

## Cholesterol

Cholesterol is a type of fat that is part of all animal cells. It is essential for many of the body's metabolic processes, including the production of hormones, bile and vitamin D. However, there's no need to eat foods high in cholesterol. The body is very good at making its own cholesterol – you don't need to help it along.

### Cholesterol is important

Cholesterol is produced by the liver and also made by most cells in the body. It is carried around in the blood by little 'couriers' called lipoproteins. We need a small amount of blood cholesterol because the body uses it to:

- build the structure of cell membranes
- make hormones like oestrogen, testosterone and adrenal hormones
- help your metabolism work efficiently, for example, cholesterol is essential for your body to produce vitamin D
- produce bile acids, which help the body digest fat and absorb important nutrients.

### How cholesterol moves around the body

Cholesterol is a white, insoluble and waxy substance. It is carried around the body by two key transport systems in the blood, which include:

- Low-density lipoprotein (LDL) cholesterol – carries most of the cholesterol that is delivered to cells. It is called the 'bad' cholesterol because when its level in the bloodstream is high, it can clog up your arteries.
- High-density lipoprotein (HDL) cholesterol – is called the 'good' cholesterol, because it helps remove excess cholesterol out of the cells, including cells in the arteries.

### Safe blood cholesterol levels

Health authorities recommend that cholesterol levels should be no higher than 5.5 mmol per litre if there are no other risk factors present. If there are other cardiovascular risk factors such as smoking and high blood pressure or pre-existing cardiovascular (heart) disease, then the aim for the LDL levels would be less than 2 mmol/l. Approximately half of all adult Australians have a blood cholesterol level above 5 mmol/l. This makes high blood cholesterol a major health concern in Australia.

### Effects of high cholesterol levels

The liver is the main processing centre for cholesterol and dietary fat. When we eat animal fats, the liver transports the fat, together with cholesterol in the form of lipoproteins, into our bloodstream.

Too much cholesterol circulating within LDL in our bloodstream leads to fatty deposits developing in the arteries. This causes the vessels to narrow and they can eventually become blocked. This can lead to heart disease and stroke.

### You do not need cholesterol in your diet

You don't need to eat foods that contain cholesterol. Your body can produce all the cholesterol it needs. High-cholesterol foods are often foods that are also high in saturated fats. These foods should be limited in a healthy diet.

## Foods that contain cholesterol

The cholesterol in your diet comes mainly from eggs and from animal products that are rich in fat such as meats and full fat dairy foods. All foods from animals contain some cholesterol. Foods from plants do not contain cholesterol.

## How to avoid saturated fats

The best way to have healthy levels of cholesterol in your diet is to limit foods high in saturated fats. Try to avoid:

- fatty meats
- processed meats like salami and sausages
- snack foods like chips
- most takeaway foods, especially deep-fried foods
- cakes, biscuits and pastries.

## Dietary tips to avoid cholesterol

The most important thing you can do to reduce your cholesterol level is to maintain a healthy lifestyle. You should try to:

- Increase the amount and variety of fresh fruit, vegetables and wholegrain foods you have each day.
- Choose low or reduced-fat milk, yoghurt and other dairy products or have 'added calcium' soy drinks.
- Choose lean meat (meat trimmed of fat or labelled as 'heart smart').
- Limit fatty meats, including sausages and salami, and choose leaner sandwich meats like turkey breast or cooked lean chicken.
- Have fish (fresh or canned) at least twice a week.
- Replace butter and dairy blends with polyunsaturated margarines.
- Include foods in your diet that are rich in soluble fibre and healthy fats, such as nuts, legumes and seeds.
- Limit cheese and ice cream to twice a week.

Other 'storage' fats that are transported in blood lipoproteins include triglycerides. When present in high concentrations in the blood, this fat is also a risk for heart attack. Some foods will affect the cholesterol level or the triglyceride level and some will affect both.

## Don't cut out all dairy foods

Some people believe that cutting out dairy foods altogether is the safest option, but this isn't true. Dairy foods are an important part of your daily diet and contribute many essential nutrients, especially calcium. Vegans, however, can obtain calcium from many other sources including soy milk.

## You don't need to avoid eggs and seafood

Some foods are high in cholesterol but are fine to eat in moderation, as long as your overall diet is low in saturated fats. For example:

- Egg yolks – a single egg yolk contains 200–250 mg of cholesterol, which is almost the uppermost recommended daily intake (300 mg). However, reducing egg intake is probably not important for healthy people with normal blood cholesterol levels.
- Seafood – prawns and seafood contain some cholesterol, but they are low in saturated fat and also contain healthy omega-3 fatty acids. Seafood is a healthy food and should not be avoided just because it contains cholesterol. However, avoid fried and battered seafood.

## Foods that may lower cholesterol levels

LDL cholesterol can be lowered by polyunsaturated oil (for example, sunflower or safflower oil). Eating oats and legumes can lower LDL cholesterol by five per cent. Food components like saponins (found in chickpeas, alfalfa sprouts and other foods) and sulphur compounds (like allicin – found in garlic and onions) may also have a positive effect in lowering cholesterol levels.

## **Plant sterols can lower cholesterol levels**

Plant sterols are found naturally in plant foods including sunflower and canola seeds, vegetable oils and (in smaller amounts) in nuts, legumes, cereals, fruit and vegetables. Some margarine and milks have concentrated plant sterols added to them. Margarine enriched with plant sterols lower LDL cholesterol in most people if the correct amount is eaten (25g/day)

## **Lifestyle tips to cut cholesterol**

Changing some of your lifestyle habits may also help to reduce your cholesterol and triglyceride levels. Suggestions include:

- Cease alcohol consumption or reduce your alcohol intake to no more than one or two drinks a day. Avoid binge drinking. This may help lower your triglyceride levels.
- Don't smoke. Smoking increases the ability of LDL cholesterol to get into artery cells and cause damage.
- Exercise regularly (for example, at least 30 minutes of brisk walking daily). Exercise increases HDL levels while reducing LDL and triglyceride levels in the body.
- Lose any excess body fat. Being overweight may contribute to raised blood triglyceride and LDL levels.
- Control your blood sugar levels if you have diabetes. High blood sugars are linked to an increased risk of atherosclerosis ('hardening of the arteries'), heart attacks and strokes.

## **Medication may be needed**

For some people, diet and lifestyle changes are not enough. High blood cholesterol levels often have a genetic component. Some people inherit altered genes that cause high cholesterol and this cannot usually be changed sufficiently by lifestyle or diet.

If you are at risk of coronary heart disease and your LDL cholesterol level doesn't drop after scrupulous attention to diet, your doctor may recommend medications to force your blood LDL levels down. Cell cholesterol levels, however, remain normal, so lowering blood cholesterol has no effect on most cell metabolic processes.

Some people get muscle aches from statins, which are the most commonly used medication to lower blood cholesterol. However, diet and exercise will still be important, even if you are taking medication. Your doctor may also refer you to a specialist who treats cardiovascular disease.

## **Where to get help**

- Your doctor
- Dietitians Association of Australia Tel. 1800 812 942
- National Heart Foundation HeartLine Tel. 1300 36 27 87

## **Things to remember**

- Cholesterol is a fatty substance essential to many metabolic processes.
- Your body needs cholesterol, but it can make its own – you don't need to consume cholesterol in your diet.
- High levels of LDL cholesterol in the blood have been linked to coronary heart disease. Foods high in saturated fats tend to boost LDL cholesterol.

**This page has been produced in consultation with, and approved by:**

Baker IDI Heart and Diabetes Institute

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