

Oxidized LDL (OxLDL)

CPT Code **83520**
Order Code **C335**

Sample Type **EDTA Plasma or Serum**
Tube Type **Lavender Top or Tiger Top**



Inflammation

Increased OxLDL levels signify increased risk for:

- Metabolic syndrome
- Cardiovascular disease
- Acute myocardial infarction

OxLDL levels may be decreased by:

- Maintaining a healthy weight/diet
- Exercising more
- Cholesterol-lowering medications

Description

Oxidized low-density lipoprotein (OxLDL) measures protein damage due to the oxidative modification of the apolipoprotein B (ApoB) subunit on LDL cholesterol. The oxidation of LDL cholesterol is one of the first steps in the development of atherosclerosis. Briefly, LDL enters the artery wall where it becomes oxidized. OxLDL is then recognized by scavenger receptors on the macrophages which engulf OxLDL, resulting in foam cell formation, vascular inflammation and the initiation of atherosclerosis.

Clinical Use

The OxLDL test may be performed on individuals at risk of metabolic syndrome.

Clinical Significance

- Individuals with high levels of OxLDL are 3.5X more likely to develop metabolic syndrome in the next 5 years¹.
- Increased OxLDL levels are associated with the presence of coronary artery disease (CAD)²⁻⁴.
- OxLDL inhibits production of endothelial nitric oxide, which can also lead to cell death and increased endothelial dysfunction, plaque formation, and platelet aggregation⁵.
- In healthy middle-aged men, high OxLDL levels are associated with a 4X greater risk of developing coronary heart disease (CHD)⁶.
- Levels of OxLDL increase in a step-wise fashion as the severity of CAD increases⁷.
- OxLDL levels may be elevated in patients with kidney disease and polycystic ovary syndrome. OxLDL levels should also be interpreted with caution in patients with known autoimmune disorders and those with diseases associated with oxidative stress, such as Alzheimer's disease.

Testing Frequency

OxLDL testing is determined by an individual's medical history, but may be performed semi-annually or annually as necessary. If the initial test result is abnormal, then follow-up testing may be performed within 3-6 months following treatment.

Sample Type

The OxLDL test should be performed on a serum or EDTA plasma sample.

Commercial Insurance or Medicare Coverage

Coverage guidelines have not been established or posted by CMS (Medicare & Medicaid). We have reviewed the larger carriers (Aetna, United Healthcare, Cigna, Blues) and information is limited or has not been posted.

Understanding Medical Necessity

The following ICD-10 codes for OxLDL listed below, and in the Cleveland HeartLab Practitioner Guide, are provided as a convenience for the ordering physician. Additional diagnostic codes can be referenced on the CMS website or guidelines specified by insurance carriers. The ordering physician should report the diagnosis code that best describes the reason for performing the test.

Diagnosis	Diagnosis Code
Type 2 Diabetes Mellitus with Hyperglycemia	E11.65
Type 2 Diabetes Mellitus without Complications	E11.9
Other Specified Diabetes Mellitus without Complications	E13.9
Pure Hypercholesterolemia, Unspecified	E78.00
Familial Hypercholesterolemia	E78.01
Pure Hyperglyceridemia	E78.1
Mixed Hyperlipidemia	E78.2
Hyperlipidemia, Unspecified	E78.5
Metabolic Syndrome	E88.81
Essential (primary) Hypertension	I10
Atherosclerotic Heart Disease of Native Coronary Artery without Angina Pectoris	I25.10



RELATIVE RISK

OxLDL
(U/L)

<60
Low

60-69
Moderate

≥70
High

Treatment Considerations

These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviewed by the treating practitioner.

✓ **Assess lifestyle habits.**

- Consider diet/exercise/weight reduction efforts if appropriate.

✓ **Assess LDL-C levels.**

- If not at goal, consider lipid-lowering therapies described in the National Cholesterol Education Program/Adult Treatment Panel III (NCEP ATP III) guidelines⁸.

✓ **Assess insulin sensitivity.**

- Consider an oral glucose tolerance test (OGTT) since metabolic syndrome is associated with an insulin-insensitive state. This is especially prudent if other markers such as high-sensitivity C-reactive protein (hsCRP), lipoprotein-associated phospholipase A₂ (Lp-PLA₂) and/or myeloperoxidase (MPO) are elevated.

References

1. Holvoet P et al. Association between circulating oxidized low-density lipoprotein and incidence of the metabolic syndrome. *JAMA*. 2008; 299: 2287-2293.
2. Holvoet P et al. Circulating oxidized LDL is a useful marker for identifying patients with coronary artery disease. *Arterioscler Thromb Vasc Biol*. 2001; 21: 844-848.
3. Nishi K et al. Oxidized LDL in carotid plaques and plasma associates with plaque instability. *Atheroscler Thromb Vasc Biol*. 2002; 22: 1649-1654.
4. Tsimikas S et al. Oxidized phospholipids, Lp(a) lipoprotein, and coronary artery disease. *N Engl J Med*. 2005; 353: 46-57.
5. Leiva E et al. Role of Oxidized LDL in Atherosclerosis. *Hypercholesterolemia*. 2015;55-78. <http://dx.doi.org/10.5772/59375>
6. Meisinger C et al. Plasma oxidized low-density lipoprotein, a strong predictor for acute coronary heart disease events in apparently healthy, middle-aged men from the general population. *Circulation*. 2005; 112: 651-657.
7. Ehara S et al. Elevated levels of oxidized low density lipoprotein show a positive relationship with the severity of acute coronary syndromes. *Circulation*. 2001; 103: 1955-1960.
8. Third report of the National Cholesterol Education Program (NCEP). Expert panel on detection, evaluation and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *National Institutes of Health*. September 2002. NIH Publication No. 02-5215.

