Understanding Cholesterol Tests

By Dr. Ramona Warren

Cholesterol is a misunderstood subject. For many years we’ve been told to avoid high cholesterol foods such as eggs and eat a low-fat diet in order to manage cholesterol levels. Cholesterol has been made out to be an enemy. However, the truth is cholesterol is an essential part of every cell membrane and is important for communication between the cells. It helps control the permeability of the cell, which allows nutrients to get inside the cell and the toxins to be released from the cell. Cholesterol is a waxy, fat-like substance produced by the liver, the intestines, the skin, brain and almost every cell in the body. Up to 80 percent of the cholesterol in the body is produced **BY** the body. The other small percentage of cholesterol comes from the foods we eat. We need cholesterol in order to produce vitamin D, sex hormones, adrenal hormones, bile salts and for the myelin sheath that covers nerve fibers. The brain consists of about 25 percent of the cholesterol in our bodies and nerve communication is dependent on cholesterol.

Cholesterol only becomes “bad” for our health when the cholesterol molecule is damaged by oxidative stress. Monitoring cholesterol levels is most commonly used for assessing your risk for heart disease. However, improper levels can also serve as an indicator of imbalances in many metabolic functions including low thyroid, poor gallbladder function, weak adrenal function, syndrome X, fatty liver and early stages of diabetes. While we’ve been told high cholesterol is “bad,” it’s important to realize that low cholesterol can be problematic, as well. Total cholesterol levels below 150mg can **negatively** impact health by increasing the risk of poor mental function, poor memory, poor hormone synthesis, weakened adrenal activity, poor metabolism, increased joint and muscle pain, poor immune function, depression, cerebral hemorrhages and an increased risk for cancer.

A lipid profile is the general blood test ordered to assess total cholesterol, high-density lipoproteins (HDL), low-density lipoproteins (LDL) levels and triglycerides.

Triglycerides are fats in the blood that come from the foods we eat. One of the most common causes of high triglyceride levels is a diet high in refined carbohydrates like bread, cereals, crackers, pasta, potatoes and corn. High triglycerides have been shown to be a much greater risk factor of heart disease and stroke than total cholesterol levels. High triglycerides are easy to get back to normal levels with the correct diet.

HDL and LDL are often referred to as cholesterol, but they are actually proteins that help transport fats through the blood stream. HDL is often referred to as your “good” cholesterol because it’s function is to take cholesterol *away* *from the arteries* removing any excess plaque, which helps in reducing the risk for heart disease. LDLs are thought of as the “bad” cholesterol because it takes cholesterol *to the arteries,* which increases plaque formation, causing “stiffness” in the arteries known as atherosclerosis – increasing the risk of heart disease and stroke. Increased LDL is often an indication of inflammation and irritation within the blood vessel. The lining of the artery gets damaged or “cut” by certain molecules and causes bleeding within the artery. The LDLs then transport cholesterol to the site of bleeding so cholesterol can “patch” the cut and stop the bleed. LDL is simply dong its job. The real problem is what causes the damage to the artery, which is often a diet high in refined foods and poor lifestyle habits such as smoking and lack of exercise.

Some important tests and ratios to consider when assessing your risk level for heart disease and stroke are listed below.

1. **Cholesterol/HDL ratio:** Divide the total cholesterol by the HDL level. This ratio should be less than 5 for men and 4.4 for women. The ideal for men is 3.5 and for women it is 3.3. Anything over 5 indicates an increased risk for heart disease.
2. **HDL/Cholesterol ratio:** This ratio gives you the percentage of HDL and is an important ratio to determine the risk of heart disease. The ratio should be at least 24 percent or higher.
3. **Triglyceride/HDL ratio:** Divide triglycerides by HDL. A ratio of two or less is a healthy range. The higher the ratio the higher the risk for heart disease.
4. **Particle size:** All LDLs are not the same. Some are larger and not as damaging as the smaller LDL particles. Knowing the particle size and the amount is important when assessing LDL levels. These tests include the NMR LipoProfile, Lipoprint, Berkeley, VAP and LPP. Any of these will distinguish the LDL particle size. Pattern A is the big, fluffy type, which is preferred. Pattern B refers to small particles, which cause inflammation and plaque. Type B is similar to BBs and much more dangerous than A, which is like cotton balls. You definitely want to have higher levels of Type A.
5. **C-Reactive Protein (CRP):** This test is a much more reliable predictor of your risk for heart disease than your total cholesterol level. It indicates inflammation especially related to your cardiovascular system. Make sure to use the hs-CRP, which is the high-sensitivity test.
6. **Interleukin-6:** This is a precursor to CRP and a marker that indicates inflammation and increased risk for cardiovascular disease and asthma.
7. **Lp(a):** This is another test showing a high risk for heart disease. This molecule helps in the repair of arteries. Apolipoprotein A-1 is a major component of HDL and Apolipoprotein B is the main component of LDL. You want to have higher levels of A-1 and lower levels of B.
8. **Homocysteine:** High levels can indicate oxidative damage and inflammation and leads to increased risk for heart disease and stroke. It causes the platelets to become sticky, leading to increased plaque formation and decreased blood flow. .
9. **Fibrinogen:** This test looks at how sticky your blood is and your risk for blood clots.

Hopefully this information will serve you in better understanding cholesterol ratios and tests to better assess your risk for heart disease.