Overview

Useful For
Monitoring serum concentration during therapy
Evaluating potential toxicity
The test may also be useful to evaluate patient compliance

Method Name
Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

NY State Available
Yes

Specimen

Specimen Type
Serum Red

Specimen Required
Container/Tube: Red top

Specimen Volume: 1 mL

Collection Instructions:
1. Draw specimen immediately before next scheduled dose (minimum 12 hours after last dose).
2. Serum must be separated from cells within 2 hours of draw.

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

- Cardiovascular Test Request Form (T724)
- Therapeutics Test Request (T831)

Specimen Minimum Volume
0.25 mL

Reject Due To

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross icterus</td>
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</tbody>
</table>

Specimen Stability Information
**Clinical and Interpretive**

**Clinical Information**

Imipramine and its metabolite desipramine are tricyclic antidepressants used to treat endogenous depression requiring 1 to 3 weeks of treatment before therapeutic effectiveness becomes apparent. Desipramine is used for treatment of endogenous depression when the patient needs a drug with significant stimulatory side effects. These drugs have also been employed in the treatment of enuresis (involuntary urination) in childhood and severe obsessive-compulsive neurosis.

**Imipramine:**

The optimal dosage of imipramine yields trough (just before the next dose) blood levels of imipramine and desipramine combined from 175 to 300 ng/mL. If desipramine is given, no imipramine should be detected and the therapeutic concentration for desipramine alone is 100 to 300 ng/mL.

Toxicity associated with imipramine is characterized by QRS widening leading to ventricular tachycardia and asystole. In some patients, toxicity may manifest at lower concentrations, or at therapeutic concentrations in the early state of therapy. Cardiac toxicity (first-degree heart block) is usually associated with blood concentrations in excess of 400 ng/mL.

**Desipramine:**

Desipramine is the antidepressant of choice in patients where maximal stimulation is indicated.

The therapeutic concentration of desipramine is 100 to 300 ng/mL. About 1 to 3 weeks of treatment are required before therapeutic effectiveness becomes apparent.

The most frequent side effects are those attributable to anticholinergic effects; dry mouth, constipation, dizziness, tachycardia, palpitations, blurred vision, and urinary retention. These occur at blood concentrations in excess of 400 ng/mL, although they may occur at therapeutic concentrations in the early stage of therapy. Cardiac toxicity (first-degree heart block) is usually associated with blood concentrations in excess of 400 ng/mL.

**Reference Values**

**IMIPRAMINE AND DESIPRAMINE**

Total therapeutic concentration: 175-300 ng/mL

**DESIPRAMINE ONLY**

Therapeutic concentration: 100-300 ng/mL

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

**Interpretation**

Most individuals display optimal response to imipramine when combined serum levels of imipramine and desipramine are between 175 and 300 ng/mL. Risk of toxicity is increased with levels above 400ng/mL.

Most individuals display optimal response to desipramine with serum levels of 100 to 300 ng/mL. Risk of toxicity is increased with desipramine levels above 400 ng/mL.

Some individuals may respond well outside of these ranges, or may display toxicity within the therapeutic range, thus, interpretation should include clinical evaluation.

Therapeutic ranges are based on specimen drawn 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 drawing; if serum is not removed within this time, tricyclic antidepressant levels may be falsely elevated due to drug release from RBCs. Specimens that are obtained from gel tubes are also not acceptable, as the drug can absorb on the gel and lead to falsely decreased concentrations.

**Clinical Reference**


**Performance**

**Method Description**

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

**PDF Report**

No

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

Monday, Wednesday, Friday; Varies

**Analytic Time**

2 days

**Maximum Laboratory Time**

4 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
80335
G0480 (if appropriate)

LOINC® Information

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