Test Definition: BA48F

Bile Acids, Bowel Dysfunction, 48 Hour, Feces

Overview

Useful For

Aids in evaluation of patients suspected of having irritable bowel syndrome-diarrhea symptoms due to bile acid malabsorption

Testing Algorithm

For information see Bile Acid-Associated Tests Ordering Guide

Special Instructions

- Bile Acid-Associated Tests Ordering Guide

Method Name

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

NY State Available

Yes

Specimen

Specimen Type

Fecal

Ordering Guidance

This test is for evaluation of bowel dysfunction or confirmatory testing for bile acid malabsorption using a 48-hour fecal collection.

For evaluation of hepatobiliary dysfunction, order BILEA / Bile Acids, Total, Serum.
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:

1. The patient should be on a fat-controlled diet (100-150 g fat per day) for 3 days before and during the collection period.
2. Patient should **not** use:
 a. Antibiotics for 7 days before or during specimen collection
 b. Statins for 5 days before or during specimen collection
 c. Laxatives (particularly mineral oil and castor oil) for 3 days before or during specimen collection.
 d. Bile acid sequestrants for 24 hours before or during specimen collection
 e. Synthetic fat substitutes (eg, Olestra) or fat-blocking nutritional supplements for 24 hours before or during the

specimen collection
3. If the patient has used barium, it is recommended to wait at least 48 hours before collecting the specimen.

Supplies: Stool Containers - 24, 48, 72 Hour Kit (T291)
Collection Container/Tube: Stool container that complies with shipping requirements
Specimen Volume: Entire 48-hour collection
Collection Instructions:
1. Do not use other containers.
2. Freeze immediately.
3. All containers must be sent together.
4. The entire collection must contain at least 5 g of feces.
5. The number of containers sent should be indicated on the labels (1 of 4, for example).
Additional Information:
1. The patient may store specimen at refrigerate temperature during the collection period, but it must be frozen immediately after completion.
2. If additional tests are ordered, aliquot and separate sample prior to freezing to allow 1 container per test.

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

Specimen Minimum Volume
5 g

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Fecal	Frozen	30 days	

Clinical & Interpretive

Clinical Information
Bile acids are natural products of cholesterol synthesis that aid in the emulsification and absorption of dietary fats in the small intestine. The majority of bile acids are reabsorbed in the ileum of the healthy individual, with only 5% excreted in feces.(1) Primary bile acids cholic acid (CA) and chenodeoxycholic acid (CDCA) are deconjugated and dehydroxylated via intestinal bacteria into secondary bile acids deoxycholic acid (DCA) and lithocholic acid (LCA), respectively.(2) The sum of CA, CDCA, DCA, LCA, and ursodeoxycholic acid (UDCA) compose the majority of bile acids in the feces. Impaired absorption of bile acids in the terminal ileum leads to excess bile acids in the colon that can cause diarrhea from chloride and water secretion; a condition called bile acid malabsorption (BAM).

Irritable bowel syndrome (IBS) is a nonspecific multifactorial disorder involving the large intestine. IBS is characterized by

cramping, bloating, diarrhea, and constipation and classified as either IBS-D (diarrhea) or IBS-C (constipation) by the Rome III criteria.(3) Up to 50% of IBS-D patients have accelerated colonic transit time; the mechanism of IBS-D pathophysiology is varied with more than 25% having BAM.(1,4)

Several methods have been developed for detection of BAM, but are not widely available in clinical practice.(5) Therefore, patients are often placed on trials of bile acids sequestrants to determine if symptoms improve.

Quantitation of fecal bile acids aids in screening for IBS-D and identification of patients with chronic diarrhea who may benefit from bile acid sequestrant therapy.

Reference Values

> or = to 18 years:
Sum of cholic acid and chenodeoxycholic acid < or =9.7%
Total bile acids < or =2619 mcmoles/48 h

Reference values have not been established for patients who are younger than 18 years of age

Interpretation

Elevated total fecal bile acid or percent cholic acid plus chenodeoxycholic acid is consistent with the diagnosis of bile acid malabsorption.

Pharmacological treatment with bile acid sequestrants has been shown to improve symptoms in some patients.

Cautions

Bile acids are not stable in stool. Stool samples must be kept frozen immediately after collection.

Supportive Data

Bile acid (BA) malabsorption is suspected when total BA is greater than 2337 mcmol/48h, **or** primary BA (% cholic acid plus chenodeoxycholic acid) is greater than 10%, **or** total BA is greater than 1000 mcmol/48h + primary BA is greater or equal to 4%.(1)

Clinical Reference

1. Vijayvargiya P, Camilleri M, Chedid V, et al. Analysis of fecal primary bile acids detects increased stool weight and colonic transit in patients with chronic functional diarrhea. Clin Gastroenterol Hepatol. 2019;17(5):922-929.e2
2. Vijayvargiya P, Camilleri M. Current practice in the diagnosis of bile acid diarrhea. Gastroenterology. 2019;156:(5):1233-1238
3. Wedlake L, A'Hern R, Russell D, Thomas K, Walters JR, Andreyev HJ. Systematic review: the prevalence of idiopathic bile acid malabsorption as diagnosed by SeHCAT scanning in patients with diarrhoea-predominant irritable bowel syndrome. Aliment Pharmacol *Ther*. 2009;30(7):707-717
4. Shin A, Camilleri M, Vijayvargiya P, et al. Bowel functions, fecal unconjugated primary and secondary bile acids, and colonic transit in patients with irritable bowel syndrome. Clin Gastroenterol Hepatol. 2013 Oct;11(10):1270-1275
5. Longstreth GF, Thompson WG, Chey WD, et al: Functional bowel disorders. Gastroenterology. 2006;130:1480-1491
6. Camilleri M, McKinzie S, Busciglio I, et al. Prospective study of motor, sensory, psychologic, and autonomic functions in patients with irritable bowel syndrome. Clin Gastroenterol Hepatol. 2008;6:772-781
7. Vijayvargiya P, Camilleri M, Shin A, Saenger A. Methods for diagnosis of bile acid malabsorption in clinical practice. Clin Gastroenterol Hepatol. 2013;11(10):1232-1239

Performance

Method Description
Fractionated fecal bile acids are quantified in a 48-hour fecal collection during which a high-fat intake diet was followed. Samples are analyzed on a tandem mass spectrometer.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Wednesday

Report Available
2 to 9 days

Specimen Retention Time
7 days

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
82542

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BA48F	Bile Acids, Bowel Dysfunc, 48 Hr, F	93338-2

Result ID	Test Result Name	Result LOINC® Value
36968	Bile Acids, % CDCA + CA, F	93337-4

36969	Total Bile Acids, F	93336-6
610285	Stool Weight	30078-0