

**Overview****Useful For**

Evaluation of cardiovascular risk

**Special Instructions**

- [Lipids and Lipoproteins in Blood Plasma \(Serum\)](#)

**Method Name**

EnzymaticColorimetric

**NY State Available**

Yes

**Specimen****Specimen Type**

Serum

**Specimen Required****Container/Tube:****Preferred:** Serum gel**Acceptable:** Red top**Specimen Volume:** 0.5 mL**Collection Instructions:**

1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

**Forms**If not ordering electronically, complete, print, and send a [Cardiovascular Test Request](#) (T724) with the specimen.**Specimen Minimum Volume**

0.25 mL

**Reject Due To**

Gross hemolysis	Reject
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**Specimen Stability Information**

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

Specimen Type	Temperature	Time	Special Container
	Frozen	90 days	

## Clinical and Interpretive

### Clinical Information

Cholesterol is a steroid with a secondary hydroxyl group in the C3 position. It is synthesized in many types of tissue, but particularly in the liver and intestinal wall. Approximately 75% of cholesterol is newly synthesized and 25% originates from dietary intake. Normally, the cholesterol in the plasma or serum is 60% to 80% esterified. Approximately 50% to 75% of the plasma cholesterol is transported by low-density lipoproteins (LDL) and 15% to 40% by high-density lipoproteins (HDL).

Serum cholesterol is elevated in the hereditary hyperlipoproteinemias and in various other metabolic diseases. Moderate-to-markedly elevated values are also seen in cholestatic liver disease. Hypercholesterolemia reflects an increase of lipoproteins of 1 or more specific classes (eg, beta-LDL, alpha-1 HDL, alpha-2 HDL, or LP-X). Hypercholesterolemia is a risk factor for cardiovascular disease.

Low levels of cholesterol can be seen in disorders that include hyperthyroidism, malabsorption, and deficiencies of apolipoproteins.

### Reference Values

The National Lipid Association and the National Cholesterol Education Program (NCEP) have set the following guidelines for lipids (total cholesterol, triglycerides, high-density lipoprotein [HDL] cholesterol, low-density lipoprotein [LDL] cholesterol, and non-HDL cholesterol) in adults ages 18 and up:

#### TOTAL CHOLESTEROL

Desirable: <200 mg/dL

Borderline high: 200-239 mg/dL

High: > or =240 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 (total cholesterol, triglycerides, HDL cholesterol, LDL cholesterol, and non-HDL cholesterol) in children 2 to 17 years of age:

#### TOTAL CHOLESTEROL

Acceptable: <170 mg/dL

Borderline high: 170-199 mg/dL

High: > or =200 mg/dL

### Interpretation

The National Lipid Association and the National Cholesterol Education Program (NCEP) have set the following guidelines for total cholesterol:

Desirable: <200 mg/dL

Borderline high: 200 to 239 mg/dL

High: > or =240 mg/dL

Values above the normal range indicate a need for quantitative analysis of the lipoprotein profile.

Values in hyperthyroidism usually are in the lower normal range; malabsorption values may be below 100 mg/dL, while beta-lipoprotein or apolipoprotein B deficiency values usually are below 80 mg/dL.

See [Lipids and Lipoproteins in Blood Plasma \(Serum\)](#) in Special Instructions.

### Cautions

Patients must be fasting for at least 12 to 14 hours if a lipid screen is ordered. If total cholesterol is the only lipid test ordered, fasting is not necessary.

Result can be falsely decreased in patients with elevated levels of N-acetyl-p-benzoquinone imine (NAPQI, a metabolite of acetaminophen), N-acetylcysteine (NAC), and Metamizole.

### Clinical Reference

1. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Edited by CA Burtis, ER Ashwood. St. Louis, MO: Elsevier Saunders, 2012
2. National Institute of Health (NIH) Publication: Second Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. NIH Publication 93-3096. 1993 Sep;93:3096
3. 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
4. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Pediatrics. 2011;128;S213

### Performance

#### Method Description

Cholesterol is measured by an automated enzymatic method. The reagents include cholesterol ester hydrolase, cholesterol oxidase, and a coupled colorimetric end-point chemistry system. The method is referenced to the Centers of Disease Control standardized method performed in the Cardiovascular Risk Assessment Laboratory. (Package insert: Bayer Cholesterol Reagent, Bayer Diagnostics Corporation, Tarrytown, NY; package insert: Roche Cholesterol Reagent, Roche Diagnostics Corporation, Indianapolis)

#### PDF Report

No

#### Day(s) and Time(s) Test Performed

Monday through Sunday; Continuously

#### Analytic Time

Same day/1 day

**Maximum Laboratory Time**

1 day

**Specimen Retention Time**

1 week

**Performing Laboratory Location**

Rochester

**Fees and 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 Regional Manager. For assistance, contact [Customer Service](#).

**Test Classification**

This test has been cleared or approved by the U.S. 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**

82465

**LOINC® Information**

Test ID	Test Order Name	Order LOINC Value
CHOL	Cholesterol, Total, S	2093-3

Result ID	Test Result Name	Result LOINC Value
CHOL	Cholesterol, Total, S	2093-3