

# Catherine Street Medical Centre

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## WHAT IS CHOLESTEROL??

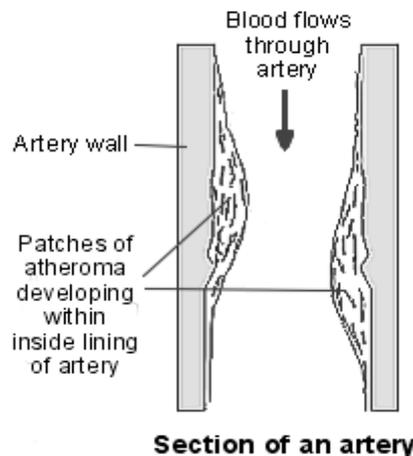
Cholesterol is a fat chemical (lipid) that is made in the cells in your body. Many different cells make cholesterol but cells in the liver make about a quarter of the total. You need some cholesterol to keep healthy.

Cholesterol is carried in the blood by particles called lipoproteins. When low-density lipoproteins (**LDL cholesterol**) carry cholesterol this is referred to as 'bad' cholesterol. Higher levels of LDL cholesterol in your blood cause an increased risk of cardiovascular disease.

However, some cholesterol in your blood is carried by high-density lipoproteins (**HDL cholesterol**). HDL cholesterol can be thought of as 'good' cholesterol and higher levels help to prevent cardiovascular disease.

**Other factors that can reduce your risk of cardiovascular disease include not smoking, choosing healthy foods, a low salt intake, regular physical activity, keeping your weight and waist size down and drinking alcohol in moderation if at all. Ensuring your blood pressure level is not raised (or taking medication to lower it if it is high) is also important.**

### What are atheroma and cardiovascular diseases?



**Patches of atheroma** are like small fatty lumps that develop within the inside lining of blood vessels (arteries). Atheroma is also known as atherosclerosis and hardening of the arteries. Patches of atheroma are often called plaques of atheroma.

Over months or years, patches of atheroma can become larger and thicker. So in time, a patch of atheroma can make an artery narrower. This can reduce the blood flow through the artery. For example, narrowing of the heart (coronary) arteries with atheroma is the cause of angina.

Sometimes, a blood clot (thrombosis) forms over a patch of atheroma and completely blocks the blood flow. Depending on the artery affected, this can cause a heart attack, a stroke, or other serious problems.

Cardiovascular diseases are diseases of the heart (cardiac muscle) or blood vessels (vasculature). However, in practice, when doctors use the term cardiovascular disease they usually mean diseases of the heart or blood vessels that are caused by atheroma.

In summary, cardiovascular diseases caused by atheroma include **angina, heart attack, stroke, transient ischaemic attack (TIA)** and **peripheral arterial disease**.

## **What factors affect the blood level of cholesterol?**

To an extent your blood cholesterol level can vary depending on your diet. However, different people who eat the same diet can have different blood cholesterol levels. In general, however, if you eat less fatty food in your diet your cholesterol level is likely to go down.

In some people a high cholesterol level is due to another condition. For example, an underactive thyroid gland, obesity, drinking a lot of alcohol and some rare kidney and liver disorders can raise the cholesterol level.

In some people a very high level of cholesterol runs in the family, due to a genetic problem with the way cholesterol is made by the cells in your body. One example is called familial hypercholesterolemia.

## **Risk factors:**

Everybody has some risk of developing small fatty lumps (atheroma) within the inside lining of blood vessels, which then may cause one or more cardiovascular diseases. However, some situations increase the risk. These include:

- **Lifestyle risk factors that can be prevented or changed:**

- Smoking.
- Lack of physical activity (a sedentary lifestyle).
- Obesity.
- An unhealthy diet - including eating too much salt.
- Excess alcohol.

### **Treatable or partly treatable risk factors:**

- High blood pressure (hypertension).
- High cholesterol blood level. However, only LDL cholesterol is a risk factor. HDL cholesterol is healthy for your body.
- High triglyceride (another type of fat) blood level.
- Diabetes.
- Kidney diseases that affect kidney function.

### **Fixed risk factors - ones that you cannot alter**

- A strong family history. This means if you have a father or brother who developed heart disease or a stroke before they were 55, or in a mother or sister before they were 65.
- Being male.
- An early menopause in women.
- Age. You are more likely to develop atheroma as you get older.
- Ethnic group. For example, people who live in Ireland and whose family came from India, Pakistan, Bangladesh or Sri Lanka have an increased risk.

However, if you have a fixed risk factor, you may want to make extra effort to tackle any lifestyle risk factors that can be changed.

**Note:** If you have two or more risk factors, your health risk is much more increased than if you just have one. For example, a middle-aged male smoker who has high blood pressure and a high cholesterol level has a high risk of developing a cardiovascular disease, such as a heart attack, before the age of 60.

## **Cholesterol blood levels**

Cholesterol blood levels are very important but must be considered in an overall assessment of your risk of cardiovascular disease. The following blood cholesterol levels are generally regarded as desirable:

- **Total cholesterol (TChol) - 5.0 mmol/L or less.**
- **LDL cholesterol after an overnight fast: 3.0 mmol/L or less.**
- **HDL cholesterol: 1.2 mmol/L or more.**
- **TChol/HDL ratio: 4.5 or less. That is, your Total Cholesterol divided by your HDL cholesterol. So the more HDL the better !**

As a rule, the higher the LDL cholesterol level, the greater the risk to health. A blood test only measuring total cholesterol may be misleading. A high total cholesterol may be caused by a high HDL cholesterol level and is therefore healthy. It is very important to know the separate LDL cholesterol and HDL cholesterol levels.

Your level of LDL cholesterol has to be viewed as part of your overall cardiovascular health risk. The cardiovascular health risk from any given level of LDL cholesterol can vary, depending on the level of your HDL cholesterol and on any other health risk factors that you may have. Therefore, a cardiovascular risk assessment considers all your risk factors together.

## **Calculating your cardiovascular health risk**

A risk factor calculator is commonly used by doctors and nurses. [This can assess your cardiovascular health risk](#). A score is calculated which takes into account all your risk factors such as age, sex, smoking status, blood pressure, cholesterol level, etc.

The calculator has been devised after a lot of research that monitored thousands of people over a number of years. The score gives a fairly accurate indication of your risk of developing a cardiovascular disease over the following 10 years. If you want to know your score, see your practice nurse or GP. You are said to have a:

- **High risk - if your score is 20% or more. That is a 2 in 10 chance or more of developing a cardiovascular disease within the following 10 years.**
- **Moderate risk - if your score is 10-20%. That is between a 1 in 10 and 2 in 10 chance.**
- **Low risk - if your score is less than 10%. That is less than a 1 in 10 chance.**

## Who should be treated to reduce their cardiovascular health risk?

Treatment to reduce the risk of developing a cardiovascular disease is usually offered to people with a moderate or high risk. That is:

- People with a risk assessment score of 10-20% or more. That is, if you have a 1 or 2 in 10 chance or more of developing a cardiovascular disease within the following 10 years.
- People with an existing cardiovascular disease (to lower the chance of it getting worse, or of developing a further disease).
- People with diabetes. If you have diabetes, the time that treatment is started to reduce cardiovascular risk depends on factors such as:
  - Your age.
  - How long you have had diabetes.
  - Your blood pressure.
  - If you have any complications of diabetes.
- People with certain kidney disorders.

The following people should also have medication to lower their cholesterol level, *regardless* of any calculated risk. The risk calculator may not necessarily take into account these people, who have a high risk of developing small fatty lumps (atheroma) that develop within the inside lining of blood vessels (arteries):

- People with a TChol to HDL ratio of 6 or more (TChol/HDL = 6 or more).
- People with inherited lipid disorders.

## What treatments are available to reduce the risk?

Everyone should aim to tackle lifestyle risk factors. This means to:

- Stop smoking if you smoke.
- Eat a healthy diet.
- Keep your salt intake to under 6 g a day.
- **Keep your weight and waist in check.**
- **Take regular physical activity.**
- **Cut back if you drink a lot of alcohol**

- If available (and if required) you may be offered a referral to a specialist service. For example, to a dietician to help you to lose weight and eat a healthy diet, to a specialist stop smoking clinic, or to a supervised exercise programme.

If you are at moderate or high risk of developing a cardiovascular disease then treatment with medication is usually advised along with advice to tackle any lifestyle issues. This usually means:

- A medicine to lower your cholesterol level, usually with a statin medicine. No matter what your current cholesterol level, treatment is advised. There are several different statin medicines. They work by blocking a chemical (enzyme) which is needed to make cholesterol in the liver.
- There is no actual target level for people who do not already have cardiovascular disease. However, for those who do have a cardiovascular disease, the aim, if possible, is to reduce TChol to less than 4.0 mmol/L *and* LDL cholesterol to less than 2.0 mmol/L.
- Treatment to lower blood pressure if it is high. This is even if your blood pressure is just mildly high.

In addition, if you already have cardiovascular disease, a daily low dose of a medicine called an antiplatelet medicine (aspirin is one example) is also usually advised. This helps to prevent blood clots from forming on patches of atheroma.

## **Can diet lower my cholesterol level?**

Changing from an unhealthy diet to a healthy diet can reduce your LDL cholesterol level. However, dietary changes alone rarely lower an LDL cholesterol level enough to change a person's risk of cardiovascular disease from a high-risk category to a lower-risk category. A healthy diet is still very important. Any extra reduction in LDL cholesterol due to diet will help.

A healthy diet also has other very important benefits apart from reducing the level of LDL cholesterol. A healthy diet can help you to reduce other dietary risks to your health, such as high levels of salt and sugar. A healthy diet can improve your health in other ways, such as eating more foods with essential minerals and vitamins.

As well as reducing your risk of cardiovascular disease, a healthy diet may also help to reduce your risk of developing some cancers. If you become sick, eating a healthy diet may

help you to recover more quickly. Also, a main way of preventing obesity and overweight is to eat a healthy diet. If you are overweight or obese, eating a healthy diet can help you lose weight.

Foods that contain plant sterols or stanols can reduce total blood cholesterol level and LDL cholesterol by about 10%. There does not seem to be much evidence, however, that this has an effect on preventing cardiovascular disease. The National Institute for Health and Care Excellence (NICE) therefore does not recommend that these products be used routinely until more information is available.

## **How much benefit do I get if my cholesterol level is reduced?**

If you have a high risk of developing a cardiovascular disease, or you already have a cardiovascular disease, lowering your LDL cholesterol level reduces your risk of developing future cardiovascular problems.

## **What if I am at low risk?**

**Even if you have a low risk of cardiovascular disease it is still very important to follow the healthy lifestyle advice. This advice, including healthy eating, regular exercise, not smoking and drinking alcohol only in moderation if at all, will help to keep your risk of cardiovascular disease as low as possible.**