

Preventing Cardiovascular Diseases

Including heart disease, stroke, transient ischaemic attack and peripheral vascular disease

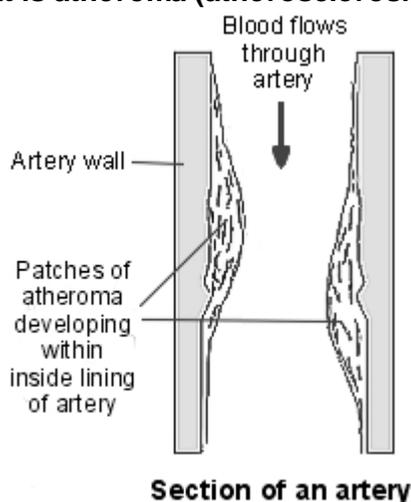
The cause of most cardiovascular disease is a build-up of atheroma - a fatty deposit within the inside lining of arteries. Lifestyle factors that reduce the risk of forming atheroma include: not smoking, choosing healthy foods, a low salt intake, regular physical activity, keeping your weight and waist size down, and drinking alcohol in moderation. Your blood pressure and cholesterol level are also important. All people aged over 40 should have a cardiovascular risk assessment - usually available at your GP surgery. If you have a high risk of developing a cardiovascular disease, treatment to reduce high blood pressure and/or cholesterol may be advised.

What is cardiovascular disease?

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.

The rest of this leaflet briefly discusses atheroma, the diseases atheroma can cause, and ways of preventing a build-up of atheroma and preventing the diseases it causes.

What is atheroma (atherosclerosis)?



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

A patch of atheroma makes an artery narrower. This can reduce the blood flow through the artery. In time, patches of atheroma can become larger and thicker.

Sometimes, a patch of atheroma may develop a tiny crack on the inside surface of the blood vessel. This may trigger a blood clot (thrombosis) to form over the patch of atheroma, which may completely block the blood flow. Depending on the artery affected, a blood clot that forms on a patch of atheroma can cause a heart attack, a stroke, or other serious problems.

See separate leaflet called Atheroma for more information.

What are the cardiovascular diseases caused by atheroma?

Heart disease

The term heart disease (or coronary heart disease) is used for conditions caused by narrowing of the coronary (heart) arteries by atheroma. The problems this can cause include angina, heart attack, and heart failure.

Heart disease is common in the UK in people aged over 50.

Note: it can be confusing, as there are other heart conditions such as heart valve problems, congenital heart problems, etc. However, these are not usually included when we talk about 'heart disease'.

Cerebrovascular disease - stroke and transient ischaemic attack (TIA)

Cerebrovascular disease means a disease of the arteries in the brain (cerebrum). The problems this can cause include a stroke and a TIA. A stroke means that part of the brain is suddenly damaged. The common cause of a stroke is due to an artery in the brain, which becomes blocked by a blood clot (thrombus). The blood clot usually forms over some atheroma. A TIA is a disorder caused by temporary lack of blood supply to a part of the brain.

Peripheral vascular disease

Peripheral vascular disease is narrowing (due to atheroma) that affects arteries other than arteries in the heart or brain. The arteries that take blood to the legs are the most commonly affected.

If you can prevent a build-up of atheroma in the arteries, you are less likely to develop the above diseases. If you already have one of the above diseases, you may prevent or delay it from getting worse if you prevent further build-up of atheroma.

Risk factors

Everybody has some risk of developing atheroma. However, certain risk factors increase the risk. Risk factors include:

- Lifestyle risk factors that can be prevented or changed:
 - Smoking.
 - Lack of physical activity.
 - Obesity.
 - An unhealthy diet and eating too much salt.
 - Excess alcohol.
- Treatable or partly treatable risk factors:
 - Hypertension (high blood pressure).
 - High cholesterol blood level.
 - High triglyceride (fat) blood level.
 - Diabetes.
 - Kidney diseases causing diminished 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.
 - Severe baldness in men at the top of the head.
 - An early menopause in women.
 - Age. The older you become, the more likely you are to develop atheroma.
 - Ethnic group. For example, people who live in the UK with ancestry 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: some risk factors are more risky than others. For example, smoking probably causes a greater risk to health than obesity does. Also, 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, an Oxford study found that men aged 50 who smoke, have high cholesterol and have high blood pressure, die, on average, 10 years earlier than men who do not have these risk factors.

Research is looking at some other factors that may be risk factors. For example, high blood levels of fibrinogen, C-reactive protein, apolipoprotein B, and homocysteine are being investigated as possible risk factors.

Known risk factors that can be prevented, changed or treated are now discussed further.

Lifestyle risk factors that can be prevented and/or changed

Smoking

Lifetime smoking roughly doubles your risk of developing heart disease. The chemicals in tobacco get into the bloodstream from the lungs and damage the arteries and other parts of the body. Your risk of having a stroke, and developing other diseases such as lung cancer are also increased. Stopping smoking is often the single most effective thing that a person can do to reduce their health risk. The increased risk falls rapidly after stopping smoking (although it takes a few years before the excess risk reduces completely). If you smoke and are having difficulty in stopping, then see your practice nurse for help and advice.

Lack of physical activity - a sedentary lifestyle

People who are physically active have a lower risk of developing cardiovascular diseases compared with inactive people. To gain health benefits you should do at least 30 minutes of moderate physical activity, on most days (at least five days per week).

- **30 minutes in a day** is probably the minimum to gain health benefits. However, you do not have to do this all at once. For example, cycling to work and back 15 minutes each way adds up to the total of 30 minutes.
- **Moderate physical activity** means that you get warm, mildly out of breath, and mildly sweaty. For example: brisk walking, jogging, swimming, cycling, etc. However, research studies do suggest that the more vigorous the exercise, the better for health - particularly for preventing heart disease.
- **On most days.** You cannot store up the benefits of physical activity. You need to do it regularly.

Being overweight

If you are overweight, you are more likely to develop cardiovascular diseases, diabetes, or certain cancers. The increased health risk of obesity is most marked when the excess fat is mainly in the abdomen rather than on the hips and thighs. As a rule, a waist measurement of 102 cm or above for men (92 cm for Asian men) and 88 cm or above for women (78 cm for Asian women) is a significant health risk.

Diet

Eating healthily helps to control obesity, and lower your cholesterol level. Both of these help to reduce your health risk. Also, there is some evidence that eating oily fish (herring, sardines, mackerel, salmon, kippers, pilchards, *fresh* tuna, etc) helps to protect against heart disease. It is probably the omega-3 fatty acids in the fish oil that help to reduce the build-up of atheroma. Also, fruit and vegetables, as well as being low in fat, also contain antioxidants and vitamins which may help to prevent atheroma from building up. Briefly, a healthy diet means:

- AT LEAST five portions, ideally more, of a *variety* of fruit and vegetables per day.
- THE BULK OF MOST MEALS should be starch-based foods (such as cereals, wholegrain bread, potatoes, rice, pasta), plus fruit and vegetables.
- NOT MUCH fatty food such as fatty meats, cheeses, full-cream milk, fried food, butter, etc. Use low-fat, mono- or poly-unsaturated

spreads. One study conducted at Harvard University found that replacing saturated fats with poly-unsaturated fats is an effective way of lowering your risk of heart attacks and other serious problems from heart disease.

- INCLUDE 2-3 portions of fish per week, at least one of which should be oily (such as herring, mackerel, sardines, kippers, salmon, or *fresh* tuna).
- LIMIT SALT to no more than 6 g a day (and less for children). See below for details.
- If you eat meat, it is best to eat lean meat, or poultry such as chicken.
- If you do fry, choose a vegetable oil such as sunflower, rapeseed or olive.

Salt

Adults should eat no more than 5 g of salt a day. This is about a teaspoon of salt. Even a modest reduction in intake can make quite a big difference. The current average daily intake of salt in the UK is 9 g per day. About three quarters of the salt we eat is already in the foods we buy. Simply checking food labels and choosing foods with lower salt options can make a big difference. A tip: sodium is usually listed on the food label. Multiplying the sodium content by 2.5 will give the salt content. Also, try not to add salt to food at the table.

Alcohol

Drinking a small or moderate amount of alcohol probably reduces the risk of developing cardiovascular diseases (38% compared with teetotallers in one study). That is, 1-2 units per day - which is up to 14 units per week. Drinking more than 15 units per week does not reduce the risk, and drinking more than the recommended upper limits can be harmful. That is, men should drink no more than 21 units per week (and no more than four units in any one day). Women should drink no more than 14 units per week (and no more than three units in any one day). One unit is in about half a pint of normal strength beer, or two thirds of a small glass of wine, or one small pub measure of spirits.

Other treatable or partially treatable risk factors

High blood pressure

You should have your blood pressure checked at least every 3-5 years. High blood pressure usually causes no symptoms, so you will not know if it is high unless you have it checked. However, over the years, high blood pressure may do some damage to the arteries and put a strain on your heart.

Sometimes high blood pressure can be lowered by: losing weight if you are overweight, regular physical activity and eating healthily as described above. Medication may be advised if your blood pressure remains high.

Cholesterol and other lipids

In general, the higher the blood cholesterol level, the greater the risk of developing cardiovascular diseases. Having a high cholesterol level is more risky if you also have other risk factors such as diabetes or high blood pressure. As a rule, no matter what your cholesterol level is, lowering the level reduces your risk. This is why people at high risk of developing a cardiovascular disease are offered medication to lower their cholesterol level.

A high blood level of triglyceride, another type of lipid (fat), also increases the health risk.

Diabetes and kidney disease

The increased risk that these conditions pose to developing cardiovascular diseases can be modified. For example, good control of blood sugar levels in people with diabetes reduces the risk. Good control of blood pressure in people with diabetes and kidney diseases reduces the risk.

Calculating your cardiovascular health risk

A 'risk factor calculator' is commonly used by GPs and practice 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 next 10 years.

Who should have their cardiovascular health risk assessed?

Current UK guidelines advise that the following people should be assessed to find their cardiovascular health risk:

- All adults aged 40 or more.
- Adults of any age who have:
 - A strong family history of early cardiovascular disease. This means if you have a father or brother who developed heart disease or a stroke before they were aged 55, or in a mother or sister before they were aged 65.
 - A first-degree relative (parent, brother, sister, child) with a serious hereditary lipid disorder. For example, familial hypercholesterolaemia or familial combined hyperlipidaemia. These diseases are uncommon.

If you already have a cardiovascular disease or diabetes then your risk does not need to be assessed. This is because you are already known to be in the high-risk group.

What does the assessment involve?

A doctor or nurse will:

- Do a blood test to check your cholesterol and glucose (sugar) level.
- Measure your blood pressure and your weight.
- Ask you if you smoke.
- Ask if there is a history of cardiovascular diseases in your family (your blood relations); if so, at what age the diseases started in the affected family members.

A score is calculated based on these factors plus your age and your sex. An adjustment to the score is made for certain other factors such as strong family history and ethnic origin.

There are many different calculators. The Framingham calculator has been used for a long time. Many health professionals are moving over to QRISK[®]2 which is more accurate and takes into account many other factors, such as whether you have a condition called atrial fibrillation, or kidney disease. The QRISK[®]2 calculator can be found online at www.qrisk.org

What does the assessment score mean?

You are given a score as a % chance. So, for example, if your score is 30%, this means that you have a 30% chance of developing a cardiovascular disease within the next 10 years. This is the same as saying a 30 in 100 chance (or a 3 in 10 chance). In other words, in this example, 3 in 10 people with the same score that you have will develop a cardiovascular disease within the next 10 years. **Note:** the score cannot say if you will be one of the three. It cannot predict what will happen to each individual person. It just gives you the odds.

You are said to have a:

- High risk - if your score is 20% or more. This is a 2 in 10 chance or more of developing a cardiovascular disease within the next 10 years.
- Moderate risk - if your score is 10-20%. This is between a 1 in 10 and 2 in 10 chance. This should be re-assessed every year.
- Low risk - if your score is less than 10%. This is less than a 1 in 10 chance. This should be re-assessed every 5 years.

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 high risk. That is:

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

What treatments are available to reduce the risk?

If you are at high risk

If you are at high risk of developing a cardiovascular disease then treatment with medicines is usually advised along with advice to tackle any lifestyle issues.

This usually means:

- Treatment with medication, usually with a statin medicine, to lower your cholesterol level. No matter what your current cholesterol level, treatment with medicines is advised. In terms of targets, your level of cholesterol has to be viewed as part of your overall cardiovascular health risk. The cardiovascular health risk from any given level of cholesterol can vary, depending on the level of your HDL cholesterol, and on other health risk factors that you may have. See separate leaflet called Cholesterol for details.
- Treatment with medication to lower blood pressure if it is high. This is even if your blood pressure is just mildly high. See separate leaflet called High blood pressure (hypertension) for details.
- Where relevant, to encourage you even more to tackle lifestyle risk factors. This means to:
 - Stop smoking if you smoke.
 - Eat a healthy diet - including keeping your salt intake to under 5 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.

For details on exactly how much risk is reduced by lowering and treating risk factors, see the guidance produced by Prodigy called 'Cardiovascular risk assessment and management' - in 'References', below.

What if I am at moderate or low risk?

If you are not in the high-risk category, it does not mean you have no risk - just a lesser risk. Treatment with medicines is not usually prescribed. However, you may be able to reduce whatever risk you do have even further by any relevant changes in lifestyle (as described above).

Some people with a moderate risk buy a low-dose statin medicine from a pharmacy, to lower their cholesterol level. Statin medicines are available on prescription and funded by the NHS if your risk is high. However, you need to buy them if your risk is not in the high category. But, if you do buy a statin and take it regularly, it is best to let your doctor know so that it can be put on your medical record.

Further help and information

British Heart Foundation

Greater London House, 180 Hampstead Road, London, NW1 7AW
Tel (Heart Helpline): 0300 330 3311 Web: www.bhf.org.uk

HEART UK (the Hyperlipidaemia Education and Atherosclerosis Research Trust UK)

7 North Road, Maidenhead, Berkshire, SL6 1PE
Tel (Helpline): 0845 450 5988 Web: www.heartuk.org.uk

British Nutrition Foundation

Web: www.nutrition.org.uk

Further reading & references

- [European guidelines on cardiovascular disease prevention in clinical practice](#), European Society of Cardiology (2012)
- [Prevention of cardiovascular disease - Guidance on the prevention of cardiovascular disease at the population level](#), NICE Public Health Guideline (June 2010)
- [Cardiovascular risk assessment and management](#), Prodigy (December 2008)
- [Scott IA](#); Evaluating cardiovascular risk assessment for asymptomatic people. *BMJ*. 2009 Jan 5;338:a2844. doi: 10.1136/bmj.a2844.
- [Hu G, Tuomilehto J, Borodulin K, et al](#); The joint associations of occupational, commuting, and leisure-time physical activity, and the Framingham risk score on the 10-year risk of coronary heart disease. *Eur Heart J*. 2007 Feb;28(4):492-8. Epub 2007 Jan 22.

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Last Checked: 7/19/2012

Document ID: 4264 Version: 42

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