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# Considering... Lipids and Atherosclerosis

A Guide to Preventing Coronary Artery Disease

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Committee on Cardiovascular and Metabolic Diseases™

Your body needs a certain amount of fats, or *lipids*, to function properly—examples of lipids include *cholesterol* and *triglycerides (TG)*. However, higher-than-normal levels of these lipids that are left untreated can lead to *atherosclerosis* of the coronary arteries or *coronary artery disease (CAD)*, a form of heart disease. In this handout, we will focus on why controlling lipid levels is important to reduce your risk for CAD, and offer helpful tips to keep your lipid levels on target.

## What is the role of cholesterol and TG in the development of CAD?

There are two main types of cholesterol in your body: “bad” cholesterol, or *low-density lipoprotein cholesterol (LDL-C)*, and “good” cholesterol, or *high-density lipoprotein cholesterol (HDL-C)*. LDL-C circulates to different tissues in the body, including the arteries, which are tubes that carry blood to the heart and other areas of the body. HDL-C transports fats from the arteries and returns them to the liver where they are removed from the body. TG are the most common fats in your body and are used as energy. Too much LDL-C and TG in your blood can block arteries, which can speed the development of *atherosclerosis*. (See below for a discussion on *atherosclerosis*.) On the other hand, high levels of HDL-C protect your heart by carrying LDL-C away from the arteries, slowing down the process of *atherosclerosis*.

## What is *atherosclerosis*, and how does it develop?

Believe it or not, *atherosclerosis* can begin in childhood and slowly develop through the years. Normally, blood flows freely through your arteries to your brain and heart. When high levels of LDL-C, TG, and other substances are carried through the blood, they form a sticky material called *plaque*. Over time, this plaque can build up, narrowing and hardening the arteries (*atherosclerosis*). Damage to the arteries causes *inflammation*, your body’s natural reaction to damage or infection. Inflammation can cause plaque to weaken and, over time, form clots, which can break off and travel through the arteries. As arteries become more clogged and hardened, blood flow can slow down or even stop, causing CAD.

## Know Your Numbers!

It is important to learn about your lipid levels to prevent CAD. Lowering LDL-C and TG levels and raising HDL-C levels can mean the difference between a healthy heart and heart disease.

These are the target goals for lipid levels. Lipids are measured in milligrams (mg) per deciliter (dL) of blood.

- ❖ **Total cholesterol (TC):** less than 200 mg/dL
- ❖ **LDL-C:** less than 100 mg/dL
- ❖ **HDL-C:** more than 50 mg/dL in women; more than 40 mg/dL in men
- ❖ **TG:** less than 150 mg/dL

Your LDL-C goal may change depending on how many risk factors you have for *coronary heart disease (CHD)*. These risk factors include smoking, high blood pressure (more than 140/90 mm Hg), family history of early heart disease, low HDL-C, and age (45 years or older for men; 55 years or older for women).

- ❖ **0–1 risk factor:** less than 160 mg/dL
- ❖ **2 or more risk factors:** less than 130 mg/dL
- ❖ **If you have diabetes or another condition that increases your risk of CHD:** less than 100 mg/dL; less than 70 mg/dL is optional to further reduce your risk for heart disease

## Some Tests Your Healthcare Provider May Perform to Determine Your Risk for CAD

- ❖ **Lipid panel** to measure your levels of TC, HDL-C, LDL-C, TG, and other lipids.
- ❖ **High-sensitivity C-reactive protein (hs-CRP)** to determine your risk for CAD by measuring *CRP* (a sign of inflammation in the arteries). Your CRP level should be less than 1.0 mg/L (milligram per liter of blood).
- ❖ **Carotid ultrasound** to show whether plaque has narrowed your carotid artery, which can increase your risk for CAD.

## Medications Can Help, But Healthy Lifestyle Changes Matter, Too!

Your healthcare provider may prescribe certain medications, such as statins, fibrates, or niacin, to lower your lipid levels. In addition to medications, lifestyle changes are just as important! Here are some tips to put you on the road to heart health:

- ❖ Eat a healthy diet
- ❖ Control your sugar and salt intake
- ❖ Avoid alcohol. If you drink, do so in moderation
- ❖ Quit smoking—if you don’t smoke, don’t start!
- ❖ Control your weight
- ❖ Exercise regularly

**References:** American Heart Association. Cholesterol. Available at: <http://www.americanheart.org/presenter.jhtml?identifier=4488>. • Brunzell JD et al. *Diabetes Care*. 2008;31(4):811-822. • Grundy SM et al. *Circulation*. 2004;110(2): 227-239. • Hansson GK. *N Engl J Med*. 2005;352(16):1685-1695. • National Heart, Lung, and Blood Institute. What is carotid ultrasound? Available at: [www.nhlbi.nih.gov/health/dci/Diseases/cu/cu\\_what\\_is](http://www.nhlbi.nih.gov/health/dci/Diseases/cu/cu_what_is). • National Heart, Lung and Blood Institute. What is coronary artery disease? Available at: [http://www.nhlbi.nih.gov/health/dci/Diseases/Cad/CAD\\_All.html](http://www.nhlbi.nih.gov/health/dci/Diseases/Cad/CAD_All.html). • Texas Heart Institute. Vulnerable plaque. Available at: <http://www.texasheartinstitute.org/HIC/Topics/Cond/vulplaq.cfm>. • All websites accessed July 11, 2008.