

Factsheet Cholesterol

Key points

- Excess cholesterol raises the risk of heart disease and stroke.
- Diet, exercise and smoking all have an impact on cholesterol levels.
- Some anti-HIV drugs may raise cholesterol levels.



Cholesterol is made in the liver from saturated fats in food. It is a fatty substance found throughout the body. It is essential for the production of the sex hormones, as well as the repair of cell membranes.

To move around the body, cholesterol joins up with certain proteins to form 'lipoproteins' which are carried in the blood. There are two kinds of lipoproteins: low density lipoproteins (LDL), which carry cholesterol from the liver to the cells; and high density lipoproteins (HDL), which return excess cholesterol to the liver. You may often hear cholesterol described as 'good' and 'bad'. HDL, or 'good' cholesterol clears cholesterol from the arteries to the liver, where it is removed from the body. LDL or 'bad' cholesterol is associated with hardening of the arteries ([atherosclerosis](#)). This condition can lead to [angina](#), [heart attack](#) and [stroke](#). It is better to have higher levels of HDL and lower levels of LDL.

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Triglycerides, another fatty substance in the blood, are one of the basic building blocks from which fats are formed. LDL and HDL cholesterol are often grouped together with triglycerides

and called blood lipids.

The effect of HIV on cholesterol

Lipid abnormalities were seen among people living with HIV prior to the introduction of effective [HIV treatment](#). People with untreated HIV often had raised LDL cholesterol and declining HDL cholesterol. Now some research has also shown that people with HIV can have lower levels of HDL cholesterol and higher levels of triglycerides, even when on treatment. Some anti-HIV drugs seem to increase cholesterol levels, especially drugs in the protease inhibitor class. Efavirenz (*Sustiva*) and *Stribild* may increase triglyceride levels. If your lipid levels have increased as a result of being on one of these drugs, they should go down if you change drugs to ones that don't increase cholesterol or triglycerides.

Measuring cholesterol

High cholesterol doesn't in itself usually have any symptoms, so diagnosis relies on testing. Your cholesterol will be checked when you are first diagnosed and then as part of your routine HIV care. Cholesterol can be measured in two ways; blood drawn from a vein is tested in a laboratory or a finger-prick blood sample is tested on a desktop analyser. Blood fats are measured in units called millimoles per litre of blood, shortened to mmol/l. The levels of each lipid will be calculated into a 'total cholesterol' reading.

Levels can vary, both from day to day and throughout the day. A single test will rarely provide enough information to guide decisions about intervention; a series of results will be required to give a clearer picture. Eating makes a marked difference to blood lipids, so it is best to measure them after an overnight fast. The average blood cholesterol level in the general population in the UK is 5.8mmol/l. The optimal level is considered to be less than 5.2mmol/l.

Diet

It may be possible to lower cholesterol levels by adjusting [your diet](#). Try to reduce fat intake and replace saturated fats with unsaturated fats; for example, eat less butter and hard cheese. Increase your intake of unsaturated fats, especially those that help to lower LDL cholesterol and increase HDL cholesterol. These include rapeseed, sunflower and olive oils, avocado and oily fish, such as mackerel, tuna, herring, salmon and sardines. Oily fish also contain a kind of polyunsaturated fat called omega-3 fats, which help prevent blood clotting and reduce triglyceride levels. There's no evidence that taking omega-3 supplements reduces triglyceride levels. Increase your intake of high-fibre foods such as wholegrain bread, pasta, rice and cereals. Eat plenty of fruit and vegetables, aiming for five portions a day. You can find out more about [healthy eating](#) on [aidsmap.com](#).

Exercise

[Regular exercise](#), such as swimming, cycling, running or brisk walking, can increase levels of HDL cholesterol. It can also help you maintain a healthy weight. Being overweight can cause an increase in LDL cholesterol.

Smoking

A chemical in cigarettes stops HDL from transporting fatty deposits to the liver, leading to high cholesterol.

Medication for treating high cholesterol

If you have high cholesterol, you will usually first be advised to make modifications to your lifestyle to try to reduce it. Drug treatment for elevated cholesterol or other lipids is usually only recommended if making changes to your diet, doing more exercise or giving up smoking have failed to have a significant effect.

Statins are the main class of drug used to lower cholesterol. They are considered safe drugs, but some types do interact with some anti-HIV drugs, so it is important a doctor prescribing a statin knows if you are on HIV treatment.

You may not be able to use statins if you have serious liver disease, or if you are **pregnant** or breastfeeding. Another drug used to treat raised cholesterol levels is ezetimibe, which blocks the absorption of cholesterol. It is not as effective as statins, but has fewer side-effects and can be used if you can't take a statin. Another type of drug, fibrates, are tablets which lower triglycerides and have a lesser effect on cholesterol.

Heart disease risk

The risk of a heart attack is increased if you **smoke**, have **high blood pressure** or **diabetes**, and if you have a heart condition. Family history of heart disease and your genetic make-up, age and sex also play a part; for example, risk of coronary heart disease in men occurs ten years earlier than in women.

There is evidence that HIV infection itself, whether or not it is effectively treated (ie, you have an undetectable viral load) raises the risk of **heart disease**. This risk increases the longer you have been HIV positive.

A doctor will assess your risk of heart attack by looking at your cholesterol and other lipid levels. While HIV may increase your risk, your actual risk will be calculated by considering this alongside any other risk factors. Leading a healthy lifestyle to reduce these risk factors will help reduce your overall risk. Stopping smoking reduces your risk of heart attack, and other diseases.

Find out more

Nutrition Information booklet