

Overview

Useful For

Assessing patient compliance

Monitoring for appropriate therapeutic level

Assessing clonazepam toxicity

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

Submission Container/Tube: Plastic vial

Specimen Volume: 1.2 mL

Collection Instructions:

- 1. Draw blood immediately before next scheduled dose (minimum 12 hours after last dose).
- 2. Within 2 hours of collection, the specimen must be centrifuged and the serum aliquoted into a plastic vial.

Forms

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

- [Therapeutics Test Request](#) (T831)
- [Neurology Specialty Testing Client Test Request](#) (T732)

Specimen Minimum Volume

0.6 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	14 days	
	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Clonazepam (5 [2-chlorophenyl]-2, 3-dihydro-7-nitro-1, 4-benzodiazepin-2-one), a benzodiazepine is useful alone or as an adjunct in the treatment of certain seizures. In addition, it may be useful in patients with panic disorder and restless legs syndrome.

Clonazepam has no definite antiseizure and antipanic mechanism of action, although it is believed to be related to its capacity to enhance gamma-aminobutyric acid (GABA) activity, which is the major inhibitory neurotransmitter in the central nervous system. It is able to suppress the spike and wave discharges in absence seizures and decreases the frequency, duration, amplitude, and spread of discharge in minor motor seizures.

Clonazepam is highly protein bound (approximately 85%). It is extensively metabolized by hepatic cytochrome P450, family 3, subfamily A (CYP3A) to inactive metabolites and has a half-life of 30 to 40 hours.

Reference Values

Clonazepam

Anticonvulsant: 20-70 ng/mL

Anxiolytic: 4-80 ng/mL

Some individuals may show therapeutic response outside of these ranges or may display toxicity within the therapeutic range, thus interpretation should include clinical evaluation.

**Note:** Therapeutic ranges are for specimens collected at trough (ie, immediately before next scheduled dose). Levels may be elevated in non-trough specimens.

Interpretation

The therapeutic range varies depending on the indication.

Some individuals may respond well outside of these ranges or may display toxicity within the therapeutic range, and thus, interpretation should include clinical evaluation.

The possibility of toxicity is increased when levels exceed 100 ng/mL.

Cautions

Specimens that are obtained from gel tubes must be removed from the gel within 2 hours.

Clinical Reference

Hiemke C, Baumann P, Bergemann N, et al: AGNP Consensus Guidelines for Therapeutic Drug Monitoring in Psychiatry: Update 2011. Pharmacopsychiatry. 2011;44(6):195-235

Performance

Method Description

Clonazepam and 7-aminoclonazepam are extracted from serum using a liquid-liquid extraction technique. The organic layer is removed, dried, and reconstituted. Analysis is by liquid chromatography-tandem mass spectrometry.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday, Wednesday

Report Available

3 to 7 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & 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 account representative. 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. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

80299

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CZPS	Clonazepam and	104541-8

	7-Aminoclonazepam, S	
Result ID	Test Result Name	Result LOINC® Value
65044	Clonazepam	3494-2
41782	7-Aminoclonazepam	28059-4