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High Blood Pressure (Hypertension)

High blood pressure happens when the force on the walls of blood vessels (caused by the blood within them) is more than normal. This means the heart has to work harder and the blood vessels are under more strain, making it a major risk factor for heart disease, [stroke](#) and other serious conditions. Healthcare professionals sometimes call high blood pressure 'hypertension'.

What is blood pressure?

Blood pressure is the pressure caused by your blood pressing out on the wall of your blood vessels. When usually measured in your arms, this relates to pressure in your arteries - the blood vessels that carry blood away from your heart to your organs, providing them with oxygen. High blood pressure (hypertension) is not a disease or illness. But it does put you more at risk of conditions such as [strokes](#) and [heart attacks](#).

Your blood pressure reading will have two figures, one 'over' the other - for example, 140/80. The higher figure (called the systolic level) is a measure of the pressure inside your arteries when your heart is pumping blood out. The lower figure (called the diastolic level) is a measure of the pressure inside your arteries when your heart is resting between beats. Blood pressure is measured in millimetres of mercury (mm Hg).

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.

What are the symptoms of high blood pressure?

The vast majority of people with high blood pressure do not know they have it, until it causes a complication such as a stroke or heart attack. Usually high blood pressure is only picked up if blood pressure is checked routinely, or as part of checks for another medical problem.

Occasionally if it is very high, you can get headaches. Even more occasionally, some people feel a bit dizzy, or their vision can be affected.

Other than the blood pressure reading being high, there isn't usually anything for the doctor to find on examination either. If blood pressure has been high for some time, or very high, there can be changes in the blood vessels at the back of the eye.

Why is high blood pressure a problem?

High blood pressure (hypertension) is a risk factor for developing serious health problems sometime in the future. If you have high blood pressure, over the years it may do some damage to your blood vessels (arteries) and put a strain on your heart. In general, the higher your blood pressure, the greater the health risk.

Cardiovascular disease is the biggest risk from having high blood pressure. Cardiovascular diseases are diseases of the heart (cardiac muscle) or blood vessels (vasculature). This usually means 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 blood vessels (arteries). 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 \(TIA\)](#).
- [Peripheral arterial disease](#).

High blood pressure is just one of several possible risk factors for developing a cardiovascular disease. Others include smoking, having high cholesterol and being overweight.

If your blood pressure is reduced, by lifestyle changes and/or medicines, you can reduce your risks of all these conditions. Fairly obviously, this improves your chances of living for longer with good health.

Keeping your blood pressure under control also reduces the risk of other health conditions, including:

- Problems with your eyesight (retinopathy).
- Aortic aneurysm.
- Heart failure.
- Chronic kidney disease.

What causes high blood pressure?

Essential (primary) hypertension

The cause of high blood pressure is not known in most cases. This is called essential or primary hypertension. The pressure in the blood vessels (arteries) depends on how hard the heart pumps and on 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.

Risk factors for high blood pressure

High blood pressure is more common in people:

- With diabetes. This is the case in both **type 1** and **type 2 diabetes**. However, it is even more common in those with type 2 diabetes.
- Of 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 take enough exercise.
 - Drink a lot of alcohol.
 - Have a lot of stress.

Secondary hypertension

In some cases, high blood pressure is caused by other conditions - this is called secondary hypertension. For example, certain kidney or hormone problems can cause high blood pressure. In some cases, medication taken for other conditions can cause blood pressure to rise.

What is high blood pressure?

High blood pressure (hypertension) 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 where the average is more than 135/85 mm Hg. That is, it is sustained at this level. High blood pressure can also 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. You can find out more about home and ambulatory blood pressure measurements below.

Blood pressure of 140/90 mm Hg or above (or average 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 (end-organ damage) due to high blood pressure.

Blood pressure of 160/100 mm Hg or above (or home/ambulatory readings 150/95 mm Hg or above)

If your blood pressure is always in this range, you will almost certainly be advised to have treatment to bring it down.

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 ongoing (chronic) kidney diseases.

Clinical Editor's Note

November 2017 - Dr Hayley Willacy has recently read guidelines from the American College of Cardiology and the American Heart Association Task Force - see 'Further Reading and References', below. These have redefined the boundaries of elevated blood pressure. The earlier the risks of developing cardiovascular disease are picked up, the greater your chances to make good lifestyle changes which can make a difference:

- Normal: <120/80 mm Hg.
- Elevated: 120-129/<80 mm Hg.
- Stage 1: 130-139/80-89 mm Hg.
- Stage 2: >140/90 mm Hg.

Some people will not need medication. They will manage through diet and exercise, to lower their risks. Older adults with high blood pressure, other medical problems and limited life expectancy will be assessed individually to make the best decision for them.

How is blood pressure measured?

Your first blood pressure reading will usually be in a clinic or GP's surgery. 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. These will commonly be in the form of home or ambulatory readings. The length of the observation period varies depending on the initial reading and whether you have other health risk factors.

Clinic/GP surgery blood pressure readings

These are readings taken by a doctor or nurse in a clinic or a GP surgery, using a standard blood pressure machine.

Home blood pressure readings

You may be given (or asked to buy) a machine to take your own blood pressure readings at home.

These are readings taken by a person whilst seated and at rest at home, using a standard blood pressure machine. You need to take readings twice a day for a week. This will give 14 top and 14 bottom readings. Add the top readings together and divide by 14. Then do the same for the bottom readings. This gives you an average reading. It's normal for your blood pressure to fluctuate, so a single raised reading isn't a cause for concern unless it's extremely high.

You may be advised to take readings twice a day for eight days rather than a week, and ignore the readings from the first day, which will tend to be higher.

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, usually over a 24-hour period.

As a rule, an average of the ambulatory blood pressure readings gives the truest 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.

How is high blood pressure diagnosed?

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

Unless a single level is extremely high (see above), your doctor will not make a diagnosis of high blood pressure without an average of several readings, usually from home or ambulatory measurements.

One reason for this is because some people become anxious in medical clinics. This 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.

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 following week or so. Also, treatment with medication is usually considered at an earlier stage if the readings remain high.

Do I need any further tests?

If you are diagnosed as having high blood pressure (hypertension) 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 normally** 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.
- Check to see if the high blood pressure has affected the heart.
- Check for other risk factors such as a high cholesterol level or diabetes.

Can I get my blood pressure down without taking medication?

Sometimes there is quite a bit you can do with lifestyle changes, and in some people this may help them to avoid medication. In particular, the following help:

- Losing weight if you are overweight.
- Reducing the salt you have in your food.
- Taking regular exercise.

Stopping smoking doesn't reduce your blood pressure as such, but smoking and high blood pressure put you at risk of the same conditions. So if you can quit smoking, you'll reduce your risk of strokes, heart attacks, etc.

See separate leaflet called [Living with High Blood Pressure](#).

What if I need medication to lower my blood pressure?

There are many different medicines for high blood pressure. They work in various different ways. Your doctor will advise on the best one for you. If it doesn't work, or you have side-effects, there are plenty of other options. The idea is to find you one or more pills which suit you, and which control your blood pressure. Once you and your doctor have cracked it, you'll need to keep taking your medication long-term to make sure you stay protected. Your blood pressure will be checked regularly and medication adjusted if need be.

See separate leaflet called [Medicine for High Blood Pressure](#).

Further reading & references

- [Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults](#); Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, 2017
- [Hypertension: management of hypertension in adults in primary care](#); NICE Clinical Guideline (August 2011)
- [Guidelines for the management of arterial hypertension](#); ESH/ESC Clinical Practice Guidelines, European Society of Cardiology (2013)
- He FJ, Li J, Macgregor GA; Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomised trials. *BMJ*. 2013 Apr 3;346:f1325. doi: 10.1136/bmj.f1325.
- [Description of the DASH \(Dietary Approaches to Stop Hypertension\) Eating Plan](#); National Institutes of Health
- [Lipid modification - cardiovascular risk assessment and the modification of blood lipids for the prevention of primary and secondary cardiovascular disease](#); NICE Clinical Guideline (July 2014)
- Ettehad D, Emdin CA, Kiran A, et al; Blood pressure lowering for prevention of cardiovascular disease and death: a systematic review and meta-analysis. *Lancet*. 2016 Mar 5;387(10022):957-67. doi: 10.1016/S0140-6736(15)01225-8. Epub 2015 Dec 24.
- [Alcohol Guidelines Review – Report from the Guidelines development group to the UK Chief Medical Officers](#); Department of Health, January 2016
- [2016 European Guidelines on cardiovascular disease prevention in clinical practice](#); European Society of Cardiology (2016)

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