



Cholesterol and Women's Cardiovascular Health

Cholesterol is a natural substance that helps the body grow and function, but having abnormal levels of cholesterol can be harmful. High cholesterol is a major risk factor for **cardiovascular disease**. Keeping your cholesterol in the normal range is one of the key ways you can reduce your risk of cardiovascular disease and stay healthy throughout your life.

This pamphlet explains

- *how cholesterol works in the body*
- *cholesterol and other risk factors for cardiovascular disease*
- *women and cardiovascular disease*
- *measuring cholesterol levels*
- *managing cholesterol levels*

Cholesterol's Role in the Body

Cholesterol is a fatty, wax-like substance. Your body uses cholesterol to make the outer coverings of **cells**. Cholesterol is an important part of certain kinds of **hormones**, including **estrogen** and **testosterone**. It also helps your body make vitamin D and produces the **bile** that helps you digest food.

Most of the cholesterol in your body is made by the liver. A small amount comes from foods, such as meat and dairy products. The fat in these foods is turned into **triglycerides**. Triglycerides travel through the bloodstream and are stored in fat cells as a source

of energy. The body also converts simple sugars found in fruits and sugary foods into triglycerides.

In the liver, cholesterol, triglycerides, and a protein are packaged into **lipoproteins**. There are two key kinds of lipoproteins:

- LDL (low-density lipoprotein)—This type of lipoprotein carries cholesterol to where it is needed in the body. If there is too much of it, it tends to collect in the walls of blood vessels. LDL sometimes is called “bad cholesterol.”
- HDL (high-density lipoprotein)—This type of lipoprotein picks up cholesterol in the blood-stream

and takes it back to the liver. The liver breaks down cholesterol so that it can pass out of the body. HDL sometimes is called “good cholesterol.”

An easy way to remember the two types of cholesterol is that you want a high level of “happy” HDL and a low level of “lousy” LDL.

Cholesterol and Cardiovascular Disease

Having abnormal levels of cholesterol or triglycerides is called dyslipidemia. A common dyslipidemia in the United States is having an LDL cholesterol level that is too high, an HDL cholesterol level that is too low, and elevated levels of triglycerides. This type of dyslipidemia increases the risk of cardiovascular disease.

When the level of LDL is high, it can collect inside the walls of blood vessels. When the level of HDL is low, there may not be enough available to remove the “bad cholesterol” from the blood vessels. LDL within the walls of blood vessels triggers a response by the body’s **immune system**. Eventually, this immune response can lead to a buildup of a substance called plaque in the blood vessels. Plaque can narrow and harden the arteries, a condition called **atherosclerosis**.

Atherosclerosis makes it harder for blood to move through the arteries. **Coronary artery disease** is a condition caused by the narrowing of the arteries in the heart. Over time, plaque can develop into a blood clot that blocks the flow of blood in the artery, causing a **heart attack**. If atherosclerosis narrows or blocks an artery in the brain, it can cause a **stroke**.

Other Risk Factors for Cardiovascular Disease

Abnormal cholesterol levels are not the only risk factor for cardiovascular disease. Other risk factors are important as well. Some of these risk factors cannot be changed, such as advancing age, male sex, and family history. Others can be modified by making lifestyle changes and getting regular health care. These risk factors include smoking, physical inactivity, obesity, a poor diet, and medical conditions such as **diabetes mellitus** and high blood pressure.

Many people have multiple risk factors for cardiovascular disease. **Metabolic syndrome** is the name given to a group of risk factors that occur together and that increase the risk of cardiovascular disease. Metabolic syndrome may be diagnosed if you have three or more of the following factors:

- Waist circumference equal to or greater than 35 inches for women and equal to or greater than 40 inches for men
- Triglyceride level 150 mg/dL or higher
- HDL cholesterol less than 50 mg/dL
- Blood pressure 130/85 mm Hg or higher
- Fasting glucose level 100 mg/dL or higher

Metabolic syndrome has become more common in the United States as the rates of obesity have increased. So

many people now have metabolic syndrome that it may overtake smoking as the leading cause of cardiovascular disease.

Women and Cardiovascular Disease

Women have a higher level of HDL than men. It is thought that estrogen, the female hormone, naturally increases the HDL level. Women have less risk of cardiovascular disease than men until about the time they reach **menopause** (usually around age 50 years), when LDL levels start to rise. By age 55 years, women have higher LDL levels than men. By about age 75 years, cardiovascular disease risk for men and women is the same. Cardiovascular disease is the number one killer of women in the United States.

Some conditions unique to women increase their risk of cardiovascular disease. These conditions include **polycystic ovary syndrome**, high blood pressure disorders that occur during pregnancy, and **gestational diabetes**. About 30% of women with polycystic ovary syndrome also have metabolic syndrome.

Measuring Cholesterol Levels

A simple blood test can show if your cholesterol levels are healthy. A complete lipoprotein analysis measures the levels of total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides (see box).

Women without risk factors should have their cholesterol levels measured every 5 years beginning at age 45 years. Women who have risk factors for cardiovascular disease may need to start cholesterol screening earlier.

Managing Cholesterol Levels and Cardiovascular Risk

If you have high cholesterol, management of your condition may depend on your risk of developing cardiovascular disease in the next 10 years. You can find out your 10-year risk by going to <http://tools.cardiosource.org/ASCVD-Risk-Estimator/>. If you are at low risk of cardiovascular disease, you may be able to manage your cholesterol levels with lifestyle changes alone. If you are at higher risk, cholesterol-lowering medications may be prescribed along with changes in lifestyle.

Lifestyle Changes

A few changes in your lifestyle often can make a big difference in your cardiovascular disease risk.

Eat a heart-healthy diet. A heart-healthy diet is one that emphasizes vegetables, fruits, beans, and low-fat dairy products; includes fish and poultry; and limits red meat, sugary foods and drinks, and sodium. The type of fat that you eat also is important. There are different types of fat found in foods:

- Saturated fats come mainly from meat and dairy products. They tend to be solid when chilled. Examples include butter and lard. You should eat

Cholesterol Levels

HDL (“good” cholesterol)	High levels are best
LDL (“bad” cholesterol)	Low levels are best
Triglycerides	High levels increase the risk of cardiovascular disease
*Total Cholesterol	180 mg/dL or lower is optimal

*Total Cholesterol = HDL + LDL + 20% of triglyceride level

only a small amount of saturated fat—it should make up no more than 5–6% of the total amount of food you eat each day.

- Trans fats are unsaturated fats that have been chemically processed to be solid at room temperature. Vegetable shortenings, margarines, crackers, cookies, and snack foods like potato chips often contain trans fats. You should limit this type of fat in your diet.
- Unsaturated fats tend to be liquid and come mostly from plants. Olive, canola, peanut, sunflower, and fish oils are all unsaturated fats. Most of the fat that you eat should be unsaturated fats.

A good way to reduce how much fat and sodium you eat is to eat fewer processed foods. Packaged cookies, chips, and other snack foods often have high levels of trans fat and saturated fat. Also, be wary of packaged foods that claim to be “low fat.” Often, low-fat packaged foods are high in sugar and salt to make them taste good. If you do eat processed foods, read food labels carefully.

If you need help with meal planning and making good food choices, many diet plans are available. You may want to explore the following resources:

- “MyPlate” at www.choosemyplate.gov
- DASH Eating Plan (Dietary Approaches to Stop Hypertension) at www.nhlbi.nih.gov/health/health-topics/topics/dash
- American Heart Association’s Diet and Lifestyle Recommendations at www.heart.org/HEARTORG/GettingHealthy/Diet-and-Lifestyle-Recommendations_UCM_305855_Article.jsp

You also can ask your health care professional for recommendations or see a nutrition professional to design an eating plan that works for you.

Exercise. Exercise can strengthen your heart and promote the health of your blood vessels. It helps boost your HDL levels and lower blood pressure levels, which

can reduce your risk of heart disease. It gives you more energy, helps you control your weight, and can help build and maintain strong bones. The Centers for Disease Control and Prevention recommends getting at least 150 minutes of exercise every week. You can divide the 150 minutes into 30-minute workouts on 5 days per week or into smaller 10-minute periods throughout each day. For example, you could go for three 10-minute walks each day.

Lose Weight. Weight loss is recommended if you are overweight or obese. Your health care professional may be able to recommend a diet and exercise program that can help you lose weight safely and effectively.

Quit Smoking. If you smoke, stop. Smoking is one of the biggest risk factors for heart disease. It decreases HDL levels and may increase the level of triglycerides in your blood. It also increases your risk of lung cancer. Stopping smoking is one of the most effective ways to decrease your risk of heart disease.

Cholesterol-Lowering Medications

The most common type of LDL-lowering drugs are called statins. These drugs cause the liver to make less cholesterol. In addition to lowering LDL levels, they also may help decrease the levels of triglycerides and increase levels of HDL.

Finally...

Having abnormal cholesterol levels is just one of the factors that can increase your risk of cardiovascular disease. Talk with your health care professional about your individual risk factors and when you should have your cholesterol levels measured. Decreasing your cardiovascular risk often involves making lifestyle changes, such as changing your diet, increasing your physical activity, and stopping smoking. Medications also may be recommended in certain cases.

Glossary

Atherosclerosis: Narrowing and clogging of the arteries by a buildup of plaque deposited in vessel walls; also called hardening of the arteries.

Bile: A substance made in the liver that helps digest fats.

Cardiovascular Disease: Disease of the heart and blood vessels.

Cells: The smallest units of a structure in the body; the building blocks for all parts of the body.

Cholesterol: A natural substance that serves as a building block for cells and hormones and helps to carry fat through the blood vessels for use or storage in other parts of the body.

Coronary Artery Disease: A disease in which the arteries that supply blood to the heart are narrowed by the buildup of cholesterol and other deposits in the walls of the arteries.

Diabetes Mellitus: A condition in which the levels of sugar in the blood are too high.

Estrogen: A female hormone produced in the ovaries.

Gestational Diabetes: Diabetes that arises during pregnancy.

Heart Attack: Damage to an area of heart muscle that occurs when its blood supply is interrupted. It almost always is caused by narrowing or blockage of the arteries in the heart.

Hormones: Substances made in the body by cells or organs that control the function of cells or organs. An example is estrogen, which controls the function of female reproductive organs.

Immune System: The body's natural defense system against foreign substances and invading organisms, such as bacteria that cause disease.

Lipoproteins: Substances that transport cholesterol to and from the liver throughout the blood.

Menopause: The time in a woman's life when menstruation stops; defined as the absence of menstrual periods for 1 year.

Metabolic Syndrome: A combination of factors, including elevated blood pressure, waist circumference of 35 inches or greater (in women), higher-than-normal blood glucose level, lower-than-normal levels of "good" cholesterol, and high levels of fats in the blood (triglycerides), that contribute to diabetes and heart disease.

Polycystic Ovary Syndrome: A condition characterized by two of the following three features: the presence many small fluid-filled sacs in the ovaries, irregular menstrual periods, and an increase in the levels of certain hormones.

Stroke: A sudden interruption of blood flow to all or part of the brain, caused by blockage or bursting of a blood vessel in the brain and often resulting in loss of consciousness and temporary or permanent paralysis.

Testosterone: A hormone produced by the testes in men and in smaller amounts by the ovaries and other tissues in women that is responsible for male sex characteristics such as hair growth, muscle development, and a lower voice.

Triglycerides: A form of body fat found in the blood and tissues. High levels are associated with cardiovascular disease.

This Patient Education Pamphlet was developed by the American College of Obstetricians and Gynecologists. Designed as an aid to patients, it sets forth current information and opinions on subjects related to women's health. The average readability level of the series, based on the Fry formula, is grade 6-8. The Suitability Assessment of Materials (SAM) instrument rates the pamphlets as "superior." To ensure the information is current and accurate, the pamphlets are reviewed every 18 months. The information in this pamphlet does not dictate an exclusive course of treatment or procedure to be followed and should not be construed as excluding other acceptable methods of practice. Variations, taking into account the needs of the individual patient, resources, and limitations unique to the institution or type of practice, may be appropriate.

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