

# Complete Blood Count (CBC) + Erythrocyte Sedimentation Rate (ESR) – [Whole Blood EDTA] Analysis

## Objective

The objective of this combined test is to evaluate hematological parameters and inflammation markers. CBC measures red blood cells, white blood cells, hemoglobin, hematocrit, and platelets, while ESR assesses inflammation by measuring the rate of red blood cell sedimentation.

## Materials and Methods

### Materials:

- Whole blood sample collected in EDTA anticoagulant tubes
- Automated hematology analyzer for CBC
- Westergren or similar apparatus for ESR
- Standard laboratory equipment (pipettes, centrifuge)

### Methods:

1. Sample Collection: Collect venous blood in EDTA tubes.
2. CBC Analysis: Perform automated counting and differential to assess red cells, white cells, hemoglobin, hematocrit, and platelets.
3. ESR Measurement: Use Westergren method to determine erythrocyte sedimentation rate over 1 hour.
4. Interpretation: Compare results to reference ranges to evaluate anemia, infection, inflammation, or hematologic disorders.
5. Quality Control: Use controls and calibrators for reliable results.

## Results

- CBC Normal ranges vary by parameter, including:
  - RBC: 4.5–6.0 million/ $\mu$ L
  - WBC: 4,000–11,000/ $\mu$ L
  - Hemoglobin: 13.5–17.5 g/dL (male), 12.0–15.5 g/dL (female)
  - Hematocrit: 38–50% (male), 34–44% (female)
  - Platelets: 150,000–450,000/ $\mu$ L
- ESR Normal ranges:
  - Men: 0–15 mm/hr
  - Women: 0–20 mm/hr
- Abnormal CBC and ESR results may indicate anemia, infection, inflammation, or hematologic malignancies.

## Conclusion

Combined CBC and ESR testing provides comprehensive hematological and inflammatory status evaluation. Results should be interpreted in clinical context with further tests as needed for diagnosis and management.