

ESR erythrocytes sedimentation rate

Prepared by: yusra othman Date: 01.08.2025
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Approved by: Sanford H. Bandy, M.D. Date: 01.09.2025
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Adopted by: _____ Date: _____
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ANNUAL REVIEW:

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SUPERSEDES: Procedure titled _____

WESTERGREN METHOD FOR ERYTHROCYTE SEDIMENTATION RATE(ESR) SYSTEMD.**PRINCIPLE:**

The ESR is a non-specific test, which indicates the presence of an inflammatory process occurring within the body. The test is used as an initial screening tool and as a follow-up test to monitor the effects of therapy and the progression or regression of disease. Well-mixed anticoagulated whole blood is placed in an ESR tube and allowed to stand for one hour. The number of millimeters that the red cells fall during this time constitutes the **Erythrocyte Sedimentation Rate** (ESR) recorded in mm/hr.

SPECIMENS:

EDTA is the anticoagulant of choice as it is the anticoagulant that causes the least amount of red blood cells shrinkage. Red blood cell size is a significant variable. It is preferable to set up the test within two hours of blood collection. However the test must be set up within 24 hours. If the blood has been refrigerated (2 - 8°C). Refrigerated blood should be brought to room temperature prior to testing.

EQUIPMENT & REAGENTS:

Equipment:

- 1.1. Fixed bore pipettes (tubes)
- 1.2. Vials with pierceable stopper caps
- 1.3. Transfer pipette
- 1.4. A rack designed to hold these tubes
- 1.5. A timing device with an audible alarm mobile clock can be used
- 1.6. Quality Control Material

CALIBRATION:

Not Applicable

QUALITY CONTROL:

Perform quality control once a month using ESR control material. Control vials should be stored according to manufacturer's direction. Invert vial until cellular material has been resuspended. Control materials are tested exactly like patient samples. All control results must be within the manufacturer's acceptable control range before reporting patient values. Refer to the manufacturer's package insert for QC ranges and means.

PROCEDURE:

1. Label the vial with the sample LIS identification number, either on tube or on paper
2. Using a transfer pipette, fill the vial to the bottom of the indicated fill line with approximately **1.0-ml of blood**
3. Place pierceable stopper cap on vial.
4. Place vial in its rack on a level surface.
5. Carefully insert the pipette (tube) through the pierceable stopper until the pipette comes in contact with the bottom of the vial. The pipette will autozero the blood and any excess will flow into the reservoir compartment.
6. To ensure proper results, it is essential that the pipette make firm contact with the bottom of the vial.
7. Let sample stand for **exactly one (1) hour**. Set the timer device to time the interval.

8. After that time period, read and record the numerical results of erythrocyte sedimentation in millimeters. This is done by reading the plasma meniscus on the calibrated pipette (tube).
9. Enter, verify, and certify results in (your laboratory system).
10. Dispose the pipette (tube) in the properly marked waste containers

CALCULATIONS:

Not Applicable

INTERPRETATIONS AND REPORTING RESULTS:

1. Report results in mm/hr. If value exceeds range, enter comment as “result is greater than reportable range.”
2. Normal Values:
Male: 0-10 mm/hour
Female: 0-20 mm/hour
Children: 4-15 years, 0-13 mm/hour

PROCEDURAL NOTES:

1. Under or over timing of the procedure will yield unacceptable results.
2. Shaking the specimen during the timed period will yield unacceptable results.
3. The ESR will be erroneously low if the concentration of anticoagulant is too great.
4. Tilting the ESR tube will increase sedimentation rates.
5. Fibrin clots in the blood will yield unacceptable results.
6. Marked fluctuations in room temperature will increase ESR results.
7. A decrease in the number of erythrocytes accelerates the ESR; an increase in RBC volume (Polycythemia) retards the ESR.
8. Hemolysis may modify the ESR. Hemolyzed specimens will be rejected. Refer to the Lab General SOP, Criteria for Specimen Rejection.
9. Pronounced Poikilocytosis (e.g., sickle cells) may inhibit sedimentation.

REFERENCES

1. Manufacturer's Package Insert: SED-o-trol, BGT BioGen Technologies GmbH
2. Manufacturer's Package Insert: Sedioplast ESR System, Polymedco, Inc.
3. Lotspeich-Steininger, Cheryl A.; Clinical Hematology, Principles, Procedures, Correlations; J.B. Lippincott Company, 1992, pages 117-118