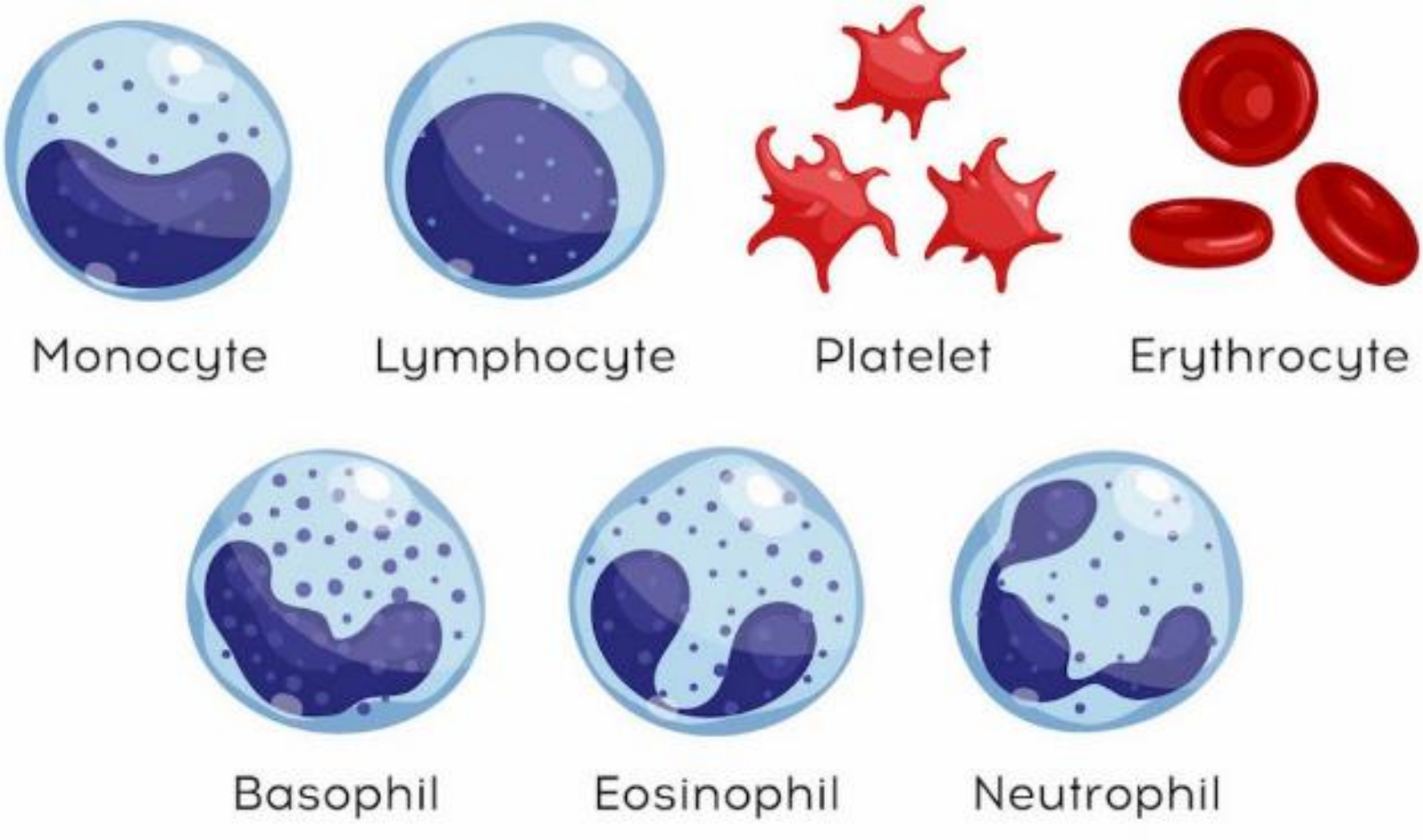
The 3 main types of blood cells :

1- Platelets **help the blood to clot. Clotting stops the blood from flowing out of the body when a vein or artery is broken.**

2- Red blood cells **carry oxygen. they each have a life span of about 120 days. Red blood cells are also called** erythrocytes.

3- White blood cells **responsible in infection. Its also called** leukocytes.

types of blood cells



Blood sampling :

Three different specimens:

Whole blood used for performing complete blood counts (blood films)

Plasma is the fluid contain blood cells (RBC ,WBC , platelets)

Serum is the fluid remain after separation of the clot when the blood put in the tube without anticoagulant .

Serum preparation

1- Collect whole blood in a covered test tube.

2- After collection of the whole blood, allow the blood to clot by leaving it at room temperature. This usually takes 15–30 minutes.

3- Remove the clot by centrifuging at 3,000 x g for 10 minutes in a centrifuge.

4- The resulting supernatant is designated serum.

Serum preparation

5- transfer the liquid component (serum) into a clean tube using a Pasteur pipette.

- The samples should be maintained at 2–8°C while handling.
- If the serum is not analyzed immediately, the serum should be stored at –20°C or lower.
- It is important to avoid freeze-thaw cycles because this is can invalidate certain tests

Plasma preparation

1- Collect whole blood into anticoagulant-treated tubes

2- Cells are removed from plasma by centrifugation for 10 minutes at 3,000x g using a centrifuge.

3- The resulting supernatant is designated plasma.

4- immediately transfer the liquid component (plasma) into a

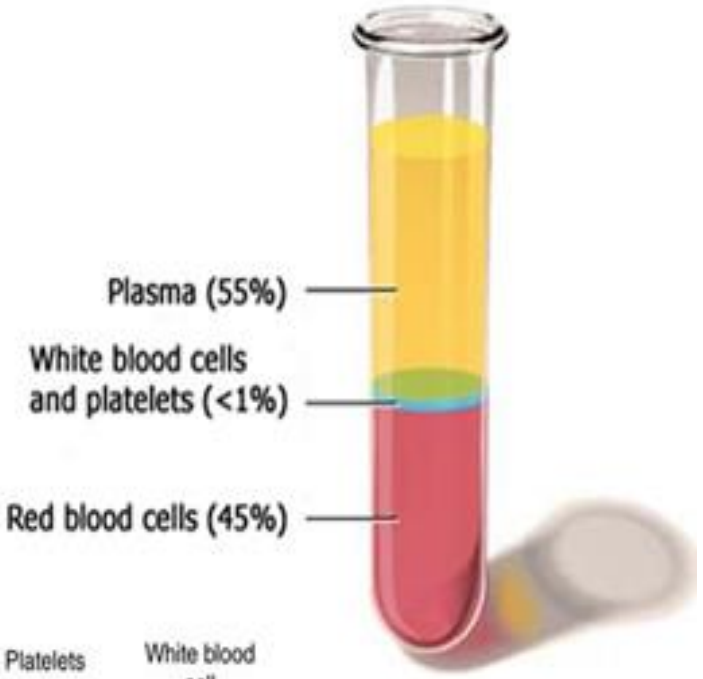
clean tube using a Pasteur pipette.

Plasma preparation

The samples should be maintained at 2–8°C while handling.
If the plasma is not analyzed immediately, the plasma should be stored, and transported at –20°C or lower.
It is important to avoid freeze-thaw cycles. Samples can invalidate certain tests.

Blood

- Contains plasma
  - 90% water
  - 10% dissolved gases, salts, nutrients, enzymes, hormones and waste



- Contains red blood cells
  - Also called erythrocytes
  - Carry oxygen with the protein hemoglobin