Test Definition: A1AFS

Alpha-1-Antitrypsin Clearance, Feces and Serum

Overview

Useful For

Diagnosing protein-losing enteropathies

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
AATS	Alpha-1-Antitrypsin, S	No	Yes
A1ATF	Alpha-1-Antitrypsin, 24 Hr, F	No	Yes

Method Name

Nephelometry

NY State Available

Yes

Specimen

Specimen Type

Fecal
Serum

Ordering Guidance

The recommended procedure for protein-losing enteropathy is A1AFS / Alpha-1-Antitrypsin Clearance, Feces and Serum.

Shipping Instructions

Feces and serum should be shipped together. Specimens shipped separately may delay testing.

Specimen Required

Both feces and serum are required. Blood **must** be drawn during the stool collection period.

Specimen Type: Serum
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Red top or serum gel
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot serum into a plastic vial

Specimen Type: Feces
Supplies: Stool Containers - 24, 48, 72 Hour Kit (T291)
Container/Tube: Stool container
Specimen Volume: Entire collection
Collection Instructions:
1. Collect a 24-hour fecal collection.
2. If no specimen is obtained within 24 hours, extend collection time to 48 to 72 hours. Document duration.

Forms

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

Specimen Minimum Volume

Homogenized feces: 1 mL; Serum: 0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK
Feces collected in any preservative or fixative	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Fecal	Frozen (preferred)	14 days	
	Ambient	14 days	
	Refrigerated	14 days	
Serum	Frozen (preferred)	28 days	
	Ambient	28 days	
	Refrigerated	28 days	

Clinical & Interpretive

Clinical Information

Alpha-1-antitrypsin (AAT) is a 54-kDa glycoprotein that is resistant to degradation by digestive enzymes and is, therefore, used as an endogenous marker for the presence of blood proteins in the intestinal tract. AAT clearance is reliable for measuring protein loss distal to the pylorus. A serum sample is required to interpret results as a serum deficiency of AAT would make the AAT fecal excretion lower and could invalidate the test utility.

Gastrointestinal protein enteropathy has been associated with regional enteritis, sprue, Whipple intestinal lipodystrophy, gastric carcinoma, allergic gastroenteropathy, intestinal lymphangiectasia, constrictive pericarditis, congenital hypogammaglobulinemia, and iron deficiency anemia associated with intolerance to cow's milk. Increased fecal excretion of AAT can be found in small and large intestine disease and is applicable to adult and children.

Reference Values

CLEARANCE:
< or =27 mL/24 h

FECAL ALPHA-1-ANTRYPSIN CONCENTRATION:
< or =54 mg/dL

SERUM ALPHA-1-ANTRYPSIN CONCENTRATION:
100-190 mg/dL

Interpretation

Elevated alpha-1-antitrypsin (AAT) clearance suggests excessive gastrointestinal protein loss. The positive predictive value of the test has been found to be 97.7% and the negative predictive value is 75%.

Patients with protein-losing enteropathies generally have AAT clearance values greater than 50 mL/24 hours and AAT fecal concentrations above 100 mg/dL.

Borderline elevations above the normal range are equivocal for protein-losing enteropathies.

Cautions

In the absence of either a 24-hour fecal collection or a contemporary serum specimen, the fecal concentration of alpha-1-antitrypsin (AAT) can be used as a surrogate marker. The clearance test is preferred as it normalizes the large range of serum AAT concentrations and the variability in random fecal AAT concentrations.

When gastric loss of AAT is suspected (eg, Menetrier disease), AAT clearance is not a reliable indicator of protein loss as AAT is sensitive to pH less than3 and rapidly destroyed. When gastric protein loss is suspected and the AAT clearance is normal, the recommendation is to repeat testing after starting an acid suppressive medication regime.

Urine contamination from patients with kidney failure and increased total protein may adversely affect fecal AAT concentration. Suggest catheterizing patient prior to collection if clinically indicated.

Quantitation of specific proteins by nephelometric means may not be possible in lipemic sera due to the extreme light scattering properties of the specimen. Turbidity and particles in the specimen may result in extraneous light scattering signals, resulting in variable specimen analysis.

Supportive Data

Protein-losing enteropathy has been studied by intravenous injection of radioactive chromium chloride or labeled human serum albumin. The correlation between radiochromium and stool alpha-1-antitrypsin clearance has been measured with excellent correlation coefficients.

Clinical Reference

1. Florent C, L'Hirondel C, Desmazures C, Aymes C, Bernier JJ. Intestinal clearance of alpha 1-antitrypsin. A sensitive method for the detection of protein losing enteropathy. Gastroenterology. 1981;81(4):777-780
2. Crossley JR, Elliott RB. Simple method for diagnosing protein-losing enteropathies. Br Med J. 1977;1(6058):428-429
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4. Schmidt PN, Blirup-Jensen S, Svendsen PJ, Wandall JH. Characterization and quantification of plasma proteins excreted in faeces from healthy humans. Scand J Clin Lab Invest. 1995;55(1):35-45
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6. Rybolt AH, Bennett RG, Laughon BE, Thomas DR, Greenough WB 3rd, Bartlett JG: Protein-losing enteropathy associated with Clostridium difficile infection. Lancet. 1989;1(8651):1353-1355
7. Molina JF, Brown RF, Gedalia A, Espinoza LR. Protein losing enteropathy as the initial manifestation of childhood systemic lupus erythematosus. J Rheumatol. 1996;23(7):1269-1271
8. Umar SB, DiBaise JK. Protein-losing enteropathy: case illustrations and clinical review. Am J Gastroenterol. 2010;105(1):43-49
9. Levitt DG, Levitt MD. Protein losing enteropathy: comprehensive review of the mechanistic association with clinical and subclinical disease states. Clin Exp Gastroenterol. 2017;10:147-168
10. Murray FR, Morell B, Biedermann L, Schreiner P. Protein-losing enteropathy as precursor of inflammatory bowel disease: A review of the literature. BMJ Case Rep. 2021;14(1):e238802

Performance

Method Description

Immunonephelometry quantitates the alpha-1-antitrypsin (AAT) contained in a 24-hour fecal collection. From the concentration of feces and serum AAT, a 24-hour clearance is calculated. In the absence of a serum specimen or a timed fecal collection, an AAT fecal concentration will be reported.(Instruction manual: Siemens Nephelometer II Operations. Siemens, Inc; Version 2.4, 07/2019)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

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 modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

82103 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
A1AFS	Alpha-1-Antitrypsin Clearance	93419-0

Result ID	Test Result Name	Result LOINC® Value
AAT24	Alpha-1-Antitrypsin, 24 Hr, F	9407-8
CRCLR	Clearance	18271-7
AATS	Alpha-1-Antitrypsin, S	6771-0