MAYO CLINIC LABORATORIES

Test Definition: AAT

Alpha-1-Antitrypsin, Serum

Overview

Useful For

Workup of individuals with suspected disorders such as familial chronic obstructive lung disease

Diagnosing alpha-1-antitrypsin deficiency

Testing Algorithm

For more information see Alpha-1-Antitrypsin-A Comprehensive Testing Algorithm.

Special Instructions

- Alpha 1 Antitrypsin-A Comprehensive Testing Algorithm

Method Name

Nephelometry

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

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

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Alpha-1-antitrypsin (A1A) is the most abundant serum protease inhibitor, and it inhibits trypsin and elastin as well as several other proteases. The release of proteolytic enzymes from plasma onto organ surfaces and into tissue spaces results in tissue damage unless inhibitors are present. Congenital deficiency of A1A is associated with the development of emphysema at an unusually early age and with an increased incidence of neonatal hepatitis, usually progressing to cirrhosis.

For more information see Alpha-1-Antitrypsin-A Comprehensive Testing Algorithm.

Reference Values

100-190 mg/dL

Interpretation

Patients with serum levels less than 70 mg/dL may have a homozygous deficiency and are at risk for early lung disease. Alpha-1-antitrypsin proteotype testing should be done to confirm the presence of homozygous deficiency alleles.

If clinically indicated, patients with serum levels less than 125 mg/dL should have proteotype testing in order to identify heterozygous individuals. Heterozygotes do not appear to be at increased risk for early emphysema.

Cautions

Low alpha-1-antitrypsin (A1A) levels may result from liver disease, and A1A proteotype testing should be done to confirm A1A deficiency disease.

Alpha-1-antitrypsin is an acute-phase reactant, and any inflammatory process will elevate serum A1A levels.

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.

Clinical Reference

1. Tejwani V, Stoller JK. The spectrum of clinical sequelae associated with alpha-1 antitrypsin deficiency. Ther Adv Chronic Dis. 2021;12_ suppl:2040622321995691. doi:10.1177/2040622321995691
2. Patel D, McAllister SL, Teckman JH. Alpha-1 antitrypsin deficiency liver disease. Transl Gastroenterol Hepatol. 2021;6:23. doi:10.21037/tgh.2020.02.23
3. Donato LJ, Snyder MR, Greene DN. Measuring and interpreting serum AAT concentration. Methods Mol Biol. 2017;1639:21-32. doi:10.1007/978-1-4939-7163-3_3

Performance

Method Description

In this Siemens Nephelometer II method, the light scattered by the antigen-antibody complexes is measured. The intensity of the measured scattered light is proportional to the amount of antigen-antibody complexes in the sample under certain conditions. If the antibody volume is kept constant, the signal behaves proportionally to the antigen volume.

A reference curve is generated by a standard with a known antigen content on which the scattered light signals of the samples can be evaluated and calculated as an antigen concentration. Antigen-antibody complexes are formed when a sample containing antigen and the corresponding antiserum are put into a cuvette. A light beam is generated with a light emitting diode (LED), which is transmitted through the cuvette. The light is scattered onto the immuno-complexes that are present. Antigen and antibody are mixed in the initial measurement, but no complex is yet formed. An antigen-antibody complex is formed in the final measurement.

The result is calculated by subtracting value of the final measurement from the initial measurement. The distribution of intensity of the scattered light depends on the ratio of the particle size of the antigen-antibody complexes to the radiated wavelength.(Instruction manual: Siemens Nephelometer II. Siemens, Inc; V 2.4, 07/2019; Addendum to the Instruction Manual 2.3, 08/2017)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

14 days

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 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

82103

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
AAT	Alpha-1-Antitrypsin, S	6771-0

Result ID	Test Result Name	Result LOINC® Value
AAT	Alpha-1-Antitrypsin, S	6771-0