

## Tests at Metropolis to assess your heart health

### Overview:

Often people associate heart health with cholesterol levels in the blood. But extensive research in this area of diagnostics has helped hospitals and laboratories across the globe to bring up newer and better tests that give a better assessment of heart health

### The Lipid Profile at Metropolis comprises of:

Cholesterol Total, HDL, LDL, VLDL, Triglycerides, Apolipoproteins A1/B, hsCRP, Lp(A)

### Cholesterol Total, HDL, LDL & VLDL

Cholesterol is different from most tests in that it is not used to diagnose or monitor a disease but is used instead to estimate risk of developing a disease — specifically heart disease. Because high blood cholesterol has been associated with hardening of the arteries (atherosclerosis), heart disease, and a raised risk of death from heart attacks, cholesterol testing is considered a routine part of preventive health care.

**Desirable:** A cholesterol below 200 mg/dL (5.18 mmol/L) is considered desirable and reflects a low risk of heart disease.

**LDL Particles:** Small LDL particles can cause plaque build up to progress much faster because they can enter the artery wall easier than large LDL particles. Too many small LDL particles can increase your risk for a heart attack beyond any other risk factors you may have, such as smoking, high blood pressure, diabetes, etc. Certain medications, proper nutrition and regular exercise can help your body produce fewer small LDL particles.

**HDL Particles:** HDL-C helps to protect against progression of plaque build-up in the artery wall. HDL2b is the workhouse of all of the HDL particle types. It has the ability to pick up and remove cholesterol. Certain medications, improved nutrition, loss of body fat, stopping tobacco use and increased physical activity are some ways that HDL-C and HDL2b can be improved.

Increased levels of VLDL-C are thought to reflect the presence of particles called lipoprotein remnants that are intermediate particles on the pathway of conversion of VLDL to LDL. When high levels of VLDL are present, the conversion of VLDL to LDL is slowed and the accumulation of intermediate particles is thought to contribute to the development of atherosclerosis and coronary heart disease.

An elevated level of VLDL cholesterol (>30 mg/dL or >0.77 mmol/L), like elevated LDL cholesterol, is considered a risk factor for heart disease and stroke. The presence of high VLDL in addition to high LDL may affect the choice of therapy used to lower a person's cholesterol, such as lifestyle changes or drug treatment.

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### Apolipoprotein A1

Apo A-I is a protein that plays a role in the metabolism of lipids and is one of the main components attached to HDL, commonly referred to as the "good cholesterol". HDL plays a very important role in

removing excess cholesterol from cells and takes it to the liver for recycling or disposal. Levels of apo A-I is directly proportional to HDL levels in the blood, and deficiencies in apo A-I correlate with an increased risk of developing CVD.

An Apo A1 test is usually ordered to diagnose conditions that cause deficiencies, evaluate patients who have a history of heart disease and high cholesterol. It is also used to monitor treatment

An apo A-I may be ordered along with an apolipoprotein B (apo B) test to determine an apo B/apo A-I ratio. This ratio is used as an alternative to a total cholesterol/HDL ratio to evaluate risk for developing heart diseases.

Low levels of apo A-I are associated with low levels of HDL and impaired clearance of excess cholesterol from the body.

### **Apo-lipoprotein B**

Like Apo-lipoprotein A1, Apo B is also a protein that is involved in the metabolism of lipids and is the main protein constituent of lipoproteins such as very low-density lipoprotein (VLDL) and low-density lipoprotein (LDL, the "bad cholesterol"). Concentrations of apo B is directly proportional to LDL-C.

Doctors usually order both an apo A-I (associated with high-density lipoprotein (HDL), the "good" cholesterol) and an apo B to determine an apo B/apo A-I ratio. This ratio is used as an alternative to a total cholesterol/HDL ratio to evaluate risk for developing CVD.

Apo B levels may be ordered to monitor the effectiveness of lipid treatment as an alternative to non-HDL-C (non-HDL-C is the total cholesterol concentration minus the amount of HDL).

Low levels of apo A-I, along with high concentrations of apo B, are associated with an increased risk of cardiovascular disease.

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### **HS CRP**

A high-sensitivity CRP (hs-CRP) test may be used by itself or in combination with other cardiac risk markers, or in combination with a lipoprotein-associated phospholipase A2 (Lp-PLA2) test that evaluates vascular inflammation. The hs-CRP test accurately detects low concentrations of C-reactive protein to help predict a healthy person's risk of cardiovascular disease (CVD).

#### **What does the test result mean?**

Relatively high levels of hs-CRP in otherwise healthy individuals have been found to be predictive of an increased risk of a future heart attack, stroke, sudden cardiac death, and/or peripheral arterial disease, even when cholesterol levels are within an acceptable range.

People with higher hs-CRP values have the highest risk of cardiovascular disease, and those with lower values have less of a risk. Specifically, individuals who have hs-CRP results at the high end of

the normal range have 1.5 to 4 times the risk of having a heart attack as those with hs-CRP values at the low end of the normal range.

The American Heart Association and U.S. Centers for Disease Control and Prevention have defined risk groups as follows:

Low risk: less than 1.0 mg/L

Average risk: 1.0 to 3.0 mg/L

High risk: above 3.0 mg/L

These values are only a part of the total evaluation process for cardiovascular diseases. Additional risk factors to be considered are elevated levels of cholesterol, LDL-C, triglycerides, and glucose. In addition, smoking, high blood pressure (hypertension), and diabetes also increase the risk level.

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## **Lp(a)**

### **How is it used?**

The Lp(a) test is used to identify an elevated level of lipoprotein (a) as a possible risk factor in the development of cardiovascular disease (CVD). The test may be used in conjunction with a routine lipid profile to provide additional information about a person's risk for CVD.

Instead, when Lp(a) is high, the presence of this added risk factor may suggest the need for more aggressive treatment of other, more treatable risk factors such as an elevated low-density lipoprotein (LDL).

### **When is it ordered?**

Lp(a) is ordered, along with other lipid tests, when an individual has a strong family history of CVD at a young age that is not explained by high LDL or low HDL.

Some health practitioners may also order these tests when:

- A person has existing heart or vascular disease, especially those individuals who have healthy lipid levels or ones that are only mildly elevated
- Someone may have an inherited predisposition for high cholesterol level
- A person has had a stroke or heart attack but has normal or only mildly elevated lipids

What does the test result mean?

A high Lp(a) level may increase a person's risk for developing CVD and cerebral vascular disease. High Lp(a) can occur in people with a normal lipid profile. An elevated level of Lp(a) is thought to contribute to risk of heart disease independently of other lipids.

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