Diet and stroke

The food we eat can influence our risk of having a stroke. Different food groups, such as fruits, vegetables and wholegrain cereals, can protect against stroke. High cholesterol and too much salt in the diet can increase our risk. This factsheet explains how and why what we eat can affect our risk of stroke and suggests ways we can make our diet healthier.

In the last few years a great deal of research has been carried out into the links between diet and health. Studies are now looking into the more specific links between diet and stroke.

A healthy diet is thought to reduce the risk of a number of diseases, including stroke, heart disease, diabetes and some cancers. Studies have shown that the best way to stay fit and healthy is to eat a diet high in fruit, vegetables, wholegrains and plant-based foods like beans and lentils, but low in fat, sugar and salt.

Fruit and vegetables

A number of large-scale studies have shown that people who eat plenty of fruit and vegetables have a lower risk of stroke. However, it is not yet known exactly why this is, or which particular nutrients are responsible for the health benefits – scientists are investigating a number of possibilities.

Fruit and vegetables are known to contain valuable vitamins, minerals, fibre and folate (folic acid), all of which may be responsible for a protective effect.

Fruit and vegetables also contain complex plant components called phytochemicals, which, as well as vitamins like beta carotene and vitamins C and E, are antioxidants. Antioxidants help protect the body's cells from damage by harmful molecules called free radicals. Free radical damage is now implicated in a range of diseases, including stroke.

One group of vegetables that seem to be particularly protective against stroke due to high levels of antioxidants are vegetables such as cauliflower, cabbage, broccoli and Brussels sprouts. Richly coloured fruits and vegetables, such as blackcurrants, kiwi fruit, oranges and red and yellow peppers, also appear to offer high protection against stroke due to high antioxidant levels.

It is thought that fibre plays an important role in preventing stroke. Fibre is found in plant-based foods and may help lower
cholesterol. It also helps to maintain a healthy digestive system.

Folate or folic acid, a B-vitamin found in dark green vegetables like broccoli and spinach, also looks likely to be important in protecting against stroke. Research has shown that low levels of folic acid in the diet are linked to high levels of a blood chemical called Homocysteine in the body, which might lead to an increased risk of stroke. An increasing number of studies have shown that potassium is important in reducing the risk of stroke. One study found that people with low potassium levels in their diet were one and a half times more likely to have a stroke. Bananas, avocados, citrus fruit and green leafy vegetables are all good sources of potassium.

Ideally, you should aim to eat at least five portions of fruit and vegetables a day. But even if you don’t eat five portions a day, increasing your fruit and vegetable intake by just one serving a day can lower your risk of stroke by around six per cent. Increasing your intake to five or six servings a day reduces your risk by around a third. (One portion equates roughly to a handful, for example, one apple, one banana, two plums, a heaped tablespoon of dried fruit like raisins, or three broccoli or cauliflower florets.) Always try to eat a variety of types of fruit and vegetables with a “rainbow of colours”. Differently coloured fruit and vegetables contain a range of different antioxidants and vitamins, and additional health benefits can result from an interaction between these different components.

Wholegrain cereals

Wholegrains are found in foods such as wholewheat bread, cereal or pasta, rye bread, brown rice, oats, couscous, barley and quinoa. Wholegrain cereals are unrefined and do not have the bran or germ removed. According to research, three servings a day of wholegrain cereals can almost halve the risk of stroke. It is thought that this is because cereals contain folic acid and are also rich in other B vitamins, such as vitamin B6, which help to lower levels of Homocysteine. Wholegrain cereals are also a valuable source of fibre which can help protect against atherosclerosis (furring and narrowing of the arteries).

Processed foods like white bread, sugary cereals and white flour pasta do not have the same benefits as wholegrain cereals.

‘Good fats’

The unsaturated fats (polyunsaturated and monounsaturated) found in fish and plant-based food are also thought to help protect against stroke. Nuts and seeds and the oils produced from them are rich in a number of beneficial nutrients. For example, nuts like almonds, hazelnuts and walnuts, seeds like sesame, sunflower and
pumpkin, and oils like sunflower and vegetable oils are all rich in vitamin E. This vitamin also helps to lower the risk of atherosclerosis.

There are some fats that can’t be made in the body and have to be obtained from food. These are essential fatty acids (EFAs) – Omega-3 and Omega-6 – found in oily fish like tuna, mackerel, herrings, salmon and sardines, and also in nuts, seeds and other plant-based food. Flaxseed (linseed), hemp seed and olive oil are also good sources. Again, these fats not only reduce the risk of atherosclerosis, but are also linked to improved cholesterol levels in the body.

A Mediterranean-style diet, high in unsaturated fat from olive oil and fish and low in saturated fat, is beneficial to our general health and can reduce our risk of stroke.

‘Bad fats’

Stroke is linked to atherosclerosis, which in turn is linked to a diet high in saturated fats and trans fats. Saturated fats are mainly found in animal products like red meat, hard cheese and foods like sausages and meat pies. Trans fats are oils that have been hydrogenated – processed to turn liquid oils into semi-hard fats. They are found in processed foods like cakes, biscuits, pastries and snacks. Both saturated and trans fats contribute to the development of atherosclerosis and an increased risk of stroke.

Cholesterol

Cholesterol plays an important role in a healthy body – for example, it helps us digest dietary fats, make hormones and build cell walls. However, too much is not good for us. Having a high cholesterol level increases the chance of having a stroke. All men over 35 and women over 45 should have their cholesterol checked regularly (your GP can advise exactly how often would suit you). It is estimated that two-thirds of all men and women in the UK have cholesterol higher than recommended levels.

What is cholesterol?

The liver makes cholesterol, an essential component of all body cells, from saturated fat in the food we eat. It is distributed where it is needed in the body. If there is a surplus, most of it is stored in the liver and some remains circulating in the blood.

Extra cholesterol may be stored in your arteries (blood vessels) and cause them to narrow over time due to deposits or patches on the blood vessel walls called atheroma.

Patches of atheroma, also called plaque, are like small fatty lumps, which develop on the linings of arteries, narrowing them (atherosclerosis). Large deposits can block an artery and the blood cannot flow through. This can affect any blood vessel – if it affects an artery to the brain, a stroke can happen.

Cholesterol travels through the blood in different types of “packages” called
lipoproteins. LDL (low density lipoprotein) and VLDL (very low density lipoprotein) are so-called “bad” cholesterol, the source of waxy plaque on the artery walls. HDL (high density lipoprotein) is “good” cholesterol.

- High-density lipoprotein (HDL) removes cholesterol from the bloodstream.
- Low-density lipoprotein (LDL) delivers cholesterol to the body.
- Very low-density lipoprotein (VLDL) transports triglycerides – another major fat found in the blood.

**How is cholesterol level measured?**

Cholesterol is measured in a blood test taken after the person being tested has fasted (usually overnight).

- An **ideal cholesterol level** is below 5.2 mmols per litre.
- A level **between 5.2 and 6.5** represents a modest risk.
- A level **between 6.5 and 7.8** represents a higher risk.
- **Over 7.8** represents a very high cholesterol risk.

The **higher** the concentration of cholesterol, the **more** of it is deposited as waxy plaques on the inner walls of arteries. If you have **already** had a stroke, you will usually be advised to lower your cholesterol to **below 3.5 mmols/l**.

**What causes high cholesterol?**

Levels of cholesterol can be affected by the **part of the world** in which you live.

Cholesterol levels are **higher** in **Northern Europe** than in **Southern Europe**, and **European** levels are much **higher** than those in **Asia**. **Types of food** in the diet are important, but it is now known that **genetics** can also play a part. High cholesterol can run in **families**, known as familial hypercholesterolaemia (FH).

**Saturated fats** raise LDL levels more than anything else in the diet. Cholesterol is present in large quantities in food such as **liver, kidneys, other meat offal, processed meats** and **fish roe**. Overweight people tend to have raised cholesterol levels and higher LDL and triglyceride levels. **Eating less saturated fat** and taking **more exercise** will help lower the average cholesterol level.

**Medication**

If you have high levels of **fat (lipid) in your blood**, known as hyperlipidaemia, your doctor may recommend **statins** or other **lipid-lowering drugs**. Lipid-lowering drugs help prevent the patches of **atheroma** from forming and also may help reduce those that are already there.

The **choice of drug depends** on the **type of lipid** causing the problem and it would usually be taken in conjunction with a **low-fat diet, losing weight** (if this is appropriate) and **giving up smoking**. It might be that you also need **specialist advice** from a dietitian.

People with **diabetes** have an **increased risk of high blood pressure** and **atherosclerosis** and are often prescribed medication at an earlier stage.
for lowering lipid levels and reducing their blood pressure.

Ways to lower your cholesterol

- Limit saturated fat from dairy products like butter, full-fat cheese, full-fat milk and ice cream – choose low-fat alternatives.
- Eat less liver and other organ meat.
- Eat food high in fibre.
- Eat oily fish; use olive oil.
- Include garlic in your meals.
- Give up smoking.
- Limit your alcohol intake.
- Exercise – it can help to increase your HDL levels.

Salt

There is mounting evidence that too much salt can lead to higher blood pressure and increase the risk of stroke.

As a nation we eat far too much salt. According to recent figures, we eat about 8–11g a day (one teaspoon contains 5g of salt). SACN (the Scientific Advisory Committee on Nutrition) has recommended a maximum intake of 6g per day although our bodies only need 4.1g. Small children and babies need even less salt in their diet.

Salt in food

Most of the salt we consume comes not from salt added during cooking or at the table, but from processed foods. These account for up to three-quarters of our intake of dietary salt. Some foods, such as pickles or smoked meats, are clearly salty. However, many people don’t realise that everyday foods like breakfast cereals, margarine and cheese have a high salt content, as do ready meals, some canned vegetables and snack foods. Bread is the single largest source of salt in our diet. Six average slices of bread contain around 3g of salt – half the recommended daily intake.

Salt is used as a preservative and to flavour food, and sometimes to improve texture. It’s also an important part of some food processes – for example, salt helps control yeast growth and the rate of fermentation in bread and inhibits the clouding of vinegar in pickles. Processing can dramatically increase the salt content of foods – for example, pork is low in salt, but bacon and sausages are very high.

However, food manufacturers and major supermarkets are now recognising the importance of reducing salt levels in food and have successfully done so in many products without affecting the taste or causing detrimental effects during processing.

Salt and blood pressure

Salt’s main impact on the risk of stroke is through its effect on blood pressure. High blood pressure, or hypertension, is the single biggest risk factor for stroke. It contributes to the hardening of the arteries, increasing the risk of them being blocked by clots that can cause strokes. High blood pressure also puts a
strain on the blood vessel walls, increasing the risk of a blood vessel bursting and bleeding into the brain – another cause of stroke.

A number of studies have shown that people in Western countries who have a high salt intake are more likely to have high blood pressure, whereas people in less developed countries, who usually eat little or no salt, have few problems with high blood pressure. Although experts don’t fully understand why a high salt intake leads to higher blood pressure, it’s thought that some people’s kidneys have difficulty dealing with a high salt load. Their bodies respond by pumping more blood through the kidneys in an attempt to clear the salt – resulting in raised blood pressure.

Reducing the risk of stroke

There’s now clear evidence that cutting salt intake effectively lowers blood pressure in people who already have high blood pressure and in those with normal blood pressure. A major international study has also shown that lowering the amount of salt you eat can keep your blood pressure down as you get older. The message is clear – eating less salt can lower blood pressure and reduce the risk of stroke.

Research also suggests that cutting the overall intake of salt by a third, from 9g to 6g, could significantly reduce the risk of strokes.

There’s also evidence that a high salt intake increases the risk of stroke independently of its effect on blood pressure. Although it’s not understood exactly why this happens, one suggestion is that it may be related to the effects of salt on the arterial walls. People with hardened arteries have a higher risk of stroke and research has shown that lowering salt intake not only lowers blood pressure, but also causes a reduction in the hardening of the arterial walls.

Watch your weight

Being overweight can increase your risk of having a stroke.

Carrying extra weight around the waist is particularly important and might increase the risk of stroke, heart disease and some cancers by up to three times.

Following a healthy diet high in fruit and vegetables and low in fat and sugar, as outlined above, and increasing exercise will result in successful weight loss for the majority of people. (You should speak with your GP before starting a new diet.)

Healthy eating tips

- Read the label – salt is hidden in processed foods, appearing as sodium, monosodium glutamate or sodium bicarbonate. Multiply sodium content by 2.5 to get the total salt content. A low sodium content is 0.3g per 100g or less.

- Take the salt off the dinner table – remember, just one teaspoon contains 5g so adding salt to meals dramatically increases your chances of exceeding the recommended 6g per day.
• Don’t add salt when cooking – flavour meals with fresh garlic, chilli, herbs, spices and lemon or lime juice instead.

• When buying tinned food, choose those in water rather than brine and those that specify no added salt or sugar.

• Beware “light”, “lite” or “diet” food – these aren’t necessarily healthy options as these terms aren’t covered by law and manufacturers can use them indiscriminately.

• Fresh, frozen, chilled, tinned and dried fruit and vegetables all count towards your 5 daily portions.

• Have a glass of orange or other fruit juice every day – studies have shown that citrus fruits and their juice can provide protection against stroke.

• Aim to eat two servings of oily fish each week – this includes tuna and salmon, and options such as mackerel, herring and sardines which won’t increase your shopping bill too much.

• Opt for lean meat and remove visible fat from meat; replace red meat with white meat like chicken and turkey which is lower in saturated fat.

• Grill, steam, bake or casserole your food rather than frying.

• Don’t use additional fat when roasting meat – try wrapping food in foil or using roasting bags.

• Make fatty, sugary foods like biscuits, pastries, cakes and sweets only very occasional treats.

• Choose lower fat salad dressings to keep salads healthy.

• Choose semi-skimmed rather than whole fat milk.

• Drink plenty of water – at least six glasses a day is recommended.

• Using smaller plates and bowls can help you control your portions and control your weight.

• Keep a food diary – it will help you recognise the ways in which you can make your diet healthier.

Useful organisations

www.eatwell.gov.uk
Food Standards Agency website with advice and information on healthy eating, understanding food labels and how food can affect our health.

www.nhs.uk/LiveWell/5ADAY
NHS Choices website with information on the benefits of eating at least five portions of fruit and vegetables each day.

British Nutrition Foundation
High Holborn House, 52–54 High Holborn, London WC1V 6RQ
Telephone: 020 7404 6504
Email: postbox@nutrition.org.uk
www.nutrition.org.uk
Information on nutrition and healthy eating.

CASH (Consensus Action on Salt and Health)
Wolfson Institute of Preventive Medicine, Queen Mary, University of London
London ECM 6BQ
Tel: 020 7882 5941
Email: cash@qmul.ac.uk
Information on salt and its effects on health.

**www.salt.gov.uk**
Food Standards Agency website with advice and information on salt.

**Food Fitness**
c/o Food and Drink Federation,
6 Catherine Street,
London WC2B 5JJ
Tel: 020 7836 2460
Website: www.fdf.org.uk
Healthy eating and lifestyle initiative from the Food and Drink Federation.

**British Dietetic Association**
5th Floor, Charles House,
148–149 Great Charles Street Queensway,
Birmingham B3 3HT
Tel: 0121 200 8080
Fax: 0121 200 8081
Email: info@bda.uk.com
Website: www.bdadweightwise.com
Healthy eating and weight loss information.

**Weight Concern**
Brook House, 1-19 Torrington Place,
London WC1E 7HB
Tel: 020 7679 1853
Fax: 020 7679 8354
Email: enquiries@weightconcern.org.uk
Website: www.weightconcern.org.uk
Charity with advice and information on healthy eating and weight loss.

**The Vegetarian Society**
Parkdale, Dunham Road, Altrincham,
Cheshire WA14 4QG
Tel: 0161 925 2000
Fax: 0161 926 9182
Email: info@vegsoc.org
Website: www.vegsoc.org
Recipes, information on vegetarian food and healthy eating.

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For further information, phone the Stroke Helpline on 0303 3033 100, email info@stroke.org.uk or visit our website www.stroke.org.uk. If you are unhappy about any aspect of The Stroke Association, please make your views known to us immediately. We will happily discuss any issues and how they can best be resolved.

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