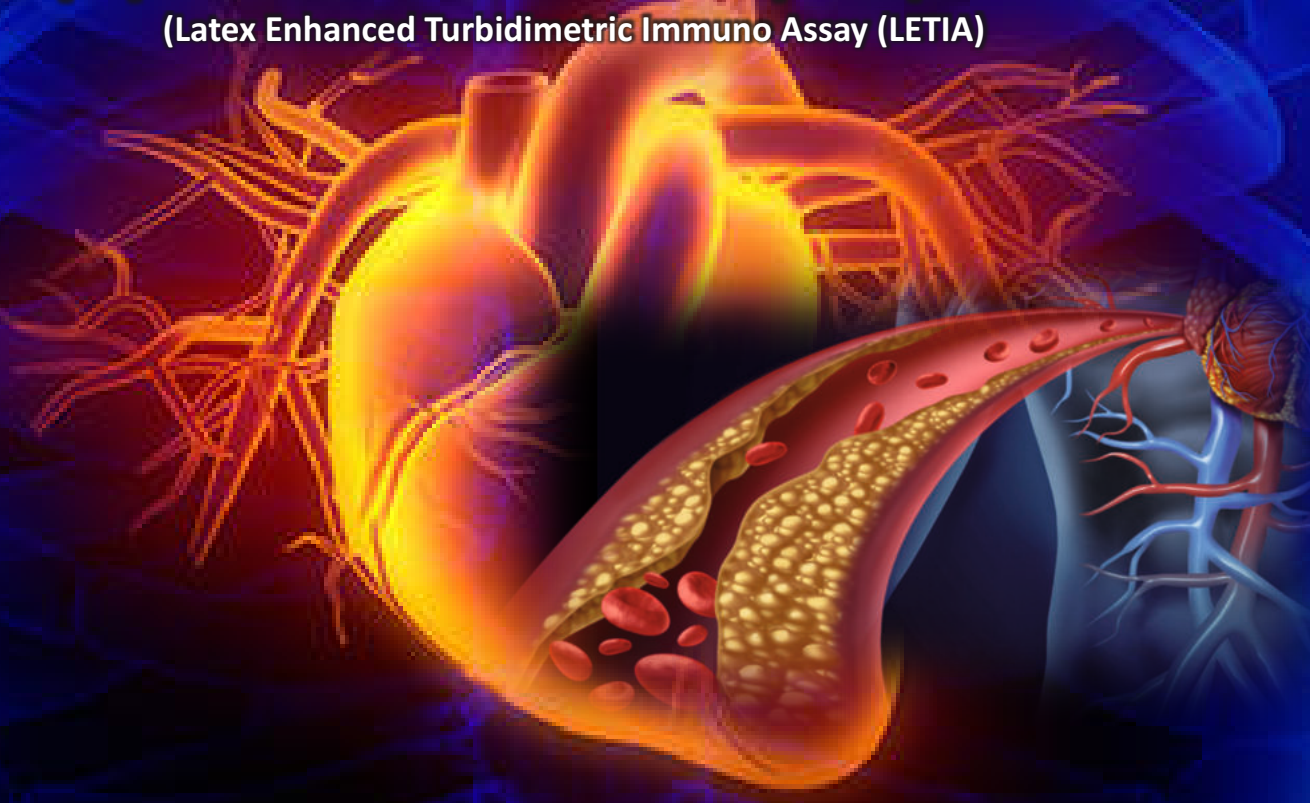


Uncover your hidden risk for heart attack and stroke with  
**(Kivo Plac Test)**  
**(Lp-PLA2)**

**Lipoprotein-Associated Phospholipase- A2**  
(Latex Enhanced Turbidimetric Immuno Assay (LETIA))

- 
- A new independent predictor of “Coronary Heart Disease”
  - Most accurate Heart Attack and Stroke Predictor
  - A vascular specific inflammatory marker critical in the formation of rupture prone plaque

# Why Kivo Plac Test?



## Clinical Utility of Lp-PLA2 (PLAC) Test:

The PLAC test measures the amount of lipoprotein-associated phospholipase-2 (Lp-PLA2) in blood. Lp-PLA2 is an enzyme primarily associated with low density lipoprotein (LDL). LDL carries Lp-PLA2 to the coronary artery walls where it activates an inflammatory response. This makes plaque, if present, more prone to rupture. Because this enzyme is associated with causing inflammation of coronary artery walls, high levels of Lp-PLA2 would therefore seem to indicate an increased risk of heart attack or stroke.

Traditional inflammatory markers, such as hs-CRP, and CRP, whilst recognized as being useful systemic inflammatory markers are not as sensitive for identifying inflammation of the coronary artery walls. As a result, the PLAC Test serves as a specific independent coronary marker.

## Lp-PLA2 activity:

The PLAC Test measures Lp-PLA2 activity quantitatively. This assists with the prediction of risk caused by the thickening or hardening of the arteries caused by the build-up of plaque. Given that the majority of heart attacks and strokes are caused by plaque rupture and thrombosis rather than narrowing of the arteries, it would seem that individuals with high levels of Lp-PLA2 might benefit from more aggressive management with therapeutic intervention and/or lifestyle modification.

## Why is the Lp-PLA2 (PLAC) test different from other tests?

- Lp-PLA2 is independent of traditional cardiovascular risk factors
- Lp-PLA2 is an enzyme produced in the plaque itself and its measurement is therefore more specific than other inflammatory markers.
- Increase in Lp-PLA2 levels are not caused by traditional risk factors.
- Imaging tests whilst able to assess the anatomical state of blood vessels, cannot identify plaque that is vulnerable to rupture

## The PLAC test helps identify hidden risk:

Lp-PLA2 levels help to identify hidden risk of cardiovascular event that might be missed from the use of more conventional risk factors (eg cholesterol levels, blood pressure, family and smoking history). Lipid levels alone cannot provide a great deal of information on the status of the artery wall whereas Lp-PLA2 is a direct measure of artery wall enzyme activity, independent of other cardiovascular markers.

Cardiovascular diseases (CVDs) are the leading cause of death globally.

An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke.

Over three quarters of CVD deaths take place in low- and middle-income countries.

Out of the 17 million premature deaths (under the age of 70) due to noncommunicable diseases in 2019, 38% were caused by CVDs.

Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol.

It is important to detect cardiovascular disease as early as possible so that management with counselling and medicines can begin.

The PLAC Test is recommended for patients with established CVD or patients at moderate to intermediate risk for CVD such as patients with including but not limited to two or more of the following risk factors:

The High Q PLAC Test is recommended for patients with established CVD3 or patients at moderate to intermediate risk for CVD, such as patients with, including but not limited to, two or more of the following risk factors:



Family history



Diabetes



Obesity



Smoker



Males aged  $\geq 45$  or females  $\geq 55$



High cholesterol

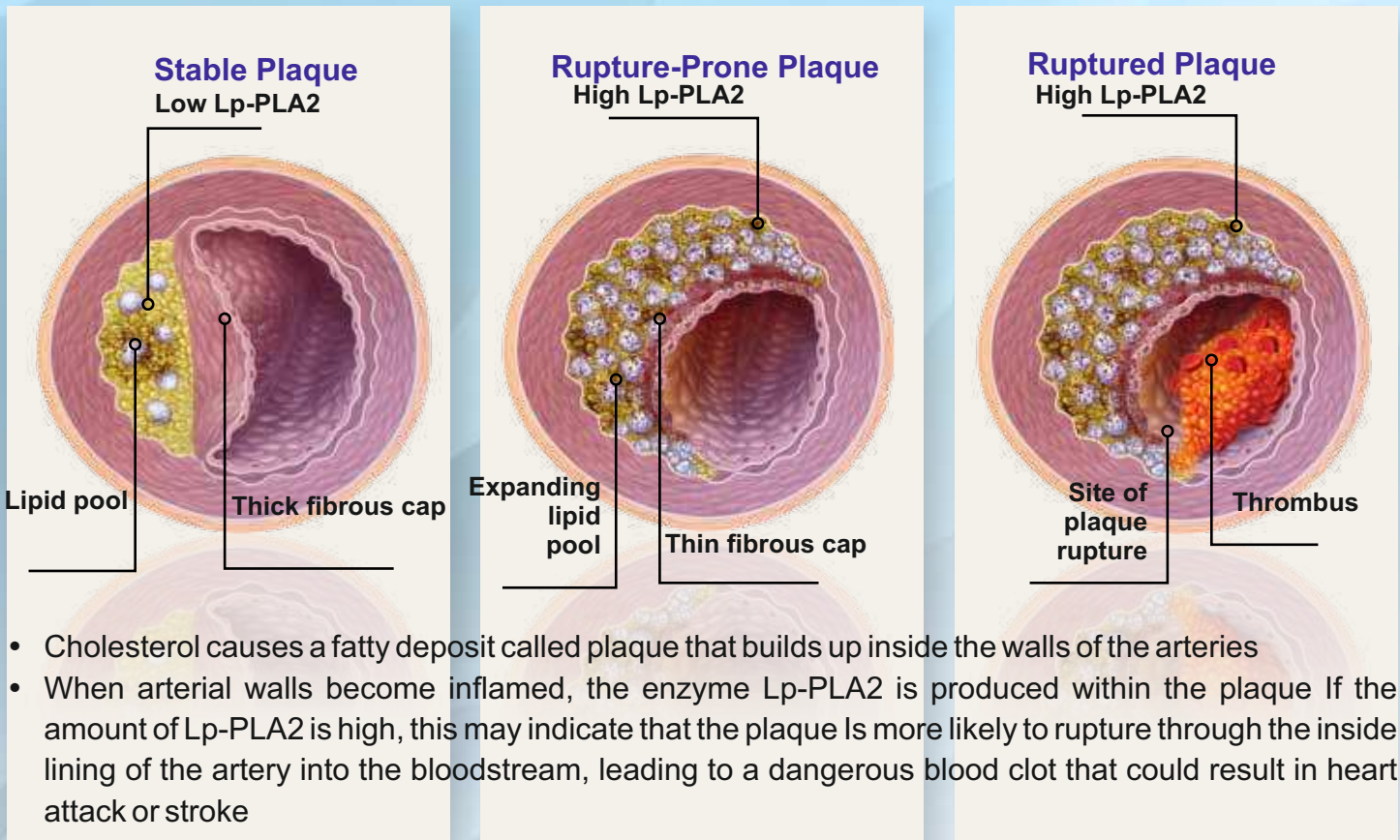


High blood pressure

More than 125,000 published patient results confirm the PLAC Test for Lp-PLA2 is the only evidence-based assay for measuring the new modifiable risk factor, lipoprotein-associated phospholipase A<sup>2</sup>, for CVD events.

# The PLAC Test clearly identifies active cardiovascular inflammatory disease

The PLAC Test is the only blood test that measures Lp-PLA2 - a vascular-specific inflammatory marker critical in the formation of rupture-prone plaque.



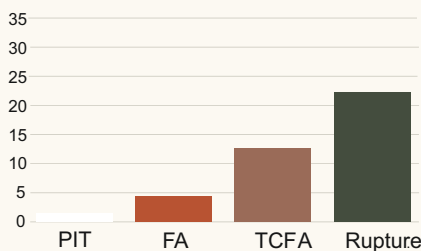
## Most cardiovascular events are due to plaque rupture:

"Coronary atherosclerosis is by far the most frequent cause of ischemic heart disease, and plaque disruption with superimposed thrombosis is the main cause of the acute coronary sign of unstable angina, myocardial infarction and sudden death

"The reduction of Lp-PLA2 with statin therapy, independent of baseline Lp-PLA2 Levels, can help predict the reduction in Cardiovascular Disease events"

### Lp-PLA2 levels increase with plaque progression<sup>1</sup>

% Lp-PLA2 staining in varying coronary plaque morphologies

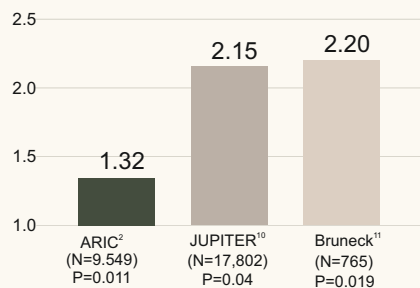


PIT = pathologic intimal thickening  
FA = fibroatheroma  
TCFA = thin-cap fibroatheroma

\*\*P<0.05 vs FA or PIT  
\*\*P<0.05 vs TCFA, FA and PIT

### The higher the level of Lp-PLA2, the higher the risk for a CV event—even with normal LDL

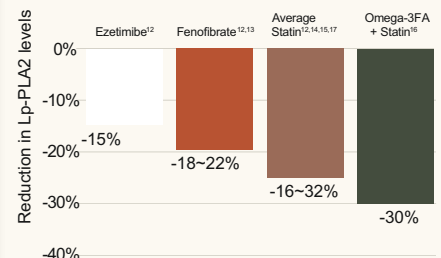
Coronary and CV event hazard ratios



Fully adjusted for traditional risk factors

### Lipid-modifying medications shown to lower Lp-PLA2

12-17



Lp-PLA2 measurement before and during statin treatment. Tracking the reduction of Lp-PLA2 in response to therapy is a better indicator of future CVD events than the reduction of LDL-C levels alone<sup>15</sup>

# Kivo Plac Test

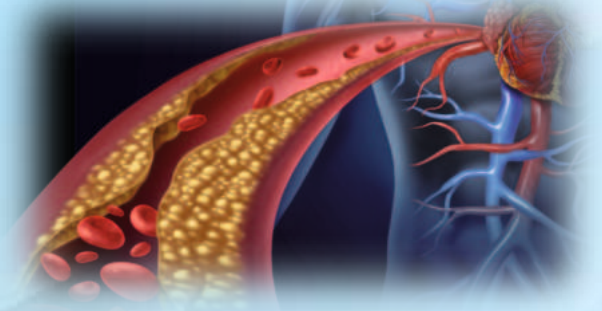
## Lipoprotein-associated phospholipase A2

(Latex Enhanced Turbidimetric Immuno Assay)  
(LETIA)



### Product Features:

- Liquid Stable Two Reagents
- Two step Fixed Time Assay
- 5 Level Calibrators provided
- Linearity: 800 ng/mL
- Measuring Wavelength 546 nm
- Serum is the preferred specimen
- Available as multipurpose reagents and system packs



### Interpretation of test results to guide treatment

Risk Levels are reported quantitatively as Low, Medium or High:

**Low Lp-PLA2** < 175 ng/ml

**Medium Lp-PLA2** 175–200 ng/ml

**High Lp-PLA2** > 200 ng/ml

High levels of Lp-PLA2 are consistently linked to higher risk of heart attack and stroke in multiple population based studies. Individuals with an elevated PLAC Test result who have two or more other risk factors are at 2 or 3 times the risk of a cardiac event. High blood pressure combined with elevated PLAC levels further raise this risk. More aggressive patient management in the form of lifestyle changes, as well as blood pressure or lipid lowering agents in an attempt to lower the Lp-PLA levels may therefore be advantageous. Further investigations using other independent cardiovascular disease markers (Apo B, Lp(a), hs-CRP etc) as well as scans and imaging may be considered. An elevated PLAC test is an actionable tool, and may indicate a need for more aggressive therapy, including treatment to lower LDL Cholesterol levels. Lipid lowering agents including statins are proven to reduce cardiovascular events. Knowing that there is active disease, rather than just risk, may create a greater sense of urgency in patients to become more compliant with treatment recommendations.

**LOW**  
Lp-PLA2 < 175  
ng/mL

**MEDIUM**  
Lp-PLA2 = 175 – 200  
ng/mL

**HIGH**  
Lp-PLA2 = Above 200  
ng/mL

### Lp-PLA2 included in four major guidelines:

- American Heart Association/American Stroke Association Guidelines for the Primary Prevention of Stroke
- American College of Cardiology Foundation/American Heart Association Guideline for Assessment of Cardiovascular Risk in Asymptomatic Adults
- American Association of Clinical Endocrinologists Guidelines for Management of Dyslipidemia and Prevention of Atherosclerosis
- European Guidelines on Cardiovascular Disease Prevention in Clinical Practice

