Overview

Useful For
Monitoring serum concentration of lamotrigine

Assessing compliance

Adjusting lamotrigine dose in patients receiving other anticonvulsant drugs which interact pharmacokinetically with lamotrigine

Method Name
Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Collection Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Draw blood immediately before next scheduled dose.

2. For sustained-release formulations ONLY, draw blood a minimum of 12 hours after last dose.

3. Spin down within 2 hours of draw.

4. Remove serum from serum gel tube if applicable.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

- Neurology Specialty Testing Client Test Request (T732)

- General Request (T239)
Test Definition: LAMO
Lamotrigine, S

-Therapeutics Test Request (T831)
Test Definition: LAMO
Lamotrigine, S

Specimen Minimum Volume
0.5 mL

Reject Due To
<table>
<thead>
<tr>
<th>Condition</th>
<th>Status</th>
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<tr>
<td>Gross hemolysis</td>
<td>OK</td>
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<tr>
<td>Gross lipemia</td>
<td>OK</td>
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<tr>
<td>Gross icterus</td>
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Specimen Stability Information

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<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
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<td>Serum</td>
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<tr>
<td>Serum</td>
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Clinical and Interpretive

Clinical Information

Lamotrigine (Lamictal) is approved for therapy of bipolar I disorder and a wide variety of seizure disorders including Lennox-Gastaut syndrome, primary generalized tonic-clonic seizures, and partial seizures. Its many off-label uses include treatment of migraine, trigeminal neuralgia, and treatment-refractory depression. Lamotrigine inhibits glutamate release (an excitatory amino acid) and voltage-sensitive sodium channels to stabilize neuronal membranes; it also weakly inhibits the 5-HT3 (serotonin) receptor.

Lamotrigine oral bioavailability is very high (approximately 98%). The drug is metabolized by glucuronic acid conjugation to inactive metabolites. The half-life is 25 to 33 hours in adults, but decreases with concurrent use of phenytoin or carbamazepine (13-14 hours), and increases with concomitant valproic acid therapy (59-70 hours), renal dysfunction, or hepatic impairment. The therapeutic range is relatively wide, 2.5 to 15 mcg/mL for most individuals. Common adverse effects are dizziness, ataxia, blurred or double vision, nausea, or vomiting.

Reference Values

Patients receiving therapeutic doses usually have lamotrigine concentrations of 2.5-15.0 mcg/mL.

Interpretation

The serum concentration should be interpreted in the context of the patient’s clinical response and may provide useful information in patients showing poor response (noncompliance?) or adverse effects, particularly when lamotrigine is co-administered with other anticonvulsant drugs.

While most patients show response to the drug when the trough concentration is in the range of 2.5 to 15.0 mcg/mL, and show signs of toxicity when the peak serum concentration is greater than 20 mcg/mL, some patients can tolerate peak concentrations as high as 70 mcg/mL.

Cautions

Serum separator tube acceptable but serum should be removed from gel within 24 hours.
Clinical Reference


Performance

Method Description
Samples are diluted and extracted online extraction by high turbulence liquid chromatography, with detection by tandem mass spectrometry. (Unpublished Mayo method)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Friday; Continuous until 2 p.m.
Saturday; Continuous until 1 p.m.
Sunday; 11 a.m.

Analytic Time
Same day/1 day

Maximum Laboratory Time
2 days

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees and Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.
**Test Classification**
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Code Information**
80175

**LOINC® Information**

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