

# Amitriptyline & Nortriptyline Test Information

Amitriptyline (Elavil®) and nortriptyline (Pamelor®) are two major tricyclic antidepressants (TCAs) used for treatment of depression and relief of chronic pain. Nortriptyline is a major metabolite of amitriptyline, and both have similar side effects, toxicities, and pharmacologic activities. Amitriptyline and nortriptyline have both antidepressant and analgesic effects through complex mechanisms that affect the production of certain chemicals in the human brain that are essential for maintaining mental health.

Amitriptyline and nortriptyline are often prescribed in combination and sometimes together with other antidepressant drugs. The serum concentrations of amitriptyline and nortriptyline need to be monitored on a regular basis in order to evaluate clinical responses and potential toxicity during therapy. The therapeutic range for amitriptyline is 125-150 ng/mL (150-300 ng/mL for combined amitriptyline and nortriptyline), and major cardiac toxicity can occur when serum concentration is above 500 ng/mL (combined or nortriptyline only).

High performance liquid chromatography (HPLC) used to be the analytical methodology for serum amitriptyline and nortriptyline. Recently, liquid chromatography-mass spectrometry (LC-MS) has been developed to improve assay throughput and selectivity. Our lab provides a rapid LC-MS assay combined with a stable isotope-labeled internal standard for serum amitriptyline and nortriptyline quantification. For more information, call the lab at 513-636-4203.

## Sample Type:

Serum (Red, No Gel)

## Volume:

1.5 mL

0.5 mL (minimum)

## Specimen Preparation:

Spin/pour off, refrigerate.

## Unacceptable Specimens:

Whole blood. Gel separator tubes, light blue (citrate) or yellow (SPS or ACD solution).

## Stability:

**Ambient:** 5 days

**Refrigerated:** 2 weeks

**Frozen:** 6 months

## Methodology:

Liquid chromatography mass spectrometry (LC-MS)

## Reporting Units:

Quantitative: ng/mL

## LC-MS Calibration Range:

5 – 500 ng/mL

## Therapeutic Range:

95-250 ng/mL; > 500 mg/mL is toxic

(for combined amitriptyline and nortriptyline)

## Shipping Conditions:

Refrigerated (cold pack), next day.

## Testing Schedule:

Tuesday, 1st Shift (for testing outside this schedule, please call 513-636-4203). **Turnaround time:** 7 – 10 days.

**Note:** Report includes individual values for amitriptyline, nortriptyline, and total.

## CPT Codes:

80335x2

## Contact Information:

Clinical Mass Spectrometry

Tel: 513-636-4203

Fax: 513-803-5014

Email: [pathology@cchmc.org](mailto:pathology@cchmc.org)

Website: <https://www.cincinnatichildrens.org/mass-spec>

## Shipping Address:

Clinical Mass Spectrometry Facility, MLC 7019

Division of Pathology and Laboratory Medicine

Cincinnati Children's Hospital Medical Center

240 Albert Sabin Way

Cincinnati, Ohio 45229-3039

## References:

1. Spitalnik S. et al. Clinical Pathology Board Review. Elsevier Saunders, 1st Ed. 2014.
2. Barbui C. et al. Amitriptyline v. the rest: still the leading antidepressant after 40 years of randomized controlled trials. The British Journal of Psychiatry 2001 (178) 129-144.
3. Theurillat R. et al. Monitoring of tricyclic antidepressants in human serum and plasma by HPLC: Characterization of a simple, laboratory developed method via external quality assessment. J. Pharm. Biomed Anal. 1998 (18) 751-760.