

High blood pressure and stroke

High blood pressure usually has no symptoms, but it is a contributing factor in around half of all strokes, making it the biggest single risk factor for stroke. This guide explains what high blood pressure is, the types of medication used to treat it and what you can do to lower your blood pressure.

What is high blood pressure?

Your heart pumps blood all around your body through your arteries. Blood pressure is a measure of how strongly the blood presses against the walls of your arteries. If this pressure is too high it puts a strain on your arteries and your heart, which makes it more likely that you will have health problems such as stroke, a heart attack, or kidney disease.

It's normal for your blood pressure to vary throughout the day. It can go down if you are asleep or sitting quietly, and can go up if you are rushing about or stressed. However, if you have a diagnosis of high blood pressure it means that your blood pressure is consistently too high. The medical term for high blood pressure is hypertension.

High blood pressure is a common problem. There are 9.5 million people with a diagnosis

in the UK. And for every 10 people diagnosed with high blood pressure, another seven don't know they have it. That is more than 5.5 million people living with untreated high blood pressure in England alone. It often has no symptoms so having it measured is the only way to tell if your blood pressure is high.

What is the link between high blood pressure and stroke?

If you have high blood pressure and it is not treated and kept under control, it increases your risk of having a stroke.

Strokes due to a blockage (ischaemic stroke)

High blood pressure puts a strain on all the blood vessels throughout your body, including the ones leading to the brain. As a result, your heart has to work much harder to keep the blood circulation going. This strain can damage your blood vessels, causing them to become harder and narrower, a condition called atherosclerosis. This makes a blockage more likely to occur, which could cause a stroke or TIA (transient ischaemic attack, sometimes called a mini stroke).

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Stroke due to bleeding in or around the brain (haemorrhagic stroke)

The extra strain that high blood pressure puts on your blood vessels may cause a weakened blood vessel to burst inside the brain, causing bleeding on and into surrounding tissues. This is called a haemorrhagic stroke.

What causes high blood pressure?

High blood pressure can develop for a variety of reasons.

- Age: high blood pressure is more common in people over the age of 65.
- Lifestyle factors such as being overweight or obese, smoking, drinking too much alcohol, not exercising and eating unhealthy food.
- Underlying health problems: high blood pressure can sometimes be caused by a health condition such as kidney disease and sleep apnoea.
- Pregnant women can develop pre-eclampsia, which causes high blood pressure.
- Family history: blood pressure problems can run in families.
- Ethnicity: certain ethnic groups, including African-Caribbean people, are more likely to develop high blood pressure (see our guide F21, *Reducing your risk of stroke: information for African and Caribbean people* for more information).

How is blood pressure measured?

Measuring your blood pressure is quick, simple and painless, and can be carried out at your doctor's surgery or at some pharmacies. A stethoscope, arm cuff, pump and dial was used until recently to measure blood pressure, but automatic devices with sensors and digital displays are now in common use.

Understanding your blood pressure reading

Your blood pressure reading is recorded as two numbers. The first number is the greatest pressure your arteries experience when your heart beats (this is called systolic pressure). The second number is the lower pressure when your heart relaxes between beats (diastolic pressure). Both pressures are measured in millimetres of mercury, written as 'mmHg'. The ideal blood pressure is between 90/60mm/Hg and 120/80mmHg.

How often should my blood pressure be checked?

All adults should have their blood pressure checked regularly. If you have normal blood pressure, try to be checked at least once every five years, preferably more often. Your blood pressure should be checked more frequently if it is nearer 140/90mmHg, as you have a higher risk of developing high blood pressure. If you've had a high or borderline reading in the past, your blood pressure should be measured at least once a year.

Women taking the contraceptive pill, who are pregnant or taking hormone replacement therapy (HRT), also need to have their blood pressure checked more often.

And if you are already taking medication to control your blood pressure, you will need to have it checked regularly.

You may be advised to buy an electronic blood pressure monitor so you can check your own blood pressure at home. In this case, you will need to have a machine that meets the standard set by the British Hypertension Society, who publish a list of validated monitors on their website (see *Other sources of help and information*). Your doctor or nurse will also need to check it for accuracy. If you are using a machine at home, you will usually be advised to take your blood pressure twice a day, at the beginning and the end of the day to start with. Once you have a good idea of your usual blood pressure it is likely your doctor will advise you to reduce the number of readings, perhaps to once a week.

How is high blood pressure diagnosed?

You are usually diagnosed with high blood pressure if it is consistently higher than 140/90mmHg.

If you have diabetes, you may be treated with medication if your blood pressure is consistently above 130/80mmHg and you have any complications of diabetes such as eye or kidney problems.

A blood pressure reading between 120/80mmHg and 140/90mmHg could mean you're at risk of developing high blood pressure if you don't take steps to keep your blood pressure under control.

Before diagnosing high blood pressure, your doctor may take a few readings over a period of days or weeks to make sure that the high

reading is consistent, and was not a reaction to being at the surgery or in hospital. Some people feel anxious about having their blood pressure taken and have a high reading then, when at other times their blood pressure is normal. This is sometimes called 'white coat effect'.

You may also be given a machine that records your blood pressure at home at regular intervals over a 24-hour period, known as 24-hour monitoring, or ambulatory monitoring. Your doctor will then use a number of the readings to take an average, to calculate your typical blood pressure.

How is it treated?

Sometimes people can reduce high blood pressure by making simple lifestyle changes, but you may also need to take medication.

If your blood pressure is consistently above 140/90mmHg (or 135/85mmHg at home) but your risk of other problems is low you'll be advised to make some changes to your lifestyle such as losing weight or stopping smoking.

If your blood pressure is consistently above 140/90mmHg (or 135/85mmHg at home) and your risk of other problems is high, you'll be offered medication to lower your blood pressure, in addition to lifestyle changes.

If your blood pressure is consistently above 160/100mmHg, even if your risk of other problems is low, you'll be offered medication to lower your blood pressure, in addition to lifestyle changes.

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If you have had a stroke or heart attack, the aim will often be to reduce your blood pressure to below 130/80mmHg.

Medication for high blood pressure

This guide can only give general information. You should always get individual advice about your own health and any treatment you may need from a medical professional such as a GP or pharmacist.

Tailoring your treatment

The medication you take will be tailored to your individual needs. The medication recommended for you at first will depend on your age and ethnicity.

If your blood pressure doesn't respond to a single medication, you might be given two or more types. This is because the drugs work in different ways, and rather than take more of one type, it can be more effective to take two or more different types. You may need to try different combinations to find out which works best for you. If you need to take four or more different types of medication to control your blood pressure, you should be referred to see a specialist.

Reviewing your medication

Some people will need to continue taking medication for high blood pressure for the rest of their lives, but if you are able to adapt your lifestyle, and your blood pressure remains low and stable for a number of years your doctor may reduce or stop your medication.

High blood pressure in pregnancy

If you are pregnant and need medication for high blood pressure, the drugs that may be used include labetalol (a type of beta-blocker), methyldopa (a centrally acting drug), and nifedipine (a calcium channel blocker). Your doctor will be able to advise you about which medications are safe for you and your baby.

Types of medication

The main groups of blood pressure medication are:

1. ACE (angiotensin-converting enzyme) inhibitors
2. angiotensin-2 receptor blockers
3. calcium channel blockers
4. thiazide-like diuretics.

These are the most commonly used ones, but other types are also available, including beta-blockers. See below for more details.

1. ACE inhibitors

These drugs are usually the first choice of treatment for people aged under 55 who are not of African-Caribbean origin. Angiotensin II is a hormone which regulates blood pressure. ACE inhibitors stop the production of this hormone and relax your arteries, so your blood pressure falls.

ACE inhibitors seem to work better at lowering your blood pressure if you also reduce the amount of salt you eat.

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Examples of ACE inhibitors include enalapril, lisinopril, perindopril and ramipril.

Possible side effects include dizziness, tiredness, weakness, rash, headaches and changes to your sense of taste. The most common side effect is a persistent dry cough. If this is troublesome, you may be advised to try an angiotensin-2 receptor blocker medication (see below) which works in a similar way.

ACE inhibitors can cause unpredictable effects if they are taken with other types of medication including non-steroidal anti-inflammatory drugs like ibuprofen, as well as other drugs such as antacids and lithium. You should not take ACE inhibitors at the same time as Angiotensin-2 receptor blockers (ARBs). Check with your GP or pharmacist before taking any other types of medication if you take an ACE inhibitor.

2. Angiotensin-2 receptor blockers (ARB)

Like ACE inhibitors, these work on the hormone angiotensin-2 by blocking its effects. They are usually used instead of an ACE inhibitor if you are not able to tolerate one. The two types of medication should not be used together.

These drugs are usually recommended for people aged under 55 who are not of African-Caribbean origin. They can be useful if you have diabetes or kidney disease as well as high blood pressure. This is because these types of drug can protect your kidneys.

Examples include candesartan, irbesartan, losartan, valsartan and olmesartan.

Possible side effects are usually mild and include dizziness, headache or cold or flu-like symptoms.

3. Calcium channel blockers

These drugs are particularly effective in controlling high blood pressure in people aged over 55 and in African-Caribbean people of any age. They stop calcium from entering the muscle cells in your heart and blood vessels. This widens your arteries and lowers your blood pressure.

Examples of calcium channel blockers include amlodipine, felodipine and nifedipine. Diltiazem and verapamil may also be prescribed.

Possible side effects include swollen ankles, ankle or foot pain, constipation, skin rashes, a flushed face, headaches, dizziness and tiredness.

You should avoid drinking grapefruit juice while taking some types of calcium channel blockers as it can increase the amount of medication in your bloodstream. This can make your blood pressure drop suddenly and increase your risk of side effects. Ask your doctor or pharmacist for advice.

4. Thiazide-like diuretics

Thiazide-like diuretics are the diuretics most commonly used to treat high blood pressure. Diuretics are also known as water pills because they work by flushing out excess water and salt from the body through urine. This class of drug is often very successful in lowering blood pressure, especially in people over 55 and those of African-Caribbean origin.

You may need to have regular blood tests after you start treatment to check that the

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potassium levels in your blood have not dropped, and that your blood sugar level is maintained.

Examples of thiazide-like diuretics include bendroflumethiazide and indapamide.

Possible side effects include an increased need to go to the toilet, feeling thirsty, dizziness, weakness, feeling lethargic or sick, muscle cramps, skin rash, an increase in uric acid (a chemical in the body that can cause kidney problems and gout), raised blood sugar levels and for men, problems with getting an erection. Taking diuretics with beta-blockers can increase your long-term risk of diabetes. Check with your doctor whether this medicine combination is right for you.

Other types of medication

Beta-blockers

Beta-blockers work by making your heart beat more slowly and with less force, which reduces your blood pressure. They are usually only recommended if other treatments haven't worked, because they are less effective than other treatments.

It is important that you do not suddenly stop taking this type of medication without seeking medical advice first. These drugs would need to be tailed off gradually. Stopping suddenly can lead to serious side effects such as a rise in blood pressure or an angina attack.

Examples of beta blockers include labetalol, atenolol, and bisoprolol.

Possible side effects include slowing of the heart rate, cold fingers and toes, nausea, diarrhoea, tiredness and disturbed sleep.

If you are taking beta-blockers and experience difficulty breathing, or develop asthma, you should contact your doctor immediately.

Other drug groups

Other drugs that may be used to control blood pressure include doxazosin and terazosin (which belong to a group called alpha-blockers), and clonidine and methyldopa (which belong to a group called centrally acting drugs). They are only usually recommended if other treatments haven't worked.

In a small number of cases, medicines to lower blood pressure can react negatively with other health conditions or types of medication you may be taking, including some over-the-counter ones. Always ensure your GP knows your full medical history, and check with your GP or pharmacist before taking any other types of medication.

Many people experience no side effects when taking their medication. However, if you are reacting badly to your blood pressure medication or start to feel unwell, make an appointment with your doctor or nurse as soon as you can.

What can I do to help myself?

To give yourself the best possible chance of lowering your blood pressure, take your medication according to the packet's instructions and as advised by your doctor. You should have your blood pressure checked and your medication reviewed at least once a year.

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If you have trouble remembering to take it, ask your GP for your medication to be given to you in pre-filled boxes with times clearly marked on them.

These tips for healthy lifestyle choices can also help to lower your blood pressure:

- reduce your salt intake. Don't add salt to your food, and avoid processed foods that contain a lot of salt
- eat at least five portions of fruit and vegetables each day
- lose weight if you need to
- reduce your caffeine intake
- give up smoking
- reduce your alcohol intake and avoid binge drinking
- be more active
- reduce your stress levels and take time to relax
- try to get at least six hours sleep a night.

Questions to ask your GP

To help you stay informed about managing your own blood pressure, you might like to ask some of the following questions when you see the GP:

- what is my blood pressure now?
- what is the right blood pressure for my age and health?

- how often should I have my blood pressure checked?
- what type of medication am I taking?
- what are the possible side effects?
- what should I do if I experience side effects?
- do I need to take other types of medication to reduce my risk of stroke, for example to lower my cholesterol?
- will the different types of medication I am taking cause a bad reaction if I take them together?
- what else can I do to reduce my blood pressure?

Where to get help and information

From the Stroke Association

Talk to us

Our Stroke Helpline is for anyone affected by a stroke, including family, friends and carers. The Helpline can give you information and support on any aspect of stroke.

Call us on **0303 3033 100**, from a textphone **18001 0303 3033 100** or email **info@stroke.org.uk**.

Read our publications

We publish detailed information about a wide range of stroke topics including reducing your risk of a stroke and rehabilitation. Read online at **stroke.org.uk** or call the Helpline to ask for printed copies.

Other sources of help and information

Blood Pressure UK

Helpline: 020 7882 6218

Website: www.bloodpressureuk.org.uk

Provides a wide range of information on living with high blood pressure, types of medication and lifestyle changes. You can become a member and receive regular magazines and information updates.

British Heart Foundation (BHF)

Website: www.bhf.org.uk

Heart Helpline: 0300 330 3311

The Heart Helpline provides information from cardiac nurses on heart and health issues.

British Hypertension Society

Website: www.bhsoc.org/bp-monitors

Publishes a list of blood pressure monitors approved for home use.

Do you know what your blood pressure is? Ask your doctor or pharmacist to check it for you.

About our information

We want to provide the best information for people affected by stroke. That's why we ask stroke survivors and their families, as well as medical experts, to help us put our publications together.

How did we do?

To tell us what you think of this guide, or to request a list of the sources we used to create it, email us at feedback@stroke.org.uk.

Accessible formats

Visit our website if you need this information in audio, large print or braille.

Always get individual advice

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