

High Blood Pressure (Hypertension)

High blood pressure is a risk factor that can increase your chance of developing heart disease, a stroke, and other serious conditions. As a rule, the higher the blood pressure, the greater the risk. Treatment includes a change in lifestyle risk factors where these can be improved - losing weight if you are overweight, regular physical activity, a healthy diet, cutting back if you drink a lot of alcohol, stopping smoking, and a low salt and caffeine intake. If needed, medication can lower blood pressure.

What is blood pressure?

Blood pressure is the pressure of blood in your arteries. Blood pressure is measured in millimetres of mercury (mm Hg). Your blood pressure is recorded as two figures. For example, 150/95 mm Hg. This is said as 150 over 95.

- **The top (first) number is the systolic pressure.** This is the pressure in the arteries when the heart contracts.
- **The bottom (second) number is the diastolic pressure.** This is the pressure in the arteries when the heart rests between each heartbeat.

Some phrases and definitions

Clinic/GP surgery blood pressure readings: these are readings taken by a doctor or nurse in a clinic or GP surgery using a standard blood pressure machine.

Home blood pressure readings: these are readings taken by a person whilst seated and at rest at home using a standard blood pressure machine.

Ambulatory blood pressure readings: these are readings taken at regular intervals whilst you go about your normal activities. A small machine that is attached to your arm takes and records the readings.

As a rule, an average of the ambulatory blood pressure readings give the most true account of your usual blood pressure. Home blood pressure readings are a good substitute if an ambulatory machine is not available. Ambulatory and home readings are often a bit lower than clinic or GP surgery readings. Sometimes they are a lot lower. This is because people are often much more relaxed and less stressed at home than in a formal clinic or surgery situation.

What is high blood pressure?

High blood pressure is a blood pressure that is 140/90 mm Hg or above each time it is taken at the GP surgery (or home or ambulatory readings always more than 135/85 mm Hg). That is, it is sustained at this level. High blood pressure can be:

- Just a high systolic pressure - for example, 170/70 mm Hg.
- Just a high diastolic pressure - for example, 120/104 mm Hg.
- Or both - for example, 170/110 mm Hg.

However, it is not quite as simple as this. Depending on various factors, the level at which blood pressure is considered high enough to be treated with medication can vary from person to person.

Blood pressure of 140/90 mm Hg or above (or home/ambulatory readings 135/85 mm Hg or above)

If your blood pressure is always in this range you will normally be offered treatment to bring

the pressure down, particularly if you have:

- A high risk of developing cardiovascular diseases (see below); or
- An existing cardiovascular disease (see below); or
- Diabetes; or
- Damage to the heart or kidney (organ damage) due to high blood pressure.

Blood pressure between 130/80 mm Hg and 140/90 mm Hg

For most people this level is fine. However, current UK guidelines suggest that this level is too high for certain groups of people. Treatment to lower your blood pressure if it is 130/80 mm Hg or higher may be considered if you:

- Have developed a complication of diabetes, especially kidney problems.
- Have had a serious cardiovascular event such as a heart attack, transient ischaemic attack (TIA) or stroke.
- Have certain chronic (ongoing) kidney diseases.

How is high blood pressure diagnosed?

A one-off blood pressure reading that is high does not mean that you have 'high blood pressure'. Your blood pressure varies throughout the day. It may be high for a short time if you are anxious, stressed, or have just been exercising.

You have high blood pressure (hypertension) if you have several blood pressure readings that are high, and which are taken on different occasions, and when you are relaxed.

Observation period

If one reading is found to be high, it is usual for your doctor or nurse to advise a time of observation. This means several blood pressure checks at intervals over time. The length of the observation period varies depending on the initial reading, and if you have other health risk factors.

For example, say a first reading was mildly high at 150/94 mm Hg. If you are otherwise well, then a period of several weeks of observation may be advised. This may involve several blood pressure measurements over the next few weeks. You may be given a machine to monitor blood pressure while you are going about doing your everyday activities (ambulatory monitoring) or given (or asked to buy) a machine to measure your blood pressure at home (home monitoring). One reason this may be advised is because some people become anxious in medical clinics, which can cause the blood pressure to rise. (This is often called white coat hypertension.) Home or ambulatory monitoring of blood pressure may show that the blood pressure is normal when you are relaxed.

The observation period is also a good time to change any lifestyle factors that can reduce blood pressure (see below). If the blood pressure readings remain high after an observation period then medication may be advised, depending on your risk factors (see below).

However, if you have diabetes, or have recently had a heart attack or stroke, you may be advised to have blood pressure checks fairly often over the next week or so. Also, treatment with medication is usually considered at an earlier stage if the readings remain high.

What causes high blood pressure?

The cause is not known in most cases

This is called essential hypertension. The pressure in the arteries depends on how hard the heart pumps, and how much resistance there is in the arteries. It is thought that slight narrowing of the arteries increases the resistance to blood flow, which increases the blood pressure. The cause of the slight narrowing of the arteries is not clear. Various factors probably contribute.

In some cases, high blood pressure is caused by other conditions

It is then called secondary hypertension. For example, certain kidney or hormone problems can cause high blood pressure.

How common is high blood pressure?

In the UK, about half of people aged over 65, and about 1 in 4 middle-aged adults, have high blood pressure. It is less common in younger adults. Most cases are mildly high (up to 160/100 mm Hg). However, *at least* 1 in 20 adults have blood pressure of 160/100 mm Hg or above. High blood pressure is more common in people:

- With diabetes. About 3 in 10 people with type 1 diabetes and more than half of people with type 2 diabetes eventually develop high blood pressure.
- From African-Caribbean origin.
- From the Indian subcontinent.
- With a family history of high blood pressure.
- With certain lifestyle factors. That is, those who: are overweight, eat a lot of salt, don't eat sufficient fruit and vegetables, don't take enough exercise, drink a lot of coffee (or other caffeine-rich drinks), or drink a lot of alcohol.

Who should have a blood pressure check?

High blood pressure usually causes no symptoms. You will not know if you have high blood pressure unless you have your blood pressure checked. Therefore, everyone should have regular blood pressure checks at least every five years. The check should be more often (at least once a year) in: older people, people who have had a previous high reading, people with diabetes, and people who have had a previous reading between 130/85 mm Hg and 139/89 mm Hg (that is, not much below the cut-off point for high blood pressure).

Why is high blood pressure a problem if it causes no symptoms?

High blood pressure is a risk factor for developing a cardiovascular disease (such as a heart attack or stroke), and kidney damage, sometime in the future. If you have high blood pressure, over the years it may do some damage to your arteries and put a strain on your heart. In general, the higher your blood pressure, the greater the health risk. But, high blood pressure is just one of several possible risk factors for developing a cardiovascular disease.

What are cardiovascular diseases?

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. 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.

Cardiovascular diseases that can be caused by atheroma include: angina, heart attack, stroke, transient ischaemic attack (TIA), and peripheral vascular disease. In the UK, cardiovascular diseases are a major cause of poor health and the biggest cause of death.

Risk factors for cardiovascular diseases

Everybody has some risk of developing atheroma which may cause one or more cardiovascular diseases. However, certain risk factors increase the risk. These include:

- Lifestyle risk factors that can be prevented or changed:
 - Smoking.
 - Lack of physical activity (a sedentary lifestyle).
 - Obesity.

- An unhealthy diet.
- Excess alcohol.
- Treatable or partly treatable risk factors:
 - Hypertension (high blood pressure).
 - High cholesterol blood level.
 - High triglyceride (fat) blood level.
 - Diabetes.
 - Kidney diseases that affect 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 aged 55, or in a mother or sister before they were aged 65.
 - Being male.
 - 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 and high blood pressure probably cause a greater risk to health than obesity. 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, a middle-aged male smoker who takes no exercise and has high blood pressure has a high risk of developing a cardiovascular disease such as a heart attack before the age of 60.

Therefore, the benefit of lowering a high blood pressure is to reduce the risk of developing a cardiovascular disease in the future.

For example, it is estimated that reducing a high diastolic blood pressure by 6 mm Hg reduces your relative risk of having a stroke in the future by about 35-40%, and reduces your relative risk of developing heart disease by about 20-25%. Larger reductions in blood pressure provide greater benefits.

Assessing (calculating) your cardiovascular health risk

A risk factor calculator is often used by doctors and nurses to predict the health risk for an individual. A score is calculated which takes into account all your risk factors, such as age, sex, smoking status, blood pressure, blood cholesterol level, etc. If you want to know your score, see your practice nurse or GP.

Current UK guidelines advise that if your score gives you a 2 in 10 risk or more of developing a cardiovascular disease within the next 10 years, then treatment is advised.

Treatments may include:

- A medicine to lower blood pressure if it is 140/90 mm Hg or higher.
- A medicine to lower your cholesterol level.
- A daily low dose of aspirin if you also have angina. This reduces the risk of blood clots forming in the blood vessels over patches of atheroma (which cause strokes and heart attacks).
- Where relevant, to encourage you to tackle lifestyle risk factors such as smoking, lack of physical activity, diet, and weight.

Do I need any further tests?

If you are diagnosed as having high blood pressure then you are likely to be examined by your doctor and have some routine tests which include:

- A urine test to check if you have protein or blood in your urine.
- A blood test to check that your kidneys are working fine, and to check your cholesterol level and sugar (glucose) level.
- A heart tracing, called an electrocardiogram (ECG).

The purpose of the examination and tests is to:

- Rule out (or diagnose) a secondary cause of high blood pressure, such as kidney disease.
- To check to see if the high blood pressure has affected the heart.
- To check for other risk factors such as a high cholesterol level or diabetes.

How can blood pressure be lowered?

There are two ways in which blood pressure can be lowered:

- Modifications to lifestyle (weight, exercise, diet, salt, caffeine and alcohol), if any of these can be improved upon (details below).
- Medication (details below).

Lifestyle treatments to lower high blood pressure

Lose weight if you are overweight

Losing some excess weight can make a big difference. Blood pressure can fall by up to 2.5/1.5 mm Hg for each excess kilogram which is lost. Losing excess weight has other health benefits too.

Regular physical activity

If possible, aim to do some physical activity on five or more days of the week, for at least 30 minutes. For example, brisk walking, swimming, cycling, dancing, etc. Regular physical activity can lower blood pressure in addition to giving other health benefits. If you previously did little physical activity, and change to doing regular physical activity five times a week, it can reduce systolic blood pressure by 2-10 mm Hg.

Eat a healthy diet

Briefly, this means:

- AT LEAST five portions, and ideally 7-9 portions, 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-unsaturated or polyunsaturated spreads.
- INCLUDE 2-3 portions of fish per week. At least one of which should be 'oily' such as herring, mackerel, sardines, kippers, pilchards, salmon, or *fresh* (not tinned) tuna.
- If you eat meat it is best to EAT LEAN MEAT, or eat poultry such as chicken.
- If you do fry, choose a VEGETABLE OIL such as sunflower, rapeseed or olive.
- LIMIT SALT in your diet (see below).

A healthy diet provides benefits in different ways. For example, it can lower cholesterol, help control your weight, and has plenty of vitamins, fibre, and other nutrients which help to prevent certain diseases. Some aspects of a healthy diet also directly affect blood pressure. For example, if you have a poor diet and change to a diet which is low-fat, low-salt, and high in fruit and vegetables, it can lower systolic blood pressure by up to 11 mm Hg.

Have a low salt intake

The amount of salt that we eat can have an effect on our blood pressure. Government guidelines recommend that we should have no more than 5-6 grams of salt per day. (Most people currently have more than this.) Tips on how to reduce salt include:

- Use herbs and spices rather than salt to flavour food.
- Limit the amount of salt used in cooking, and do not add salt to food at the table.
- Choose foods labelled 'no added salt', and avoid processed foods as much as possible.

Restrict your number of caffeine drinks

Caffeine is thought to have a modest effect on blood pressure. It is advised that you restrict your coffee consumption (and other caffeine-rich drinks) to fewer than five cups per day.

Drink alcohol in moderation

A small amount of alcohol (1-2 units per day) may help to protect you from heart disease. 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. However, too much alcohol can be harmful.

- Men should drink no more than 21 units of alcohol per week (and no more than four units in any one day).
- Women should drink no more than 14 units of alcohol per week (and no more than three units in any one day).

Cutting back on heavy drinking improves health in various ways. It can also have a direct effect on blood pressure. For example, if you are drinking heavily, cutting back to the recommended limits can lower a high systolic blood pressure by up to 10 mm Hg.

Lifestyle - in summary

It is estimated that dietary and exercise interventions discussed above can reduce blood pressure by at least 10 mm Hg in about 1 in 4 people with high blood pressure.

Treatment with medication

When is medication treatment started for high blood pressure?

Medication to lower blood pressure is usually advised for:

- All people who have a blood pressure that remains at 160/100 mm Hg or above after a trial of any relevant lifestyle changes.
- People with a blood pressure that remains at 140/90 mm Hg or above after a trial of any relevant lifestyle changes AND who have:
 - Diabetes; or
 - An existing cardiovascular disease; or
 - A 2 in 10 risk or more of developing a cardiovascular disease within the next 10 years (as described above).
- People with a blood pressure of 130/80 mm Hg or more who have certain diseases. For example, people who have certain complications from diabetes, people who have had a recent heart attack, stroke or transient ischaemic attack (TIA) - sometimes called a mini-stroke. Also, some people with certain chronic (ongoing) kidney diseases.

What is the target blood pressure to aim for?

If you are taking medication to lower high blood pressure:

- For most people who are otherwise well, the target is to reduce blood pressure to 140/90 mm Hg or below.
- In some people, the target is to get the blood pressure to an even lower level. This

generally applies to people who have diseases where very good blood pressure control is important. This includes:

- People who have a cardiovascular disease.
- People with diabetes.
- People who have a chronic kidney disease.

Your GP or practice nurse will advise you what your target blood pressure is.

What medicines are used to lower blood pressure?

There are several medicines that can lower blood pressure. The one chosen depends on such things as: if you have other medical problems; if you take other medication; possible side-effects of the medicine; your age; your ethnic origin, etc. Some medicines work well in some people, and not so well in others. One or two medicines may be tried before one is found to suit.

One medicine reduces high blood pressure to the target level in less than half of cases. It is common to need two or more different medicines to reduce high blood pressure to a target level. In about a third of cases, three medicines or more are needed to get blood pressure to the target level. In some cases, despite treatment, the target level is not reached. However, although to reach a target level is ideal, you will benefit from any reduction in blood pressure.

See separate leaflet called '*Medication for High Blood Pressure*' for more details.

How long is medication needed for?

In most cases, medication is needed for life. However, in *some* people whose blood pressure has been well controlled for three years or more, medication *may* be able to be stopped. In particular, in people who have made significant changes to lifestyle (such as having lost a lot of weight, or stopped heavy drinking, etc). Your doctor can advise you.

If you stop medication, you should have regular blood pressure checks. In some cases the blood pressure remains normal. However, in others it starts to rise again. If this happens, medication can then be started again.

Smoking and high blood pressure

Smoking does not directly affect the level of your blood pressure. However, smoking greatly adds to your health risk if you already have high blood pressure. If you smoke, you should make every effort to stop. If you smoke and are having difficulty in stopping, then see your practice nurse for help and advice.

Further help and information

Blood Pressure Association

60 Cranmer Terrace, London, SW17 0QS

Tel: 020 8772 4994 Web: www.bpassoc.org.uk

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The clinicians responsible for the production of this document are:

Original Author: Dr Tim Kenny
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