MAYO CLINIC LABORATORIES

Test Definition: MEPHS

Mephobarbital and Phenobarbital, Serum

Overview

Useful For

Monitoring of mephobarbital and phenobarbital therapy

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
MBARS	Mephobarbital, S	No	Yes
PHBRS	Phenobarbital, S	No	Yes

Method Name

Gas Chromatography Mass Spectrometry (GC-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 are **not acceptable**)
Submission Container/Tube: Plastic vial
Specimen Volume: 2.0 mL
Collection Instructions:
1. Collect specimen immediately before next scheduled dose.
2. Centrifuge and aliquot serum into plastic vial within 2 hours of collection.

Forms

If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume

0.7 mL

Reject Due To

Gross hemolysis	Reject

Gross lipemia	OK
Gross icterus	OK

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

Mephobarbital is an orally administered, methylated barbiturate used for the treatment of epilepsy.(1,2) It is demethylated by hepatic microsomal enzymes to generate its major metabolite, phenobarbital. During long-term use, most of the mephobarbital activity can be attributed to the accumulation of phenobarbital. Consequently, the pharmacological properties, toxicity, and clinical uses of mephobarbital are the same as phenobarbital.(1,2) The use of mephobarbital is uncommon as it offers no significant advantage over phenobarbital alone.(1,2)

Reference Values

MEPHOBARBITAL
Therapeutic range: 1.0-7.0 mcg/mL
Toxic concentration: > or =15.0 mcg/mL

PHENOBARBITAL
Therapeutic range
Children: 15.0-30.0 mcg/mL
Adults: 20.0-40.0 mcg/mL
Toxic concentration: > or =60.0 mcg/mL

Interpretation

Mephobarbital concentrations above 15 mcg/mL have been associated with toxicity.

Phenobarbital concentrations between 35 and 80 mcg/mL have been associated with slowness, ataxia, and nystagmus, while concentrations above 100 mcg/mL have been associated with coma without reflexes.

Cautions

Concentration at which toxicity occurs varies and results should be interpreted in light of the clinical situation.

Specimens collected in serum gel tubes are not acceptable because the drug can absorb on the gel and lead to falsely decreased concentrations.

Clinical Reference

1. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham C-AD, Wittwer CT,

eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:454-454.e484
2. Baselt RC. Disposition of Toxic Drugs and Chemical in Man. 12th ed. Biomedical Publications; 2020
3. 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
4. Mihic SJ, Mayfield J. Hypnotics and sedatives. In: Brunton LL, Knollman BC, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. 14th ed. McGraw-Hill Education; 2023

Performance

Method Description
Barbiturates are extracted from serum using solid-phase extraction techniques. The serum is buffered and eluted with organic solvent. The organic phase is dried, reconstituted, and analysis performed by gas chromatography-mass spectrometry, using selected ion monitoring. The assay utilizes deuterated barbiturates as internal standards.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Thursday

Report Available
3 to 9 days

Specimen Retention Time
2 weeks

Performing Laboratory Location
Rochester

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

80184

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MEPHS	Mephobarbital and Phenobarbital, S	97183-8

Result ID	Test Result Name	Result LOINC® Value
89706	Mephobarbital, S	3750-7
84582	Phenobarbital, S	3948-7