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Statins and other Lipid-lowering Medicines

Statins work by blocking the action of a certain chemical (enzyme) which is needed to make cholesterol.

What are statins?

Statins are a group of medicines that are commonly used to reduce the level of cholesterol in the blood.

Types of statins

Statins available on prescription include:

- [Atorvastatin](#).
- [Fluvastatin](#).
- [Pravastatin](#).
- [Rosuvastatin](#).
- [Simvastatin](#).

They each have different brand names.

What are statins used for?

Your doctor will advise if you should take a statin. A statin is usually advised if:

- You have a high cholesterol level (called hyperlipidaemia - read more about [hyperlipidaemia](#) and [familial hypercholesterolaemia](#)).
- You have an atheroma-related disease. This is a [cardiovascular disease](#) such as [angina](#) or [peripheral arterial disease](#), or you have had a [heart attack \(myocardial infarction\)](#), [stroke](#) or [transient ischaemic attack \(TIA\)](#). A statin helps to reduce the risk of these conditions getting worse.
- You have a high increased risk of developing an atheroma-related disease, such as an increased risk of heart disease. Risk is measured as a percentage. Risk is considered to be high when your score is 10% or more (that is, a 1 in 10 chance or more of developing a cardiovascular disease within the 10 years that follow). [See the separate leaflet called Cardiovascular Health Risk Assessment](#).

Note: a statin is just one factor in reducing your risk of developing cardiovascular diseases. [See the separate leaflet called Cardiovascular Disease \(Atheroma\)](#).

What happens when you take a statin?

You should have a blood test before starting treatment. This checks the level of cholesterol. It also checks if your liver is working properly. After starting treatment you should have a blood test within 1-3 months and again at 12 months. The blood test is to check that the liver has not been affected by the medication. The blood may also be checked to measure the cholesterol level to see how well the statin is working.

What is the target cholesterol level to aim for?

There is no actual target cholesterol blood level for people who do not already have cardiovascular disease. However, national guidelines recommend that people who have not been diagnosed with cardiovascular disease should be started on [atorvastatin](#) 20 mg a day. This is a 'high-intensity' statin - the aim of giving high-intensity statins is to reduce your low-density lipoprotein (LDL) cholesterol (sometimes called the 'bad cholesterol') by at least 40%.

If you do have a cardiovascular disease the aim, if possible, is to reduce total cholesterol (TChol) to less than 4.0 mmol/L and LDL cholesterol to less than 2.0 mmol/L. If the target is not reached at first, the dose may need to be increased or a different preparation used. National guidelines recommend that for people who have cardiovascular disease, the drug of choice is atorvastatin 80 mg a day.

A study of over 165,000 patients taking statins has shown that about half of people taking statins did not reduce their LDL cholesterol by at least 40%. There may be several reasons for this, including people not taking their statin tablets regularly. However, people who were not prescribed 'high-intensity statins' (such as atorvastatin 20-80 mg a day) were less likely to reach this target.

Once age and starting cholesterol level were taken into account, people who did not reach this 40% target were 22% more likely to have a heart attack or stroke over the following six years.

If you are taking a statin, you may want to ask your GP what your pre-treatment and on-treatment levels of LDL cholesterol are. If your cholesterol has not reduced by at least 40% on treatment, you could discuss your medication with your doctor.

Side-effects of statins

Most people who take a statin have no side-effects, or only minor ones. Read the information leaflet that comes with your medicine. It will have a full list of possible side-effects. It is always important to discuss the risks and benefits of any treatment with your healthcare professional or pharmacist.

Possible statin side-effects include:

- [Headache](#).
- [Pins and needles](#).
- Tummy (abdominal) pain.
- [Bloating](#).
- [Diarrhoea](#).
- [Feeling sick \(nausea\)](#).
- A rash.
- Muscle damage (myopathy), which is rare.

Some people taking statins have reported memory loss but studies have not shown any link between taking a statin and experiencing any memory loss.

Do's and don'ts of taking statins

Tell your doctor if you have any unexpected muscle pains, tenderness, cramps or weakness. This is because a rare side-effect of statins is a severe form of muscle inflammation. Your doctor may need to adjust your dose of statin to reduce the risk.

You should not take a statin if you have active liver disease, if you are pregnant or intend to be pregnant, or if you are breastfeeding. You should stop a statin if you develop liver disease.

Do not eat grapefruit or drink grapefruit juice if you are taking some statins. A chemical in grapefruit can increase the level of statin in the bloodstream, which can make side-effects from the statin more likely. This is only a problem with simvastatin, atorvastatin and lovastatin. Other statins, such as pravastatin, do not interact with grapefruit.

Various other medicines may interfere with statins - for example, some antibiotics and ciclosporin. The doses of either the statin or the other interacting medicine may need to be adjusted. So, if you are prescribed (or buy) another medicine, remind the doctor or pharmacist that you are on a statin in case an interaction is likely.

Tell a doctor if you develop chest symptoms such as unexplained shortness of breath or cough. This is because (in very rare cases) statins may cause a disease called interstitial lung disease.

Alternatives to statins

Statin are the most effective medicines for reducing cholesterol levels for most people. However, there are other medicines that are sometimes used if statins can't be used or aren't sufficiently effective. These include:

- Bile acid sequestrants which include [colestyramine](#), [colesevelam](#) and [colestipol](#). They work by binding to bile acids which are passed into the gut from the liver and gallbladder. This stops bile acids being re-absorbed into the bloodstream, which has a knock-on effect of lowering cholesterol. Bile acid sequestrants may be used during pregnancy because they are safe while statins can't be used during pregnancy.
- Fibrates which include [bezafibrate](#), [ciprofibrate](#), [fenofibrate](#), and [gemfibrozil](#). One of these is used mainly if you have a high level of another type of lipid (triglyceride) with or without a high cholesterol level.
- [Ezetimibe](#) is sometimes used in certain situations in combination with a statin, or on its own. It prevents the absorption of cholesterol from the gut.
- Bempedoic acid is another type of medicine which helps to reduce cholesterol levels and is used particularly in people who don't respond to other cholesterol-lowering medication. It is also available in combination with ezetimibe.
- Fish oils may help to reduce blood lipid levels. These occur naturally in oily fish such as mackerel. This is why at least 1-2 portions of oily fish per week are recommended in a healthy diet. Dietary supplements ('fish oil tablets', which contain omega-3 fatty acids) are also available. However, the value of fish oil supplements is controversial, as the evidence from research trials is unclear.

The National Institute for Health and Care Excellence (NICE) has recommended [inclisiran](#), alirocumab or evolocumab as an option for reducing cholesterol in some patients with high cholesterol that has not responded to statins or ezetimibe.

NICE has also recommended a medication called **icosapent ethyl** for those people who:

- Are already taking a statin.
- Have controlled levels of LDL cholesterol.

- Have high levels of triglycerides; **and**
- Have a high risk of having a cardiovascular event.

This is because evidence has shown that icosapent ethyl reduces the risk of cardiovascular events in these people. See Further Reading below for more information.

Where to buy statins

Statin medicines are available on prescription and funded by the NHS in the UK if you have a cardiovascular disease, or you have a high risk of developing a cardiovascular disease. A statin is not usually prescribed for people with lower levels of risk.

Some statins are available to buy without a prescription. Some people choose to buy a statin to lower their cholesterol level.

However, statins are an addition and not a replacement for changing lifestyle factors to reduce your risk of cardiovascular disease. Everyone should follow a healthy lifestyle of not smoking, maintaining a healthy body weight, eating a healthy diet, getting regular physical exercise and only drinking alcohol in moderation. See the leaflet on [Cardiovascular Disease](#) for more information.

Further reading & references

- [Cardiovascular disease: risk assessment and reduction, including lipid modification](#); NICE Clinical Guideline (July 2014 -last updated May 2023)
- [Vissere FLJ, Mach F, Smulders YM, et al; 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice. Eur Heart J. 2021 Sep 7;42\(34\):3227-3337. doi: 10.1093/eurheartj/ehab484.](#)
- [Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk](#); European Society of Cardiology/European Atherosclerosis Society (2019)
- [Report of the Joint British Societies for the Prevention of Cardiovascular Disease](#); JBS3, 2014
- [Linton MF, Yancey PG, Davies SS, et al; The Role of Lipids and Lipoproteins in Atherosclerosis. Endotext 2019.](#)
- [Ezetimibe for treating primary heterozygous-familial and non-familial hypercholesterolaemia](#); NICE Technology appraisal guidance, February 2016
- [Bempedoic acid with ezetimibe for treating primary hypercholesterolaemia or mixed dyslipidaemia](#); NICE Technology appraisal guidance, April 2021
- [Inclisiran for treating primary hypercholesterolaemia or mixed dyslipidaemia](#); NICE Technology appraisal guidance, October 2021
- [Alirocumab for treating primary hypercholesterolaemia and mixed dyslipidaemia](#); NICE Technology appraisal guidance, June 2016
- [Evolocumab for treating primary hypercholesterolaemia and mixed dyslipidaemia](#); NICE Technology appraisal guidance, June 2016
- [Icosapent ethyl with statin therapy for reducing the risk of cardiovascular events in people with raised triglycerides](#); NICE Technology appraisal guidance, July 2022

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