



Diabetes  
New Zealand

# Cholesterol and blood lipids explained

Blood lipids are the fatty substances in the blood including cholesterol, HDL cholesterol, LDL cholesterol and triglycerides. Hypercholesterolemia is the term for high levels of blood cholesterol.

Cholesterol can be good or bad, so it's important to know what cholesterol is, how it affects your health and how to manage your blood cholesterol levels.

Understanding the facts about cholesterol will help you take better care of your heart and body, reducing your risk of heart attack and stroke.

## Cholesterol

Cholesterol is a soft waxy substance your body uses to protect nerves, make cell tissues and produce certain hormones. Cholesterol plays a vital role in how every cell wall throughout the body works.

You get cholesterol in two ways. Your body makes some of it, and the rest comes from food. Food containing saturated fats causes the body to make more cholesterol.

Cholesterol and other fats can't dissolve in the blood. They have to be transported to and from the cells by special carriers called lipoproteins.

## Low-density lipoprotein

Low-density lipoprotein (LDL) is known as the 'bad' cholesterol.

Your LDL cholesterol level greatly affects your risk of heart attack and stroke. The lower your LDL cholesterol is, the lower your risk.

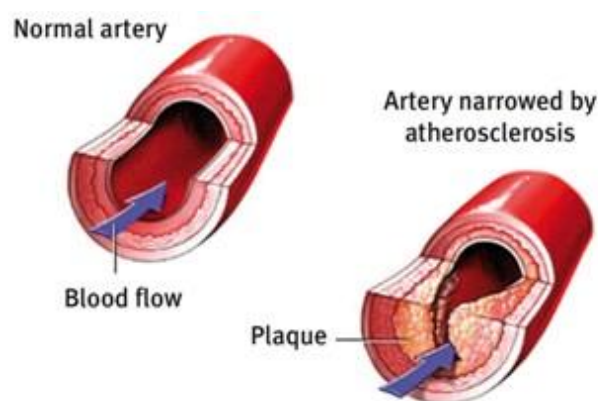
When too much LDL cholesterol circulates in the blood, it can slowly build up in the inner walls of the arteries forming atherosclerosis.

When you have diabetes, LDL cholesterol is often smaller and denser than normal and this can be especially dangerous to artery walls.

## Atherosclerosis

Build-up of cholesterol (plaque) in your arteries causes your arteries to narrow. This is called atherosclerosis.

Large deposits of cholesterol can completely block an artery, so the blood can't flow through. If a clot forms and blocks a narrowed artery, it can cause a heart attack or stroke.



## High-density lipoprotein

High-density lipoprotein (HDL) is known as the 'good' cholesterol. Your body makes HDL cholesterol for your protection. HDL carries cholesterol away from your arteries. Having a high level of HDL cholesterol reduces your risk of heart attack.

HDL cholesterol levels are often lower than normal in people with diabetes. This means that less LDL cholesterol can be cleared from the blood, increasing the risk of artery damage.

As a rule, women have higher HDL cholesterol levels than men. The female hormone oestrogen tends to raise HDL cholesterol, which may help explain why pre-menopausal women are usually protected from developing heart disease until after menopause.

## Triglyceride

Triglyceride is another type of 'bad' fat. If you have high levels of both triglycerides and blood cholesterol, you run a greater risk of coronary heart disease. The risk is particularly high if you also have a high level of LDL cholesterol and a low level of HDL cholesterol.

HDL helps to take triglycerides out of the blood but high levels of triglycerides prevent HDL from working effectively.

High triglycerides are often found in people with diabetes. Too much carbohydrate can raise triglycerides in some people and lower HDL cholesterol so careful monitoring of your blood glucose level is important.

## Measuring cholesterol

The most common measurement is total blood cholesterol. The cholesterol ratio is obtained by dividing the HDL cholesterol level into the total cholesterol.

Measuring your blood lipids level involves a simple blood test at a laboratory. It is best not to eat for 12 hours before your test. This is called a fasting blood test. Talk to your doctor about having a test.

### Lipid targets for people with diabetes

Lipids	Goal
Total cholesterol	Less than 4 mmol/L
LDL cholesterol	Less than 2.5 mmol/L
HDL cholesterol	Greater than 1 mmol/L
Total cholesterol / HDL ratio	Less than 4.5
Triglycerides	Less than 1.7 mmol/L

## The National Heart Foundation of New Zealand Facts

A 1 mmol/L reduction in LDL cholesterol leads to a 30-35% reduction in coronary heart disease and stroke

In 1997, 23% of New Zealanders had a total cholesterol greater than 6.5 mmol/L.

For more heart health information visit [www.heartfoundation.org.nz](http://www.heartfoundation.org.nz)

## Reduce your risk

If a blood vessel that supplies blood to the muscles in your heart (coronary artery) becomes blocked, you may have a heart attack.

If an artery that supplies blood to your brain becomes blocked, you may have a stroke.

By following a healthy lifestyle to manage your diabetes, you will also reduce your risk of having a heart attack or stroke.

To reduce your risk:

- Know your cholesterol levels and reach the desirable targets
- Control your blood pressure
- Achieve optimum blood glucose control
- Follow the Heart Foundation's nine steps to eating for a healthy heart
- Control your weight
- Do regular physical activity
- Be smoke free
- Follow your healthcare professional's recommendations.

## The Heart Foundation's nine steps to eating for a healthy heart

1. Enjoy three meals a day, selecting from dishes that encourage you to eat plant foods and fish, with little or no dairy fat, meat fat or deep fried foods
2. Choose fruits and/or vegetables at every meal and most snacks
3. Select whole grains, wholegrain breads, or high fibre breakfast cereals in place of white bread and low fibre varieties at most meals and snacks
4. Include fish, or dried peas, beans and soy products, or a small serving of lean meat or skinned poultry, at one or two meals each day
5. Choose low fat milk, low fat milk products, soy or legume products every day
6. Use small amounts of oil, margarine, nuts or seeds
7. Drink plenty of fluids each day, particularly water, and limit sweetened drinks and alcohol
8. Use only small amounts of total fats and oils, sugar and salt when cooking and preparing meals, snacks, or drinks. Choose ready-prepared foods low in these ingredients.
9. Mostly avoid or rarely include butter, deep-fried and fatty foods, and only occasionally choose sweet bakery products.

Source: The National Heart Foundation of New Zealand