Overview

Useful For
Verifying systemic absorption of orally administered itraconazole

Patients with life-threatening fungal infections

Patients considered at risk for poor absorption or rapid clearance of itraconazole

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

Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Forms
If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume
0.18 mL

Reject Due To

<table>
<thead>
<tr>
<th>Gross hemolysis</th>
<th>OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross lipemia</td>
<td>OK</td>
</tr>
<tr>
<td>Gross icterus</td>
<td>OK</td>
</tr>
</tbody>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Serum Red</td>
<td>Refrigerated (preferred)</td>
<td>29 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>29 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
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Clinical and Interpretive

Clinical Information

Itraconazole is a synthetic triazole antifungal drug approved for treatment and prophylaxis of a variety of fungal infections. Its activity results from inhibition of fungal synthesis of ergosterol, an integral component of fungal cell membranes.

Concerns about adequate absorption and drug interactions are some of the major indications for therapeutic drug monitoring. Mean oral bioavailability approximates 55% but is highly variable; absorption can be enhanced by food or acidic drinks. Hepatic enzyme inducers can cause low serum itraconazole levels, and coadministration of these drugs has been associated with itraconazole therapeutic failure.

Itraconazole therapeutic efficacy is greatest when serum concentrations exceed 0.5 mcg/mL for localized infections, or 1.0 mcg/mL for systemic infections. An active metabolite, hydroxyitraconazole, is present in serum at roughly twice the level of the parent drug. These concentrations refer to analysis by high-performance liquid chromatography; quantitation by bioassay results in considerably higher apparent drug measurements due to reactivity with the active metabolite.

Reference Values

ITRACONAZOLE (TROUGH)

>0.5 mcg/mL (localized infection)

>1 mcg/mL (systemic infection)

HYDROXYITRACONAZOLE

No therapeutic range established; activity and serum concentration are similar to parent drug.

Interpretation

A lower cutoff concentration has not been defined that applies in all cases. The serum concentration must be interpreted in association with other variables, such as the nature of the infection, the specific microorganism, and minimal inhibitory concentration (MIC) results, if available. Localized infections are more likely to respond when serum itraconazole is more than 0.5 mcg/mL (by high-performance liquid chromatography); systemic infections generally require drug concentrations more than 1.0 mcg/mL. Consider target of more than 1.5 mcg/mL for itraconazole plus hydroxyitraconazole.

Cautions

Enteropathy, H2-histamine receptor blockers, hepatic enzyme inducers, and other variables can result in low to non-detectable serum levels with concomitant high risk of therapeutic failure.

AIDS patients and organ transplant patients receiving immunosuppressive therapy tend to have lower serum itraconazole levels on standard doses and are thus at high risk of therapeutic failure.

Clinical Reference

Performance

Method Description
Itraconazole and hydroxyitraconazole are extracted by mixing serum samples with acetonitrile to precipitate proteins. The supernatant is removed and analyzed by an in-house developed liquid chromatography-tandem mass spectrometry (LC-MS/MS) method. (Unpublished Mayo method)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Friday; 8 a.m.

Analytic Time
Same day/1 day

Maximum Laboratory Time
3 days

Specimen Retention Time
2 weeks

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
80299

LOINC® Information

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<th>Order LOINC Value</th>
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<tr>
<td>ITCON</td>
<td>Itraconazole, S</td>
<td>10989-2</td>
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# Test Definition: ITCN

Itraconazole, S

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<th>Result LOINC Value</th>
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<tbody>
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<td>10989-2</td>
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<tr>
<td>5122</td>
<td>Hydroxyitraconazole</td>
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