# Lp-PLA$_2$ (The PLAC® Test)

CPT Code 83698
Sample Type EDTA Plasma or Serum

Order Code C167
Tube Type Lavender Top or Tiger Top

inflammation

**Increased levels of Lp-PLA$_2$ may lead to increased risk of:**

- Coronary heart disease
- Stroke
- Myocardial infarction

**Lp-PLA$_2$ levels can be reduced by:**

- Treatment with statins
- Supplementation with niacin
- Lifestyle modifications

## Description

Lp-PLA$_2$, or lipoprotein-associated phospholipase-A$_2$, measures disease activity within the artery wall below the collagen or calcified cap due to the activation of macrophages. Lp-PLA$_2$ is not an acute phase reactant. When disease is active in the artery, increased levels of Lp-PLA$_2$ are produced by macrophages and foam cells within the intima of the artery[1]. Lp-PLA$_2$ also interacts with oxidized LDL, which increases inflammation and enhances a proatherogenic state, as well as plaque vulnerability[2]. Research suggests that it plays a direct role in the atherosclerotic disease process[3].

## Clinical Use

The Lp-PLA$_2$ test may be performed on individuals at intermediate or high risk for developing coronary heart disease who are any age with at least two major risk factors, those ≥65 years of age with one major risk factor, smokers, those with a fasting blood glucose of ≥100 mg/dL, or those who have metabolic syndrome.

## Clinical Significance

- Lp-PLA$_2$ accumulates within human atherosclerotic plaques and vulnerable lesions[4].
- Elevated Lp-PLA$_2$ levels can predict the development of coronary artery disease in apparently healthy individuals[5,6] and the risk of future adverse cardiac and cerebrovascular events[7].
- Individuals with normal systolic blood pressure, but high Lp-PLA$_2$ levels, are 2x as likely to have a stroke[7], while those with elevated systolic blood pressure and Lp-PLA$_2$ levels are 7x more likely to experience a stroke[8].
- Post-menopausal women not using hormone therapy who have an elevated Lp-PLA$_2$ have a 64% increased risk of ischemic stroke[9].

## Testing Frequency

The frequency of testing is determined by an individual's medical history, but may be performed alongside a standard lipid panel in patients at moderate to high risk for CHD or ischemic stroke. These patients may have two or more risk factors such as a family history of CVD or hypertension.

## Sample Type

The Lp-PLA$_2$ test should be performed on a serum or EDTA plasma sample.

## Commercial Insurance or Medicare Coverage

Coverage guidelines, also known as NCD (National Coverage Determination) or LCD (Local Coverage Determination) have been established or posted by CMS (Medicare & Medicaid). Guidelines should be reviewed for coverage and limitations. Limited information has been provided by the majority of the larger carriers (Aetna, United HealthCare, Cigna, Blues).

## Understanding Medical Necessity

*The following ICD-9 codes for Lp-PLA$_2$ are listed as a convenience for the ordering practitioner. The ordering practitioner should report the diagnosis code that best describes the reason for performing the test and provide the 4th and 5th ICD-9 digit as appropriate.*

| Diagnosis | Diagnosis Code |
|---|---|
| Diabetes Mellitus Type II or Unspecified, Not Stated as Uncontrolled | 250.00 |
| Diabetes Mellitus Type II or Unspecified, Uncontrolled | 250.02 |
| Pure Hypercholesterolemia | 272.0 |
| Mixed Hyperlipidemia | 272.2 |
| Other and Unspecified Hyperlipidemia | 272.4 |
| Benign Essential Hypertension | 401.1 |
| Unspecified Essential Hypertension | 401.9 |
| Coronary Atherosclerosis of Unspecified Type of Vessel, Native or Graft | 414.00 |
| Coronary Atherosclerosis of Native Coronary Artery | 414.01 |
| Other Abnormal Blood Chemistry | 790.6 |

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## RELATIVE RISK

Lp-PLA$_2$ (ng/mL)

| ≤200 Low | >200 High |
|---|---|

## Treatment Considerations

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

✓ **Assess LDL-C levels.**

- If not at goal, consider lipid-lowering therapy, ideally with a statin-based regimen if not contraindicated.

✓ **Assess omega-3 fatty acid levels.**

- Omega-3 fatty acid supplementation, along with statin therapy, may reduce Lp-PLA$_2$ levels[10].

✓ **Assess HDL-C levels.**

- If not at goal, consider niacin or fenofibrate therapy.
- Assess CoQ10 levels as recent evidence suggests that low ApoA1 and/or HDL-C levels are associated with low CoQ10 levels[11].

✓ **Assess the presence of CAD with imaging techniques such as CIMT or coronary artery calcium scoring.**

- Consider aspirin therapy if not contraindicated.
- Consider clopidogrel if history of CAD (i.e., myocardial infarction or revascularization) and/or a history of cerebrovascular disease (i.e., TIA or stroke).

✓ **Assess dental health (periodontal disease).**

- Refer to dentist to identify gum disease.

  *NOTE: Periodontal therapy may reduce Lp-PLA$_2$ levels[12].*

✓ **Assess smoking habits.**

*NOTE: Smoking cessation is essential as individuals who smoke are at increased risk of heart disease and blood clots.*

✓ **Assess blood pressure.**

- If not at goal, consider initiating, or titrating, anti-hypertensive therapy.

  *NOTE: An elevated blood pressure may contribute to endothelial damage and coronary disease formation.*

✓ **Assess lifestyle habits.**

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


### References

1. Ferguson JF et al. Translational studies of lipoprotein-associated phospholipase A(2) in inflammation and atherosclerosis. *J Am Coll Cardio*. 2012; 59: 764-772.
2. Gonçalves I et al. Evidence supporting a key role of Lp-PLA$_2$-generated lysophosphatidylcholine in human atherosclerotic plaque inflammation. *Arterioscler Thromb Vasc Biol*. 2012; 32: 1505-1512.
3. Serruys PW et al. (2008). Effects of the direct lipoprotein-associated phospholipase A$_2$ inhibitor darapladib on human coronary atherosclerotic plaque. *Circulation*. 2008; 118: 1172-1182.
4. Kolodgie FD et al. Lipoprotein-associated phospholipase A$_2$ protein expression in the natural progression of human coronary atherosclerosis. *Arterioscler Thromb Vasc Biol*. 2006; 26: 2523-2529.
5. Ballantyne CM et al. Lipoprotein-associated phospholipase A$_2$, high-sensitivity C-reactive protein, and risk for incident coronary heart disease in middle-aged men and women in the Atherosclerosis Risk in Communities (ARIC) study. *Circulation*. 2004; 109: 837-842.
6. Daniels LB et al. Lipoprotein-associated phospholipase A$_2$ is an independent predictor of incident coronary heart disease in an apparently healthy older population: The Rancho Bernardo Study. *J Am Coll Cardiol*. 2008; 51: 913-919.
7. Ballantyne CM et al. Lipoprotein-associated phospholipase A$_2$, high sensitivity C-reactive protein, and risk for incident ischemic stroke in middle-aged men and women in the Atherosclerosis Risk in Communities (ARIC) study. *Arch Intern Med*. 2005; 165: 2479-2484.
8. Gorelick PB. Lipoprotein-associated phospholipase A$_2$ and risk of stroke. *Am J Cardiol*. 2008; 101 (suppl): 34F-40F.
9. Wassertheil-Smoller S et al. Lipoprotein-associated phospholipase A$_2$, hormone use, and the risk of ischemic stroke in postmenopausal women. *Hypertension*. 2008; 51: 1115-1122.
10. Davidson MH et al. Efficacy and tolerability of adding prescription omega-3 fatty acids 4 g/d to simvastatin 40 mg/d in hypertriglyceridemic patients: An 8-week, randomized, double-blind, placebo-controlled study. *Clin Ther.* 2007; 39: 1354-1367.
11. Toyama K et al. Rosuvastatin combined with regular exercise preserves coenzyme Q10 levels associated with a significant increase in high-density lipoprotein cholesterol in patients with coronary artery disease. *Atherosclerosis*. 2011; 217: 158-164.
12. Lösche W et al. Lipoprotein-associated phospholipase A$_2$ and plasma lipids in patients with destructive periodontal disease. *J Clin Periodontol*. 2005; 32: 640-644.



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