Test Definition: GABA

Gabapentin, Serum

Overview

Useful For

Monitoring serum gabapentin concentrations

Assessing compliance

Adjusting dosage in patients

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Red top (serum gel/SST is **not acceptable**)
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL serum
Collection Instructions:
1. Draw blood immediately before next scheduled dose.
2. Within 2 hours of collection, centrifuge and aliquot serum into a 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)

Specimen Minimum Volume

Serum: 0.2 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 & Interpretive

Clinical Information

Gabapentin is an antiepileptic drug that is effective in treating seizures, neuropathies, and a variety of neurological and psychological maladies. Although designed as a gamma-aminobutyric acid (GABA) analogue, gabapentin does not bind to GABA receptors, nor does it affect the neuronal uptake or degradation of GABA. In fact, the precise mechanism by which it exerts its analgesic and anticonvulsant effects is unknown.

After oral administration and absorption, gabapentin circulates essentially unbound to serum proteins. In addition, gabapentin does not undergo hepatic metabolism, unlike most other antiepileptic drugs, and is eliminated almost entirely by renal excretion with a clearance that approximates the glomerular filtration rate. The elimination half-life is 5 to 7 hours in patients with normal kidney function.

Since gabapentin does not bind to serum proteins, it does not exhibit pharmacokinetic variability and interactions with other highly protein-bound medications (eg, phenytoin). In addition, the lack of hepatic metabolism eliminates the interactions with other hepatically cleared medications, which can induce/inhibit hepatic drug metabolizing enzyme systems (eg, cytochrome P450 enzymes). Therefore, gabapentin serum concentration is not changed following the addition or discontinuation of other common anticonvulsants (ie, phenobarbital, phenytoin, carbamazepine, or valproic acid), nor are their serum concentrations altered upon the addition or discontinuation of gabapentin.

In general, adverse effects with gabapentin are infrequent and usually resolve with continued treatment. The most common side effects include somnolence, dizziness, ataxia, and fatigue. Experience to date indicated that gabapentin is safe and relatively nontoxic.

Reference Values

2.0-20.0 mcg/mL

Toxic Range: > or =25.0 mcg/mL

Interpretation

Therapeutic ranges are based on specimens collected immediately before the next dose (ie, trough).

Most epileptic patients show a response to the drug when the trough concentration is in the range of 2 to 20 mcg/mL. Therapeutic drug monitoring may be useful due to inter-individual variation in pharmacokinetics and dose-dependent bioavailability; specimens for measurements should be collected before the morning dose since the short half-life may

affect the interpretation of the concentration.

Cautions

This test cannot be performed on whole blood. Serum must be separated from cells within 2 hours of collection.

Specimens collected in serum gel tubes (serum separator tubes) are not acceptable as the drug/analyte can absorb on the gel barrier and lead to falsely decreased concentrations.

Clinical Reference

1. 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
2. Patsalos 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;49(7):1239-1276
3. Johannessen SI, Tomson T. Pharmacokinetic variability of newer antiepileptic drugs: when is monitoring needed? Clin Pharmacokinetics. 2006;45(11):1061-1075
4. Milone MC, Shaw LM: Therapeutic drugs and their management. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:420-453

Performance

Method Description

Gabapentin and the internal standard are separated from other serum constitutes with analysis on a tandem mass spectrometer equipped with an electrospray ion source using multiple reaction monitoring.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 to 2 days

Specimen Retention Time

2 weeks

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

80171

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
GABA	Gabapentin, S	9738-6

Result ID	Test Result Name	Result LOINC® Value
80826	Gabapentin, S	9738-6