



The Skinny on Fats and Cholesterol

Too much cholesterol in the blood is one of the top risk factors for heart disease (others include: being male, smoking, high blood pressure, diabetes, and lack of exercise). Total cholesterol levels should stay under 200 mg/dl, and if you have known cardiovascular disease, under 160 mg/dl!

Cholesterol and Vascular Disease

Most heart disease is caused by atherosclerosis, which occurs when cholesterol, fat, and other substances build up in the walls of the arteries that supply blood to the heart. These deposits, called plaque, narrow the arteries and can slow down or block the flow of blood. One of the most important functions of blood is to carry a constant supply of life-giving oxygen to the heart. Without oxygen, heart muscle tissues are damaged or destroyed, resulting in chest pain (angina), a heart attack (myocardial infarction), or even death. In the same manner, a buildup in the arteries supplying blood to the brain can cause a stroke.

Atherosclerosis is a slow progressive disease that starts very early in life yet might not show symptoms for many years. Recent research is beginning to show evidence that inflammation of the lining of our arteries (endothelial dysfunction) begins at a very early age, and is worsened by lifestyle factors like smoking, elevated blood sugars, and elevated blood pressure. The risk of elevated blood sugars that are not yet diagnostic of diabetes may explain why people newly diagnosed with diabetes already have damage to their blood vessels, eyes, and kidneys!!! Risk factors for elevated blood sugar are family history of diabetes, being overweight, not exercising regularly, and having elevated triglycerides, especially after eating! Have these checked at your next annual exam!!

Cholesterol education has resulted in a 20 percent drop in the consumption of fat since the mid 1970's. But heart disease prevention is more complex: Several types of fats influence cholesterol levels and they need to be minimized in the diet. Time to learn more.....

Cholesterol Explained

Cholesterol is a lipid. It is a soft, fat-like substance needed in small quantities for proper body function. It is found in all body tissues and is used to build cell membranes and is converted into various hormones. Cholesterol comes from two sources: 1) it is produced by the body, mainly in the liver, and 2) it is found in the food we eat - especially animal products such as meat, poultry, seafood, dairy products and eggs.

Blood Cholesterol Levels

To check your cholesterol, the doctor will order a blood sample and measure the lipids in milligrams per deciliter (mg/dl). A level above 200 mg/dl increases your risk for heart disease. If your blood cholesterol is in the High category, you have more than twice the risk of someone whose cholesterol is less than 200 mg/dl.

Unfortunately, total blood cholesterol does not give you the whole picture - **one out of every five heart attack victims has a total cholesterol level in the normal range!** To really determine your risk for heart disease, you need to have a lipid analysis to determine your bad (LDL), good (HDL), and triglyceride levels.

Lowering your high blood cholesterol level will slow fatty buildup in the walls of the arteries and reduce your risk of a heart attack. Long term, lowering your cholesterol will actually start to dissolve away any build-up of cholesterol in the blood vessels!! Factors that will influence blood cholesterol levels include eating a low-fat diet, replacing saturated fat with unsaturated fat, shedding pounds if you're overweight, exercising regularly, and stopping smoking. Read on for more information....

Good & Bad Cholesterol

Like other nutrients, cholesterol has to travel to the body's cells through the blood. Because it is not water soluble, it must be transported to organs by special carriers called lipoproteins. There are several kinds of these lipoproteins.

- **LDL** is the major cholesterol carrier in the blood. LDL cholesterol is referred to as "**bad**" because it slowly builds up in the walls of arteries. Together with other substances, LDL cholesterol can form plaque (a thick, hard deposit) that restricts the flow of blood (atherosclerosis) through the arteries. The LDL-cholesterol level greatly affects your risk of heart attack or stroke - it is a better predictor of heart attack or stroke risk than total blood cholesterol. When it comes to LDL-cholesterol levels, **the lower your level the lower your risk.**
- **HDL** carries about one-third to one-fourth of blood cholesterol. HDL cholesterol is referred to as "**good**" because it not only carries cholesterol away from the arteries and back to the liver where it is removed from the body, but it picks up the cholesterol dumped by LDL. **Having less than 35 mg/dl of HDL-cholesterol is considered a risk factor for heart disease** even when total cholesterol and LDL-cholesterol levels are normal. That is because you have less of this "good" cholesterol working in your system, and **the higher your HDL, the less likely you are to have heart disease!**

- **Triglycerides** circulate in the blood in small particles, and contain cholesterol, adding to the total cholesterol burden. These particles, called Very Low Density Lipoproteins (VLDL), may deposit themselves on the artery walls. In this way they do play a part in artery blockage and are linked to heart attacks and strokes. We get triglycerides primarily from the fat in our diet and luckily these lipids are much more responsive than cholesterol to lifestyle changes such as exercising and eating a low-fat diet. See our [triglyceride article](#) for more information.

Other Fats

Dietary cholesterol has only a modest impact on blood cholesterol levels for most of us because of the bodies' self-regulation mechanisms. The liver usually regulates itself to keep potentially harmful LDL-cholesterol from building up in the blood. When we eat foods high in cholesterol, the small intestine absorbs less of it and the liver reduces its production of cholesterol. Unfortunately, some of us called "cholesterol responders" have faulty cholesterol management systems and the blood cholesterol level becomes too high or is unbalanced.

Cholesterol has other "helpers" - the fats we eat. Fats and oils are mixtures of fatty acids and are classified as either: 1) **saturated** or 2) **unsaturated** depending on what type of fatty acid is predominant. Unsaturated fats are further broken down into: a) **monounsaturated** and b) **polyunsaturated** fats.

- **Saturated fats** have all the hydrogen the carbon atoms can hold. **The more saturated fatty acids** in a fat, **the harder it is at room temperature** and, in general, **the more damaging it is to your health**. They are found **mainly in foods from animals** such as meat, poultry, and whole-milk dairy products like cream, milk, ice cream, butter, lard, and cheese. Saturated fat is also found in some plant oils: coconut, palm kernel, and palm oils. **Saturated fats raise "bad" LDL cholesterol levels** far more than anything else we eat! Lowering blood cholesterol level through diet must include reduction of dietary saturated fat. Saturated fats are the major factor behind clogging of arteries!
- **Monounsaturated fats** are found in greatest amounts in plant-based foods: **olive**, peanut and **canola** oils. When substituted for saturated fat, monounsaturated fats **help lower LDL's while leaving HDL's unchanged**. Monounsaturated oils are liquid at room temperature but start to solidify when chilled. These are a big component of the **Mediterranean diet** connected with a lower incidence of heart disease!
- **Polyunsaturated fats** are also found in plant-based foods: safflower, sunflower, corn and soybean oils to name a few. When used instead of saturated fats, polyunsaturated fats tend to **lower LDL's but they lower HDL's as well**. Polyunsaturated oils are liquid at room temperature and in the refrigerator.

- **Trans Fatty Acids** are **bad actors** in the heart disease program – they are formed when unsaturated fatty acids are subjected to a man-made process called **hydrogenation**. This means to add a hydrogen molecule by heating the oil under pressure and bubbling hydrogen gas through it. This **changes the structure** of the unsaturated fatty acid molecules and **makes them similar to saturated fatty acids**. Partially hydrogenated soybean oil means that some portion of the unsaturated fatty acids in the oil have combined chemically with hydrogen to become more saturated.

Trans fats are used to make margarine or cooking fats like those often used in processed and fast foods because they allow foods to stay fresh longer on the shelf. This allows manufacturers to use cheaper grades of oil (improving profits) while giving foods a creamier consistency or by hardening oil so it can be molded into stick form or put in a can (*Crisco*). **Trans fatty acids increase the risk of heart disease** by raising blood levels of artery-clogging LDL cholesterol and triglycerides and lowering levels of good HDL cholesterol! They have been proven to have an inflammatory effect on the walls of your blood vessels making the build up of cholesterol worse and more rapid!

If you didn't hear me the first time - these are BAD ACTORS and are to be avoided at all costs in the diet!! In an on-going study of 80,000 nurses, researchers found that the chance of suffering a heart attack was 53 percent higher for the women who consumed the largest amounts of trans fats than for those consuming the least amount of them. **Avoid trans fatty acids** - use tub margarine sparingly if at all, and use olive or canola oils that are high in mono unsaturated fat instead of hydrogenated vegetable shortening. Avoid commercially prepared and processed foods, and for those you do buy, **read the labels carefully** and **avoid those with trans fatty acids (partially hydrogenated or, hydrogenated oils)** in them.

Everything in Moderation

Moderation is the key factor when it comes to fat intake, particularly since a diet high in fat often leads to being over weight, which has many negative effects on health, including an increased risk of heart disease, high blood pressure, and diabetes.

Cholesterol-rich foods are usually high in dietary fat, particularly saturated fat. There are some foods that contain lots of cholesterol but little saturated fat. These include egg yolks, shellfish such as shrimp and squid, liver and other organ meats. Eat them in moderation - It is wise to follow the current public

health recommendations: eat no more than three or four egg yolks per week, including those used in cooking, and only modest amounts of other animal foods.

Dietary Items to Increase

- **Fiber** from beans, oats, psyllium seed, and fruit pectin **lowers cholesterol levels** in most studies. Doctors of natural medicine often recommend that people with elevated cholesterol eat more of these high-fiber foods. However, even grain fiber (which does not lower cholesterol by itself) seems to help protect against heart disease. It makes sense to eat more of all types of fiber. [See our Fiber Article](#).
- **Soy protein reduces cholesterol.** The saponins in soy bind to cholesterol to limit its absorption in the intestine and soy's phytosterols also block the absorption of cholesterol. Isoflavones from soybeans may also have this effect. Tofu, tempeh, miso, and soy powders are derived from soybeans. [See our Soy Protein article](#).
- **Fish** contains little saturated fat, and **fish oil contains EPA and DHA, omega-3 fatty acids that protect against heart disease.** Omega-3 fatty acids, a form of polyunsaturated fat that is different from the omega-6 fatty acids found in most vegetable oils, lowers blood levels of triglyceride and very low-density lipoproteins (VLDL). In fact, eating fish may increase HDL cholesterol and is linked to a reduced risk of heart disease in most, but not all studies. and other fermented milk products lower cholesterol. Recent studies have shown a benefit to eating fish several times a week, especially fatty fish like salmon, mackerel, sardines, herring, and tuna. Fish oil capsules are the next best thing if you are not a fish fancier, but can have some side effects. The most common are fishy "burps", and fish oil can thin your blood at higher doses, though not as much as taking an aspirin a day.
- **B Vitamins** - High levels (several grams per day) of vitamin B3 in the form of niacin lowers cholesterol beautifully. Niacin at amounts as low as 50–100 mg. may cause flushing, headache, and stomachache in some people. Many people have trouble taking the higher doses (up to 2,000mg) needed to treat high cholesterol. Further, high doses of Niacin can cause liver toxicity, and these levels of niacin should only be taken under the supervision of your doctor who will follow your liver function tests. See more info on [Niacin](#). Vitamins B6, B12, and folic acid lower homocysteine, a substance linked to heart disease risk. Homocysteine may increase the rate at which LDL is oxidized or damaged, therefore, lowering homocysteine levels should further help protect against heart disease.
- **Garlic** - Many human studies have been done on garlic's ability to lower serum cholesterol levels. Some are positive and others are not. Persons with no aversion to the odor can chew **one whole clove of raw garlic daily**. The majority of the studies done used garlic tablets, yet I am skeptical about their ability to help – several testing agencies found no

garlic potency in some tested tablets. Use the real stuff – no pain, no gain! See our [Garlic article](#).

- **Policosanol** is an all-natural substance derived from the wax of sugar cane, or extracted from the wax of honey bees. It is helpful in reducing cholesterol levels in people with abnormally high cholesterol. In a six-month study, 10 mg per day of policosanol reduced total cholesterol by 16% and LDL cholesterol by 24%, and increased HDL cholesterol by 29%! I have had very good personal clinical experience with Policosanol in my practice! For more information, [see our Policosanol article](#).
- **Guggul**, the mixture of ketonic steroids from the gum oleoresin of the Commiphora mukul tree, is an approved treatment of hyperlipidemia in India. **Recent clinical studies question whether guggul is effective** in the treatment of high cholesterol (and may actually worsen it)! I personally have not seen the beneficial clinical response to abnormal lipids that previous studies suggested in my medical practice. Daily intakes of guggul are typically based on the amount of guggulsterones in the extract and most extracts contain 5–10% guggulsterones. The most frequently used amount of guggulsterones is 25 mg three times per day. See our [Gum Guggul article](#) for the latest **cautions**.

Dietary Items to Avoid

- Increased sugar consumption reduces HDL. It also increases triglycerides, a risk factor linked to heart disease. Decrease your dietary intake of sugar – it will also help you reduce your weight, which further helps improve your cholesterol status!
- Boiled or French press coffee increases cholesterol levels. Modern paper coffee filters apparently trap the offending oils and chemicals and keep them from entering the cup - paper filtered coffee does not increase cholesterol levels in most studies. However, paper filtered coffee appears to increase homocysteine—a risk factor for heart disease. The effects of decaffeinated coffee remain in debate.
- You may have heard that drinking one (for women or those over 65) or two (for men under 65) alcoholic beverages a day is linked to a lower incidence of heart disease in some studies. Rarely, if ever, should this be used as a method to help manage elevated cholesterol! Never start drinking alcohol for supposed health benefits without checking with your doctor first!

Alcohol can interact dangerously with certain medications, and it can worsen medical conditions such as liver disease, pancreatitis and high blood pressure to name a few. In addition, heavy drinkers are at increased risk of cancers of the oral cavity, larynx and esophagus, and as little as a drink or two a day places a woman at increased risk of breast cancer. Pregnant women and people with a personal or family history of alcoholism should never drink alcohol.

Antioxidants

Antioxidants are substances that are normally produced by the body to protect itself and are also found in various substances in nature. The oxidation process is familiar: it causes metal to rust, fruit to turn brown and oils to go rancid. In our body oxidation can severely damage cells allowing diseases to get a foothold. Antioxidants protect cells from oxidation by neutralizing other substances produced by the body in its normal daily functions - free radicals. Free radicals are destructive to body tissues when they are not properly broken down. Things like cigarette smoke and polluted air also increase the free radical concentration in the body, and this is how they produce their health harming effects!

A study at the University of Maryland Medical center found that large doses of two antioxidants, vitamin C and E, may decrease the heart-disease risk posed by a high-fat diet. In the study published in the Journal of the American Medical Association, 20 subjects ate a meal of Egg McMuffins and Sausage McMuffins with slabs of fried hash browns on two separate occasions. The first time, they ate the fat-packed breakfast they had impaired blood vessel function for up to four hours afterward. But no such impairment was found on the second occasion, when they swallowed 20 times the recommended daily dosage of vitamins C and E immediately before eating the same meal.

While this was a small preliminary study and researchers have yet to determine whether there are any long-term benefits, vitamin supplementation is an inexpensive way to help prevent disease causing processes! It is always wise to eat foods high in these vitamins - this will automatically help you to avoid a high-fat diet. Vitamin C is found in green and red peppers, collard greens, broccoli, spinach, tomatoes, potatoes, strawberries, oranges and other citrus fruits. Vitamin E is found in vegetable oils, nuts, wheat germ and green leafy vegetables.) See more [Vitamin E](#) information.

Your Job:

- If you are a healthy adult over 20, **test your blood cholesterol levels** at least once every five years. If your family has a history of heart disease this should be done more often!
- **Moderate your egg intake.** One egg yolk has about 213 milligrams of cholesterol. Egg whites, on the other hand, have no cholesterol or fat and are a great source of protein. You can substitute two egg whites for each egg yolk in many recipes that call for eggs.
- **Limit your total fat intake** to less than 30 percent of calories, with less than 10 percent coming from saturated fats. Eat more fruits, vegetables, whole grains fish, and poultry without skin instead of meats and baked goods. Use low-fat or skim milk dairy products instead of whole milk.
- **Stop Smoking!!** Smoking is linked to a lowered level of HDL – your heart protective "good" cholesterol. Smoking actually damages and inflames the

- linings of the blood vessels and makes them more likely to have build-up of cholesterol plaque that can lead to a heart attack or stroke! A double threat if your cholesterol is abnormal!
- **Lose weight!** Obesity increases the risk of heart disease in part because weight gain lowers HDL. Weight loss increases HDL and reduces triglycerides – get to your ideal body weight!
 - **Exercise regularly** - this increases HDL, an effect that occurs even from walking! Exercisers have a lower risk of heart disease. However, if you are over forty years of age or already suspect or know that you have heart disease talk with your doctor before starting an exercise program. Overdoing exercise can actually trigger a heart attack if you have heart disease.
 - **Reduce stress** and learn to overcome feelings of anger or hostility to reduce the risk of heart disease. The combination of feelings of anger or hostility, stress, and time urgency is called type A behavior. Men (but apparently not women) with these traits are at high risk for heart disease in most, but not all, studies.⁶³ Stress or Type A behavior may even elevate cholesterol in men!

Cholesterol Reduction Cautions

Perhaps you can lower your total cholesterol too much?? Studies suggest that while people with low cholesterol (less than 160 mg/dl) are at less of a risk for coronary heart disease, they are apparently more likely to die from non-cardiac causes, like stroke. What's more, people with high blood cholesterol who lower it with medications sometimes have a higher rate of non-cardiac or non-heart related deaths. The message – do it without medication if possible!

Cholesterol is not a matter of the lower the better. If you have normal cholesterol levels (between 160 and 200 mg/dl) you shouldn't get over-zealous and try to drive it down even further in the hopes of improving your heart health.

If your doctor has suggested that you lower your cholesterol levels, unless you have pre-existing heart disease, don't rush to take cholesterol-lowering drugs as an "easy fix". Start with regular exercise, eating a low-fat diet, smoking cessation, and nutritional supplementation with soy and fiber, and if necessary after these life-style changes, add some Policosanol or "no flush" niacin.

Your last resort should be prescription cholesterol lowering medications. Only if a vigorous effort on your part to do things naturally doesn't work, or you have an inherited cholesterol problem, should you consider prescription medication!