

CHOLESTEROL 101: WHAT DO YOUR CHOLESTEROL LABS MEAN?

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The following article aims to help you better understand your cholesterol test results!

Everyone knows at least something about cholesterol. Either through a brief meeting with your doctor who gave you back your results, through the scary headlines in newspapers or through one of the thousands of blogs you can find on the internet.

If your health goal is preventing heart disease or longevity, this is for you!

Let's answer some questions: What is a traditional cholesterol lab result or 'lipid panel' and what do the markers on them mean? Is there some extra information on it that can help you assess your risk of cardiovascular disease? And what might be missing on your panel, but is very important as well? But first...

What is cholesterol?

It's a molecule. You either eat it or make it. What you don't eat, your body will produce. **Dietary cholesterol** makes up about 10-15 percent of your **body's cholesterol**.

Dietary cholesterol usually doesn't influence your body's cholesterol much.

As you may know, cholesterol is needed for several things like:

- You need it to make vitamin D
- Cholesterol is needed to make steroid hormones like estrogen, progesterone, testosterone & cortisol
- It's needed to build bile, brains and cell membranes

What is the difference between LDL & LDL cholesterol?

Cholesterol is a lipid and just like fats, it doesn't mix with water. The body designed special busses to drive lipids & cholesterol around. These are called **lipoproteins**. LDL stands for Low-Density Lipoproteins.

LDL is just a bus for cholesterol & lipids. It drops lipids & cholesterol into tissues.

When we talk about LDL Cholesterol, we mean all the Cholesterol that is actually in the 'bus' called LDL. This measurement is also what you will find in the lab results.

LDL was often called 'bad cholesterol' because it is the LDL particles (the busses, not the passengers) that can form plaque in the arteries. We now know that this plaque is trying to bandage small 'wounds' or holes in the arteries. It is the holes that are the actual problem.

Tips for addressing this problem are for another day.

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Now LDL comes in small sizes and big sizes. It's the small LDL particles that are more **plaque-forming** or **atherogenic** than the big LDL particles because the small particles can fit more easily in those small holes. This is important because a traditional lipid panel measures LDL cholesterol. The passengers on the bus. Not the number of busses.

The problem with LDL cholesterol:

Let's say Suzy and Ann both have the same LDL cholesterol. Say Suzy has a number of 100 cholesterol passengers sitting in a few big LDL busses. And let's say Ann has the same 100 cholesterol passengers transported in a lot of small busses.

This still means that Ann has a bigger risk for plaque formation than Suzy. So, if we would know the number of buses, we could estimate the size of buses and therefore the risk.

What is the difference between HDL & HDL Cholesterol?

Same thing. Using the 'bus' analogy again, HDL is a different bus line. It brings cholesterol back to the liver. HDL Cholesterol is the cholesterol that was on the bus called HDL. HDL stands for High-Density Lipoproteins.

HDL (cholesterol) was often called '**good cholesterol**', but science has a much more nuanced opinion on that these days.

What can you find in a typical lab result (called a 'lipid panel') from your doctor?

1. Triglycerides (free fats in the blood)

Usually, we want them to be under 150 mg/dl (or 3.8 mmol/l). The **optimal range** is 50-100 mg/dl (or 1.29-2.58 mmol/l).

2. Total Cholesterol

This is all the cholesterol in your blood. So all cholesterol in all the possible buses in your blood. Usually, we want total cholesterol below 200 mg/dl (or 5 mmol/l).

3. LDL Cholesterol

We talked about it. This measures the cholesterol 'passengers' on the LDL bus. But for a good risk assessment, we need to know the number of LDL particles as well. The convention in regular medicine is less than 100 mg/dl (or 2.59 mmol/l) for people who don't have heart disease.

Please don't let your take away from this article be that LDL cholesterol is useless!

4. HDL Cholesterol

For men, the reference ranges are typically between 35-65 mg/dl (0.91-1.68 mmol/l). The **optimal range** is 55-75 mg/dl (or 1.42 - 1.94 mmol/l)

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The hidden information on your lipid panel:

What you typically don't see on your traditional lipid panels is the **Triglyceride to HDL ratio**. To calculate this is pretty simple: Divide the triglycerides by HDL cholesterol (in mg/dl). If the number is above 2.0 there is an increased risk for cardiovascular disease. This ratio is more predictive than the other numbers on the traditional lipid panel.

What markers would we like to add to the traditional lipid panel?

1. ApoB100 or ApoB

So how can we count the number of LDL busses? Turns out that all sizes of LDL particles have the same 'backbone'. This backbone of LDL is a protein called **ApoB100 or ApoB**. So when you see this marker on typically a more advanced lipid panel, this can tell you how many LDL particles there are. It is typically measured in mg/dl (or nmol/l). Together with the LDL cholesterol (the passengers), we can estimate if the busses are small or big.

It is not traditionally measured. If your doctor is a cardiologist, ask him or her about it.

2. Lipoprotein a or LP(a)

When a protein called "**apolipoprotein a**" binds to the backbone ApoB as mentioned above of LDL it becomes a 'special' form of LDL called LP(a). You pronounce this as '**LP little A**'.

LP(a) is more atherogenic (more plaque-forming) and it is important to know because more than 15% of the world population has elevated LP(a) levels due to genetic reasons (according to research scientist Benoît Arsenault it would be closer to 20 per cent.)

In comparison to LDL, HDL and triglycerides, LP(a) doesn't change much over time. Measure it once and you have a pretty good idea of how your LP(a) will be in ten or twenty years. People with elevated LP(a) should pay a little more attention to living a low inflammatory lifestyle.

It is not traditionally measured. If your doctor is a cardiologist, ask him or her about it.

Be sure to save this little guide. Most people at some point in time will measure cholesterol. If nobody ever measured your cholesterol, this guide will help you later!