MAYO CLINIC LABORATORIES

Test Definition: APOAB

Apolipoprotein A1 and B, Serum

Overview

Useful For

Assessment of cardiovascular risk

Follow-up studies in individuals with basic lipid measures inconsistent with risk factors or clinical presentation

Definitive studies of cardiac risk factors in individuals with significant family histories of coronary artery disease or other increased risk factors

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
RBAA1	Apolipoprotein B/A1 ratio	No	Yes
APOA1	Apolipoprotein A1, S	Yes	Yes
APOLB	Apolipoprotein B, S	Yes	Yes

Method Name

Automated Turbidimetric Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions: Centrifuge and aliquot 1 mL of serum.

Forms

If not ordering electronically, complete, print, and send a Cardiovascular Test Request Form (T724) with the specimen.

Specimen Minimum Volume

0.5 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)	8 days	
	Ambient	24 hours	
	Frozen	60 days	

Clinical & Interpretive

Clinical Information

Apolipoprotein B (ApoB) is the primary protein component of low-density lipoprotein (LDL). Apolipoprotein A1 (ApoA1) is the primary protein component of high-density lipoprotein (HDL). Elevated ApoB and decreased ApoA1 are associated with increased risk of cardiovascular disease. Multiple studies have reported that ApoB and ApoA1 are more strongly associated with cardiovascular disease than the corresponding lipoprotein cholesterol fraction (see APOA1 / Apolipoprotein A1, Serum and APOLB / Apolipoprotein B, Serum).

ApoB is present in all atherogenic lipoproteins including LDL, Lp(a), intermediate-density lipoprotein (IDL), and very low-density lipoprotein (VLDL) remnants. ApoA1 is the nucleating protein around which HDL forms during reverse cholesterol transport. The ApoB:ApoA1 ratio represents the balance between atherogenic and antiatherogenic lipoproteins. Several large prospective studies have shown that the ApoB:ApoA1 ratio performs as well, and often better, than traditional lipids as an indicator of risk.(1-3)

Reference Values

Males

Age	Apolipoprotein A (mg/dL)	Apolipoprotein B (mg/dL)	Apolipoprotein B/A1 ratio
<24 months	Not established	Not established	Not established
2-17 years	Low: <115 Borderline low: 115-120 Acceptable: >120	Acceptable: <90 Borderline high: 90-109 High: > or =110	<0.8
>18 years	> or =120	Desirable: <90 Above Desirable: 90-99 Borderline high: 100-119 High: 120-139 Very high: > or =140	Lower Risk: <0.7 Average Risk: 0.7-0.9 Higher Risk: >0.9

Females

Age	Apolipoprotein A (mg/dL)	Apolipoprotein B (mg/dL)	Apolipoprotein B/A1 ratio
<24 months	Not established	Not established	Not established
2-17 years	Low: <115 Borderline low: 115-120 Acceptable: >120	Acceptable: <90 Borderline high: 90-109 High: > or =110	<0.8
>18 years	> or =140	Desirable: <90 Above Desirable: 90-99 Borderline high: 100-119 High: 120-139 Very high: > or =140	Lower Risk: <0.6 Average Risk: 0.6-0.8 Higher Risk: >0.8

Interpretation

Elevated apolipoprotein B (ApoB) confers increased risk of atherosclerotic cardiovascular disease, even in a context of acceptable LDL cholesterol concentrations.

Extremely low values of ApoB (<48 mg/dL) are related to malabsorption of food lipids and can lead to polyneuropathy.

Reduced apolipoprotein A1 (ApoA1) confers an increased risk of coronary artery disease. Extremely low ApoA1 (<20 mg/dL) is suggestive of liver disease or a genetic disorder.

Elevated ApoB:ApoA1 ratio confers increased risk of atherosclerotic cardiovascular disease, independently of LDL and HDL cholesterol concentrations.

Cautions

In very rare cases, gammopathy, in particular type IgM (Waldenstrom macroglobulinemia), may cause unreliable results.

Clinical Reference

1. Reiner Z, Catapano AL, De Backer G, et al: ESC/EAS Guidelines for the management of dyslipidaemias: The task force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS). Eur Heart J 2011;32(14):1769-1818

2. McQueen MJ, Hawken S, Wang X, et al: Lipids, lipoproteins, and apolipoproteins as risk markers of myocardial infarction in 52 countries (the INTERHEART study): a case-control study. Lancet 2008;372:224-233

3. Thompson A, Danesh J: Associations between apolipoprotein B, apolipoprotein AI, the apolipoprotein B/AI ratio and coronary heart disease: a literature-based meta-analysis of prospective studies. J Intern Med 2006;259:481-492

4. Jacobson TA, Ito MK, Maki KC, et al: National Lipid Association recommendations for patient-centered management of dyslipidemia: Part 1-executive summary. J Clin Lipidol 2014 Sep-Oct;8(5):473-488

5. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. Pediatrics 2011 Dec;128 Suppl 5:S213-S256

Performance

Method Description

Antiapolipoprotein B antibodies react with the antigen in the sample to form antigen:antibody complexes which, following agglutination, can be measured turbidimetrically.(Package Insert: Tina-quant Apolipoprotein B, Roche Diagnostics. Indianapolis, IN. 05/2019)

Antiapolipoprotein A-1 antibodies react with the antigen in the sample to form antigen:antibody complexes which, following agglutination, can be measured turbidimetrically.(Package Insert: Tina-quant Apolipoprotein A-1, Roche Diagnostics. Indianapolis, IN. 05/2019)

PDF Report

No

Day(s) Performed

APOA1: Monday through Sunday
APOLB: Monday through Saturday

Report Available

1 to 3 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

82172 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
APOAB	Apolipoprotein A1 and B, S	55724-9

Test Definition: APOAB

Apolipoprotein A1 and B, Serum

Result ID	Test Result Name	Result LOINC® Value
APOLB	Apolipoprotein B, S	1884-6
APOA1	Apolipoprotein A1, S	1869-7
RBAA1	Apolipoprotein B/A1 ratio	1874-7