

# Cholesterol and Heart Disease

By Dr. Lenore Coleman

## What Is Cholesterol?

Cholesterol is a soft, waxy substance found among the lipids (fats) in the bloodstream and in the body's cells. It is normal to have cholesterol. The body uses cholesterol for many functions, from building cells to making the bile acids that help digest fat. Cholesterol is an important part of a healthy body because it's used to form cell membranes, some hormones and other needed tissues. Elevated levels of cholesterol in the blood are a major risk for coronary heart disease, which leads to heart attack. Hypercholesterolemia is the term used for high levels of blood cholesterol.

Two sources of cholesterol exist: the body makes some of it in the liver, while the rest is derived from animal products in the diet, such as meats, poultry, fish, eggs, butter, cheese and whole milk. Cholesterol is only made in animals and in humans. Food from plants like fruits, vegetables and cereals do not have cholesterol. Saturated fat is a type of fat found in the greatest amounts in foods from animals including meat, dairy products, and some vegetable oils. These foods are high in cholesterol.

Triglycerides are another type of fat, which is the major storage form of body fat. Like cholesterol, triglycerides are produced by the body and also come from dietary sources.

Cholesterol and other fats cannot dissolve in the blood and are carried to the tissues by special proteins called lipoproteins, which enable cholesterol to dissolve in the blood. There are two major lipoprotein classes—high-density lipoprotein (HDL) and low-density lipoprotein (LDL). It is important for you to know about lipoproteins since that is what your doctor measures when he orders a blood test for cholesterol.

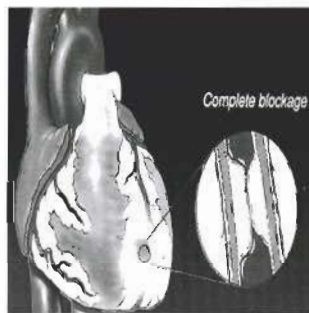
LDL cholesterol (LDL-C) is the most important contributor to clogged arteries (known as atherosclerosis). A high level of LDL-C, often known as “bad” cholesterol, has been shown to increase the risk of heart disease.

HDL cholesterol, or “good” cholesterol, contains mostly protein plus a small amount of cholesterol. HDL-C carries cholesterol away from the arteries and back to the liver, where it is passed from the body. High HDL-C levels are desirable, protecting against clogged arteries, while low HDL-C levels increase the risk of coronary heart disease. An easy way to remember the distinction between these two is that LDL-C is the “Lousy” or “Lethal” cholesterol, while HDL-C is the “Happy” or “Healthy” cholesterol.

## Why do people with diabetes need to control their cholesterol?

It is very important that you control your cholesterol levels in the blood if you have diabetes. Over the years, it has been proven that people with diabetes are more prone to getting heart disease and experiencing heart attacks. In fact, according to the latest guidelines of the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III), people with diabetes should consider their risk for heart disease the same as people without diabetes that have already had a heart attack. It appears that having abnormal blood fat (example: high triglycerides) in addition to high cholesterol levels contribute to increased heart disease risk. People with diabetes need to know their target level for blood cholesterol and take the necessary steps to lower their cholesterol levels to the normal range. A reminder of the seriousness of heart disease in diabetes is that heart attacks are the leading cause of death in people with diabetes.

## How does lowering cholesterol lower heart attack risk?



**Clogged Artery**

The coronary arteries, located in the heart, are the “fuel supply” to the heart muscle and provide blood for heart muscle contraction. Coronary artery disease is the process of cholesterol buildup within the walls of the coronary arteries. The heart attack occurs when a coronary artery becomes closed and oxygen-rich blood can no longer get through to feed the heart muscle. The closure is caused by the buildup of cholesterol or more commonly when the cholesterol buildup (plaque) ruptures and a blood clot forms and blocks the artery.

## What are the risk factors for coronary heart disease (CHD)?

The risk factors for CHD, as established by the National Cholesterol Education Program (NCEP-ATP III), include the following:

- ◆ Age (male > 45 years; female > 55 years or premature menopause without estrogen replacement therapy)
- ◆ Family history of premature CHD
- ◆ Current cigarette smoking

- ◆ Hypertension
- ◆ Elevated total cholesterol
- ◆ Low HDL cholesterol (< 40 mg/dL)

While certain risk factors (e.g., family history, age, gender) cannot be changed, others can be modified. Modifiable risk factors for heart disease include smoking, hypertension, diabetes, and elevated blood cholesterol. In addition, patients can lose weight and increase physical activity to reduce risk.

## Understanding High Cholesterol and Its Treatment

How often should you check your cholesterol levels?

It is generally recommended that all healthy adults over the age of 20 years have their fasting total cholesterol level measured at least once every five years. Fasting high-density lipoprotein cholesterol (HDL-C) should be measured at the same time if accurate results are available. A full-fasting lipoprotein analysis, which includes measurement of total cholesterol, LDL-C, HDL-C and triglycerides, is recommended for high-risk asymptomatic patients.

When is the cholesterol level considered to be high?

The NCEP-ATP III guidelines include the following recommendations for initial classification based upon the following total cholesterol levels:

- ◆ Desirable: Less than 200 mg/dL
- ◆ Borderline-high: 200-239 mg/dL
- ◆ High: 240 mg/dL or above



## What are the nonmedical treatment options for high cholesterol?

### Lifestyle changes

Diet, weight loss, and regular exercise are often the first steps prescribed to lower blood cholesterol and prevent heart disease.

Diets high in cholesterol and saturated fats can increase blood cholesterol levels. Foods from animal sources (meat, fish, poultry, dairy products) contain cholesterol. Organ meats, such as liver, are especially high in cholesterol. Although foods of plant origin have no cholesterol, they may contain types of dietary fats that increase blood cholesterol levels.

Reducing dietary fat and cholesterol can help people lose weight and lower heart disease risk factors. Limiting dietary cholesterol intake to 200 mg/day and eating a higher proportion of complex carbohydrates (bran, oatmeal and vegetable fiber) can lower cholesterol levels by an average of 10-15 percent and triglyceride levels by 15-20 percent.

## Putting it all together for heart disease

It is clear that diabetes carries a very high risk for developing early, serious heart disease. One reason is because people with diabetes have a high occurrence of all of the factors that promote heart attacks. They have high blood sugar (A1C), high blood pressure, and high blood fats, especially cholesterol. All of these risk factors for heart disease need to be very aggressively treated in people with diabetes. This has been recognized by a national campaign on Being Smart about your Heart—Know the ABC's of diabetes. This campaign urges people with diabetes to know and achieve the goals of A1C, blood pressure control and cholesterol reduction. This is the way you can reduce your risk of heart disease. **NBV**