Cholesterol

Family Health Center
606 N Third Avenue Suite #101 - Sandpoint, Idaho 83864 - Phone (208) 263-1435 - www.fhcsandpoint.com

What is it?

Cholesterol is a type of fat made by your liver. Some cholesterol comes from the food you eat. Animal foods - such as eggs, meat, and dairy products - have cholesterol in them. Foods that come from plants don't have cholesterol. And it's not just the cholesterol in foods that counts. Foods high in saturated fat can also raise your cholesterol level, because your liver turns saturated fat into cholesterol.

Fat has more than twice the calories of carbohydrate or protein. Also your body easily uses calories from the fat you eat to make body fat, compared with calories from carbohydrates and proteins. Fat in your diet may also confuse your appetite, not letting it tell you when you're full.

Normal cholesterol is essential for a number of vital functions. It is an ingredient of cell membranes and is used by the body in the production of bile and sex hormones. Excess cholesterol however can be harmful.

Because cholesterol and saturated fat do not mix with blood, which is mostly water, the cholesterol must be carried in the blood stream by different types of packages called *lipoproteins*, which are manufactured by the liver. *Low density lipoproteins* (LDL) deliver cholesterol to the body, and *high density lipoproteins* (HDL) remove cholesterol from the blood stream. Too much LDL cholesterol is bad for the body because it builds up in the arteries, while the HDL form is good because it helps remove cholesterol from the blood stream. It's the balance between the different forms of cholesterol which tells you what your cholesterol level means.

Why is cholesterol unhealthy?

Some cholesterol is needed for good health. Too much cholesterol can raise your risk of having a heart attack or stroke. The extra cholesterol may be stored in your arteries (large blood vessels) and cause them to become *atherosclerotic* (lined with hard waxy deposits).

Large deposits of cholesterol can completely block an artery. If an artery that supplies blood to your heart becomes blocked, a heart attack occurs. If an artery that supplies blood to your brain becomes blocked, a stroke occurs.

Cholesterol guidelines

Total Cholesterol

- Less than **200** is best. Have your level checked every 5 years.
- Between **200 - 239** is borderline high. If you don't have any other risk factors for heart disease, your doctor may suggest you watch what you eat and recheck the level every 1 - 2 years. If you have other risk factors, your doctor may want to find out what your HDL and LDL cholesterol levels are before making suggestions.
- Above **240** means you're at increased risk for heart disease. Your doctor may want to measure your HDL and LDL cholesterol level before suggesting what to do.

LDL Cholesterol ("Bad" cholesterol)

- LDL cholesterol under **130** is best.
- LDL cholesterol of **130 - 159** is borderline high.
- An LDL cholesterol level of **160** or more means you are at higher risk for heart disease.

HDL Cholesterol ("Good" cholesterol)

- An HDL cholesterol level of less than **40** for men or **50** for women means that you are at increased risk for heart disease, even if your total cholesterol is less than 200.

Total Cholesterol/HDL Cholesterol ratio

- A ratio greater than **5.0** for men or **4.0** for women mean an increased risk. This ratio is the best single predictor of heart disease.

Who gets it?

The typical American diet provides 6 - 8 tablespoons of fat per day - many times what is required to maintain health. Since Americans tend to eat large quantities of red meat and dairy products, much of this fat is high in cholesterol. Thus a diet that is high in saturated fat raises cholesterol where as polyunsaturated fat lowers cholesterol.

Age is also an important factor - total cholesterol increases on the average 1% per year during adulthood.

Men tend to have a higher total cholesterol level than women up until age 50. In addition women tend to carry a higher proportion of beneficial HDL cholesterol.

There are some genetic factors which influence cholesterol levels. However, the clearly identifiable inherited cholesterol disorders account for only about 5% of patients with increased cholesterol.

What are the symptoms?

There are no symptoms of increased cholesterol levels with the exception of extremely high levels which can cause *pancreatitis*. That is why it is so important to have your cholesterol checked on a regular basis. You should start having your cholesterol tested by the time you are 35 years old. In general, cholesterol levels should be monitored about every 5 years. How often you have your cholesterol level checked depends upon what your cholesterol level is and what other risk factors for heart disease you have. Children and young adults with a family history of heart disease before age 50 or a family history of very high cholesterol should also have their cholesterol levels measured.

How do you prevent it?

You can do a number of things to improve your cholesterol level.

Eat more of these	**Eat less of these**
- Fish, poultry, lean beef	- Sausage, organ meat
- Skim or 1% milk	- Whole or 2% milk
- Sherbet, sorbet, ice milk	- Ice cream
- Egg whites	- Egg yokes
- Steamed vegetables	- Fried vegetables
- Baked potatoes	- French fries
- Clear soups	- Cream soups
- Unsaturated vegetable oils: corn, canola, sunflower, sesame, olive, soybean	- Saturated oils: coconut, palm oil lard and bacon fat
- Angel food cake	- Cheesecake
- Graham crackers, animal crackers, fig bars, wafers	- Pastries, donuts, croissants
- Pretzels, popcorn, bagels, English muffins	- Potato chips, breads made with egg yolks
- Pancakes, cereal	- Eggs and bacon

Total cholesterol intake should be no more than 300 mg/day (one large egg yolk contains 215 mg). Total fat intake should be less than 30% of all calories, saturated fat less than 10%.

Eating healthy can help lower your LDL cholesterol, and may protect the body from the damaging effects of cholesterol. You can raise your HDL cholesterol level by quitting smoking if you smoke, losing weight if you're overweight, and exercising if you're inactive.

Following a healthy diet almost always lowers cholesterol levels. This may be easier than you think. It mostly takes a bit of common sense and a real interest in improving your health. You don't have to quit eating your favorite foods, although you might need to eat them less often or replace them with healthier choices. Interestingly, a recent study demonstrated that eating one clove of garlic per day reduces cholesterol by 9%.

Can it be treated?

Yes - and there is proven benefit. In fact, lowering your cholesterol 1% lowers heart disease by 2%. If healthy eating, exercising and other changes (such as stopping smoking) don't work after about 6 months, your family doctor may want to discuss using medicine, especially if you already have heart disease or are at very high risk of heart disease death. This is a lifelong treatment so it should be started only if healthy habits don't work and you are clearly at risk. Medication is intended to work along with diet and exercise - not in place of them.

Are there complications?

Elevated cholesterol is a major risk factor for coronary artery disease, heart attacks and stroke. Unfortunately, the effects of cholesterol build up slowly over time so most people may not realize it until they have already suffered one of the complications.

In summary

- Your cholesterol should be checked beginning at age 35 - then about every 5 years.
- The total cholesterol/HDL cholesterol ratio is the best single predictor of heart disease risk.
- Following a healthy diet almost always lowers cholesterol.
- For more information, contact the National Cholesterol Education Program at www.nhlbi.nih.gov/about/ncep.

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