Test Definition: PENTS

Pentobarbital, S

Overview

Useful For

Monitoring of pentobarbital therapy treatment

Method Name

Gas Chromatography-Mass Spectrometry (GC-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: 1.2 mL

Collection Instructions:

1. Draw blood immediately before next scheduled dose.

2. Centrifuge and aliquot serum in 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 and Interpretive

Clinical Information

Pentobarbital is a short-acting barbiturate with anticonvulsant and sedative-hypnotic properties. Uses include sedation induction; relief of preoperative anxiety; control of status epilepticus or seizures resulting from meningitis, tetanus, alcohol withdrawal, poisons, chorea, or eclampsia; and induction of coma in the management of cerebral ischemia and increased intracranial pressure that may follow stroke or head trauma.(1,2)

Pentobarbital is administered orally, parenterally, and rectally. The duration of hypnotic effect is about 1 to 4 hours. The drug distributes throughout the body with about 35% to 45% of a dose bound to plasma proteins in the blood. Metabolism takes place in the liver via oxidation to the inactive metabolite, hydroxypentobarbital. Elimination is biphasic; half-life is about 4 hours in the first phase, and 35 to 50 hours in the second phase. Excretion occurs through the urine, mainly as glucuronide conjugates of metabolites, with only about 1% excreted as unchanged drug.(1,2) Tolerance to the hypnotic effects of pentobarbital occurs after about 2 weeks of continuous dosing.

Reference Values

Therapeutic range

Hypnotic: 1-5 mcg/mL

Therapeutic coma: 20-50 mcg/mL

Reducing intracranial pressure: 30-40 mcg/mL

This degree of sedation requires artificial respiratory support.

Toxic concentration: >10 mcg/mL

Interpretation

Pentobarbital concentrations above 10 mcg/mL have been associated with toxicity.

Cautions

The concentration at which toxicity occurs varies and results should be interpreted in light of 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. NEMBUTAL Sodium Solution (pentobarbital sodium injection). Package insert: Ovation Pharmaceuticals Inc; October 2007

2. Physician's Desk Reference (PDR): 61st edition. Thomson PDR; 2007

3. Baselt RC: Disposition of Toxic Drugs and Chemicas in Man. 10th ed. Biomedical Publications; 2014:2211

4. Milone MC, Shaw LM: Therapeutic drugs and their management. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:800-831

5. Langman LJ, Bechtel LK, Meier BM, Holstege C: Clinical toxicology. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:832-887

6. Mihic SJ, Mayfield J, Harris RA: Hypnotics and sedatives. In: Brunton LL, Hilal-Dandan R, Knollmann BC, eds. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 13th ed. McGraw-Hill Education; 2017

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

1 to 8 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. 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. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

80345

G0480 (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
PENTS	Pentobarbital, S	3924-8

Test Definition: PENTS

Pentobarbital, S

Result ID	Test Result Name	Result LOINC Value
8239	Pentobarbital, S	3924-8