MAYO CLINIC LABORATORIES

Test Definition: CDP

Chlordiazepoxide and Metabolites, Serum

Overview

Useful For

Monitoring chlordiazepoxide therapy

Assessing toxicity

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Shipping Instructions

Ship specimen in amber vial to protect from light.

Specimen Required

Supplies: Amber Frosted Tube, 5 mL (T915)
Collection Container/Tube: Red top (serum get/SST are **not acceptable)**
Submission Container/Tube: Amber vial
Specimen Volume: 1 mL
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot serum into an amber vial.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Neurology Specialty Testing Client Test Request (T732)
-Therapeutics Test Request (T831)

Specimen Minimum Volume

0.3 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	LIGHT PROTECTED
	Ambient	28 days	LIGHT PROTECTED
	Frozen	28 days	LIGHT PROTECTED

Clinical & Interpretive

Clinical Information

Chlordiazepoxide (Librium) is a benzodiazepine widely used in the treatment of anxiety and alcohol withdrawal symptoms, as well as a premedication for anesthesia. The mechanism of action of all benzodiazepines remains unclear. However, it is known that benzodiazepines facilitate gamma-amino butyric acid (GABA)-mediated neurotransmission in the brain. Benzodiazepines most likely facilitate the inhibitory presynaptic or postsynaptic reactions of GABA.

Chlordiazepoxide is metabolized to long-acting metabolites in the liver to the active metabolites nordiazepam (desmethyldiazepam) and oxazepam, and the clearance of the drug is reduced considerably in older adults and in patients with hepatic disease.

Therapeutic assessment should include measurement of both the parent drug (chlordiazepoxide) and the primary active metabolite (nordiazepam), with a proposed combined chlordiazepoxide and nordiazepam reference interval of 700 to 1000 ng/mL. However, therapeutic and toxic concentrations can vary greatly and should be interpreted in the full clinical context of the patient. Since chlordiazepoxide has a wide therapeutic index and toxicity is dose-dependent, routine drug monitoring is not indicated in all patients.

Reference Values

Therapeutic concentration:
Chlordiazepoxide: 400-3,000 ng/mL

Cutoff concentrations by liquid chromatography tandem mass spectrometry:
Chlordiazepoxide: 10 ng/mL
Nordiazepam: 10 ng/mL
Oxazepam: 10 ng/mL

Interpretation

Combined concentrations of chlordiazepoxide and nordiazepam above 5000 ng/mL have been associated with toxicity.

Cautions

The specimen must be protected from light.

Clinical Reference

1. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43

2. Burtis CA, Ashwood ER, Bruns DE, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. WB Saunders Company; 2011:1109-1188
3. Hiemke C, Bergemann N, Clement HW, et al. Consensus guidelines for therapeutic drug monitoring in neuropsychopharmacology: Update 2017. Pharmacopsychiatry. 2018;51(1-02):9-62
4. Adeli K, Higgins V, Bohn MK. Reference information for the clinical laboratory. In: In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:1390-1470

Performance

Method Description
The internal standard mixture containing chlordiazepoxide-d5, diazepam-d5 , nordiazepam-d5, oxazepam-d5, and temazepam-d5 is added to serum samples, mixed, and centrifuged. The supernatant is diluted and injected on a liquid chromatography tandem mass spectrometer.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Wednesday

Report Available
2 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
CDP	Chlordiazepoxide and metabolites, S	33060-5

Result ID	Test Result Name	Result LOINC® Value
8610	Chlordiazepoxide	3457-9
37321	Nordiazepam	3537-8
622870	Oxazepam	3886-9