Background Information

Lacosamide (LCM) is an antiepileptic drug (AED) approved by the Food and Drug Administration for the adjunctive treatment of partial onset seizures. LCM has a novel mode of action by selectively enhancing the slow deactivation of sodium gated channels. This differs from most AEDs that enhance the fast deactivation of sodium gated channels. LCM plasma concentrations peak within 1-4 hours when taken orally, and has a half-life of 13 hours. The major human metabolite is O-desmethyl lacosamide (ODL).

Ultraviolet (UV) spectroscopy, high-performance liquid chromatography (HPLC)-UV, high-performance thin layer chromatography and liquid chromatography-tandem mass spectrometry (LC-MS/MS) have all been used for the measurement of LCM. Although HPLC-UV is one of the most commonly used techniques for the measurement of AEDs, it suffers from analytical interference and long run times. New methods have recently been reported using LC-MS/MS, which offers better specificity, shorter run times and simple sample preparation.

Clinical Indications

Therapeutic drug monitoring (TDM) of this drug is used to optimize seizure control while limiting adverse effects, establishing an individualized therapeutical range, and to assess compliance to therapy.

Interpretation

- **Lacosamide**: Expected random concentration for patients receiving 200-400 mg/day is 2.2-19.8 µg/mL.
- **O-desmethyl lacosamide**: Expected random concentration for patients receiving 200-400 mg/day is up to 2.5 µg/mL.

Limitations of the Assay

- Assay is linear from 0.4-47.5 µg/mL and 0.3-48.2 µg/mL for lacosamide and o-desmethyl lacosamide, respectively.
- Minimum sample size of 0.5 mL is required.
- This is a laboratory-validated assay that uses analyte specific reagents (ASR), which will be indicated.

Methodology

- Lacosamide and o-desmethyl lacosamide are extracted by protein precipitation and analyzed by LC-MS/MS.
- Blood should be collected in a serum, no additive (Red), vacutainer. Do not use serum separator tubes.
- Serum should be removed from the cells and stored at 4°C prior to testing.

References

## Test Name

**Lacosamide**

### Ordering Mnemonic
**LACOS**

### Lacosamide Expected Concentration
Expected random concentration for patients receiving 200-400 mg/day is 2.2-19.8 µg/mL.

### O-desmethyl lacosamide Expected Concentration
Expected random concentration for patients receiving 200-400 mg/day is up to 2.5 µg/mL.

### Patient Preparation
N/A

### Specimen Requirements
0.5 mL Serum (No additive)

### Disclaimers or Notations
Not FDA-approved

### Billing Code
88181

### CPT Code
82542

### Related Tests
- Levetiracetam
- Gabapentin
- Zonisamide
- Topiramate
- Lamotrigine
- Rufinamide

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### Test Overview


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### Technical Information Contact:
- **Drew Payto**
  - 216.442.5685
  - paytod@ccf.org

### Scientific Information Contact:
- **Sihe Wang, PhD**
  - 216.445.2634
  - wangs2@ccf.org