

# What I tell my patients about hypertension

Hypertension, perhaps better known as high or raised blood pressure, is very common in the general population and an important cause of premature illness and early death. More often than not, blood pressure (BP) is found to be raised as part of a routine medical examination or when another matter has caused you to seek advice from a doctor. You are probably not aware of your BP, whether raised or not. You may understandably resent the new diagnosis and may resist the idea of treatment with drugs.

## What is blood pressure?

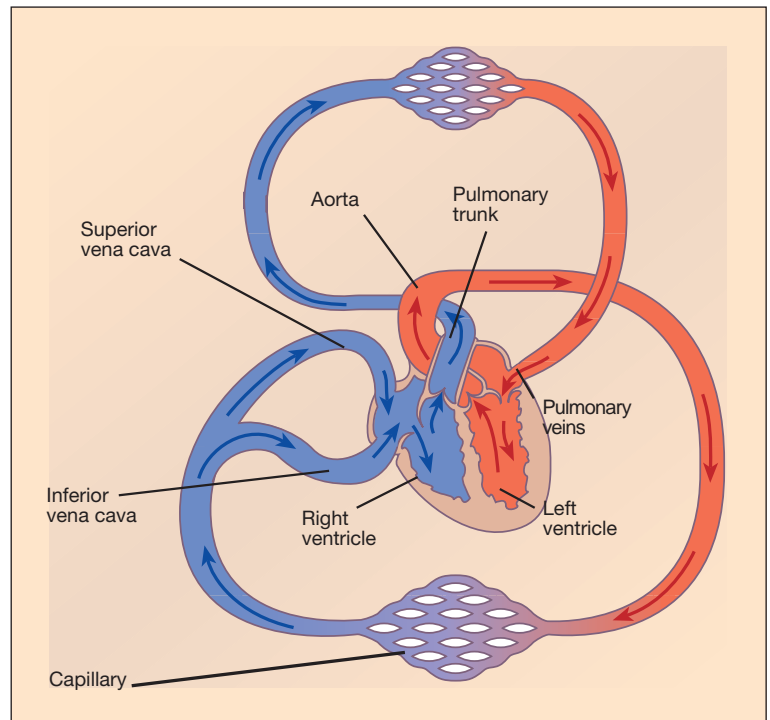
The heart is a pump which forces blood through the lungs to collect oxygen (Figure 1). Using a network of blood vessels (arteries) it distributes this oxygen-containing blood to all parts of the body to supply nutrients to our cells. Blood pressure is a measure of the force of the heartbeat and of the state of tension in blood vessels. There are two figures that are used in blood pressure: an upper figure (systolic pressure) and a lower figure (diastolic pressure). Both of these are important. BP is measured in millimetres of mercury (mmHg).

## Why do we measure BP?

Measuring BP is a quick, painless way to find out about the health of your heart and arteries. A regular part of doctors' practice for many decades, we have come to realise how common high BP is, the harm that it can do and, recently, how effective treatment can be in saving lives. The importance of measuring BP has increased steadily.



*Blood pressure is measured in millimetres of mercury*



*Figure 1. The major blood vessels and the heart*

## How do we measure BP?

The most common way to measure BP is to use a BP-cuff (sphygmomanometer) which can be inflated by a hand pump. The cuff is placed around either upper arm and inflated, while the measurer listens over the main arm artery with a stethoscope. The pressure is read by looking at a falling column of liquid mercury, while listening to the sound of the blood trying to get past the inflated cuff applied to the upper arm. This technique is over 90 years old (and some meters definitely look it!). More modern approaches include automated machines, some with printouts.

## Are there problems getting an accurate BP reading?

Absolutely. There are several crucial requirements for accuracy. These include selecting a BP-cuff that is the right size for the arm (too small a cuff will exaggerate the BP level), making sure that the arm is relaxed while the measurement takes place, not rushing the measurement, and making sure that the mercury column is intact and vertical. Check how the next person measures your BP.

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## What is 'normal' BP?

Extremely high BP levels are almost always serious and may merit treatment straight away. If the BP elevation is minor, it is best to repeat BP measurements over a few months to see how things progress. Sometimes BP will become normal. Taking BP when someone is extremely anxious or angry, or has just rushed in to a clinic or surgery, is not sensible as the BP normally changes with physical and mental exercise, emotion, and with sleep and meals. For some people, the very act of having their BP taken by a doctor or a nurse puts it up. This is popularly called the 'white coat' effect. Despite these reservations, we have 90 years of experience of this type of BP reading, and nearly all of the information about the effects of successful BP treatment comes from single readings taken at rest in a hospital/clinic setting.

Evidence now suggests that BP values of 140/90 mmHg or higher are raised with no allowance for age. This does not mean that everyone with a reading greater than these values must then start BP treatment, although the risk of BP-related illness remains higher than this threshold in the long term. Equally, the cut-off does not mean that everyone with a reading under 140/90 mmHg will be OK for life. Whether to start BP treatment is a decision that patients and doctors make on an individual basis, with an individual assessment of the risks and benefits, weighing up other risk factors such as age, gender, cholesterol, weight, smoking and heart muscle thickness.

## What about BP measures I can take at home?

Because of the problems achieving accurate measurements that we have previously discussed, increasing use is being made of automated machinery that patients can use at home. This can be in the form of small devices, such as OMRON

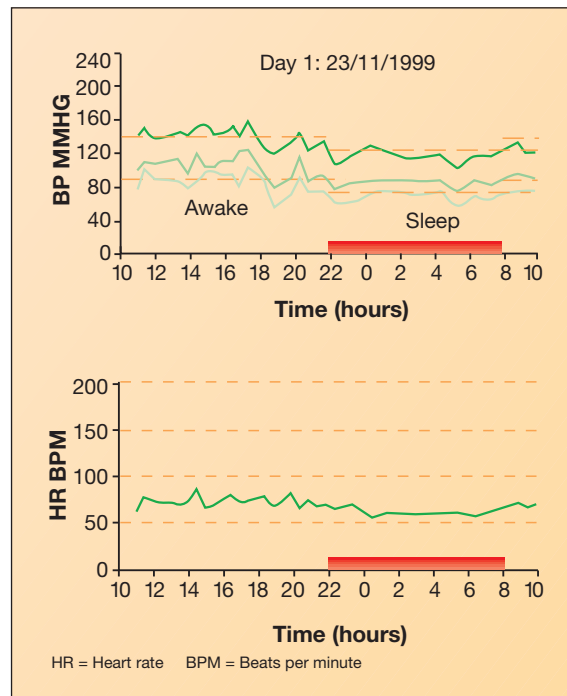


Figure 4. Ambulatory BP monitoring traces: normal diurnal rhythm BP falls during sleep (shaded area)

705CP or OMRON HEM-705CP, that can be fitted and used by patients. (These are not on NHS prescription yet and cost about £100, so check with your doctor before purchasing.) Larger portable automatic BP machines that record BP regularly for 24- or 48-hours at your home and place of work are also available. Both of these methods, especially the 24-hour recordings (also known as ambulatory BP monitoring), are more accurate, more reliable and can avoid the 'white coat' effect. However, these methods cost more. Figure 2 shows a 24-hour BP tracing.

## Why does BP rise in the first place?

The question is simple – the answer is not. Overall, there could be as many as one in four or five of the UK population with BP levels higher than 'normal'. In affluent societies, systolic (upper figure) BP rises with age. This relates to high salt and fat intake in our diet, causing blood vessels to stiffen and 'furr'. Other reasons for high BP include overweight, kidney diseases, the contraceptive pill, and hormone and nervous system imbalances. High blood pressure (and diabetes, too) often runs in families.

In younger patients, it can be important that any underlying reason for high BP is discovered. Most often (90%) there is no treatable underlying reason for the BP to have risen.

## What if my BP is high and I feel perfectly well?

This is a typical comment, and perfectly fair. High blood pressure is linked to heart attacks, to heart pump failure, strokes, kidney failure, and furring-

Figure 3. Ambulatory BP monitoring machines can be used at home or at work



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**Table 1. Details of the most common types of BP medication. Indications for use and main side-effects**

Type	Example	Effective in	Don't use with...	Side-effects	Cost
Diuretic	Bendrofluazide	Elderly	Gout	Gout, diabetes Impotence	1
Beta-blocker	Atenolol	BP + angina	Poor circulation Asthma	Tiredness Cold hands and feet Wheeziness Poor circulation	1
Calcium-channel blocker	Nifedipine Amlodipine	BP + angina	Unstable angina Leg swelling	Flushing Leg swelling	2,3
Alpha-blocker	Doxazosin	Most situations		Dizziness	2,3
ACE inhibitor	Enalapril	Heart problems Kidney problems	<100% kidney blood supply	Cough	2,3
Angiotensin antagonist	losartan	Difficulties with ACE	<100% kidney blood supply	None	2,3

Cost: 1=cheap (<£5/month); 2=moderately expensive (£5–£10/month); 3=very expensive (>£10/month)

up of arteries. Not everyone with high BP will die prematurely; not everyone with normal BP will escape a heart attack or stroke. But having high BP puts anyone's risk of these problems up, especially if the fat in the blood (cholesterol) is also raised or if you smoke cigarettes.

Raised BP in the early stages causes few – or sometimes, no – symptoms. This is why it so often used to go undetected, slowly causing problems that built up and then suddenly resulted in serious illness or even death. Headaches, tiredness, nose-bleeds and blurred vision can also be signs of seriously elevated BP.

Given how easy it is to measure BP, and to treat it if raised, everyone should have their BP measured at every visit to the doctor and, ideally, every five years after the age of 40. This is especially true if there are other close relatives with raised BP.

### How can BP be treated – can I help myself?

Yes, there are many things that you can do. Relaxation, stress relief, gentle aerobic exercise (check with your doctor), losing weight, cutting down on excessive alcohol, and reducing intake of salt in food and drinks, can all help to some extent. If BP elevation is mild these measures may restore BP to normal over a few months. Even if they do not, they are sensible lifestyle changes, together with not smoking. If drugs are needed to control BP fully, the drugs will work better at lower doses if these lifestyle measures are in place.

### BP drugs – doesn't that mean therapy for life and nasty side-effects?

It is true that most patients need drug therapy for as long as their BP is raised. This is often for a very long time, maybe indefinitely. Sometimes if the lifestyle measures work well it is possible to withdraw or reduce drug therapy.

All drug therapies can have some side-effects. Table 1 lists the common drug treatments with the main side-effects. Please don't read the information insert in the pillbox and then expect to experience all of the side-effects mentioned. Most patients, most of the time, do not experience any side-effects from BP drugs.

If your BP has been very high, treatment may make you feel more tired than you did before as your BP falls. This does not usually last for too long.

### Which drugs are the 'best' ones to take?

There are two 'bests' to consider here. First of all, the older drugs are those we have used longest and know most about in terms of their effects, both good and bad. Older drugs do tend to have a larger number of side-effects. They are often among the cheapest BP medicine. Newer drugs have not been used for long enough to know about long-term safety. They do have fewer side-effects as a rule. They are usually not cheap.

Most of the information about the benefit of taking BP pills comes from trials using the older-style drugs. Recently, a few of the newer



drugs have been shown to be as effective at preventing illness as the older ones. Probably, it matters more that the BP falls to safe levels after starting treatment than the taking of one particular drug over another. Not everyone responds straight away with a fall in BP after starting a drug. It may take some months of trial and error with drug types and doses before you are matched with a successful drug. Understanding doctors – and patient patients – both prepared to persevere, are essential to long-term success. I feel that it helps to set a time target for each patient. This way, clear goals are set and progress can be measured.

### How should my treatment be monitored, and what of the future?

Once established on successful treatment, BP should be checked every six to 12 months. Referrals to attend BP clinics in hospital are necessary when either there is no success or drug side-effects are a significant problem.

Successful treatment of BP can help protect against heart and blood vessel diseases in later life, and the misery and suffering that these can bring.

Treatment goals should be to bring BP into the normal ranges. At present, we know that it is safe to reduce BP to 130–140/80–85 mmHg, and maybe even lower. Whether there is a lower limit for safe reduction of BP beyond which the risks of reduction exceed the benefits, is not yet known.

### High BP in patients with kidney diseases, on dialysis, or after kidney transplantation

Raised BP is a cause of kidney failure and also a sign of kidney disease. Scarring of the kidney causes some hormones to be released that raise

BP and also activate the nervous system. In addition, the kidney cannot excrete enough salt and water, which puts BP up. We know that in diabetic kidney damage, in inherited polycystic kidney disease, and in kidney inflammation and scarring, raised BP can hasten kidney failure and make dialysis necessary earlier. Treatment can prolong the time that failing kidneys can go on working. Certain drugs, known as ACE (angiotensin-converting enzyme) inhibitors (Table 1), act particularly well, provided the blood supply to the kidneys is satisfactory.

About 80% of dialysis patients have raised BP and need treatment. EPO (erythropoietin) therapy can raise BP significantly in about one in four patients. Those on haemodialysis can have problems because some drugs can have a more powerful effect on BP the closer a patient gets to his/her dry weight. Sometimes it is necessary to omit BP drug doses on dialysis day, though this is not ideal if the BP is then too high again the same or the next day. If strict attention is paid to salt and water balance by the patient and the dialysis staff, the need for BP drugs can be reduced. It is not yet known how intensively to treat BP in dialysis patients.

About 80–90% of patients with a renal transplant need BP therapy. Reasons include the fact that the transplanted kidney may have come from a hypertensive donor; and the use of immune suppressing drugs cyclosporin and steroids, both of which raise BP and can contribute to fluid retention. Raised BP in transplant patients can lead to heart attacks, strokes, and the premature loss of kidney transplant function and earlier return to dialysis. Treatment often means several drugs at high dose, especially in the early days, but is often successful. Some BP drugs can interfere with cyclosporin or tacrolimus – drugs given to stop the body rejecting the transplanted kidney.

### Key points

- Measuring BP is a quick, painless way to find out about the health of your heart and arteries.
- Extremely high BP levels are almost always serious and may merit treatment straight away.
- Relaxation, stress relief, gentle aerobic exercise, losing weight, cutting down on excessive alcohol, and reducing intake of salt in food and drinks, can all help to reduce BP.
- Most patients, most of the time, do not experience any side-effects from BP drugs.

### Are treatments becoming more effective?

Treating raised BP is one of modern medicine's success stories. Thirty years ago, raised BP usually was noted after a stroke or a heart attack, and therapies were crude and ineffective. We have entered the new millennium with effective treatments, usually well tolerated by patients, which can save lives. The challenge is to detect BP changes early enough to prevent future complications, to identify those patients at special risk of complications and, in particular, to try to find ways to reduce the BP of the whole population or to prevent the steady rise in BP we see with ageing ■

#### Further reading

[www.mayohealth.org/mayo/9911/htm/hypertension.htm](http://www.mayohealth.org/mayo/9911/htm/hypertension.htm)  
[www.kidneypatientguide.org.uk](http://www.kidneypatientguide.org.uk)  
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