



Patient

High 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 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.

However, a high level of cholesterol increases your risk of atheroma forming in your blood vessels. Atheroma is the main underlying cause of various cardiovascular diseases. Read more about atheroma and cardiovascular diseases.

Although many foods contain cholesterol, it is poorly absorbed by the gut into the body. Therefore, cholesterol that you eat in food has little effect on your body and blood cholesterol level.

A certain amount of cholesterol is present in the bloodstream. Cholesterol is carried in the blood as part of particles called lipoproteins. There are different types of lipoproteins but the most relevant to cholesterol are:

Low-density lipoproteins carrying cholesterol (LDL cholesterol)

This is often referred to as 'bad' cholesterol. This is the one mainly involved in forming blockages in the arteries (atheroma). The majority of cholesterol in the blood is LDL cholesterol but how much varies from person to person.

High-density lipoproteins carrying cholesterol (HDL cholesterol)

This is often referred to as 'good' cholesterol. This may prevent atheroma forming.

What are triglycerides?

Triglycerides are another type of fat in the body. However, for most people triglycerides are much less important than the level of cholesterol in determining whether you are at increased risk of cardiovascular disease.

- Triglycerides are the main form of fat stored in the body. When you think of fat on your hips or stomach, you're thinking of triglycerides.
- Triglycerides are the end product of digesting and breaking down the bulky fats that are present in our food. Any food we eat that isn't used for energy immediately - carbohydrates, fat, or protein - is also converted into triglycerides.
- They are bundled into globules and transported through the blood by lipoproteins, like cholesterol. The triglycerides are taken up by fat (adipose) cells, to be used for energy if food isn't available later.

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. Hyperlipidaemia means too much lipid (particularly cholesterol) in your bloodstream. Read more about hyperlipidaemia.

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 the body. One example is called familial hypercholesterolaemia. Read more about familial hypercholesterolaemia.

What causes high cholesterol?

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 change

- 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 the UK 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. See separate leaflet called Preventing Cardiovascular Diseases.

Note: risk factors interact. So, 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 (see below). The following blood cholesterol levels are generally regarded as desirable:

- **Total cholesterol (TChol):** 5.0 mmol/L or less. However, about 2 in 3 adults in the UK have a TChol level of 5.0 mmol/L or above.
- **LDL cholesterol:** 3.0 mmol/L or less.
- **HDL cholesterol:** 1.2 mmol/L or more.
- **TChol/HDL ratio:** 4.5 or less. That is, your TChol divided by your HDL cholesterol. This reflects the fact that for any given TChol level, 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.

See separate leaflet called Preventing Cardiovascular Diseases.

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.

For details on exactly how much risk is reduced by lowering and treating risk factors, find out more about the National Institute for Health and Care Excellence Clinical Knowledge Summary (NICE CKS), '[Cardiovascular risk assessment and management](#)' (note UK access only).

How can I 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 medicine (usually a medicine called a statin) is often used if you are at increased risk of cardiovascular disease. Read more about the treatments to lower your cholesterol level in the section on hyperlipidaemia.

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.

Further reading & references

- [Lipid modification - cardiovascular risk assessment and the modification of blood lipids for the prevention of primary and secondary cardiovascular disease](#); NICE Clinical Guideline (July 2014)
- [2016 European Guidelines on cardiovascular disease prevention in clinical practice](#); European Society of Cardiology (2016)
- [Simon Broome Diagnostic criteria for index individuals and relatives - Appendix F](#); NICE (2008)
- [2016 ESC/EAS Guidelines for the Management of Dyslipidaemias](#); European Society of Cardiology (2016)
- [Report of the Joint British Societies for the Prevention of Cardiovascular Disease](#); JBS3, 2014
- [de Souza RJ, Mente A, Maroleanu A, et al; Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies. BMJ. 2015 Aug 11;351:h3978. doi: 10.1136/bmj.h3978.](#)
- [Linton MF, Yancey PG, Davies SS, et al; The Role of Lipids and Lipoproteins in Atherosclerosis](#)
- [Malhotra A, Redberg RF, Meier P; Saturated fat does not clog the arteries: coronary heart disease is a chronic inflammatory condition, the risk of which can be effectively reduced from healthy lifestyle interventions. Br J Sports Med. 2017 Aug;51\(15\):1111-1112. doi: 10.1136/bjsports-2016-097285. Epub 2017 Apr 25.](#)
- [Crandall JP, Mather K, Rajpathak SN, et al; Statin use and risk of developing diabetes: results from the Diabetes Prevention Program. BMJ Open Diabetes Res Care. 2017 Oct 10;5\(1\):e000438. doi: 10.1136/bmjdr-2017-000438. eCollection 2017.](#)

Disclaimer: This article is for information only and should not be used for the diagnosis or treatment of medical conditions. Patient Platform Limited has used all reasonable care in compiling the information but makes no warranty as to its accuracy. Consult a doctor or other healthcare professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

Author:

Peer Reviewer:

10-Mar-2021 09:41

Page 3 of 4

Dr Colin Tidy
Document ID:
4218 (v47)

Dr Adrian Bonsall
Last Checked:
21/09/2017

Next Review:
20/09/2020

This article is for information only and should not be used for the diagnosis or treatment of medical conditions. Patient Platform Limited has used all reasonable care in compiling the information but make no warranty as to its accuracy. Consult a doctor or other health care professional for diagnosis and treatment of medical conditions. For details see our conditions. <https://patient.info/terms-and-conditions>