



High Cholesterol (Hypercholesterolemia)

What Is It?

Cholesterol is a fatty substance that occurs naturally in the body. It performs several vital functions. It is needed to make the walls surrounding the body's cells and is the basic material that is converted to certain hormones. Your body makes all the cholesterol you need. You need only a small amount of fat in your diet to make enough cholesterol to stay healthy.

The fat and cholesterol you eat are absorbed in the intestine and transported to the liver. The liver converts fat into cholesterol, and releases cholesterol into the bloodstream. There are two main types of cholesterol: low-density lipoprotein (LDL) cholesterol (the "bad" cholesterol) and high-density lipoprotein (HDL) cholesterol (the "good" cholesterol).

High levels of LDL cholesterol are linked to atherosclerosis, which is the accumulation of cholesterol-rich fatty deposits in arteries. This can cause arteries to narrow or become blocked, slowing or stopping the flow of blood to vital organs, especially the heart and brain. Atherosclerosis affecting the heart is called coronary artery disease, and it can cause a heart attack. When atherosclerosis blocks arteries that supply blood to the brain, it can cause a stroke.

High levels of HDL cholesterol actually protect against heart attacks and strokes by removing cholesterol from the arteries and bringing it back to the liver.

Because high cholesterol levels can cause atherosclerosis, doctors recommend that people keep their cholesterol levels within a specific range. In general, adults older than 20 should try to keep their total cholesterol level below 200 milligrams per deciliter.

For a more precise assessment of the risk of atherosclerosis, your LDL cholesterol should be checked. According to guidelines established by the government-sponsored National Cholesterol Education Program, the desirable level for LDL cholesterol depends on whether or not a person already has a disease caused by atherosclerosis or diabetes or other risk factors for coronary artery disease. In addition to a high LDL cholesterol level and diabetes, risk factors for coronary artery disease include:

- Being a male older than 45
- Being a female older than 55
- Being a female with premature menopause
- Having a family history of premature coronary artery disease (a father or brother younger than 55 with coronary artery disease or a mother or sister younger than 65 with coronary artery disease)
- Smoking cigarettes
- Having high blood pressure
- Not having enough good cholesterol (high density lipoprotein or HDL)

If you have coronary artery disease, peripheral arterial disease or have had a stroke from atherosclerosis, your LDL cholesterol should be 70 milligrams per deciliter or less.

The more risk factors you have, the lower your target LDL cholesterol should be. In general, an LDL cholesterol level of less than 100 is best, but less than 130 may be acceptable for people with few or no risk factors.

Your level of HDL cholesterol is also very important. People with levels below 40 milligrams per deciliter are more likely to develop atherosclerosis, heart disease and stroke. Levels of HDL cholesterol above 60 milligrams per deciliter are associated with less atherosclerosis and are thought to help protect against heart disease and stroke.

Symptoms

Most people with high cholesterol don't have any symptoms until cholesterol-related atherosclerosis causes significant narrowing of the arteries leading to their hearts or brains. The result can be heart-related chest pain (angina) or other symptoms of coronary artery disease, as well as symptoms of decreased blood supply to the brain (transient ischemic attacks or stroke).

About 1 out of every 500 people has an inherited disorder called familial hypercholesterolemia, which can cause extremely high cholesterol levels (above 300 milligrams per deciliter). People with this disorder can develop nodules filled with cholesterol (xanthomas) over various tendons, especially the Achilles tendons of the lower leg. Cholesterol deposits also can occur on the eyelids, where they are called xanthelasma.

Diagnosis

Your doctor will ask if anyone in your family has had coronary artery disease, high cholesterol or diabetes. The doctor will ask about your diet and if you have ever smoked. He or she will check your blood pressure and look for xanthomas and xanthelasma. Your doctor can confirm a diagnosis of high cholesterol with a simple blood test.

Expected Duration

If your cholesterol level is high, you will need to make a long-term effort to bring it down. You can significantly lower your cholesterol levels by sticking with a diet that is low in saturated fats, high in fruits and vegetables, and by substituting "good" fats for "bad" fats. The dietary changes need to be permanent to maintain lower cholesterol levels. Daily exercise also is important. Exercise can raise HDL (good) cholesterol and lower total cholesterol.

Prevention

You may help to prevent high cholesterol by staying on a healthy diet and exercising daily. Avoid high-fat foods (eggs, fatty red meats, palm or coconut oil, dairy products made with whole milk). Instead eat more fresh fruits and vegetables, whole-grain breads and cereals, and low-fat dairy products.

Treatment

The initial treatment of high cholesterol should always be lifestyle changes. This means altering your diet and getting more exercise. Some people respond dramatically to dietary changes.

There is no consensus on the best diet. The most effective diet to lower total and LDL cholesterol is a vegetarian diet. However, this is not an easy diet to follow.

Many people prefer a "Mediterranean style" diet. There is no strict definition for what should be included in this type of diet. In general, this means:

- Getting the majority of daily food calories from plant sources, especially fruits and vegetables, grains, beans, nuts, and seeds
- Using olive oil as the principal fat, replacing other fats and oils
- Having some low-fat cheese and/or yogurt daily
- Eating fish a couple times per week
- Limiting processed foods
- Drinking alcohol in moderation unless medically not indicated. No more than two drinks per day for men and one per day for women.

Diet

The National Cholesterol Education Program recommends the following diet:

- Saturated fat -- less than 7% of calories
- Monounsaturated fat -- about 20% of calories
- Polyunsaturated fat -- about 10% of calories
- Protein -- about 15% of calories
- Carbohydrates -- about 50% of calories
- Fiber -- about 25 grams of soluble fiber per day
- Cholesterol -- less than 200 milligrams per day

Avoid all trans fats.

To maintain a desirable weight, you should take in only as many calories as you burn each day. If you need to lose weight, you need to take in fewer calories than you burn.

People who aren't sure how to follow such a diet may find it useful to work with a health care professional such as a dietitian, nutritionist, doctor or nurse.

In addition to dietary changes, you should get at least 30 minutes of moderate-intensity exercise, such as brisk walking, daily.

Medications

Whether you need medication to lower your cholesterol level depends on how you respond to diet and your personal risk of heart attack and stroke.

There are five types of cholesterol-lowering medications:

- Bile acid-binding resins, including cholestyramine (Questran) and colestipol (Colestid). They are used less often today because they lower HDL (good) cholesterol as well as LDL (bad) cholesterol.
- Niacin (several brand names).

- Fibrates, including gemfibrozil (Lopid), fenofibrate (Tricor) and clofibrate (Abitrate). Fibrates are especially helpful for people with high triglyceride levels.
- Statins, also called HMG-CoA reductase inhibitors, including lovastatin (Mevacor), simvastatin (Zocor), pravastatin (Pravachol), fluvastatin (Lescol), atorvastatin (Lipitor), and rosuvastatin (Crestor). Statins block an enzyme called HMG-CoA reductase, which is necessary for the production of cholesterol. They are the most commonly prescribed cholesterol lowering medication.
- Selective inhibitors of intestinal cholesterol absorption. There is only one available, ezetimibe (Zetia).

If your cholesterol is not controlled with diet and other lifestyle changes, your doctor may recommend that you take one or more of these medications. Each type of medication works differently and has different types of side effects.

In addition to dietary changes or medication, people with high cholesterol should try to control their other risk factors for coronary artery disease. This means keeping blood pressure at normal levels, not smoking, controlling your blood sugar, maintaining or losing weight and following a regular exercise schedule.

When To Call a Professional

Because it is possible to have high cholesterol for many years without symptoms, it is important to have your blood cholesterol level checked periodically. Current guidelines recommend that adults older than 20 undergo a full fasting lipid profile once every five years. This test measures LDL and HDL cholesterol and triglyceride levels. If the numbers are outside the desirable range, your doctor may suggest that you change your diet and monitor your cholesterol more frequently.

Prognosis

The effectiveness of following a healthy diet and using medications to lower cholesterol varies from person to person. On average, diet and exercise can lower LDL cholesterol by about 10%. Medications can lower LDL cholesterol by another 20% to more than 50%.