



# High blood pressure (Hypertension)

---

## Information for patients from the Department of Renal (Kidney) Medicine

This leaflet is not meant to replace the information discussed between you and your doctor, but can act as a starting point for such a discussion or as a useful reminder of the key points.

### What is high blood pressure (hypertension) and what causes it?

High blood pressure is one of the most common and preventable causes of premature heart disease, stroke, vascular and kidney disease in the UK. About one in four of all adults and more than half of those over 60 years old are affected.

The cause of high blood pressure is not fully understood in most of those affected, who are often described as having 'essential hypertension'.

A number of different factors are known to be important. These include:

- excessive retention of salt in the body by the kidneys
- reduced blood flow in the kidneys, partly due to increased activity of nerves involved in 'stress' responses (the sympathetic nervous system)
- increased activity in a complex system of hormones (known as the 'renin-angiotensin-aldosterone' system).



## How is blood pressure measured?

Blood pressure is usually measured using a device called a sphygmomanometer or 'blood pressure monitor' where a cuff is applied to the upper arm over the brachial artery. Some devices measure blood pressure at the wrist, over the radial artery, although we do not recommend using these.

When measuring blood pressure, two readings are taken at the same time. The upper reading (systolic) reflects the pressure generated within the arteries when the heart is contracting. The lower reading (diastolic) reflects the pressure that remains in the artery when the heart is relaxing and filling. Blood pressure is therefore often presented as 'systolic/diastolic' with units 'millimeters of mercury' or 'mmHg' for short. For example: 140/85 mmHg, where 140 is the systolic, and 85 is the diastolic blood pressure. Although both systolic and diastolic readings have significance, most guidelines and targets for 'optimal' blood pressure control now focus on systolic blood pressure (the upper reading).

## Why do you recommend that I measure my blood pressure at home?

Home blood pressure monitoring is now recommended for people with hypertension by all major guidelines (such as NICE) and allows us to more fully evaluate your blood pressure, particularly if you are having a 'virtual' consultation with us by video or phone.

In addition, around one quarter of people have the 'white coat effect' where their blood pressure readings are higher at their GP surgery or hospital clinic than they are at home. For these people, home or automated wearable device ('ambulatory') blood pressure measurements are very helpful.

## What blood pressure monitor should I buy?

It is important that, whatever device you are using, it has been validated - in other words, its accuracy has been confirmed. A regularly updated list of validated monitors can be found on the British and Irish Hypertension Society web site [bihsoc.org/bp-monitors/for-home-use/](https://bihsoc.org/bp-monitors/for-home-use/)

We do not recommend or endorse any particular brand or model of blood pressure monitor, but these can be bought from pharmacies or online.

Monitors should be recalibrated or replaced according to manufacturer instructions – usually every two to four years – to make sure that the readings they generate are reliable. Some manufacturers offer recalibration services and we recommend checking individual manufacturers web sites for more information on this.

## How should I measure my own blood pressure?

Detailed guidance, including a short film on how to measure your blood pressure, can be found on the Blood Pressure UK web site [www.bloodpressureuk.org/BloodPressureandyou/Homemonitoring/Howtomeasure](http://www.bloodpressureuk.org/BloodPressureandyou/Homemonitoring/Howtomeasure)

In brief, you should:

- Make sure that the arm on which you are taking measurements is free of constricting clothing and comfortably supported at the level of your heart.
- Place the cuff around your upper arm, as per manufacturer instructions. You should make sure that the cuff is an appropriate size for your arm.
- After resting for five minutes, take a blood pressure reading and make a note of that reading. Take two further readings, with one to two minutes between each reading.
- If you are taking your blood pressure at home for the first time, always compare readings in both arms. If one arm has a systolic blood pressure of more than 15mmHg higher than the other, always take readings on the **higher** arm. Otherwise always use this same arm for future readings.

In general, we will ask you to take **two sets of three readings per day** (morning, between 6am and 10 am, before your blood pressure medication, if you take these; and in the evening, between 8pm and 10 pm), **for either one day or three consecutive days** before your appointments and on other selected occasions (for example a few weeks after changing blood pressure medication or medication doses). Occasionally we will ask for readings over five to seven consecutive days.

A sheet on which you can record your home blood pressure readings can be found at the end of this leaflet.

## How is high blood pressure treated?

Usual treatment for high blood pressure includes lifestyle changes such as reducing salt in the diet, increasing exercise, and losing weight where appropriate, plus blood pressure lowering medications.

Lifestyle changes that are recommended for people with high blood pressure include the following.

- **Salt intake.** The average salt intake in the UK is 9 grams per day. The recommended daily salt intake for an adult is 5 to 6 grams per day. Reducing the amount of salt in your food lowers blood pressure, and makes blood pressure lowering medications more effective. Although stopping adding salt to your food when cooking or at the table is important, 80% of the salt we eat is already present in food when we buy it – so called 'hidden salt'. Understanding food labelling can help you see where these hidden sources of salt are found.
- **Healthy diet.** You should follow a diet that is rich in fresh fruit and vegetables, and low in saturated fat.
- **Weight.** You should try to maintain a body mass index between 20 and 25 kg/m<sup>2</sup>. Those with BMI greater than 30 kg/m<sup>2</sup> and high blood pressure should definitely try to lose weight to achieve at least a BMI of 27.5 kg/m<sup>2</sup>, but preferably lower. See BMI chart at the end of this leaflet.

- **Alcohol consumption.** You should adhere to current weekly UK limits (less than 21 units for men; less than 14 units for women) with at least two alcohol free days in a week. One unit of alcohol is equivalent to half-pint of average strength beer; a small glass of wine (125 ml); or a single pub measure of spirits. Remember that stronger beers (such as continental lager) and larger glasses of wine (175 ml or 250 ml) will contain more units.
- **Exercise.** You should try to exercise for at least 30 minutes three times a week, although more is recommended if possible. A variety of different types of exercise – aerobic/endurance (for example running), resistance (for example weights), or isometric (for example planks) - all appear to be equally helpful in reducing blood pressure.

For more information on lifestyle modification visit the Blood Pressure UK website [www.bloodpressureuk.org/BloodPressureandyou/Yourlifestyle](http://www.bloodpressureuk.org/BloodPressureandyou/Yourlifestyle)

### **Medicines for high blood pressure are made up of three common classes**

- “Renin-angiotensin system” blocking drugs: these block various parts of a complex hormone system called the “renin-angiotensin system”. Examples include: ACE inhibitors (end in –pril) such as ramipril; angiotensin receptor blockers (end in –sartan) such as losartan or irbesartan; renin inhibitors such as aliskiren.
- Vasodilators: these directly relax muscles in the blood vessel wall. Examples include: calcium channel blockers such as amlodipine; alpha-blockers such as doxazosin.
- Diuretics or “water pills”: these encourage the kidney to excrete salt and water. Examples include: bendroflumethiazide, indapamide, frusemide, spironolactone.

For more information on blood pressure lowering medicines visit the Blood Pressure UK website [www.bloodpressureuk.org/BloodPressureandyou/Medicines](http://www.bloodpressureuk.org/BloodPressureandyou/Medicines)

### **My blood pressure is not controlled – why is that?**

Despite treatment, in about half of people taking medication, their blood pressure will be higher than desirable. There are a number of possible reasons for this.

- **Inadequate numbers of blood pressure medications:** many people need three or more different types of blood pressure tablet.
- **Inadequate doses of blood pressure medications:** although some people will not be able to tolerate higher doses of some tablets due to the side effects, it is quite common for less-than-maximal doses of medication to be prescribed without a good reason.
- Not taking medications regularly or in amounts suggested by your doctor.
- Not enough changes to your lifestyle.
- The “white coat effect”.
- **“Secondary” hypertension:** underlying causes such as over-production of certain hormones (for example aldosterone) or kidney artery narrowing are found in five to 10 out of every 100 people with uncontrolled blood pressure.

If you or your doctor think any of the above apply to you, this can be discussed at your clinic visits.

## What is resistant hypertension?

Resistant hypertension is generally means blood pressure that remains uncontrolled in someone who is taking at least three or four blood pressure lowering medications at an adequate dose, who has made appropriate changes to their lifestyle (for example salt intake, weight loss), and who has been investigated for underlying causes of high blood pressure. People with resistant hypertension also need to have the 'white coat effect' excluded by ambulatory or home blood pressure monitoring.

People with resistant hypertension are more likely to suffer heart disease or stroke, compared to people with controlled blood pressure. Treatment options for people with resistant hypertension include additional blood pressure lowering medications – spironolactone or amiloride – or sometimes enrolment into clinical trials of novel treatments such as renal denervation or other device based therapy.

## Where can I get more information?

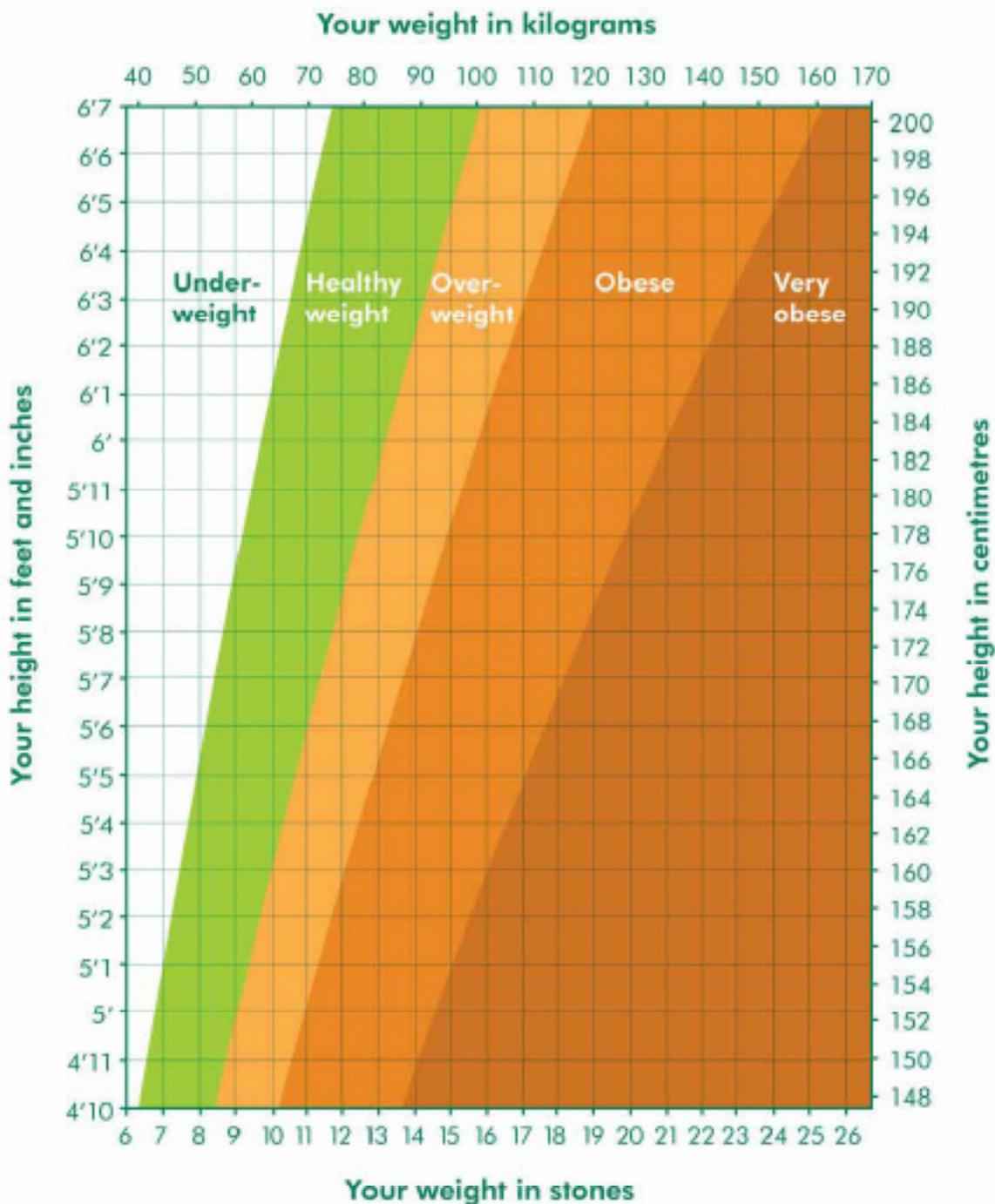
- Blood Pressure UK [www.bloodpressureuk.org/Home](http://www.bloodpressureuk.org/Home)  
(Section on salt: [www.bloodpressureuk.org/BloodPressureandyou/Yourlifestyle/Eatingwell/Salt](http://www.bloodpressureuk.org/BloodPressureandyou/Yourlifestyle/Eatingwell/Salt))
- British Heart Foundation [www.bhf.org.uk/heart-health/prevention.aspx](http://www.bhf.org.uk/heart-health/prevention.aspx)

Thank you for taking the time to read this information leaflet. If you have any further questions please speak to your GP.

## Body Mass Index Chart

Body Mass Index (BMI) is calculated by dividing your weight (in kilograms) by your height (in metres) squared.

- A BMI less than 18.5 kg/m<sup>2</sup> is underweight.
- A BMI between 18.5 and 24.9 kg/m<sup>2</sup> is a healthy weight.
- A BMI between 25 and 29.9 kg/m<sup>2</sup> is overweight.
- A BMI of 30 kg/m<sup>2</sup> or higher is obese (well above the healthy weight range for your height).
- A BMI of 40 kg/m<sup>2</sup> or higher is very obese.



**Home blood pressure readings****Name:****NHS/Hospital number:**

If this is the first time you have measured your blood pressure (BP), please check readings in both arms. If the systolic BP is more than 15 mmHg higher in one arm, always use this arm for future measurements.

On each occasion you measure your BP rest for 5 minutes with your BP cuff on. Take three readings on each occasion, with 1 to 2 minutes between each reading. Take readings over 1 day or over 3 to 7 consecutive days, as directed.

See [www.bloodpressureuk.org/BloodPressureandyou/Homemonitoring/Howtomeasure](http://www.bloodpressureuk.org/BloodPressureandyou/Homemonitoring/Howtomeasure) for further guidance on home BP measurements. The BHS publishes a list of validated BP monitors suitable for home use ([bihsoc.org/bp-monitors/for-home-use/](http://bihsoc.org/bp-monitors/for-home-use/))

Day	1: / /20	2: / /20	3: / /20	4: / /20	5: / /20
<b>Morning</b> (if on blood pressure medication, take blood pressure readings before tablets)	1: ___ / ___ mmHg				
	2: ___ / ___ mmHg				
	3: ___ / ___ mmHg				
<b>Evening</b>	1: ___ / ___ mmHg				
	2: ___ / ___ mmHg				
	3: ___ / ___ mmHg				

**This leaflet has been produced with and for patients**

If you would like this information in **another language, audio, Braille, Easy Read, or large print** please ask a member of staff. You can ask someone to contact us on your behalf.

**Any complaints, comments, concerns, or compliments** please speak to your doctor or nurse, or contact the Patient Advice and Liaison Service (PALS) on 01227 78 31 45, or email [ekh-tr.pals@nhs.net](mailto:ekh-tr.pals@nhs.net)

**Patients should not bring in large sums of money or valuables into hospital.** Please note that East Kent Hospitals accepts no responsibility for the loss or damage to personal property, unless the property had been handed in to Trust staff for safe-keeping.

**Further patient leaflets** are available via the East Kent Hospitals web site [www.ekhufft.nhs.uk/patientinformation](http://www.ekhufft.nhs.uk/patientinformation)