

## Cholesterol &amp; Cardiovascular Health

**Is this the right time to be thinking about cardiovascular health?**

It's never too soon, or too late, to make lifestyle improvements that will protect your heart and blood vessels as you grow older.

**What is cardiovascular disease?**

Cardiovascular disease (CVD) is disease of the heart and blood vessels that can cause heart attack or stroke. CVD is the leading cause of death in the United States, cuts life expectancy by an estimated average of seven years, and accounts for millions of medical office, hospital, and emergency room visits in the US yearly.

One form of CVD is atherosclerosis. This narrowing or hardening of the arteries results from deposits of lipids (fats) in areas where minor damage has occurred in an artery wall. Atherosclerosis is an invisible process that often begins early in life, but can be partly reversible with improvement in cholesterol levels.

**Cholesterol's role**

A high blood level of lipids, particularly cholesterol, contributes to atherosclerosis over time. Known as hypercholesterolemia or hyperlipidemia, this risk factor is genetically influenced but also modifiable by lifestyle changes and/or medical treatment.

Cholesterol is a necessary constituent in cell membranes, hormones, and myelin.

It is synthesized by the liver and circulates in the blood in the form of lipoproteins, including LDL (low-density lipoprotein) and HDL (high-density lipoprotein). LDL cholesterol (sometimes known as "the bad") is the main source for arterial deposits, while HDL ("the good") transports cholesterol away from the arteries.

Cholesterol levels associated with increased risk for CVD are shown in the table below (mg/dl). Triglyceride (TG), fat in the blood, is also associated with increased risk.

	Desirable	Borderline	High Risk
<b>Cholesterol</b>	< 200	200—239	≥ 240
<b>LDL</b>	< 130	130—159	≥ 160
<b>HDL</b>	≥ 60		< 40
<b>TG</b>	< 150	150—199	≥ 200

**How does nutrition affect cholesterol levels?**

The greatest influence on blood lipid levels is saturated fat. Saturated fat blocks liver receptors that recognize cholesterol, which causes the liver to synthesize too much cholesterol. Several types of dietary fat affect blood cholesterol:

- **Saturated (sat) fat**, which is hard at room temperature, is found in many animal sources—beef, duck, lamb, veal, pork, and high-fat dairy products (whole milk, butter, cream, and cheese). Sat fat is also high in some vegetable sources—coconut, palm, and palm kernel oils (used in candy), and hydrogenated oils (margarine and fat used for deep-frying and baking).
- **Unsaturated fat** lowers cholesterol levels in the blood. Two types, polyunsaturated and monounsaturated, are found in liquid oils, most nuts, soybeans, and fish. Monounsaturated

fat (olive and canola oils) and fat from fish both lower LDL while maintaining beneficial HDL levels.

- **Trans fat** increases cholesterol levels in the blood. It is a byproduct of the hydrogenation process that turns liquid oil into solid fat. Food labels indicate the presence of trans fat, which is found in some margarines, baked goods, snack foods, and deep-fried products.
- **Cholesterol** in foods contributes to the total body pool of cholesterol. Cholesterol is found only in animal products (meat, poultry, fish, and dairy products), and is highest in egg yolks, caviar, and organ meat such as liver.

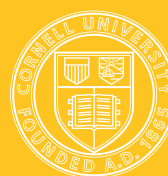
**How can I lower my cholesterol?**

The most important strategy is to decrease sat fat intake. The goal is to consume no more than 7% to 10% of energy (kcal) from sat fat, which would be 14 to 20 grams (g) in a total daily intake of 1800 kcal. Cholesterol intake from foods should average no more than 200-300 mg/day.

Food labels can help you identify saturated fat and cholesterol content. The percent Daily Value (%DV) listed on labels corresponds to 20g of sat fat and 300mg of cholesterol, but these are suggested upper limits and not minimums to strive for, as with other nutrients. It's wise to limit any foods that contain more than 3g of sat fat per serving, because your daily intake would add up quickly. For foods that are not labeled, try consulting the recipe, the cook, or a listing of food values. When information is not available, keep serving sizes small.

**Nutrition quick-start**

- **GO natural** with unprocessed plant-based foods, including vegetables, beans, fruits, whole grains, and a sprinkling of nuts and seeds. Increase your fiber intake gradually.
- **GO for** low-fat dairy products.
- **GO with** fish, chicken and turkey more often than other meats. Choose lean cuts of those meats and eat smaller amounts.



## Make "Heart-Healthy" Food Choices

	<b>Choose these</b>	<b>Limit these</b>
<b>Fruits, vegetables, nuts, and beans</b>	<p>Almost all are low in saturated fat and are good sources of fiber.</p> <p>Nuts (raw or dry roasted) are mostly low in sat fat but high in calories.</p> <p>Avocado is high in unsaturated fat.</p> <p>Low-fat coconut milk (check label and use in moderation).</p>	<p>Vegetables that are fried or in butter or cream sauce.</p> <p>Regular coconut milk (43g sat fat per cup).</p>
<b>Grains</b>	<p>Regular breads, crackers, pasta, rice, and other grains. Choose whole grains often.</p> <p>Low-fat baked desserts—see below.</p>	<p>High fat breads and crackers.</p> <p>Pasta and grains prepared with butter or cream sauce.</p> <p>Most baked desserts—see below.</p>
<b>Dairy products</b>	<p>Skim, non-fat, or 1% products—milk, yogurt, cottage cheese, ricotta cheese.</p> <p>Reduced-fat cheeses, ice cream, frozen yogurt, and dairy substitutes (check label).</p>	<p>Whole milk (5g sat fat per cup).</p> <p>Regular cheese (6g sat fat per oz).</p> <p>Butter (8g sat fat per tablespoon).</p> <p>Cream, half &amp; half, sour cream, cream cheese, and ice cream.</p> <p>Whipped toppings.</p>
<b>Eggs</b>	Egg whites.	Egg yolks (limit to a few per week).
<b>Poultry, fish, and other meat</b>	<p>Chicken and turkey (especially breast and drumstick)—naturally low in sat fat.</p> <p>Low fat lunch meats (such as turkey, lean roast beef and ham).</p> <p>Fish—try to include a serving several times weekly, as it contains beneficial polyunsaturated fat.</p> <p>Beef, pork, lamb—choose lean cuts, trim fat or drain fat when cooking.</p> <p>Goat and venison are low in sat fat.</p> <p>Reduced fat lunch meats.</p>	<p>High fat beef, pork, lamb.</p> <p>High fat lunch meats (such as bologna and corned beef).</p> <p>Duck and goose (high in sat fat).</p> <p>Liver, other organ meats, and caviar (high in cholesterol).</p>
<b>Fats and oils</b>	Liquid oils and margarine made with liquid oil as the first ingredient. Olive and canola oils are best—highest in monounsaturated fat.	Butter, lard, stick margarine, other hard shortening, coconut oil, palm oil, palm kernel oil, ghee.
<b>Desserts</b>	<p>Fruit.</p> <p>Sorbet, sherbet, ices, reduced fat ice cream, frozen yogurt.</p> <p>Low fat baked goods (check labels or bake with improved recipes).</p>	<p>Most baked goods, including cakes, croissants, cookies, scones, pies, and other pastry made with butter or other hard shortening.</p> <p>Ice cream, whipped toppings.</p> <p>Custard, mousse (made with cream).</p>
<b>Beverages</b>	<p>Water, seltzer.</p> <p>Skim or 1% milk.</p> <p>Juice (in moderation).</p> <p>Artificially sweetened drinks, including diet soda (in moderation).</p> <p>Coffee, tea (use only low-fat milk or non-dairy creamer).</p>	<p>Alcohol—may increase TG levels, raise blood pressure, and cause unwanted weight gain.</p> <p>Sweetened beverages—may raise TG levels and cause unwanted weight gain.</p> <p>Licorice root tea—may raise blood pressure.</p>

*The most important strategy is to decrease sat fat intake.*

- **GO creative**—use herbs, spices and lemon juice rather than butter and cream sauces.
- **GO for planning**—make a list of at least five healthy meals you can prepare or obtain in fewer than 30 minutes.
- **GOing out to eat?** If you go often, go for un-fried foods, with sauces, gravies, and salad dressings on the side. Ask about ingredients (especially butter, cheese, and cream) and request low-fat preparation when possible.
- **GO to the “Heart Healthy” chart** to assist in making choices about food.

### What else improves lipid levels?

- **Weight management and exercise** can help lower LDL and TG, and raise HDL. If TG levels are high, limit alcohol and sweets as well as sat fat.
- **Dietary fiber**, especially soluble fiber from oats, brown rice, barley, and beans, decreases cholesterol by increasing its excretion from the body. Psyllium (an ingredient in products such as Metamucil) and flaxseed are also high in fiber. Always increase dietary fiber gradually, to avoid digestive disturbance.
- **Various other food components** have potential value in lowering cholesterol, but may not be as effective or safe as soluble fiber. Some are described here, and information is available at the dietary supplements website listed below.

*Fish oil supplements* may improve blood lipid levels. However, these may contain toxic levels of mercury and other contaminants.

*Plant sterols* have cholesterol-lowering properties and are used as functional ingredients in certain foods such as margarine.

*Niacin* (nicotinic acid or vitamin B3) in high doses decreases cholesterol, but should be used under medical supervision due to potential side-effects.

*Garlic* may slightly reduce cholesterol and improve CVD risk.

*Other supplements*, such as ginseng, lecithin, cinnamon, and vitamin E, are *not* particularly effective in lowering cholesterol and/or CVD risk.

### What can worsen my lipid levels?

- **Certain illnesses and medications** can raise blood lipid levels. Some common examples include untreated hypothyroidism, uncontrolled diabetes, and Accutane treatment for acne.

- **Cigarette smoking** decreases beneficial HDL levels and increases CVD risk by raising blood pressure and impairing circulation.

### Know your cholesterol level

Cholesterol should be checked every five years, or more frequently if it's high or you have other risk factors. Keep track of your levels on a table such as the one below, while identifying and reducing sources of saturated fat in your regular food pattern. Dietary improvements can reduce lipid levels within a few weeks, but the improvements must be sustained to minimize risk of atherosclerosis. Medications to lower lipids are sometimes needed when dietary efforts are not sufficient and/or other CVD risk factors are present.

<b>Date</b>				
<b>Cholesterol</b>				
<b>LDL</b>				
<b>HDL</b>				
<b>TG</b>				
<b>Blood Pressure</b>				

### What more can be done to prevent cardiovascular disease?

The majority of heart disease could be prevented by managing three major risk factors influenced by lifestyle:

- cholesterol
- cigarette smoking
- high blood pressure (hypertension).

Cigarette smoking, hypertension, and other risk factors that can be improved by lifestyle are described briefly here.

- **Cigarette smoking:** In addition to its many other negative effects, tobacco smoke produces arterial damage that hastens atherosclerosis (i.e., hardening of the arteries). Resources to help with tobacco cessation, including location of “tobacco facts,” are listed at the end of this fact sheet.
- **High blood pressure:** Hypertension causes silent damage to blood vessels and raises the risk of heart disease and stroke. Medical monitoring is extremely important in managing hypertension. In addition, lifestyle strategies can help keep your blood pressure in check—these include regular moderate exercise (such

as walking), smoking cessation, weight management, low alcohol intake, and decreased salt intake.

- **Physical inactivity:** Regular, moderate-to-vigorous physical activity helps prevent heart disease and can help control blood cholesterol, diabetes, obesity, and blood pressure.
- **Overweight:** People with excess body fat are more likely to develop CVD, even with no other risk factors. Overweight can increase the heart's burden, raise blood pressure and cholesterol, and predispose susceptible individuals to Type 2 diabetes. Many people have difficulty losing weight, but losing as few as 10 pounds can lower CVD risk if you're overweight.
- **Diabetes mellitus:** Diabetes increases the risk of CVD, especially if blood sugar is not well controlled. About 75% of people with diabetes die of some form of heart or blood vessel disease. If you have diabetes, it's very important to work with a healthcare provider to manage it and any other risk factors for heart disease.
- **Alcohol:** Drinking too much or too often can raise blood pressure, cause heart failure or stroke, and contribute to high triglycerides, cancer, liver disease, and obesity. Moderate consumption of alcohol (one drink daily for women, two drinks for men) may slightly lower the risk of heart disease. However, it is not recommended that nondrinkers start, or that drinkers increase, alcohol consumption.
- **Stress:** Response to stress possibly contributes to development of CVD and can increase other established risk factors. For example, people under stress may overeat, start smoking or smoke more than they otherwise would.

Risk factors that *cannot* be modified include increased age and positive family history of CVD. With more than one risk factor, your overall risk for CVD is multiplied.

### Cholesterol screening at Gannett

Gannett's laboratory on Level 2 can perform either a simple cholesterol test or a lipid profile that includes cholesterol, HDL, LDL, TG, and glucose levels. An order for testing is needed from a Gannett or outside medical provider.

Blood is drawn in a fasting state. Refrain

from eating or drinking for 12-14 hours before the test (water is okay). Results are provided by a nurse, and a follow-up appointment is recommended if results are high. For further information or to discuss fees, walk in or call the lab at 255-6099.

## Further information

### 1. Cholesterol

- **Consult a registered dietitian** at Gannett or in your community for assistance with nutrition and CVD risk.
- **Visit a medical provider** or cardiologist for further CVD risk assessment and treatment.

- **Obtain information related to cholesterol from these organizations** with extensive print and online resources in English and other languages:

American Heart Association  
[www.americanheart.org](http://www.americanheart.org)  
phone 800 242-8721

National Heart Lung and Blood Institute [www.nhlbi.nih.gov/guidelines/cholesterol/](http://www.nhlbi.nih.gov/guidelines/cholesterol/)

Nutrient values (including sat fat) for specific foods and fast foods may be found in booklet form and at websites, including [www.ars.usda.gov/nutrientdata](http://www.ars.usda.gov/nutrientdata)

Information on food preparation without trans fat is offered by the New York City College of Technology Trans Fat Help Center [www.notransfatnyc.org](http://www.notransfatnyc.org)

Supplement information and fact sheets are available at <http://dietary-supplements.info.nih.gov/>

### 2. Tobacco

- **Gannett Health Services** medical providers can help with tobacco cessation strategies. For additional information and links see [www.gannett.cornell.edu/medical/tobaccoCessation/](http://www.gannett.cornell.edu/medical/tobaccoCessation/)
- **The Cornell University Wellness Program** offers FREE quit tobacco counseling. Call 607 255-3703 or see <http://wellness.cornell.edu/quitsmoking.html>
- **NYS Quitsite** provides assistance at NY State Smokers' Quitline 1-866-697-8487 (1-866-NYS-QUITS) and website: [www.nysmokefree.com/newweb/default.aspx](http://www.nysmokefree.com/newweb/default.aspx)

### 3. Hypertension

- **Gannett Health Services** nurses provide blood pressure monitoring, and medical staff can help with treating high blood pressure. Look for literature at Gannett or online at [www.gannett.cornell.edu/healthAtoZ/healthAdvice/highBloodPressure.html](http://www.gannett.cornell.edu/healthAtoZ/healthAdvice/highBloodPressure.html)
- **National Heart Lung and Blood Institute** has online resources including diet and treatment guidelines and ordering information for printed literature at [www.nhlbi.nih.gov/guidelines/hypertension/](http://www.nhlbi.nih.gov/guidelines/hypertension/)

**This nutrition information is provided by the Cornell Healthy Eating Program (CHEP) at Gannett Health Services. See hours and contact information below.**

#### Contact Us:

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We're open Mon–Sat, except for breaks.

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Check web for hours: [www.gannett.cornell.edu](http://www.gannett.cornell.edu)

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