

## Overview

### Useful For

Monitoring doxepin therapy

Evaluating potential doxepin toxicity

Evaluating patient compliance

### 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 are **not acceptable**)

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 1 mL

#### Collection Instructions:

1. Collect specimen immediately before next scheduled dose (minimum 12 hours after last dose).
2. Centrifuge and aliquot serum into a plastic vial. **Serum must be separated from cells 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

0.25 mL

### Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

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**Specimen Stability Information**

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	28 days	
	Ambient	7 days	
	Frozen	28 days	

**Clinical & Interpretive****Clinical Information**

Doxepin is recommended for the treatment of psychoneurotic patients with depression or anxiety, or with depression or anxiety associated with alcoholism or organic disease.

Nordoxepin (*N*-desmethyldoxepin) is the major metabolite and is usually present at concentrations equal to doxepin. Optimal efficacy occurs at combined serum concentrations between 50 and 150 ng/mL.

Like other tricyclic antidepressants, the major toxicity of doxepin is expressed as cardiac dysrhythmias, which occur at concentrations more than 500 ng/mL. Other side effects include nausea, hypotension, and dry mouth.

**Reference Values**

Therapeutic concentration (doxepin + nordoxepin): 50-150 ng/mL

**Note:** Therapeutic ranges are for specimens collected at trough (ie, immediately before next scheduled dose). Levels may be elevated in non-trough specimens.

**Interpretation**

Most individuals display optimal response to doxepin when combined serum levels of doxepin and nordoxepin are between 50 and 150 ng/mL. Some individuals may respond well outside of this range or may display toxicity within the therapeutic range; thus, interpretation should include clinical evaluation. Risk of toxicity is increased with combined levels are above 500 ng/mL.

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

**Cautions**

This test cannot be performed on whole blood. Serum must be separated from cells within 2 hours of collection; if serum is not removed within this time, tricyclic antidepressant levels may be falsely elevated due to drug release from red blood cells.

Specimens that are obtained from gel tubes are not acceptable because the drug can absorb on the gel and lead to falsely decreased concentrations.

**Clinical Reference**

1. Wille SM, Cooreman SG, Neels HM, Lambert WE. Relevant issues in the monitoring and the toxicology of antidepressants. *Crit Rev Clin Lab Sci*. 2008;45(1):25-89
2. Thanacoody HK, Thomas SHL. Antidepressant poisoning. *Clin Med (Lond)*. 2003;3(2):114-118
3. Hiemke C, Bergemann N, Clement HW, et al. Consensus guidelines for therapeutic drug monitoring in

neuropsychopharmacology: Update 2017. Pharmacopsychiatry. 2018;51:9-62

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

The tricyclic antidepressants are extracted from serum using a solvent to precipitate proteins. The supernatant is removed, and analysis is by liquid chromatography tandem mass spectrometry.(Unpublished Mayo method)

### PDF Report

No

### Day(s) Performed

Monday, Wednesday, Friday

### Report Available

3 to 5 days

### Specimen Retention Time

14 days

### 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

80299

### LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
DXPIN	Doxepin and Nordoxepin, S	43122-1

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Result ID	Test Result Name	Result LOINC® Value
63507	Doxepin	3579-0
37125	Nordoxepin	3862-0
37126	Doxepin and Nordoxepin	3582-4