

**AL RASHEED UNIVERSITY
DEPARTMENT OF MEDICAL
LABORATORY TECHNIQUES**



Erythrocyte Sedimentation Rate (ESR)

**BLOOD TRANSFUSION
LAB**

M.Sc. MAHER ALI



- **ESR** can be defined as a measurement of the rate at which the RBCs (erythrocytes) settle from the plasma in anticoagulated blood.
- It measures the amount of inflammation in your body.
- It is nonspecific test, meaning that it does not tell your doctor exactly where the inflammation is occurring in the body.
- The **normal reference** range for ESR results is:

1–13 mm/hr. For males

1–15 mm/hr. For female

Westergren method

This is the most common Trusted Source ESR method.

Wintrobe method

The Wintrobe methods similar to the Westergren method, except the tube used is 100 mm long and thinner. A disadvantage of this method is that it's less sensitive than the Westergren method.

Stages of ESR test

Stage of aggregation

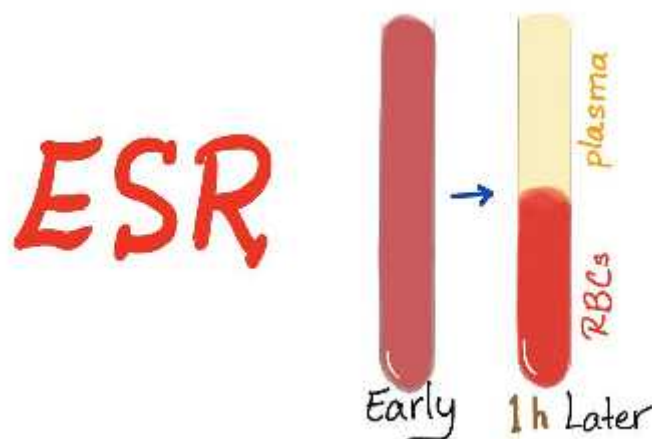
It is the stage of rouleaux formation/aggregation. It occurs in the first 10-15 min.

Stage of sedimentation

It is the stage of actual RBCs sedimentation; it occurs at constant rate. This occurs in 30-40 minutes out of 1hr.

Stage of packing

In this stage, there is a slower rate of falling during which packing of sedimenting RBCs in column occurs due to overcrowding. It occurs in final 10 minutes in 1 hour.



Procedure

- Put **0.4 cc** of Sodium Citrate in a plain test tube.
- Withdraw **2 cc** of blood from the patient vein using a syringe.
- Immediately, add **1.6 cc** of blood from the syringe in the plain tube and shake the tube for 2 min to ensure a good mixing of blood with Sodium Citrate.
- Fill the Westergren pipette exactly to 0 mark, make sure that there are no air bubbles at all in the blood.
- Place the pipette vertically on the rack and leave it undisturbed for 60 min. Avoid any vibration to the tube and do not expose it to a direct sunlight.
- Read the results in mm/hr.

Symptoms

- joint pain
- headaches
- weight loss
- pain in the shoulders, neck

- digestive symptoms, such as:
- diarrhea
- fever
- blood in your stool
- unusual abdominal pain

high ESR Result	Low ESR result
Cancers	Sickle-Cell Anemia
Kidney disease	RBCs Abnormalities
Heart disease	Low Fibrinogen
Infection	Extreme Leukocytosis
Rheumatoid arthritis	
Bone infections	

