High blood pressure and stroke

High blood pressure (also called hypertension) usually has no symptoms. If not treated and kept under control, it is one of the major risk factors for stroke. Both lifestyle changes and medication can help to control your blood pressure. This factsheet explains what high blood pressure is, the medications that are most commonly used to treat it and what you can do to lower your blood pressure.

What is blood pressure?

Blood pressure is a measure of the force with which blood presses on the walls of your arteries as it is pumped around your body. This pumping action is driven by your heart, which when you are at rest will normally beat between 60 and 90 times a minute and pumps the blood through the arteries out to various parts of your body.

How is blood pressure measured?

Measuring blood pressure is quick, simple and painless, and can be carried out at your doctor’s surgery or at some pharmacies. An inflatable cuff will be placed around one arm and a stethoscope will be used to listen to the blood flow. Readings are measured against a column of mercury. Alternatively an automatic digital machine may be used. An Ambulatory Blood Pressure Monitoring (ABPM) machine, attached to a belt, is sometimes used to record blood pressure over a 24-hour period.

Blood pressure is measured with two readings, firstly when the heart beats (systolic pressure) and secondly when the heart relaxes between beats (diastolic pressure). Blood pressure is always higher when the heart beats than when it is relaxing. The readings are expressed as a fraction and the systolic reading is always written before the diastolic figure. Both pressures are measured in millimetres of mercury, written as ‘mmHg’.

Normal blood pressure

The lower your blood pressure is the better. The optimal blood pressure is less than 120/80 mmHg. If, on multiple readings, the first figure (your systolic blood pressure) is between 120 and 139, or the second figure (your diastolic blood pressure) is between 80 and 89, high blood pressure is likely to develop at some point. This is sometimes called pre-hypertension.

What is high blood pressure?

Your blood pressure varies 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. Hypertension, or high blood pressure, develops when the pressure of the blood running through
the vessels is consistently too high. You are usually considered to have high blood pressure if you have a measurement that is **consistently above 140/90 mmHg**. If you have diabetes, treatment will usually be considered if your blood pressure is consistently above 130/80 mmHg. Drug treatment should be considered in this case. Before giving a diagnosis of high blood pressure, your doctor may take a few readings over a period of days or weeks to make sure that a higher reading is consistent, and not a reaction to being at the surgery or hospital (sometimes referred to as ‘white coat hypertension’).

If your blood pressure is high, your doctor will discuss with you ways to reduce it, especially if you are at particular risk, for instance, if you have diabetes or circulatory problems, or if you smoke or are overweight.

High blood pressure is a **common problem**, affecting around 10 million people in the UK. Studies have found that 39 per cent of men and 31 per cent of women have blood pressure above the normal range.

**What are the symptoms of high blood pressure?**

High blood pressure is very often a silent condition that shows no symptoms. Unfortunately, it can also be dangerous. **There is no clear way of knowing you have high blood pressure, apart from having it measured.** The damage that is caused by raised blood pressure occurs over time. People with high blood pressure usually only get symptoms when the strain on their arteries leads to more serious problems such as angina, heart attack or stroke.

Studies have shown that around three fifths of men and nearly half of women with high blood pressure are not being treated.

**Why is high blood pressure dangerous?**

If high blood pressure is not treated and kept under control, it puts you at much greater risk of a stroke. **High blood pressure is the single most important risk factor for stroke.** It causes about 50 per cent of strokes due to a blockage (ischaemic stroke) and also increases the risk of strokes due to bleeding in the brain (haemorrhage).

High blood pressure puts a **strain on blood vessels** all over the body, including vital arteries to the brain, and the heart has to work much harder to keep the blood circulation going. This strain can cause vessels to become clogged up or to weaken, and this in turn can lead to narrow blood vessels and blood clots. Within the brain, this process contributes to memory loss, cognitive decline and dementia.

When a clot forms a blockage in an artery leading to the brain, or in a blood vessel inside the brain, it can result in a **stroke or transient ischaemic attack** (TIA or mini-stroke). More rarely, this extra strain may cause a cerebral haemorrhage where a blood vessel bursts inside the brain and blood spills into surrounding tissue. This is also a type of stroke. The symptoms of stroke include numbness or weakness down one side of the body, blurred vision and slurred speech.

If you have high blood pressure you are also more at risk of having a heart attack or developing other forms of heart disease in the future.
Because of the increased strain on your heart and blood vessels, untreated high blood pressure puts you at risk of angina which can cause chest pain and breathlessness and may lead to a heart attack. High blood pressure can also cause kidney damage and damage to the retina (part of the eye).

**What are the risk factors for high blood pressure?**

**High blood pressure develops for a variety of reasons.** Factors such as being overweight, drinking too much alcohol, getting little exercise and eating an unhealthy diet all contribute to high blood pressure.

It is also more common in middle-aged and elderly people as **blood pressure tends to rise as you get older**. It is estimated that more than two thirds of those aged 75 and over have high blood pressure. In some people, high blood pressure may be caused by another underlying condition, such as certain kidney disorders. Also, some people are more at risk than others. For instance, blood pressure problems can run in families, and certain **ethnic groups**, such as South Asian and African-Caribbean people, are particularly at risk.

**How often should blood pressure be checked?**

All adults should have their blood pressure checked regularly. For those with previously normal pressure, that means **at least once every five years**, preferably more often. Women taking the contraceptive pill or who are pregnant or on hormone replacement therapy (HRT), and some people taking specific medicines, also need blood pressure checks more often.

If you've had a high or borderline reading in the past, but do not currently need medicines, your blood pressure should be measured at least once a year. If you are **already taking medicines** to control your blood pressure, you will probably need a check **four times a year**. You can help protect yourself by ensuring your blood pressure is checked regularly at intervals suggested by your doctor.

You may be advised to buy an **electronic blood pressure monitor** so that this can be done at home. In this case, you will need to have a machine which meets the standard set by the British Hypertension Society and has been checked for accuracy by your doctor or nurse.

**How is high blood pressure treated?**

Medical advice, for all but the mildest forms of high blood pressure, is likely to include the daily use of drugs to bring blood pressure down. Both **lifestyle changes and medication can bring blood pressure down to a normal level**. If your blood pressure is below 140/90, you will normally not need any treatment with medicines. If you have higher levels, your doctor will aim to reduce the upper figure of your blood pressure to below 140 and the lower figure to below 85. If you have diabetes or have already had a stroke or heart attack, the aim will be to reduce your blood pressure even further to below 130/80 mmHg. This is not always possible, but **even small reductions in blood pressure can significantly reduce your risk of stroke or heart disease**.
What can I do to reduce my blood pressure?

**Give up smoking**

Tobacco smoke contains toxic chemicals which damage blood vessel walls, leading to narrowing and furring of the arteries, called atherosclerosis. Smoking also increases the stickiness of a type of blood cell called platelets, which increases the risk of blood clots forming in major arteries to the brain and heart. Smoking therefore increases even further the risk of stroke or heart disease in someone with high blood pressure. There is a wide range of nicotine replacement products available and there are clinics to help you give up smoking. **Ask your doctor** to advise you on which options would be the most suitable for you.

**Eat a healthy diet**

**Cutting down the fat, sugar and salt content of your diet is good for your blood pressure**, as is eating high fibre foods. Being overweight may contribute to high blood pressure. Reducing your saturated fat intake can help reduce cholesterol levels – too much cholesterol in the bloodstream may contribute to narrowing of the arteries. Increase your intake of fruit and vegetables to include at least five servings per day. Eating too much salt may contribute to high blood pressure in some people, notably people of African or Caribbean descent. Reduce your salt intake by cutting down on the amount you add when cooking, not adding salt at the table and being aware of the salt content of packaged and processed foods.

**Drink sensibly**

In large amounts, **alcohol increases blood pressure** and can contribute to narrowing of the arteries. Heavy drinking increases the risk of all types of stroke. **Binge drinking** – drinking double the recommended units in one sitting – raises blood pressure dramatically and greatly increases the risk of haemorrhagic stroke, caused by the bursting of a blood vessel. Avoid binge drinking and stick to recommended alcohol guidelines – no more than three to four units per day for a man, or two to three for a woman. A standard glass of wine is about two units, a single measure of spirit is one unit and a pint of five per cent strength beer or lager is three units.

**Get regular exercise**

Moderate exercise for a total of **30 minutes per day** on at least five days per week can improve your health and help control your blood pressure. You just need to get slightly out of breath and feel a small increase in your heart rate to reap the benefits. If you are used to being inactive, you can build up to this, adding a few minutes each week. Always consult a doctor before beginning any exercise programme.

**Reduce your stress levels**

Taking the time to **relax**, in addition to other lifestyle changes, may help to keep your blood pressure under control. There are a range of stress reducing activities, including yoga, meditation, relaxation techniques and deep breathing exercises. Ask at your local leisure centre, gym or library about classes that are on offer.
Medications for high blood pressure

If lifestyle changes do not reduce your blood pressure to normal and it is consistently at or above 140/90, you may need to take one or more medicines from the following five main groups of blood pressure lowering (antihypertensive) drugs:

- ACE (Angiotensin-converting Enzyme) inhibitors
- Angiotensin receptor blockers
- Beta blockers
- Calcium channel blockers
- Thiazide diuretics.

Doctors can now choose from a great many individual and combination drugs to control blood pressure. The groups of medications described in this factsheet are the ones most commonly used, but other types of drug are available. Most people need to take more than one type of drug to control their blood pressure. These days, drug therapies are tailored for the individual patient. For example, a middle-aged man and an elderly woman, both with moderate hypertension, are likely to be prescribed entirely different drugs.

Side effects of high blood pressure medications

It is very important that you take the blood pressure tablets prescribed by your doctor to keep your high blood pressure under control. Some people, however, react in unwanted ways to the drugs that they have been prescribed and experience side effects.

We all vary in the way our bodies deal with drugs and the different groups of drugs available work in different ways. A drug that suits one person may not suit another. For example, beta-blockers are not suitable for people with asthma but may be particularly useful for people who have had a heart attack.

Some commonly experienced side effects include swollen ankles, cold hands and feet, tiredness, nightmares, coughing and dizziness. Some people suffer symptoms such as loss of libido or impotence without realising they are caused by their medication.

Equally, medications can be wrongly blamed for symptoms which have an entirely different cause, so ask your doctor about any symptoms you have, and any possible side effects of your medication. In most instances side effects will be minor, but 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 – your doctor can choose from a wide range of alternatives.

The main groups of medicines for high blood pressure

ACE inhibitors

These drugs are usually the first choice of treatment for people under 55 years of age. Angiotensin is a hormone produced in the body which regulates blood pressure. By blocking production of this hormone, ACE inhibitors cause dilation of the arteries and a fall in blood pressure. In addition, they increase the loss of salt and water in the urine.

Possible side effects include dizziness on sitting down or standing up, kidney problems, rash, dry cough, stuffy nose, sore throat, stomach upsets and acute allergy with swelling around the mouth, throat and (rarely) airway.
Examples include enalapril, lisinopril, perindopril and ramipril.

**Angiotensin receptor blockers**

These are the newest blood pressure drugs. Like ACE inhibitors, they limit angiotensin but work by blocking its effects rather than by blocking its production. These drugs work on the kidney, adrenal glands, heart, brain and sympathetic nervous system.

Possible side effects are usually mild and include dizziness, high levels of potassium in the blood and allergic reactions.

Examples include candesartan, losartan and valsartan.

**Beta blockers**

Beta-blockers (or B-blockers) are long established but generally no longer recommended as a first choice of treatment, except in a few special situations. For example, people who cannot take an ACE inhibitor or Angiotensin receptor blocker, those who have had a heart attack, chest pain (angina) or heart failure, and younger women who may become pregnant. Beta-blockers work on a number of sites, including the heart, kidneys, brain, arteries and nerves which monitor blood pressure. If, for some reason, you want to stop taking your beta blockers, seek medical advice. These drugs should not be stopped suddenly but tailed off gradually.

Possible side effects include slowing of the heart rate, heart failure, wheezing, cold fingers and toes, stomach upsets, asthma, tiredness and disturbed sleep.

Examples of beta blockers include atenolol, oxprenolol, and propranolol.

**Calcium-channel blockers**

These drugs seem to be particularly effective in controlling hypertension in people aged 55 and older or people of African-Caribbean descent of any age. They have a relaxing effect on the muscles in the arteries, causing them to dilate, leading to a fall in blood pressure.

Possible side effects include headache, fluid retention, ankle swelling, fatigue, nausea, flushing, dizziness, thickening of the gums, skin rashes, constipation and passing urine during the night.

Examples of calcium channel blockers include amlodipine diltiazem and nifedipine.

**Thiazide-type diuretics**

Thiazide-type diuretics are also known as water pills. They work on the kidneys, leading to an increase in the excretion of water and salt in the urine, but their exact mechanism for lowering blood pressure is not known. This class of drug is often very successful in lowering blood pressure, especially in older people. Blood tests are usually needed around three to four weeks after starting treatment to check that there are no harmful effects on kidney function and that the potassium levels in the blood have not dropped.

Possible side effects include dizziness, stomach upsets, skin rashes, impotence, changes in the mineral and fat content of the blood, increased uric acid (leading to the risk of gout) and a rise in blood sugar.

Examples of diuretics include
bendroflumethiazide, chlorthalidone and indapamide.

Other drugs

Other drugs that may be used to control blood pressure include Alpha blockers such as doxazosin and terazosin, and centrally acting drugs such as clonidine and methyldopa.

Considerations when taking medications

To give yourself the best possible chance of getting your blood pressure down, take your medicines according to the instructions on the packet. If you have trouble remembering to take them, ask your GP for your medicines to be given to you in pre-filled boxes with times clearly marked on them, or get a friend or relative to help you to remember.

You may need to try several different types of blood pressure drugs before you find the ones that suit you best and more than half of all people with high blood pressure need to take more than one drug to control it. Don’t be concerned if you have to go back to your doctor several times before you find the right combination of drugs for you. For a small number of people it is not easy to lower their blood pressure and keep it under control.

Sometimes the medication you have been prescribed does not control your blood pressure. In such cases, your doctor may decide to increase the dose or add another drug, switch you to an entirely different type of treatment or refer you to a specialist.

If, with treatment, your blood pressure is lowered and stays low, your doctor may recommend reducing the dose, or even take you off medication altogether, although this is less likely. However, it is likely that you will have to continue taking medication for high blood pressure forever. You should continue to have your blood pressure regularly monitored to check that it does not rise again. Ask your doctor how often this is required and remember to make an appointment at the correct interval. You should keep taking the medication unless your doctor tells you otherwise. Do not give up. There is strong evidence that regular use of medication for high blood pressure will considerably reduce your risk of having a stroke.

Please note recent research has highlighted the added importance of stabilising blood pressure as well as trying to lower it. The implications of this research are not yet clear.

Questions to ask your doctor

You may also like to ask your doctor the following questions to help you stay informed:

- What is my blood pressure now?
- What is a healthy blood pressure for my age and health?
- How often should I have my blood pressure checked?
- What type of medication am I taking?
- What side effects are possible from my medication?
- What should I do if I experience side effects?
- Do I need to take other medications
High blood pressure and stroke

to reduce my risk of stroke e.g. aspirin to thin my blood or statins to lower my cholesterol?

• What are the interactions between the different medications I am taking?

• Are there other measures that I can take to reduce my blood pressure?

Useful organisations

All organisations are UK wide unless otherwise stated.

**Stroke Association**
*Stroke Helpline:* 0303 3033 100
*Web:* stroke.org.uk
*Email:* info@stroke.org.uk
Contact us for information about stroke, emotional support and details of local services and support groups.

**Blood Pressure Association**
*BP Info Line:* 0845 2410989
11am-3pm, Mon-Fri
*Website:* www.bpassoc.org.uk
Provides a wide range of information about topics such as living with high blood pressure, medications and lifestyle changes. Membership entitles you to a quarterly magazine and information updates.

**British Heart Foundation (BHF)**
*Heart Helpline:* 0300 330 3311
*BHF Publications Order Line:* 0870 600 6566
*Website:* www.bhf.org.uk
The Heart Helpline provides information from cardiac nurses on heart and health issues.

**High Blood Pressure Foundation**
*Tel:* 0131 332 9211
*Website:* www.hbpf.org.uk
Works to improve assessment, treatment and understanding through events for the general public and training with health professionals. They also carry out research.

Disclaimer: The Stroke Association provides details of other organisations for information only. Inclusion in this factsheet does not constitute a recommendation or endorsement.

Glossary of terms

**ACE Inhibitor** = a group of blood pressure lowering drugs

**Angiotensin receptor blockers** = a group of blood pressure lowering drugs

**Antihypertensive drug** = a drug that lowers blood pressure

**Beta blockers** = a group of blood pressure lowering drugs

**Calcium channel blockers** = a group of blood pressure lowering drugs

**Diastolic pressure** = your blood pressure when your heart relaxes between beats. The second figure of your blood pressure reading

**Hypertension** = high blood pressure

**Systolic pressure** = your blood pressure when your heart beats. The first figure of your blood pressure reading

**Thiazide diuretics** = a group of blood pressure lowering drugs
High blood pressure and stroke

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