Test Definition: APOLB

Apolipoprotein 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

Confirmation of suspected abetalipoproteinemia or hypobetalipoproteinemia

Method Name

Automated Turbidimetric Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

If only apolipoprotein B is required, order this test.

If both apolipoprotein A and apolipoprotein B are required, order APOAB / Apolipoprotein A1 and B, Serum.

Shipping Instructions

Send specimen refrigerated.

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL serum
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:

-Cardiovascular Test Request Form (T724)
-General Test Request (T239)

Specimen Minimum Volume
Serum: 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). LDL contains a variable amount of cholesterol, but each LDL contains exactly one ApoB protein. Therefore, ApoB is a more reliable indicator of circulating LDL compared to LDL cholesterol (LDL-C). ApoB has been demonstrated to perform equally with LDL particles measured by nuclear magnetic resonance spectroscopy.(1)

Apolipoprotein B is strongly associated with increased risk of developing cardiovascular disease (CVD) and often outperforms LDL-C at predicting risk of coronary heart disease.(2-4) Patients with acceptable non-high-density lipoprotein cholesterol (non-HDL-C) or LDL-C but elevated ApoB remain at higher risk of developing CVD; conversely, patients with acceptably low ApoB but moderate non-HDL-C or LDL-C elevations are at a reduced risk for CVD.(5,6)

Finally, in 7 different placebo-controlled randomized clinical trials, on-statin reduction of ApoB was more closely related to CVD risk reduction than non-HDL-C or LDL-C.(7)

Reference Values
Less than 2 years: Not established

2-17 years:
Acceptable: <90 mg/dL
Borderline high: 90-109 mg/dL
High: > or =110 mg/dL

> or =18 years:
Desirable: <90 mg/dL
Above Desirable: 90-99 mg/dL
Borderline high: 100-119 mg/dL
High: 120-139 mg/dL
Very high: > or =140 mg/dL

Interpretation

Elevated apolipoprotein B (ApoB) confers increased risk of coronary artery disease. ApoB can be used as a therapeutic target analogous to non-HDL-C and LDL-C.

Apolipoprotein B values less than 48 mg/dL are considered very low (<2.5th population percentile). Possible causes include aggressive lipid-lowering therapy, malnutrition, hepatobiliary disease or drug interactions. Decreased ApoB may indicate hypobetalipoproteinemia (HBL). Genetic testing for HBL is available (HYPBG / Hypobetalipoproteinemia Gene Panel, Varies).

Cautions

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

Clinical Reference

1. Cole TG, Contois JH, Csako G, et al. Association of apolipoprotein B and nuclear magnetic resonance spectroscopy-derived LDL particle number with outcomes in 25 clinical studies: assessment by the AACC Lipoprotein and Vascular Diseases Division Working Group on best practices. Clin Chem. 2013;59(8):752-770
2. Sierra-Johnson J, Fisher RM, Romero-Corral A, et al. Concentration of apolipoprotein B is comparable with the apolipoprotein B/apolipoprotein A-I ratio and better than routine clinical lipid measurements in predicting coronary heart disease mortality: findings from a multi-ethnic US population. Eur Heart J. 2009;30(6):710-717
3. Steffen BT, Guan W, Remaley AT, et al. Use of lipoprotein particle measures for assessing coronary heart disease risk Post-American Heart Association / American College of Cardiology Guidelines: The Multi-Ethnic Study of Atherosclerosis. Arterioscler Thromb Vasc Biol. 2015;35(2):448-454
4. 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(5):481-492
5. Mora S, Buring JE, Ridker PM. Discordance of low-density lipoprotein (LDL) cholesterol with alternative LDL-related measures and future coronary events. Circulation. 2014;129(5):553-561
6. Pencina MJ, D'Agostino RB, Zdrojewski T, et al. Apolipoprotein B improves risk assessment of future coronary heart disease in the Framingham Heart Study beyond LDL-C and non-HDL-C. Eur J Prev Cardiol. 2015;22(10):1321-7. doi:10.1177/2047487315569411
7. Thanassoulis G, Williams K, Ye K, et al. Relations of change in plasma levels of LDL-C, non-HDL-C and apoB with risk reduction from statin therapy: a meta-analysis of randomized trials. J Am Heart Assoc. 2014;3(2):e000759
8. 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;8(5):473-488
9. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. Pediatrics. 2011;128 Suppl 5:S213-S256
10. Contois JH, McConnell JP, Sethi AA, et al. Apolipoprotein B and Cardiovascular Disease Risk: Position Statement from the AACC Lipoproteins and Vascular Diseases Division Working Group on Best Practices. Clinical Chemistry. 2009:55:3:407-419
11. Cao J, Donato L, El-Khoury JM, Goldberg A, Meeusen JW, Remaley AT. ADLM Guidance Document on the

measurement and reporting of lipids and lipoproteins. J Appl Lab Med, 2024; 9(5):1040-1056

Performance

Method Description
Anti-apolipoprotein 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; V13.0 03/2022)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
1 to 3 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 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

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
APOLB	Apolipoprotein B, S	1884-6

Test Definition: APOLB

Apolipoprotein B, Serum

Result ID	Test Result Name	Result LOINC® Value
APOLB	Apolipoprotein B, S	1884-6