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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.

Statins are a group of medicines that are commonly used to reduce the level of cholesterol in the blood. They include [atorvastatin](#), [fluvastatin](#), [pravastatin](#), [rosuvastatin](#) and [simvastatin](#). They each have different brand names.

### Who should take a statin?

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; or, it can delay the disease becoming worse.
- You have a high increased risk of developing an atheroma-related disease. For example, if you have diabetes, or other risk factors. 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 separate leaflet called Cardiovascular Health Risk Assessment](#).

**Note:** a statin is just one factor in reducing your risk of developing cardiovascular diseases. [See separate leaflet called Preventing Cardiovascular Diseases](#).

### What happens when I 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.

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 low-density lipoprotein (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.

### What are the possible side-effects or problems with 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. Possible statins' side-effects include headache, pins and needles, tummy (abdominal) pain, bloating, diarrhoea, feeling sick (nausea), and a rash.

#### Clinical Editor's Note

**Nov 2017** - Dr Hayley Willacy recently read a research paper in the British Medical Journal looking at the long-term use of statins - see Further Reading. They followed 3,234 people in the US Diabetes Prevention Program Outcomes Study for a period of 10 years. The most commonly prescribed statins were simvastatin (40%) and atorvastatin (37%). Taking a statin was associated with a 36% increased risk of subsequently being diagnosed with type 2 diabetes, compared to those who had not been prescribed these medicines. The risk fell to 30% after taking other factors into account. Although those who were prescribed statins had slightly higher levels of blood glucose to start with, this still didn't explain their higher rates of diabetes. They found no link between the strength of the statin used and diabetes risk. Monitoring HbA1c levels may be useful in people who are prescribed a statin.

### Points to remember

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. Muscle pains may be more likely if you are also taking a medicine called [amlodipine](#) or [diltiazem](#). 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 breast-feeding. 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.

## Other medicines to reduce cholesterol and other lipids

Other medicines are sometimes used to lower cholesterol and other blood types of fats (lipids). 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.
- 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.
- 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.

## Can I buy a statin?

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.

## 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)
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- **Report of the Joint British Societies for the Prevention of Cardiovascular Disease**; JBS3, 2014
- **2016 ESC/EAS Guidelines for the Management of Dyslipidaemias**; European Society of Cardiology (2016)
- **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)
- **Linton MF, Yancey PG, Davies SS, et al**; The Role of Lipids and Lipoproteins in Atherosclerosis
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- **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.

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