Lipoprotein Subfractionation

Subfractionation is the process of separating cholesterol particles into smaller pieces.

Lipoprotein Fractionation, Ion Mobility

This test separates, counts, and measures the particles that make up LDL-C and HDL-C. LDL-P is a strong predictor of cardiovascular risk beyond a basic lipid panel. A high number of small and medium LDL particles indicates an increased risk for heart disease. A low number of large HDL particles indicates increased risk for heart disease.

Knowing your particle number in addition to your traditional lipid panel can help your doctor better manage your medications to reduce your risk of cardiovascular events.

Apolipoproteins

Apolipoproteins bind lipids (fats) in order to form lipoproteins. Lipoproteins carry lipids in the blood. Some of the lipids carried this way include cholesterol and triglycerides.

ApoB

ApoB is a type of apolipoprotein. It is the major protein found in certain lipoproteins. These are the ones most closely linked to heart disease. So high levels of ApoB are linked to a greater risk for heart disease. The level can be decreased by eating a healthy diet, exercising more, losing weight, and taking certain medications.

Lp(a)

Lp(a) is a combination of apolipoproteins and a lipoprotein. High levels are linked to heart disease and stroke. These levels may be influenced by genetics. Diet and exercise don't seem to help lower them, but certain medications do.

Inflammation

Coronary artery disease is associated with the severity of atherosclerosis, which is an inflammatory disease.

Fibrinogen

Fibrinogen is a part of the blood's clotting process that can be elevated due to inflammation. Continually high levels are linked to increased risk for heart disease. Fibrinogen levels can be lowered by stopping smoking and losing excessive body fat.

hs-CRP

High levels indicate inflammation due to infection or tissue injury. Moderately elevated levels may be associated with increased heart disease risk. If both hs-CRP and Lp-PLA$_2$ levels are high, your risk for a heart attack or stroke increases. Certain medications and food may have anti-inflammatory benefits.

Lp-PLA$_2$

High levels of Lp-PLA$_2$ may predict risk of a heart attack or stroke. When both hs-CRP and Lp-PLA$_2$ levels are high, risk for a heart attack or stroke increases significantly. Certain medications can reduce levels of Lp-PLA$_2$.

Heart Failure

Heart failure occurs when the heart can no longer pump effectively enough to meet the body's needs for oxygen.

NT-proBNP

NT-proBNP is a hormone released from heart muscle cells in response to stress or strain on the heart. A high level of NT-proBNP is a warning that the heart is being overworked. Early identification of high levels may help your physician decide on a treatment plan to lower the risk of a cardiac event.

ST2

ST2 is a specific type of protein. If heart failure has already been diagnosed, an ST2 test monitors its progression. High levels of ST2 may mean heart failure is getting worse, and that a change in therapy is needed.

Metabolic Markers

Your metabolism is the result of all the processes in your body working together to create the energy that helps you each day.

Hemoglobin A1c

The hemoglobin A1c test is used to help figure out who may have diabetes either now or in the future by measuring blood sugar levels over the past 90 days. High levels may indicate pre-diabetes or diabetes.

Glucose

Glucose testing measures sugar levels in the blood. High glucose levels may mean you are not responding to the insulin your pancreas is making, so sugar is not getting to the cells where it is needed. Diabetes is the most common disease that causes irregular glucose levels.

Homocysteine

High levels of homocysteine can cause injury to blood vessel walls, increasing the risk for heart disease and stroke. Eating more foods that contain vitamin B and folic acid plays an important part in reducing homocysteine levels.

Insulin

Constant high levels of insulin increase risk for heart disease, diabetes, and other health conditions. High insulin levels can be improved with proper nutrition, exercise, stress management, or certain medications.

Omega-3 and -6 Fatty Acids, Plasma

Lower omega-3 index is linked to an increased risk of cardiovascular disease, including sudden cardiac death. Eating foods high in omega-3 fatty acids or taking omega-3 supplements can increase omega-3 fatty acid levels.

Vitamin D

Low vitamin D levels are linked to an increased risk of heart disease, stroke, diabetes, hypertension, and heart failure. Vitamin D levels may be low for many reasons, such as not enough sun exposure, not eating a balanced diet, and obesity. Taking vitamin D supplements is one way to increase vitamin D levels.

Cardiovascular Genetics

Every individual is unique. The genes that you are born with may impact your heart health. Our genetic tests may help doctors assess the risk for heart disease.

KIF6 Genotype

People who are KIF6 carriers may have a higher risk of heart disease events (such as a heart attack).

CYP2C19 Genotype

The CYP2C19 genotype test evaluates how well your body processes the medication clopidogrel (Plavix®). If you are a poor or intermediate metabolizer, Plavix may be less effective at preventing blood clots.

LPA-Aspirin Genotype

The LPA-aspirin genotype test can give insight into your risk of heart disease, as well as your response to aspirin. If you are an LPA-aspirin carrier, you may have a higher risk of heart disease events (such as a heart attack). However, if you are an LPA-aspirin carrier, low-dose aspirin may help reduce your risk.

4q25-AF Risk Genotype

The 4q25-AF genotype test evaluates your risk for atrial fibrillation (AF [irregular heartbeat]) and your risk for stroke caused by AF. If you are a 4q25-AF risk carrier, you may have a higher risk for AF and stroke caused by AF.

LPA-Intron 25 Genotype

The LPA-Intron 25 genotype test assesses your risk for heart disease. If you are an LPA-Intron 25 carrier, you may have a higher risk of heart disease.

9p21 Genotype

The 9p21 genotype test determines risk levels for certain types of heart disease. If you are a 9p21 carrier, you may have a higher risk of a heart attack (myocardial infarction) before the age of 60 if you are female, and 50 if you are male, or abdominal aortic aneurysm (AAA), blocked coronary arteries, or a heart attack at any age.

ApoE Genotype

The ApoE genotype test assesses your risk of heart disease, as well as your response to different amounts of dietary fats. There are six ApoE genotypes: 2/2, 2/3, 3/3, 2/4, 3/4, and 4/4. If you have the 3/4 or 4/4 genotype, you may have a higher risk of heart disease.

Lowering blood pressure, blood sugar and cholesterol reduces risk, but 50% of heart attack or stroke victims have *normal* cholesterol levels. Measuring inflammation levels can help identify *hidden risk* so your provider can catch the beginning or treat advanced stages of vascular disease. Always review your results and treatment considerations with your medical provider.
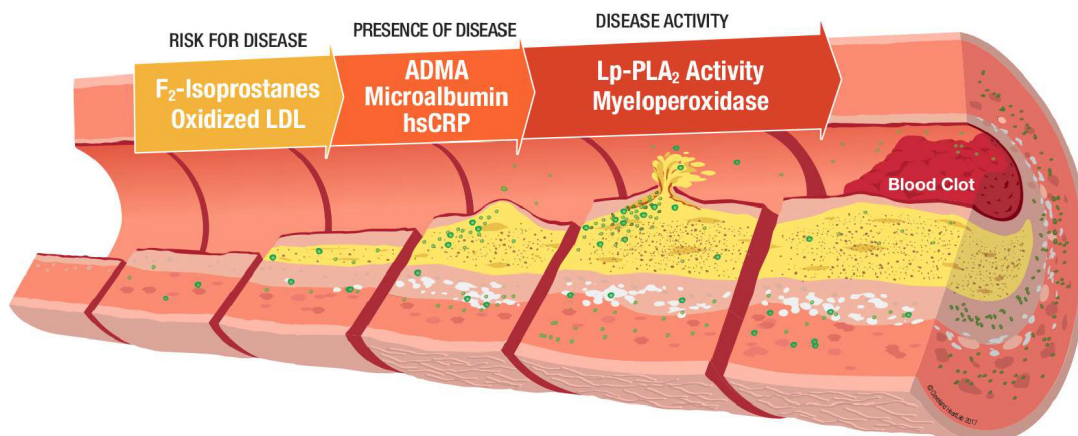
Jane Q. Citizen
Gender Female
DOB 06/30/1950
Patient ID 123456789

Medical Provider
ALEXANDER WOOD, M.D.

inflammation testing™
from **Cleveland**HeartLab

RISK FOR DISEASE — F_2-Isoprostanes / Oxidized LDL
PRESENCE OF DISEASE — ADMA / Microalbumin / hsCRP
DISEASE ACTIVITY — Lp-PLA₂ Activity / Myeloperoxidase
Blood Clot

Disclaimer: The information provided here is for educational purposes only, and the results provided should be reviewed and interpreted by the treating physician. This Patient Report is generated when three or more of the inflammation tests listed below are ordered, or for repeat tests due to a sample problem.

Risk for Disease

Test	Result
F_2-Isoprostanes/ Creatinine (ng/mg)	0.82 L

Your result in the desirable range suggests the levels of oxidation in your body are low.

Your body needs F_2-Isoprostanes for basic functions like making muscle. In excess, F_2-IsoPs caused by inactivity, smoking and processed foods increase oxidation and blood vessel damage.

Test	Result
Oxidized LDL (OxLDL) (U/L)	57 L

Your result is in the desirable range, suggesting that you have low levels of OxLDL.

OxLDL measures oxidized damage to LDL cholesterol (bad cholesterol). High levels trigger inflammation, increasing your risk of developing metabolic syndrome and your future risk of plaque build-up.

Your Lifestyle Considerations

- Limit your intake of processed foods, exercise regularly and if you smoke, quit.
- Eat foods rich in anti-oxidants and high in fiber, and consider a heart healthy Mediterranean-style diet.
- Limit foods high in sugar and salt (sodium) to reduce the damage to your endothelium (vessel lining).
- Your provider may order an imaging test to identify cardiovascular disease.
- Strive for optimal oral health to reduce inflammation associated with periodontal disease.

Presence of Disease

Test	Result
ADMA (ng/mL)	109 M

You have modest levels of ADMA in your blood suggesting you may have low nitric oxide levels and endothelial dysfunction.

ADMA is a chemical in your blood that reduces nitric oxide production needed to keep a healthy endothelium (the cells that line your blood vessels). High levels of ADMA indicate damage to these cells.

Test	Result
Microalbumin/ Creatinine (mg/g)	3.4 L

Your result in the desirable range suggests you have a low risk of endothelial damage.

Microalbumin measures the health of the endothelium, a thin layer of cells lining blood vessels. Risk factors can damage that lining in the kidneys causing them to leak albumin, a protein not normally found in urine.

Test	Result
hsCRP (mg/L)	0.9 L

Your result in the desirable range suggests that you have low amounts of general inflammation in your body.

hsCRP measures inflammation in the body. Increases of hsCRP are seen with recent illness, tissue injury, if you are fighting a virus or infection, with periodontal (gum) disease as well as with cardiovascular disease.

Disease Activity

Test	Result
Lp-PLA₂ Activity (nmol/min/mL)	62 L

Your result is in the desirable range suggesting that you may have limited active cholesterol build-up.

Lp-PLA₂ Activity measures vascular-specific inflammation. When cholesterol enters and gets trapped in the vessel wall, inflammation occurs. Lp-PLA₂ Activity may identify active cholesterol build-up inside the vessel wall and the progression of cardiovascular disease.

Test	Result
Myeloperoxidase (MPO) (pmol/L)	542 H

You have high levels of MPO that suggest you may have vessel damage and increased risk of plaque rupture which may lead to a heart attack.

MPO identifies vulnerable plaque due to the breakdown of cells lining the blood vessel. This breakdown leads to white blood cells attacking the vessel wall and marks the progression of cardiovascular disease.

"L" or Low Risk
UND = Undetectable

"M" or Moderate Risk

"H" or High Risk

TNO = Test Not Ordered
TNP = Test Not Performed
INC = Incomputable

ClevelandHeartLab®
Know your risk.

6701 Carnegie Ave. | Suite 500 | Cleveland, OH 44103
p 866.358.9828 | f 866.869.0148
knowyourrisk.com | clevelandheartlab.com