MAYO CLINIC LABORATORIES

Test Definition: DIA

Diazepam and Nordiazepam, S

Overview

Useful For

Assessing compliance

Monitoring for appropriate therapeutic level

Assessing diazepam 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 (Serum gel/SST are **not acceptable**)

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Collection Instructions: Centrifuge and aliquot serum into plastic 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)

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Minimum Volume

0.3 mL

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Diazepam, a benzodiazepine derivative, is an anxiolytic agent that reduces neuronal depolarization resulting in decreased action potentials. It enhances the action of gamma-amino butyric acid (GABA) by tightly binding to A-type GABA receptors, thus opening the membrane channels and allowing the entry of chloride ions. It is also used as a muscle relaxant, procedural sedation agent, and sedative-hypnotic agent to treat withdrawal states (ie, ethanol), along with other conditions (seizures).

Diazepam is metabolized to several metabolites in the liver including temazepam, oxazepam, and nordiazepam (desmethyldiazepam), and the clearance of the drug is reduced considerably in older individuals and in patients with hepatic disease.

Therapeutic assessment typically includes measurement of both the parent drug (diazepam) and the active metabolite (nordiazepam).

Reference Values

Therapeutic concentrations

Diazepam and Nordiazepam: 200-2,500 ng/mL

Interpretation

For seizures:

Serum concentrations are not usually monitored during early therapy because response to the drug can be monitored clinically as seizure control. If seizures resume despite adequate therapy, another anticonvulsant must be considered.

Toxicity is commonly seen when diazepam plus nordiazepam concentrations exceed 3000 ng/mL. Adverse effects of benzodiazepines in therapeutic doses usually reflect the drug's pharmacology and include sedation, slurred speech, and ataxia. Respiratory depression/arrest may occur with large overdoses or following rapid intravenous injection with short-acting benzodiazepines.

Cautions

No significant cautionary statements

Clinical Reference

1. Langman LJ, Bechtel L, Holstege CP: Clinical toxicology. In: Burtis CA, Ashwood ER, Bruns DE, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics.. WB Saunders Company; 2011:1109-1188

2. Burtis CA, Ashwood ER, Bruns DE, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. WB Saunders Company; 2011:Table 60.2

Performance

Method Description

The internal standard mixture containing chlordiazepoxide-d5, diazepam-d4, and nordiazepam-d5 is added to serum samples. The serum samples are treated with phosphate buffer and extracted via liquid/liquid extraction. The organic layer from the extraction is dried under nitrogen, reconstituted, and injected on a liquid chromatography-tandem mass spectrometer.(Unpublished Mayo method)

PDF Report

No

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

Fees & Codes

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 US Food and Drug Administration.

CPT Code Information

80346

G0480 (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
DIA	Diazepam and Nordiazepam, S	49044-1

Result ID	Reporting Name	LOINC®
8629	Diazepam	3548-5
2475	Nordiazepam	3537-8
2459	Diazepam and Nordiazepam	16757-7