

**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

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 1.2 mL

**Collection Instructions:**

1. Draw blood immediately before next scheduled dose.
2. Within 2 hours of collection, the specimen must be centrifuged and the serum aliquoted into a plastic vial.

**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	

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## 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 pentobarbital's hypnotic effects 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.

### Clinical Reference

1. Package insert: NEMBUTAL Sodium Solution (pentobarbital sodium injection). Deerfield, IL: Ovation Pharmaceuticals Inc, October 2007
2. Physician's Desk Reference (PDR): 61st edition. Montvale, NJ: Thomson PDR, 2007
3. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Fourth edition. St. Louis, MO. Elsevier Saunders, 2006, p 2312
4. Nader R, Horwath AR, Wittwer CT: In Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Sixth edition. St. Louis, MO, Elsevier, 2018

## 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) and Time(s) Test Performed**

Wednesday; 12 a.m.

**Analytic Time**

1 day

**Maximum Laboratory Time**

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 U.S. 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

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

