Overview

Useful For
Measuring tauro- and glycol-conjugated and unconjugated bile acid constituents in serum

Monitoring patients receiving bile acid therapy, such as cholic acid, deoxycholic acid, or ursodeoxycholic acid

Aiding in the evaluation of liver function; evaluation of liver function changes before the formation of more advanced clinical signs of illness such as icterus

Determining hepatic dysfunction as a result of chemical and environmental injury

Indicating hepatic histological improvement in chronic hepatitis C patients responding to interferon treatment

Indicating intrahepatic cholestasis of pregnancy

Highlights
Bile acids are elevated in individuals with liver dysfunction.

This bile acid test can be used in the diagnosis of intrahepatic cholestasis of pregnancy.

Fractionated bile acids, including tauro- and glycol-conjugates of cholic acid, chenodeoxycholic acid, deoxycholic acid, and ursodeoxycholic acid are individually summed and reported.

Testing Algorithm
See Ordering Guide: Bile Acid-Associated Tests in Special Instructions.

Special Instructions
- Ordering Guide: Bile Acid-Associated Tests

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

NY State Available
Yes

Specimen

Specimen Type
Serum

Advisory Information
This bile acid test is useful in diagnosing intrahepatic cholestasis of pregnancy.

Do not use this assay for the diagnosis of peroxisomal biogenesis disorders (see BAIPD / Bile Acids for Peroxisomal Disorders, Serum) or inborn errors of bile acid metabolism.

Specimen Required
Patient Preparation: Patient must be fasting for 12-14 hours.
Collection Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Forms

If not ordering electronically, complete, print, and send a Gastroenterology and Hepatology Client Test Request (T728) with the specimen.

Specimen Minimum Volume

0.3 mL

Reject Due To

<table>
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<tr>
<th>Hemolysis</th>
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<tbody>
<tr>
<td>Lipemia</td>
<td>Mild OK; Gross OK</td>
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<tr>
<td>Icterus</td>
<td>NA</td>
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<tr>
<td>Other</td>
<td>Nonfasting specimen or plasma</td>
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Specimen Stability Information

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

Clinical Information

Bile acids are formed in the liver from cholesterol, conjugated primarily to glycine and taurine, stored and concentrated in the gallbladder, and secreted into the intestine after the ingestion of a meal. In the intestinal lumen, the bile acids serve to emulsify ingested fats and thereby promote digestion. During the absorptive phase of digestion, approximately 90% of the bile acids are reabsorbed.

The efficiency of the hepatic clearance of bile acids from portal blood maintains serum concentrations at low levels in normal persons. An elevated fasting level, due to impaired hepatic clearance, is a sensitive indicator of liver disease. Following meals, serum bile acid levels have been shown to increase only slightly in normal persons, but markedly in patients with various liver diseases, including cirrhosis, hepatitis, cholestasis, portal-vein thrombosis, Budd-Chiari syndrome, cholangitis, Wilson disease, and hemochromatosis. No increase in bile acids will be noted in patients with intestinal malabsorption. Metabolic hepatic disorders involving organic anions (eg, Gilbert disease, Crigler-Najjar syndrome, and Dubin-Johnson syndrome) do not cause abnormal serum bile acid concentrations.
### Reference Values

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Normal (nmol/mL)</th>
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<tbody>
<tr>
<td>Total Cholic Acid</td>
<td>&lt; or =5.00</td>
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<tr>
<td>Total Chenodeoxycholic Acid</td>
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</tr>
<tr>
<td>Total Deoxycholic Acid</td>
<td>&lt; or =6.00</td>
</tr>
<tr>
<td>Total Ursodeoxycholic Acid</td>
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<td>Total Bile Acids</td>
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### Interpretation

Total bile acids are metabolized in the liver and can serve as a marker for normal liver function. Increases in serum bile acids are seen in patients with acute hepatitis, chronic hepatitis, liver sclerosis, liver cancer, and intrahepatic cholestasis of pregnancy.

### Cautions

This test does not measure sulfated bile acids.

### Clinical Reference


### Performance

**Method Description**

Bile acid concentrations in serum are measured by liquid chromatography-tandem mass spectrometry stable isotope dilution analysis. Serum is mixed with isotopically labeled internal standards of selected bile acids and then subjected to protein precipitation. Sample preparation is semi-automated using a liquid handler. Reverse-phase liquid chromatography is performed using mobile phases to separate free bile acids, their respective tauro- and glyco-conjugates and 2 bile acid precursors.(Unpublished Mayo method)

**PDF Report**

No

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

Monday through Friday; 8 a.m.

**Analytic Time**

2 days (not reported on Saturday or Sunday)

**Maximum Laboratory Time**

7 days
Specimen Retention Time
1 month

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
82542

LOINC® Information

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<td>Total bile acids</td>
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