

# High blood pressure and stroke



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High blood pressure is the biggest single risk factor for stroke. This guide explains why high blood pressure can cause a stroke, and what you can do about it.

High blood pressure plays a part in about half of all strokes. But while high blood pressure is a serious condition, there are things you can do to reduce your risk of a stroke.

## Staying healthy and reducing high blood pressure

If you're diagnosed with high blood pressure after a stroke, it may come as a shock. Many people with high blood pressure need to take long-term medication and make some healthy lifestyle changes, to reduce the risk of another stroke or transient ischaemic attack (TIA or mini-stroke).

High blood pressure usually has no symptoms, so you probably will not feel any different when you're taking medication. But medication is highly effective at lowering your blood pressure and reducing your risk of a stroke.

For more information, turn to 'How is high blood pressure treated?' on **Page 5**.

## What is high blood pressure?

Your heart pumps blood all around your body through a network of blood vessels. Blood pressure is a measure of how strongly the blood presses against the walls of your blood vessels. It's measured in millimetres of mercury (mmHg).

Your blood pressure goes up and down over the course of a day. For example, it changes if you're active, resting, calm or stressed. A diagnosis of high blood pressure means your blood pressure stays high over a long period. The medical term for this is hypertension.

High blood pressure is very common. It affects about one in three adults in England, but many people do not realise they have it.

### What is the link between high blood pressure and stroke?

High blood pressure can lead to stroke in different ways. It can lead to blood clots in the brain, and can damage the tiny blood vessels deep inside the brain. It can also make a stroke due to bleeding in the brain more likely.

#### Strokes due to a clot (ischaemic stroke)

High blood pressure damages your blood vessels by making them become narrower and stiffer, and causing a build-up of fatty material. This process is called atherosclerosis. Clots can form on the areas of fatty material, and if a clot travels to the brain, it causes a stroke or transient ischaemic attack (TIA or mini-stroke).

#### Stroke and cognitive problems due to small vessel disease

Small vessel disease means having damage to the tiny blood vessels deep inside the brain. This makes a stroke more likely, and it can affect your thinking ability (cognitive problems). High blood pressure over a long time is a risk factor for small vessel disease.

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

High blood pressure can damage blood vessels inside the brain, causing bleeding in the brain. This is called a haemorrhagic stroke.

#### Small change: big reduction in stroke risk

If you can lower your blood pressure by just 10 mmHg, you could cut your risk of stroke by over 25%.

### How is high blood pressure diagnosed?

You might have your blood pressure taken at a clinic, GP surgery or pharmacy. Or you may be given a machine that records your blood pressure at home at regular intervals over a 24-hour period. You often need a few readings to check the results over time, as blood pressure varies during the day.

#### How is blood pressure measured?

Measuring your blood pressure is quick and simple. An inflatable cuff is wrapped around your arm. This tightens and then slowly deflates. Your blood pressure reading shows up on an electronic screen.

#### Understanding your blood pressure reading

Your blood pressure reading is recorded as two numbers.

- **Systolic:** the pressure when your heart beats.
- **Diastolic:** the pressure in between heartbeats.

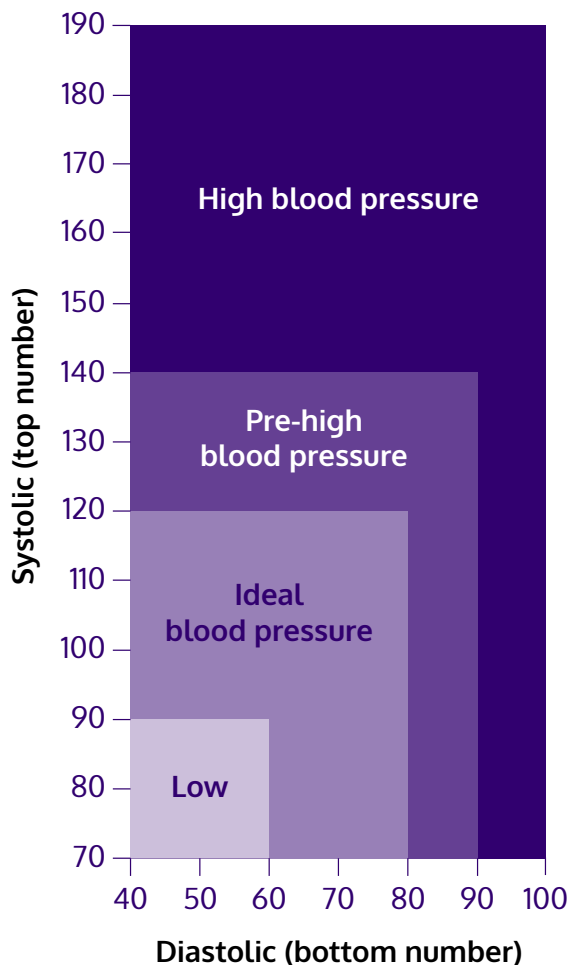
Both numbers are equally important, and blood pressure is counted as being high if either number is high.

#### What do the numbers mean?

Blood pressure is measured in 'millimetres of mercury', written as 'mmHg'. For example: 90/60 mmHg. You may hear your doctor say this as '90 over 60.'

The ideal blood pressure is usually between 90/60 mmHg and 120/80 mmHg.

The chart on the next page gives an overview of blood pressure measurements. Look for where your systolic and diastolic number meet on the chart.



### High blood pressure is generally diagnosed if:

- It's above 140/90 mmHg when measured by a health professional. They may take more than one reading.
- You're aged over 80, and your blood pressure is over 150/90 mmHg when measured by a health professional.
- It averages above 135/85mmHg when you measure it at home (or an average of 145/85mmHg if you are aged over 80 and measuring it at home.)

If your blood pressure is usually between 121/81 and 139/89, it's considered the high end of normal, or pre-high blood pressure. This could mean you are at risk of developing high blood pressure. Ask your GP for advice about getting back to a normal level.

If you have conditions such as diabetes or kidney disease, you might be offered medication at 130/80.

If you've had a stroke or TIA and your doctor has measured your systolic blood pressure to be 130 mmHg or more, you may be prescribed medication to bring it down.

### Why is the target level lower for home blood pressure testing?

Some people can have a higher reading if they feel anxious about seeing a medical professional. Home blood pressure test results are likely to be lower, so the cut-off point for diagnosis needs to be lower.

## Monitoring your blood pressure

### How often should I get checked?

- If your blood pressure is usually at the high end of normal (between 121/81 and 139/89), you should have an annual check.
- If you have been diagnosed with high blood pressure, you should be monitored until you reach your target blood pressure. Afterwards, you should have a check once every six months to a year.
- All adults over 40 should have their blood pressure checked at least every five years. If you're from a black African, black Caribbean or South Asian background, you're encouraged to get checked at an earlier age.

### Home blood pressure monitoring

It's possible to monitor your own blood pressure at home. Your GP may provide a home monitor in some areas, or advise on using one you've bought.

Some fitness trackers and mobile devices can measure blood pressure. These can help you keep an eye on blood pressure, but most are not as accurate as a medical device. Ask your GP if they can use these readings.

The NHS website has a tool at [nhs.uk/health-assessment-tools](https://www.nhs.uk/health-assessment-tools) to help you understand your blood pressure reading.

### Who can get high blood pressure?

The chance of having high blood pressure goes up as we get older. You're more likely to develop it if you have a family history of high blood pressure. And people of black African or black Caribbean origins are more likely to have high blood pressure than others.

Some things that put you at greater risk of high blood pressure include:

- Eating too much salt.
- Being inactive.
- Being overweight.
- Drinking too much alcohol.
- Smoking.

Some health conditions can cause high blood pressure, including:

- Kidney disease.
- Diabetes.
- Obstructive sleep apnoea (interrupted breathing during sleep).
- Lupus (immune disorder).

Some medications can affect blood pressure including the combined oral contraceptive pill (combi pill) and steroids. Illegal drugs such as cocaine and amphetamines can also raise blood pressure.

### Stress and high blood pressure

Feeling stressed can raise your blood pressure for a short time, but it's not a direct cause of high blood pressure. However, if you're under stress often, you might eat unhealthy food, drink too much or lose out on sleep. These things can eventually lead to high blood pressure. So it's a good idea to reduce your stress levels as part of a healthy lifestyle.

### High blood pressure in pregnancy

If you have high blood pressure during pregnancy, your blood pressure will be monitored during pregnancy, labour and after the birth. If it's very high, you may need to stay in hospital until it improves.

The most commonly used medication for high blood pressure in pregnancy is labetalol. If you cannot take labetalol, methyldopa and nifedipine are possible alternatives. These are not licensed for use in pregnancy, but they can be offered along with advice about the risks and the reasons for using it.

If you were already on blood pressure medication before becoming pregnant, you might need to change to a different type as some types are not safe to use in pregnancy. You should speak to your doctor to discuss the best way to manage your blood pressure during pregnancy.

## How is high blood pressure treated?

Your GP or practice nurse can advise you about reducing your blood pressure, including with medication and lifestyle changes. Lowering your blood pressure, even by a small amount, can help you stay healthy.

### Medication for high blood pressure

If you're diagnosed with high blood pressure and your GP thinks you are at risk of a stroke, they will recommend a medication they think will work for you.

For details of different types of blood pressure medication available, see our 'Quick guide to blood pressure medication' on **Page 6**.

Whether you're offered medication depends on your individual risk of a stroke. Things that increase your risk include a previous stroke, heart problems or diabetes.

Before starting medication, you will have blood and urine tests, and you may have an electrocardiogram (ECG) to check for heart problems.

If you are aged under 40 and you're diagnosed with high blood pressure, you should be referred for checks to look for the causes of your high blood pressure.

### Tailoring your treatment

There are several different types of medication for high blood pressure, and we know that age, ethnicity and family history affect how they work. Other medications can also affect how they work. Your GP will work with you to make sure your prescription is tailored to your needs.

You might need to try different doses or take more than one type, depending how you respond.

Blood pressure medications can be more effective in combination. But if you are taking four different types and your blood pressure remains high, you should be referred to see a specialist.

### Getting started with your medication

It can sometimes take a while to adjust to taking a long-term medication. You will have regular blood pressure checks, and you may be able to monitor your blood pressure at home.

Your pharmacist can give you support with taking medicines, such as practical tips for taking tablets and advice about side effects.

### Pharmacy-based support service (England only)

In England, you can join the New Medicines Service (NMS) by asking your pharmacist. The service helps you get started with your medicine and supports you with solving any problems. You will get three appointments with your pharmacist in a private consultation room or over the phone.

### How long will I be on medication?

The aim of the medication is to keep your blood pressure low and stable over many years. Some people may be advised to continue taking medication for high blood pressure for the rest of their lives.

Alongside treatment, you should have advice and support with healthy lifestyle changes. With support from a GP or pharmacist, some people may eventually be able to reduce or stop their medication.

### Side effects and drug interactions

Like all medications, blood pressure medications can cause side effects. Do not stop taking your medication without speaking to a health professional. Always check with your GP or pharmacist before taking new types of medication, including any over-the-counter treatments and supplements.

### Lifestyle changes

On top of medication, healthy lifestyle changes can often help to lower your blood pressure even more.

When you're diagnosed with high blood pressure, you should be given advice about any lifestyle changes you need to make. Getting support can help you with things you may find hard, like changing your diet or being more active.

Ask your GP surgery or pharmacist about local support services. Free help is available with quitting smoking. Visit [nhs.uk/live-well](https://www.nhs.uk/live-well) for more information on eating healthily, losing weight, getting more active, cutting down on drinking alcohol and reducing stress and anxiety.

#### Lifestyle changes: a quick guide

- Reduce your salt intake. Our leaflet 'Your Guide to Eating Well' has tips.
- Get help with quitting smoking.
- Eat plenty of fruit and vegetables as part of a balanced diet.
- Lose weight if you need to.
- Reduce your alcohol intake and avoid binge drinking.
- Cut down on caffeine by drinking less coffee, tea and cola.
- Be more active.
- Reduce your stress levels and take time to relax.

Visit [stroke.org.uk/reduce-my-risk](https://www.stroke.org.uk/reduce-my-risk) for more information.

### Quick guide to blood pressure medication

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.

The main groups of blood pressure medication are:

1. ACE inhibitors. Abbreviated from angiotensin-converting enzyme.
2. Angiotensin-2 receptor blockers (ARB).
3. Calcium channel blockers.
4. Thiazide-like diuretics.
5. Other types of medication.

#### 1. ACE inhibitors

ACE inhibitors work by relaxing your blood vessels. Examples of ACE inhibitors include enalapril, lisinopril, perindopril and ramipril.

#### Who can and cannot take it?

They are often used with people aged under 55, who are not of black African or black Caribbean origin. But they can still be an option for other people.

They can be used in combination with some other blood pressure medications, but if you're taking them with diuretics, you need regular checks on your kidney function.

#### How to take it

They are usually taken as a tablet once a day. You'll have a blood test soon after starting ACE inhibitors, to check kidney function.

They are more effective if you eat less salt. Using potassium-based salt substitutes can raise blood potassium levels, so check with your GP or pharmacist before using them.



### Common side effects

The most common side effect is a persistent dry cough. Other side effects can include dizziness, tiredness, rash, headaches and changes to your sense of taste.

### 2. Angiotensin-2 receptor blockers (ARB)

Like ACE inhibitors, these work on the hormone angiotensin-2 by blocking its effects. Examples include candesartan, irbesartan, losartan, valsartan and olmesartan.

### Who can and cannot take it?

These drugs are usually used instead of an ACE inhibitor if you're not able to tolerate one. The two types of medication should not be used together.

They are mainly used with people under 55, who are not of black African or black Caribbean origin. But they can still be an option for other people.

They can help to protect your kidneys if you have diabetes or kidney disease.

### How to take it

They are usually taken as a tablet once a day. Try to take it at the same time every day.

### Common side effects

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

### 3. Calcium channel blockers

They stop calcium from entering the muscle cells in your heart and blood vessels. This relaxes your arteries and lowers your blood pressure. Examples of calcium channel blockers include amlodipine, felodipine and nifedipine, as well as the less commonly used diltiazem and verapamil.

### Who can and cannot take it?

These medications are particularly effective in people aged over 55, or in black African and black Caribbean people of any age.

### How to take it

They are usually taken as a tablet once a day. 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 GP or pharmacist for advice.

### Common side effects

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

### 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.

Examples include indapamide and bendroflumethiazide.

### Who can and cannot take it?

Diuretics are often used with people over 55, and people of black African and black Caribbean origins. They can also be an option for other people, and they may be used if calcium channel blockers cause side-effects.

### How to take it

They are usually taken as a tablet once a day. It can be helpful to take them in the morning, as taking them in the evening can mean you need a wee during the night.

You may need to have regular blood tests after you start treatment to check potassium levels and blood sugar.

### Common side effects

Possible side effects include needing to wee more often, thirst, dizziness, weakness, feeling lethargic or sick, muscle cramps and skin rash.

### 5. 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 have not worked, because they are less effective than other treatments on their own. It's important you do not suddenly stop taking this type of medication without seeking medical advice first.

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 sleep problems. It can make asthma worse or affect your breathing if you have heart failure.

#### **Other medication groups**

Other medications 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). Another type of diuretic called spironolactone can also be used at low doses. These medications are only usually recommended if other treatments have not worked.



## Where to get help and information

### From the Stroke Association

#### Talk to us

Our Stroke Support 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 **helpline@stroke.org.uk**

#### Read our information

Log onto **stroke.org.uk**, where you can find easy-to-understand information, videos and an online community to support you. You can also call the Helpline to ask for printed copies of our guides

## Other sources of help and information

### Blood Pressure UK

Website: **bloodpressureuk.org.uk**

Helpline: **020 7882 6218**

Provides a wide range of information on high blood pressure.

### British Heart Foundation (BHF)

Website: **bhf.org.uk**

Heart Helpline: **0808 802 1234**

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

### British and Irish Hypertension Society

Website: **bihsoc.org**

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

## Your notes

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### 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

This guide contains general information about stroke. But if you have a problem, you should get individual advice from a professional such as a GP or pharmacist. Our Helpline can also help you find support. We work very hard to give you the latest facts, but some things change. We don't control the information provided by other organisations or websites.

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Surviving a stroke is just the start of a long and hard journey back to life. But with strength, determination and the right support, recovery is possible.

The Stroke Association is registered as a charity in England and Wales (No 211015) and in Scotland (SC037789). Also registered in the Isle of Man (No. 945) and Jersey (No. 221), and operating as a charity in Northern Ireland.