

**Overview****Useful For**

Monitoring clobazam therapy

**Highlights**

Both clobazam and norclobazam are detected in serum specimens.

**Method Name**

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

**NY State Available**

Yes

**Specimen****Specimen Type**

Serum Red

**Specimen Required**

**Collection Container/Tube:** Red top (serum gel/SST are **not** acceptable)

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 0.5 mL

**Collection Instructions:**

1. Draw blood immediately before next scheduled dose.
2. Centrifuge and aliquot serum to plastic vial within 2 hours of collection.
3. Trough specimens are recommended as therapeutic ranges are based on specimens drawn at trough (ie, immediately before the next dose).

**Forms**

If not ordering electronically, complete, print, and send a [Therapeutics Test Request](#) (T831) with the specimen.

**Specimen Minimum Volume**

0.35 mL

**Reject Due To**

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

**Specimen Stability Information**

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	28 days	
	Ambient	28 days	
	Frozen	28 days	

## Clinical and Interpretive

### Clinical Information

Clobazam is a broad spectrum, antiepileptic drug used to for various types of seizures, Lennox-Gastaut syndrome (a type of childhood onset epilepsy), and migraine prophylaxis. Clobazam blocks voltage-dependent sodium channels, potentiates gamma-aminobutyric acid (GABA) activity at some of the GABA receptors, and inhibits potentiation of the glutamate receptor and carbonic anhydrase enzyme, all which contribute to its antiepileptic and antimigraine efficacy.

In general, clobazam shows favorable pharmacokinetics with good absorption (1-4 hours for the immediate-release formulation), low protein binding, and minimal hepatic metabolism. Elimination is predominantly renal, and it is excreted unchanged in the urine with an elimination half-life of approximately 21 hours. As with other anticonvulsant drugs eliminated by the renal system, patients with impaired renal function exhibit decreased clobazam clearance and a prolonged elimination half-life.

Serum concentrations of other anticonvulsant drugs are not significantly affected by the concurrent administration of clobazam, with the exception of patients on phenytoin whose serum concentrations can increase after the addition of clobazam. Other drug-drug interactions include the coadministration of phenobarbital, phenytoin, or carbamazepine, which can result in decreased clobazam concentrations. In addition, concurrent use of posaconazole and clobazam may result in the elevation of clobazam serum concentrations. Therefore, changes in cotherapy with these medications (phenytoin, carbamazepine, posaconazole, or phenobarbital) may require dose adjustment of clobazam and therapeutic drug monitoring can be helpful. The most common adverse drug effects associated with clobazam include: weight loss, loss of appetite, somnolence, dizziness, coordination problems, memory impairment, and paresthesia.

### Reference Values

#### CLOBAZAM

Therapeutic Range: 30-300 ng/mL

#### NORCLOBAZAM

Therapeutic Range: 300-3,000 ng/mL

### Interpretation

The results of this test should be interpreted in conjunction with the patient's physical signs, symptoms, and other laboratory test results.

Most individuals display optimal response to clobazam when serum levels of clobazam are between 30 and 300 ng/mL and N-desmethyloclobazam are between 300 and 3000 ng/mL. Risk of toxicity is increased when clobazam levels are above 500 ng/mL or N-desmethyloclobazam levels are above 5000 ng/mL.

Some individuals may respond well outside of these ranges or may display toxicity within the therapeutic range, thus,

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interpretation should include clinical evaluation.

**Cautions**

No significant cautionary statements

**Clinical Reference**

1. [Hiemke C, Bergemann N, Clement HW, et al: Consensus guidelines for therapeutic drug monitoring in neuropsychopharmacology: Update 2017. Pharmacopsychiatry. 2018 Jan;51\(1-02\):9-62](#)

2. Patslos PN, Berry DJ, Bourgeois BF, et al: Antiepileptic drugs-best practice guidelines for therapeutic drug monitoring: a position paper by the subcommission on therapeutic drug monitoring, ILAE Commission on Therapeutic Strategies. *Epilepsia*. 2008 Jul;49(7):1239-1276

3. Johannessen SI, Tomsom T: Pharmacokinetic variability of newer antiepileptic drugs: when is monitoring needed? *Clin Pharmacokinet*. 2006;45(11):1061-1075

**Performance****Method Description**

Methodology involves a simple deproteinization using acetonitrile, followed by dilution, and analysis by liquid chromatography-tandem mass spectrometry (LC-MS/MS).(Unpublished Mayo method)

**PDF Report**

No

**Day(s) Performed**

Monday through Friday

**Report Available**

Same day/1 to 5 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**

80339 (G0480 if appropriate)

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**LOINC® Information**

Test ID	Test Order Name	Order LOINC Value
CLOBZ	Clobazam and metabolite, S	79408-1

Result ID	Test Result Name	Result LOINC Value
65483	Clobazam	3487-6
92363	N-desmethyloclobazam	35107-2