

## 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	
	Frozen	60 days	
	Ambient	24 hours	

## 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

- 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
- 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
- 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
- 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
- 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**

Rochester

**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

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