MAYO CLINIC LABORATORIES

Test Definition: ETX

Ethosuximide, Serum

Overview

Useful For

Monitoring ethosuximide therapy

Determining compliance

Assessing ethosuximide toxicity

Method Name

Enzyme-Multiplied Immunoassay Technique (EMIT)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions:
1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and the serum aliquoted into a plastic vial within 2 hours of collection.

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

0.25 mL

Reject Due To

Gross	Reject

hemolysis	

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Ethosuximide (Zarontin) is used in the treatment of absence (petit mal) epilepsy in adults and children 3 years and older. Ethosuximide is almost completely absorbed from the gastrointestinal tract, reaching a peak plasma concentration in 1 to 4 hours following oral administration.

Approximately 10% to 20% of the drug is excreted unchanged in the urine; the remainder is metabolized by hepatic microsomal enzymes. The volume of distribution of ethosuximide is approximately 0.7 L/kg, and its half-life is 17 to 56 hours (adult) and 30 hours (pediatric). Minimal ethosuximide circulating in the blood is bound to protein (approximately 22%).

Ethosuximide produces a barbiturate-like toxicity, characterized by central nervous system and respiratory depression, nausea, and vomiting, when the blood level is greater than 120 mcg/mL.

Reference Values

Therapeutic: 40-100 mcg/mL
Critical value: >150 mcg/mL

Interpretation

Dosage is guided by blood levels; the therapeutic range for ethosuximide is 40 to 100 mcg/mL.

Toxic concentration: above 120 mcg/mL.

Cautions

No significant cautionary statements

Clinical Reference

1. Milone MC, Shaw LM. Therapeutic drugs and their management. In: Rifai N, Chiu RWK, Young I, Burnham C-AD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:420-453.e9
2. Brunton LL, Knollmann BC, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics, 14th ed. McGraw-Hill Education, 2023
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

Performance

Method Description

The enzyme-multiplied immunoassay technique assay is a homogeneous enzyme immunoassay technique used for the analysis of specific compounds in biological fluids. The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PD) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically. Endogenous serum G6PD does not interfere, because the coenzyme functions only with the bacterial (*Leuconostoc mesenteroides*) enzyme employed in the assay.(Package insert: Ethosuximide reagent. Siemens Healthcare Diagnostics, Inc; 04/2015)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 day

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 has been modified from the manufacturer's instructions. Its performance characteristics were 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

80168

LOINC® Information

MAYO CLINIC LABORATORIES

Test Definition: ETX

Ethosuximide, Serum

Test ID	Test Order Name	Order LOINC® Value
ETX	Ethosuximide, S	3616-0

Result ID	Test Result Name	Result LOINC® Value
8769	Ethosuximide, S	3616-0