MAYO CLINIC LABORATORIES

Test Definition: CLDL1

Cholesterol, Low-Density Lipoprotein (LDL), Calculated, Serum (Non-Orderable)

Overview

Useful For

Only orderable as part of a profile. For more information see LPSC1 / Lipid Panel, Serum

Calculation of low-density lipoprotein cholesterol using total cholesterol, non-high-density lipoprotein (HDL) cholesterol, HDL cholesterol, and triglyceride concentrations

Managing atherosclerotic cardiovascular disease risk

Method Name

Only orderable as part of a profile. For more information see LPSC1 / Lipid Panel, Serum

Calculation

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Only orderable as part of a profile. For more information see LPSC1 / Lipid Panel, Serum

Reject Due To

Gross hemolysis	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Lipoprotein cholesterol measurements are essential in managing risk for atherosclerotic cardiovascular disease (ASCVD). Atherosclerosis is defined by a buildup of plaque within arterial walls. ASCVD includes coronary heart disease, strokes, and peripheral artery disease. ASCVD develops over decades and is often asymptomatic until the patient experiences a life-threatening event such as a heart attack, stroke, or aneurysm.

Low-density lipoprotein cholesterol (LDL-C) is the primary lipoprotein responsible for atherogenic plaque. Very low-density lipoprotein cholesterol (VLDL-C) is also atherogenic and the combination of LDL-C and VLDL-C is called non-high-density lipoprotein (HDL) cholesterol. Serum LDL-C and non-HDL cholesterol are directly associated with risk for ASCVD and often referred to as "bad" cholesterol. HDL-C is often referred to as "good" cholesterol because HDL-C concentrations are inversely related to ASCVD risk.

Adjusted LDL-C calculations, like the Sampson/NIH equation, are endorsed by multiple guidelines as being more accurate when triglycerides are greater than 150 mg/dL and/or LDL-C is less than 70 mg/dL.

Reference Values

Only orderable as part of a profile. For more information see LPSC1 / Lipid Panel, Serum

The National Lipid Association and the National Cholesterol Education Program have set the following guidelines for lipids in a context of cardiovascular risk for adults 18 years old and older:
LDL CHOLESTEROL
Desirable: <100 mg/dL
Above Desirable: 100-129 mg/dL
Borderline High: 130-159 mg/dL
High: 160-189 mg/dL
Very High: > or =190 mg/dL

The Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents has set the following guidelines for lipids in a context of cardiovascular risk for children 2 to 17 years old:

LDL CHOLESTEROL
Acceptable: <110 mg/dL
Borderline High: 110-129 mg/dL
High: > or =130 mg/dL
Reference values have not been established for patients who are younger than 24 months of age.

Interpretation

Maintaining desirable concentrations of lipids lowers atherosclerotic cardiovascular disease risk. Establishing appropriate treatment strategies and lipid goals require that blood lipid values be considered in context with other risk factors including, age, sex, smoking status, and medical history of hypertension, diabetes, and cardiovascular disease.

Low-density lipoprotein cholesterol results of 190 mg/dL or above in adults (> or =160 mg/dL in children) are severely elevated and may indicate familial hypercholesterolemia.

Cautions

Calculated low-density lipoprotein cholesterol (LDL-C) is not applicable when triglyceride level is above 800 mg/dL.

Consider repeat measurement of LDL-C prior to initiating or changing lipid therapy.

Clinical Reference

1. Grundy SM, Stone NJ, Bailey AL, et al: 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2019 Jun 18;139(25):e1082-e1143
2. 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. doi: 10.1016/j.jacl.2014.07.007
3. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents; National Heart, Lung, and Blood Institute. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. Pediatrics. 2011 Dec;128 Suppl 5(Suppl 5):S213-S256. doi: 10.1542/peds.2009-2107C
4. Sampson M, Ling C, Sun Q, et al: A new equation for calculation of low-density lipoprotein cholesterol in patients with normolipidemia and/or hypertriglyceridemia. JAMA Cardiol. 2020 May 1;5(5):540-548

Performance

Method Description

The low-density lipoprotein (LDL) cholesterol concentration is calculated from total cholesterol (TC), triglyceride (TG), and high-density lipoprotein cholesterol (HDLc) concentrations, according to the following formula by National Institutes of Health.

$$LDL = \frac{TC}{0.948} - \frac{HDLc}{0.971} - \left(\frac{TG}{8.56} + \frac{TG*nonHDLc}{2140} - \frac{TG(2)}{16,100} \right) - 9.44$$

nonHDLc = Non-HDL cholesterol = TC – HDLc

This calculation is performed in the laboratory information system, SCC Soft.

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

1 day

Specimen Retention Time

1 week

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Cholesterol, Low-Density Lipoprotein (LDL), Calculated, Serum (Non-Orderable)

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

Not Applicable

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CLDL1	Cholesterol, LDL, Calculated, S	No LOINC Needed

Result ID	Test Result Name	Result LOINC® Value
CLDL1	Cholesterol, LDL, Calculated, S	13457-7