Overview

Useful For
Aiding in the diagnosis of the sick euthyroid syndrome

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

Portions of this test are covered by patents held by Quest Diagnostics.

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel

Submission Container/Tube: Plastic vial

Specimen Volume: 0.8 mL

Specimen Minimum Volume
0.4 mL

Reject Due To

<table>
<thead>
<tr>
<th>Gross hemolysis</th>
<th>Reject</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>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>28 days</td>
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Clinical and Interpretive

Clinical Information
Reverse triiodothyronine (rT3) differs from triiodothyronine (T3) in the positions of the iodine atoms attached to the aromatic rings. The majority of rT3 found in the circulation is formed by peripheral deiodination (removal of an iodine atom) of T4 (thyroxine). rT3 is believed to be metabolically inactive.

The rT3 level tends to follow the T4 level: low in hypothyroidism and high in hyperthyroidism. Additionally, increased levels of rT3 have been observed in starvation, anorexia nervosa, severe trauma and hemorrhagic shock, hepatic dysfunction, postoperative states, severe infection, and in burn patients (ie, sick euthyroid syndrome). This appears to be the result of a switchover in deiodination functions with the conversion of T4 to rT3 being favored over the production of T3.

Reference Values
10-24 ng/dL

Interpretation
In hospitalized or sick patients with low triiodothyronine (T3) values, elevated reverse triiodothyronine (rT3) values are consistent with sick euthyroid syndrome. Also, the finding on an elevated rT3 level in a critically ill patient helps exclude a diagnosis of hypothyroidism.

The rT3 is high in patients on medications such as propylthiouracil, ipodate, propranolol, amiodarone, dexamethasone, and the anesthetic agent halothane. Dilantin decreases rT3 due to the displacement from thyroxine-binding globulin, which causes increased rT3 clearance.

To convert from ng/dL to nmol/L, multiply the ng/dL result by 0.01536.

Cautions
Generally, reverse triiodothyronine tests are not necessary since triiodothyronine should not be ordered in hospitalized or sick patients.

Clinical Reference


Performance

Method Description
Reverse triiodothyronine-13C (rT3-13C) is added to patient sample as an internal standard. rT3 and rT3-13C are dissociated with a protein precipitation and then extracted from the specimens using a solid-phase cartridge. The eluate is dried down under nitrogen, reconstituted with mobile phase, and analyzed by liquid chromatography-tandem mass spectrometry using multiple reactions monitoring in the positive mode.(Zhang Y, Conrad AH, Conrad GW: Detection and quantification of 3, 5, 3'-triiodothyronine and 3, 3', 5'-triiodothyronine by electrospray ionization tandem mass spectrometry. J Am Soc Mass Spectrom. 2005 Nov;16[11]:1781-1786; Sakai H, Nagao H, Sakurai M, et al. Correlation between serum levels of 3,3',5'-triiodothyronine and thyroid hormones measured by liquid chromatography-tandem mass spectrometry and immunoassay PLoS One. 2015;10[10]:e0138864. doi:
Test Definition: RT3
T3 (Triiodothyronine), Reverse, S


PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Friday; 10 a.m.

Analytic Time
2 days

Maximum Laboratory Time
6 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
84482

LOINC® Information

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<th>Order LOINC Value</th>
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<tr>
<td>RT3</td>
<td>T3 (Triiodothyronine), Reverse, S</td>
<td>3052-8</td>
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<table>
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<th>Result LOINC Value</th>
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