Test Definition: BILEA

Bile Acids, Total, Serum

Overview

Useful For

An aid in the evaluation of liver function

Evaluation of liver function changes before the formation of more advanced clinical signs of illness such as icterus

An aid in the determination of hepatic dysfunction as a result of chemical and environmental injury

An indicator of hepatic histological improvement in chronic hepatitis C patients responding to interferon treatment

An indicator for intrahepatic cholestasis of pregnancy

Testing Algorithm

See Bile Acid-Associated Tests Ordering Guide

Special Instructions

- Bile Acid-Associated Tests Ordering Guide

Method Name

Enzymatic

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

This test is for evaluation of hepatobiliary dysfunction.

For evaluation of bowel dysfunction, order BA48F / Bile Acids, Bowel Dysfunction, 48 Hour, Feces.
For evaluation of patients treated with urso or cholate, order BAFS / Bile Acids, Fractionated and Total, Serum.
For evaluation of inborn errors of metabolism, order BAIPD / Bile Acids for Peroxisomal Disorders, Serum.

Specimen Required

Patient Preparation:
Fasting: 12 hours, required; Infants and pregnant patients do not need to fast.
Container/Tube:

Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions:
1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and serum aliquoted into plastic vial within 2 hours of collection.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-General Request (T239)
-Gastroenterology and Hepatology Test Request (T728)

Specimen Minimum Volume

0.25 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	24 hours	
	Frozen	30 days	

Clinical & 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.

Significant increases in total bile acids in nonfasting pregnant females can aid in the diagnosis of cholestasis. Other factors, such as complete medical history, physical exam, and liver function tests should also be considered.

Reference Values

< or =10 mcmol/L

Reference interval applies to fasting total bile acid concentrations.

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, and liver cancer.

Cautions

Serum total bile acid testing is generally not suitable for differentiation among the various types of liver diseases.

Total bile acid concentration is increased after meals; samples should be collected under fasting conditions.

Clinical Reference

1. Sawkat Anwer M, Meyer DJ: Bile Acids in the diagnosis, pathology, and therapy of hepatobiliary diseases. Vet Clin North Am Small Anim Pract. 1995 March;25(2):503-517
2. Javitt NB: Diagnostic value of serum bile acids. Clin Gastroenterol. 1977;6:219-226
3. Osuga T, Mitamura K, Mashige F, et al: Evaluation of fluorimetrically estimated serum bile acid in liver disease. Clin Chim Acta. 1977;75:81-90
4. Shima T, Tada H, Morimoto M, et al: Serum total bile acid level as a sensitive indicator of hepatic histological improvement in chronic hepatitis C patients responding to interferon treatment. J Gastroenterol Hepatol. 2000 March;15(30):294-299
5. Lebovics E, Seif F, Kim D, et al: Pruritus in chronic hepatitis C: Association with high serum bile acids, advanced pathology, and bile duct abnormalities. Dig Dis Sci. 1997 May;42(5):1094-1099
6. Korman MG, Hofmann AF, Summerskill WHJ: Assessment of activity in chronic active liver disease. Serum bile acids compared with conventional tests and histology. NEJM 1974 June 20;290:1399-1402
7. Manzotti C, Casazza G, Stimac T, Nikolova D, Gluud C. Total serum bile acids or serum bile acid profile, or both, for the diagnosis of intrahepatic cholestasis of pregnancy. Cochrane Database Syst Rev. 2019 Jul 5;7(7):CD012546. doi: 10.1002/14651858.CD012546.pub2

Performance

Method Description

In the presence of thionicotinamide adenine dinucleotide (Thio-NAD), the enzyme 3-alpha-hydroxysteroid dehydrogenase (3-alpha-HSD) converts bile acids to 3-keto steroids and Thio-NADH. The reaction is reversible and a 3-alpha-HSD can convert 3-keto steroids and Thio-NADH to bile acids and Thio-NAD. In the presence of excess NADH, the enzyme cycling occurs efficiently and the rate of formation of the Thio-NADH is determined by measuring specific

change of absorbance at 405 nm.(Package insert: Total Bile Acids Assay Kit. Diazyme Laboratories; 03/2024)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 to 2 days

Specimen Retention Time
1 week

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & 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 account representative. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
82239

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BILEA	Bile Acids, Total, S	14628-2

Result ID	Test Result Name	Result LOINC® Value
BILEA	Bile Acids, Total, S	14628-2