Overview

Useful For
Monitoring serum concentration of levetiracetam, particularly in patients with renal disease
Assessing compliance
Assessing potential toxicity

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

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required

Container/Tube:

Preferred: Red top

Acceptable: Serum gel

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.

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)
- Therapeutics Test Request (T831)

Specimen Minimum Volume
0.5 mL
**Test Definition: LEVE**

Levetiracetam, S

**Reject Due To**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>OK</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>OK</td>
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<tr>
<td>Gross icterus</td>
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**Specimen Stability Information**

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
<td>28 days</td>
<td></td>
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<tr>
<td></td>
<td>Ambient</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>28 days</td>
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**Clinical and Interpretive**

**Clinical Information**

Levetiracetam is approved for treatment of partial, myoclonic, and tonic-clonic seizures, and is used off-label for manic states and migraine prophylaxis. Levetiracetam has very favorable pharmacokinetics with good bioavailability and rapid achievement of steady state. Its hepatic metabolism is minimal and nonoxidative, making it safe for use with hepatic enzyme inducers or inhibitors. The major metabolite is a carboxylic acid derivate, which is inactive and accounts for roughly one quarter of the administered dose. Levetiracetam is excreted renally, with a mean half-life of 7 hours in adults and slightly less than that in children. Renal dysfunction may warrant therapeutic monitoring and/or dose adjustment.

Given the lack of drug interactions and favorably pharmacokinetics, the primary uses for therapeutic drug monitoring of levetiracetam are compliance assurance and management of physiological changes such as puberty, pregnancy, and aging. Toxicities associated with levetiracetam use include decreased hematocrit and red blood cell count, decreased neutrophil count, somnolence, asthenia, and dizziness. These toxicities may be associated with blood concentrations in the therapeutic range.

**Reference Values**

12.0-46.0 mcg/mL

**Interpretation**

Most individuals display optimal response to levetiracetam with serum levels 12 to 46 mcg/mL. Some individuals may respond well outside of this range, or may display toxicity within the therapeutic range; thus, interpretation should include clinical evaluation. Toxic levels have not been well established. Therapeutic ranges are based on specimen drawn at trough (ie, immediately before the next dose).

**Cautions**

This test cannot be performed on whole blood.

**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
80177

LOINC® Information

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<td>30471-7</td>
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<td>Result LOINC Value</td>
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