

Carbamazepine (Tegretol) – [Serum] Analysis

Objective

The objective of this test is to measure serum levels of Carbamazepine (Tegretol), an anticonvulsant medication used in epilepsy, bipolar disorder, and neuropathic pain. This test helps monitor therapeutic drug levels to ensure efficacy and avoid toxicity.

Materials and Methods

Materials:

- Serum sample from patient
- Immunoassay or high-performance liquid chromatography (HPLC) kits
- Automated analyzers or HPLC equipment
- Standard laboratory equipment (pipettes, centrifuge)

Methods:

1. Sample Collection: Collect venous blood and separate serum by centrifugation.
2. Measurement: Quantify Carbamazepine concentration using immunoassay or HPLC.
3. Calibration: Use standard calibrators to ensure assay accuracy.
4. Interpretation: Compare serum levels to therapeutic ranges; high levels suggest toxicity, low levels suggest subtherapeutic dosing.
5. Quality Control: Include controls and calibrators to validate assay performance.

Results

- Therapeutic range: 4–12 µg/mL (may vary by laboratory)
- Subtherapeutic levels: May result in seizure recurrence or treatment failure
- Toxic levels: May cause dizziness, ataxia, nausea, or more severe adverse effects

Conclusion

Serum Carbamazepine measurement is essential for therapeutic drug monitoring to optimize treatment efficacy and minimize toxicity. Results should be interpreted in conjunction with clinical assessment and patient symptoms.