

2.04.32	Measurement of Lipoprotein-Associated Phospholipase A₂ in the Assessment of Cardiovascular Risk		
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Section:	2.0 Medicine	Page:	Page 1 of 13

Policy Statement

Measurement of lipoprotein-associated phospholipase A₂ (Lp-PLA₂) is considered **investigational**.

Policy Guidelines

Measurement of lipoprotein (a) enzyme is a distinct laboratory test. Measurement of lipoprotein (a) enzyme is addressed in Blue Shield of California Medical Policy: Novel Biomarkers in Risk Assessment and Management of Cardiovascular Disease, and genetic testing for lipoprotein (a) variants is addressed in Blue Shield of California Medical Policy: Genetic Testing for Lipoprotein(a) Variant(s) as a Decision Aid for Aspirin Treatment.

Coding

The following CPT code is specific for this test:

- **83698:** Lipoprotein-associated phospholipase A₂ (Lp-PLA₂)

Description

Lipoprotein-associated phospholipase A₂ (Lp-PLA₂), also known as platelet-activating factor acetylhydrolase, is an enzyme that hydrolyzes phospholipids and is primarily associated with low-density lipoproteins. Accumulating evidence has suggested that Lp-PLA₂ is a biomarker of coronary artery disease and may have a proinflammatory role in the progression of atherosclerosis.

Related Policies

- Genetic Testing for Lipoprotein(a) Variant(s) as a Decision Aid for Aspirin Treatment
- Novel Biomarkers in Risk Assessment and Management of Cardiovascular Disease

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates [e.g., Federal Employee Program (FEP)] prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Regulatory Status

In December 2014, the PLAC[®] Test (diaDexus, San Francisco, CA), a quantitative enzyme assay, was cleared for marketing by the U.S. Food and Drug Administration through the 510(k) process for Lp-PLA₂ activity. It was considered substantially equivalent to a previous version of the PLAC[®] Test (diaDexus), which was cleared for marketing by the Food and Drug Administration in July 2003. Food and Drug Administration product code: NOE.

Rationale

Background

Low-Density Lipoproteins

Low-density lipoproteins (LDLs) have been identified as major atherogenic lipoproteins and have long been identified by the National Cholesterol Education Project as the primary target of cholesterol-lowering therapy. LDL particles consist of a surface coat composed of phospholipids, free cholesterol, and apolipoproteins surrounding an inner lipid core composed of cholesterol ester and triglycerides. Traditional lipid risk factors such as low-density lipoprotein cholesterol, while predictive on a population basis, are weaker markers of risk on an individual basis. Only a minority of subjects with elevated LDL and cholesterol levels will develop clinical disease, and up to 50% of cases of coronary artery disease (CAD) occur in subjects with "normal" levels of total and low-density lipoprotein cholesterol.

Treatment

Although treatment for elevated coronary disease risk with statins targets cholesterol levels, selection for treatment involves estimation of future CAD risk using well-validated prediction models that use additional variables.

Lipoprotein-associated phospholipase A₂ (Lp-PLA₂), also known as platelet-activating factor acetylhydrolase, is an enzyme that hydrolyzes phospholipids and is primarily associated with LDLs. Accumulating evidence has suggested that Lp-PLA₂ is a biomarker of CAD and may have a proinflammatory role in the progression of atherosclerosis. Recognition that atherosclerosis represents, in part, an inflammatory process has created considerable interest in the measurement of proinflammatory factors as part of cardiovascular disease risk assessment.

Interest in Lp-PLA₂ as a possible causal risk factor for CAD has generated development and testing of Lp-PLA₂ inhibitors as a new class of drugs to reduce the risk of CAD. However, clinical trials of Lp-PLA₂ inhibitors have not shown significant reductions in CAD end points.¹⁻³ Furthermore, assessment of Lp-PLA₂ levels has not been used in the selection or management of subjects in the clinical trials.

Literature Review

Evidence reviews assess whether a medical test is clinically useful. A useful test provides information to make a clinical management decision that improves the net health outcome. That is, the balance of benefits and harms is better when the test is used to manage the condition than when another test or no test is used to manage the condition.

The first step in assessing a medical test is to formulate the clinical context and purpose of the test. The test must be technically reliable, clinically valid, and clinically useful for that purpose. The following is a summary of the key literature.

A large body of literature has accumulated on the utility of risk factors in the prediction of future cardiac events. The evidence assessed for this review consists of large, prospective cohort studies that have evaluated the association between lipoprotein-associated phospholipase A₂ (Lp-PLA₂) and cardiovascular outcomes.

The National Cholesterol Education Program (NCEP) ATP-III guidelines have indicated that to determine the clinical significance of Lp-PLA₂, the emerging risk factors should be evaluated against the following criteria⁴:

- Significant predictive power that is independent of other major risk factors.
- A relatively high prevalence in the population (justifying routine measurement in risk assessment).

- Laboratory or clinical measurement must be widely available, well-standardized, and inexpensive, have accepted population reference values, and be relatively stable biologically.
- Preferable, but not necessarily, modification of the risk factor in clinical trials will have shown reduction in risk.

A 2002 Blue Cross Blue Shield Association Technology Evaluation Center (TEC) Assessment summarized the steps necessary to determine the utility of a novel cardiac risk factor.⁵ The following 3 steps were required:

- Standardize the measurement of the risk factor.
- Determine its contribution to risk assessment. As a risk factor, it is important to determine whether the novel risk factor independently contributes to risk assessment compared with established risk factors.
- Determine how the novel risk assessment will be used in the management of the patient, compared with standard methods of assessing risk, and whether any subsequent changes in patient management result in an improvement in patient outcome.

Lp-PLA2 and Cardiovascular risk

Clinical Context and Test Purpose

The purpose of Lp-PLA2 testing in patients who have risk of cardiovascular disease (CVD) is to inform improve patient stratification using risk prediction models that alter management decisions and improve health outcomes.

The question addressed in this evidence review is: Does testing for Lp-PLA2 improve health outcomes for individuals at risk for CVD?

The following PICOTS were used to select literature to inform this review.

Patients

The relevant population of interest is individuals are at risk for CAD.

Interventions

The relevant intervention of interest is testing for Lp-PLA2 as a biomarker of CAD.

Comparators

The relevant comparator of interest is standard assessment of cardiovascular risk.

Outcomes

The primary outcomes of interest are development of CVD such as coronary artery disease, stroke, and mortality.

Timing

The development of CVD typically occurs over many years or decades.

Setting

Asymptomatic patients are typically evaluated by primary care physicians. Symptomatic patients are referred to cardiology.

Technically Reliable

According to the U.S. Food and Drug Administration's Summary of Safety and Effectiveness for the PLAC Lp-PLA2 assay, the intraassay precision of the test using the coefficient of variation was 7%, and the interassay precision using the coefficient of variation was 9%, with a detection limit of 1.2 ng/mL. Reference intervals for the Lp-PLA2 assay were calculated from samples for 251 apparently healthy males and 174 apparently healthy females ages 40 to 70 years; the reference interval calculated from the samples (central 90%) was determined to be between 120 ng/mL and 342 ng/mL for females and between 131 ng/mL and 376 ng/mL for males.⁶ The

Food and Drug Administration concluded that the assay demonstrated acceptable technical performance.

Clinically Valid

Lp-PLA2 as a Predictor of Coronary Artery Disease

Results of numerous, large-scale observational studies have examined whether Lp-PLA2 is an independent risk factor for CAD. Some of these observational studies have been evaluated in systematic reviews and meta-analyses. A representative sample of some of the larger studies is given next.

Systematic Reviews

The Emerging Risk Factors Collaboration performed a patient-level meta-analysis (2012) of the association between novel lipid risk factors and cardiovascular risk.⁷ Records from 37 prospective cohort studies enrolling 165,544 participants were combined to predict cardiovascular risk over a median follow-up of 10.4 years. Reviewers examined the independent association of markers with cardiovascular risk and the ability to reclassify risk into clinically relevant categories. For Lp-PLA2, 11 studies (n=32,075 participants) measured this factor. Overall, Lp-PLA2 was an independent risk factor for cardiovascular events with a hazard ratio of 1.12 (95% confidence interval [CI], 1.09 to 1.21) for each 1 standard deviation increase in Lp-PLA2 activity. There was no significant improvement in risk reclassification following the addition of Lp-PLA2 to the reclassification model, with a net reclassification improvement of 0.21 (95% CI, -0.45 to 0.86). The fact that the net reclassification improvement crossed 0.0 indicates that the addition of Lp-PLA2 to the model did not result in an important magnitude of change.

Garza et al (2007) reviewed 14 observational studies enrolling 20,549 patients.⁸ This systematic review reported the predictive ability of Lp-PLA2 levels for cardiovascular disease (CVD) after adjustment for traditional cardiac risk factors. The combined odds ratio for an elevated Lp-PLA2 level was reported as 1.60 (95% CI, 1.36 to 1.89) for the development of future cardiac events.

A patient-level meta-analysis by Thompson et al (2010) evaluated the association among Lp-PLA2 levels, CAD, stroke, and mortality.⁹ A total of 79,036 participants from 32 prospective studies were included in this review. Significant associations were found between Lp-PLA2 and all 3 outcome measures. For every 1 SD increase in Lp-PLA2 levels, the relative risk (RR) adjusted for conventional risk factors was 1.10 (95% CI, 1.04 to 1.17) for CAD, 1.08 (95% CI, 0.97 to 1.20) for stroke, and 1.16 (95% CI, 1.09 to 1.24) for vascular death. There was also a significant association between Lp-PLA2 levels and nonvascular deaths (RR=1.10; 95% CI, 1.04 to 1.17). Reviewers estimated that this strength of association was similar to that seen for non-high-density lipoprotein cholesterol (HDL-C) and systolic blood pressure.

Association between Lp-PLA2 and CAD in General Population Samples

Some of the representative cohort and case-control studies evaluating the association between Lp-PLA2 and cardiovascular outcomes are described next.

The West of Scotland Coronary Prevention Study (WOSCOPS) was a 5-year, case-control trial (2000) evaluating 6595 men with elevated cholesterol levels and no history of a heart attack.¹⁰ Researchers looked at a smaller population of this study to determine if inflammatory markers such as Lp-PLA2 and high-sensitivity C-reactive protein correlated with coronary heart disease (CHD) events. The 580 men who went on to have a myocardial infarction or revascularization were compared with 1160 age- and smoking-matched men who did not have an event. Results showed that those with the highest levels of Lp-PLA2 had twice the risk of an event compared with those with the lowest levels, even after adjustment for traditional risk factors and other inflammatory mediators.

The Atherosclerosis Risk in Communities (ARIC) study (2004) evaluated the various risk markers and their association with increased risk in a large, diverse population of more than 12,000 people.¹¹ At enrollment, patients were free of CHD and were followed for the development of

the disease for the next 9 years. The case-cohort component of the study examined 2 inflammatory markers, Lp-PLA₂, and high-sensitivity C-reactive protein, in a subset of 608 cases and 740 controls. Results showed that elevated levels of Lp-PLA₂ were higher in incident CHD cases. In people with nonelevated low-density lipoprotein levels (<130 mg/dL), Lp-PLA₂ levels were independently associated with CHD, even after adjustment for traditional risk factors and CRP. Koenig et al (2004) reported similar results in a study of 934 apparently healthy men ages 45 to 64 who were followed between 1984 and 1998.¹² During this period, 97 men experienced a coronary event. Elevated Lp-PLA₂ levels appeared to be predictive of future coronary events in middle-aged men with moderately elevated total cholesterol, independent of CRP levels.

Ballantyne et al (2005) studied Lp-PLA₂ in the 12,762 apparently healthy subjects participating in the ARIC study.¹³ Mean levels of both Lp-PLA₂ and CRP were higher in the 194 stroke cases; the authors concluded that Lp-PLA₂ levels might provide complementary information beyond traditional risk factors in identifying those at risk for ischemic stroke.

As part of the PEACE study, Lp-PLA₂ levels were measured in 3766 patients with stable CAD followed for a median of 4.8 years.¹⁴ After adjusting for other baseline risk factors, patients in the highest quartile of Lp-PLA₂ were 1.4 times more likely (95% CI, 1.17 to 1.70; $p < 0.001$) to experience an adverse cardiovascular outcome than patients in the lowest quartile. Winkler et al (2007) studied 3232 consecutive patients referred for coronary angiography and reported that Lp-PLA₂ levels were an independent predictor of cardiac mortality (hazard ratio, 2.0; 95% CI, 1.4 to 3.1; $p < 0.001$) after adjusting for established risk factors, including CRP and N-terminal b-natriuretic peptide.¹⁵ In 2007, Persson et al evaluated the relation between Lp-PLA₂ and the metabolic syndrome in 4480 nondiabetic patients without a history of CAD.¹⁶ Both Lp-PLA₂ (RR=1.54; 95% CI, 1.07 to 2.24) and metabolic syndrome (RR=1.42; 95% CI, 1.06 to 1.90) were significant predictors of a first cardiac event. The combination of elevated Lp-PLA₂ and metabolic syndrome conferred a further increase in risk (RR=1.97; 95% CI, 1.34 to 2.90).

The Rancho Bernardo Study (2008) enrolled 1077 community-dwelling older adults without known heart disease and followed patients a mean of 16 years to assess for development of heart disease.¹⁷ Lp-PLA₂ levels were an independent predictor of cardiac events, with RRs for patients in the second, third, and fourth quartiles of 1.66, 1.80, and 1.89, respectively, compared with the first quartile.

A 2011 study evaluated the discriminatory ability of Lp-PLA₂ for incident CHD in 421 cases and 800 controls from the Nurses' Health Study.¹⁸ Lp-PLA₂ was a significant predictor of CHD after adjustment for traditional risk factors (RR=1.75; 95% CI, 1.09 to 2.84). It also added significantly to the discriminatory ability, as judged by an increase in the area under the curve, improving it from 0.720 without Lp-PLA₂ to 0.733 with Lp-PLA₂, and improved the net reclassification improvement index for discriminating between patients with and without CHD ($p = 0.004$).

Other studies have correlated Lp-PLA₂ levels with different parameters of CVD. Multiple publications have reported that Lp-PLA₂ levels are associated with characteristics of "vulnerable atherosclerotic plaques," both in the coronary¹⁹ and in the carotid arteries.²⁰ Subsequent publications have also found an association between Lp-PLA₂ levels and plaque rupture²¹ and fibrous cap thickness in patients with acute coronary syndrome.²² Muller et al (2013) reported that Lp-PLA₂ levels were associated with low fractional flow reserve on cardiac catheterization in 197 patients with stable CAD.²³ Tehrani et al (2013) evaluated the association between Lp-PLA₂ levels and the protective effect of HDL-C on incident CHD among 3888 adults with known CVD.²⁴ Among patients with the highest tertile of Lp-PLA₂, the relation between HDL-C levels and incident CHD was attenuated, although there was no consistent association between higher levels of Lp-PLA₂ and CHD risk across HDL-C categories. Recent studies have shown associations between Lp-PLA₂ and cardiovascular events in a nonwhite multiethnic population,²⁵ in the severity of angiographically defined CAD in a Chinese sample,²⁶ and subclinical atherosclerosis in young adults.²⁷

Some studies have shown that the association between Lp-PLA₂ and CAD diminishes or disappears after adjustment for other risk factors. For example, Allison et al (2007) studied 508 patients with peripheral vascular disease followed an average of 6.7 years.²⁸ While there was a modest univariate association between Lp-PLA₂ and cardiovascular events, this association disappeared after adjusting for established risk factors. In the Rotterdam Coronary Calcification Study (2007), a similar diminution of risk was observed.²⁹ This population-based study followed 520 patients for 7 years and evaluated the association between Lp-PLA₂ and coronary calcification using electron-beam computed tomography scan. The unadjusted odds ratio for each standard deviation increase in Lp-PLA₂ was 1.6 (95% CI, 1.1 to 2.4); however, this association became nonsignificant after controlling for lipid levels.

Association of Lp-PLA₂ and CAD in Specific Populations

Some studies have specifically evaluated Lp-PLA₂ as a risk factor in the diabetic population. For example, Saremi et al (2010) performed a secondary analysis of the Veterans Affairs Diabetes Trial examining risk factors that predict the progression of coronary artery calcification over an average of 4.6 years of follow-up.³⁰ Lp-PLA₂ mass was 1 of 2 significant independent predictors that remained ($p=0.01$) after adjustment for standard risk factors. Hatoum et al (2010) evaluated Lp-PLA₂ as a risk factor for incident CHD in 1517 diabetic patients enrolled in the Health Profession Follow-Up Study.³¹ After adjusting for standard risk factors, the RR for incident CHD for the upper quartile of Lp-PLA₂ activity compared with the lower quartile was 1.39 (95% CI, 1.01 to 1.90; $p=0.03$).

Association between Lp-PLA₂ and CAD in Patients Receiving CAD Preventive Drugs

If Lp-PLA₂ levels change in response to effective CAD preventive drugs such as statins, and there is an association between CAD risk on treatment and Lp-PLA₂ levels, then measurement of Lp-PLA₂ levels may be useful in monitoring treatment response.

Interventional studies of antihyperlipidemic drugs (e.g., statins, fibrates, and niacin) have shown that Lp-PLA₂ levels decrease during treatment. A secondary analysis of the Pravastatin or Atorvastatin Evaluation and Infection Therapy-Thrombolysis In Myocardial Infarction (PROVE IT-TIMI 22) trial (2006), in which Lp-PLA₂ levels were measured at baseline ($n=3648$) and 30 days ($n=3265$), showed that patients randomized to atorvastatin 80 mg/d, but not pravastatin 40 mg/d, experienced a 20% reduction of Lp-PLA₂ levels at 30 days.³² The 30-day Lp-PLA₂ level was independently associated with an increased risk of cardiovascular events. A 2006 secondary analysis from the Diabetes and Combined Lipid Therapy Regimen (DIACOR) trial demonstrated lower Lp-PLA₂ levels (16.8% overall reduction) after treatment compared with baseline.³³

Rosenson (2008) randomized 55 hyperlipidemic subjects with metabolic syndrome to fenofibrate, or placebo.³⁴ Fenofibrate treatment was associated with a 13% reduction in Lp-PLA₂ levels compared with placebo. Saougos et al (2007) studied the effect of 3 lipid-lowering agents (rosuvastatin, ezetimibe, fenofibrate) on Lp-PLA₂ levels.³⁵ All 3 agents significantly lowered Lp-PLA₂ levels; fenofibrate also selectively increased HDL-associated Lp-PLA₂ levels.

Although Lp-PLA₂ levels respond to CAD preventive drugs, some studies have shown that Lp-PLA₂ levels do not correlate with subsequent CAD risk in treated patients. At least 2 clinical trials have examined the change in Lp-PLA₂ levels in patients treated with statins versus placebo and evaluated whether the clinical utility of Lp-PLA₂ levels for risk stratification is modified by statin treatment.^{36,37} Ridker et al (2012) analyzed the changes in Lp-PLA₂ levels among patients in the JUPITER trial, an randomized controlled trial of 17,802 subjects allocated to rosuvastatin or placebo.³⁶ Among patients who received rosuvastatin, Lp-PLA₂ mass decreased by 33.8%. In the placebo group, Lp-PLA₂ levels were predictive of subsequent cardiac events, but this was not true in the rosuvastatin group. In a similar analysis of the MIRACL randomized controlled trial, Ryu et al (2012) analyzed 2587 patients treated with high-dose atorvastatin, or placebo.³⁷ Atorvastatin reduced Lp-PLA₂ levels in 2587 patients treated with high-dose atorvastatin. Atorvastatin reduced Lp-PLA₂ mass by 32.1% and Lp-PLA₂ activity by 29.5%. In the placebo group, Lp-PLA₂ levels were predictive of adverse cardiac outcomes, but no correlation was

found in the atorvastatin group. In a 2014 clinical trial by White et al, patients were randomized to placebo or darapladib, a Lp-PLA2 inhibitor.¹ A secondary analysis of this trial by Wallentin et al (2016) demonstrated that, although baseline Lp-PLA2 levels were associated with cardiovascular risk, there was no association between changes in Lp-PLA2 levels and outcomes.³⁸

Section Summary: Clinically Valid

A large consistent body of evidence has established that Lp-PLA2 level is an independent predictor of CAD. Relatively few studies have examined the degree to which Lp-PLA2 improves on existing CAD prediction models regarding clinically important magnitudes of reclassification.

Levels of Lp-PLA2 decrease substantially after treatment with antilipid medications, including statins. However, in treated patients, Lp-PLA2 levels may no longer be associated with risk of CAD, and thus may not be useful as a measure of treatment response.

Clinically Useful

Although the preceding studies showed that Lp-PLA2 level is an independent risk factor for CAD, clinical utility depends on whether the use of Lp-PLA2 levels improves on existing models of CAD prediction, which then translates into differences in treatment that improve patient outcomes. Establishing improved outcomes compared with existing prediction models could be demonstrated with clinical trials, but the expected difference in outcomes would probably be so small that the sample size of the trial would be impractically large. Decision modeling is another approach to estimating differences in patient outcomes due to the improved reclassification of risk. A robust, validated model using Lp-PLA2 levels to predict CAD outcomes is necessary to use the test to manage patients. No studies identified evaluated whether a testing strategy that uses Lp-PLA2 levels improves health outcomes.

Section Summary: Clinically Useful

Changes in patient management that could potentially occur with a strategy using Lp-PLA2 levels are not well-established. Studies that directly evaluate patient management changes and/or health outcome improvements are needed to determine whether the use of Lp-PLA2 measurement has efficacy in CVD. Alternatively, robust decision modeling studies may demonstrate clinically important changes in health outcomes by incorporating Lp-PLA2 levels into CAD prediction models. Groups such as the American Heart Association have often incorporated results from decision models to inform their guidelines when the data underlying the models are robust. Incorporation of Lp-PLA2 into decision models is necessary to demonstrate the potential clinical utility of the biomarker.

Summary of Evidence

For individuals who have a risk of cardiovascular disease who receive Lp-PLA2 testing, the evidence includes studies of technical reliability and studies of the association between Lp-PLA2 and various coronary artery disease outcomes. Relevant outcomes are overall survival, disease-specific survival, and test validity. The studies have demonstrated that Lp-PLA2 levels are an independent predictor of cardiovascular disease. Although Lp-PLA2 levels are associated with cardiovascular disease risk, changes in patient management that would occur as a result of obtaining Lp-PLA2 levels in practice are not well-defined. To demonstrate clinical utility, clinicians must have the tools to incorporate Lp-PLA2 test results into existing risk prediction models that improve classification into risk categories alter treatment decisions and lead to improved health outcomes. Direct evidence for such improved health outcomes with Lp-PLA2 testing in clinical practice is lacking. The evidence is insufficient to determine the effects of the technology on health outcomes.

Supplemental Information

Practice Guidelines and Position Statements

American College of Cardiology and American Heart Association

The American College of Cardiology and American Heart Association published joint guidelines on the assessment of cardiovascular risk in asymptomatic patients in 2013.³⁹ Lipoprotein-associated phospholipase A₂ (Lp-PLA₂) testing was not mentioned in these guidelines, which was a change from 2010 guidelines.⁴⁰ In their prior guideline, Lp-PLA₂ was given an IIb recommendation for assessing cardiovascular risk in intermediate-risk asymptomatic adults.

American Association of Clinical Endocrinologists

The American Association of Clinical Endocrinologists published guidelines on the management of dyslipidemia and prevention of atherosclerosis in 2012.⁴¹ These guidelines made the following recommendations for Lp-PLA₂ testing (see Table 1).

Table 1. Guidelines on Dyslipidemia and Atherosclerosis

Recommendation	GOE	LOE
Assess markers of inflammation in patients where further stratification of risk is necessary. Highly sensitive CRP (hsCRP) and Lp-PLA ₂ provide useful information in these instances and appear to be synergistic in predicting risk of CVD and stroke	B	1
Measure Lp-PLA ₂ , which in some studies has demonstrated more specificity than hsCRP, when it is necessary to further stratify a patient's CVD risk, especially in the presence of systemic highly sensitive CRP elevations	B	2

CRP: C-reactive protein; CVD: cardiovascular disease; GOE: grade of evidence; LOE: level of evidence; Lp-PLA₂: lipoprotein-associated phospholipase A₂.

A 2017 update to guidelines published jointly by the American Association of Clinical Endocrinologists and American College of Endocrinology recommended the measurement of Lp-PLA₂ as an additional indication of cardiovascular risk.⁴² Citing several studies in which Lp-PLA₂ was comparable with high-sensitivity C-reactive protein as a risk predictor, the guidelines accordingly recommended the use of Lp-PLA₂ data in situations requiring a more specific evaluation of risk of atherosclerotic cardiovascular disease that is provided by high-sensitivity C-reactive protein.

European Society of Cardiology et al

In 2012, the European Society of Cardiology and other cardiovascular disease societies issued clinical practice guidelines on cardiovascular disease prevention.⁴³ These guidelines included the following statement about Lp-PLA₂ testing:

- LpPLA₂ may be measured as part of a refined risk assessment in patients at high risk of a recurrent acute atherothrombotic event (*Class IIb recommendation; Level of Evidence B; weak evidence*).

U.S. Preventive Services Task Force Recommendations

No U.S. Preventive Services Task Force recommendations on the use of Lp-PLA₂ in the assessment of cardiovascular risk have been identified.

Medicare National Coverage

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials

A search of ClinicalTrials.gov in November 2016 did not identify any ongoing or unpublished trials that would likely influence this review.

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Documentation for Clinical Review

- No records required

Coding

This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement.

IE

The following services may be considered investigational.

Type	Code	Description
CPT®	83698	Lipoprotein-associated phospholipase A ₂ (Lp-PLA ₂)

Type	Code	Description
HCPCS	None	
ICD-10 Procedure	None	
ICD-10 Diagnosis	All Diagnoses	

Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

Effective Date	Action	Reason
10/30/2015	Policy title change from Coronary Heart Disease (CHD) - Assessment of Emerging Risk Factors Policy revision without position change BCBSA Medical Policy adoption	Medical Policy Committee
03/01/2016	Policy revision without position change	Medical Policy Committee
02/01/2017	Policy revision without position change	Medical Policy Committee
02/01/2018	Policy revision without position change	Medical Policy Committee

Definitions of Decision Determinations

Medically Necessary: A treatment, procedure, or drug is medically necessary only when it has been established as safe and effective for the particular symptoms or diagnosis, is not investigational or experimental, is not being provided primarily for the convenience of the patient or the provider, and is provided at the most appropriate level to treat the condition.

Investigational/Experimental: A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

Split Evaluation: Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department. Please call (800) 541-6652 or visit the provider portal at www.blueshieldca.com/provider.

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well

as contract language, including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.