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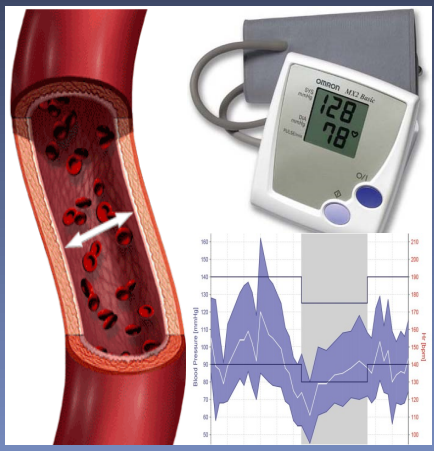
HYPERTENSION



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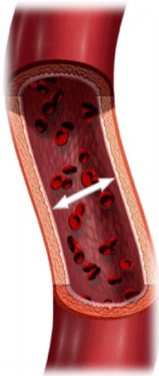
Hypertension

High blood pressure (hypertension) is a very common condition, affecting 1 in 4 adults in the UK and 70% of people over 70 years of age. There is a direct relationship between high blood pressure readings and the incidence of coronary artery disease and stroke:

half of coronary artery disease cases
and
two thirds of stroke cases
are due to
raised blood pressure



Blood pressure is the pressure exerted on the walls of the arteries when the heart pumps; the term "systolic" relates to the maximum pressure exerted on the artery when the heart contracts, and the term "diastolic" to the minimum pressure exerted on the artery when the heart relaxes. Both the systolic (top reading) and diastolic (bottom reading) are important:

for adults aged 40 to 69
every 20 mmHg ↑ in systolic blood pressure
or
10 mmHg ↑ in diastolic blood pressure
doubles
the risk of death from coronary artery disease

Blood pressure changes throughout the day, tending to be highest in the morning and lowest in the evening. It can rise transiently with stress and will be higher during physical activity than before. Some patients become anxious about having their blood pressure taken, which can make clinic readings higher than they would be at home - the "white coat" effect.

For this reason doctors differentiate between clinic readings and readings obtained at home or from ambulatory monitoring, and the latest NICE (National Institute for Clinical Excellence) and BIHS (British and Irish Hypertension Society) guidelines (2016) categorise blood pressure as follows:

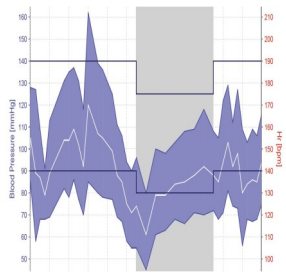
Definition	Clinic BP		ABPM/Home BP
Normotensive (normal BP)	<140/90	or	<135/85
Stage 1 hypertension	≥140/90	or	≥135/85
Stage 2 hypertension	≥160/90	or	≥150/95
Severe hypertension	≥180/≥110		

A clinic blood pressure reading of 180/110 mmHg or higher warrants immediate treatment and referral for specialist care under a cardiologist. Blood pressures of up to 140/90 mmHg do not generally warrant treatment, but blood pressures between these measurements, i.e. 140-180/90-110 mmHg should be investigated with a 24 hour ambulatory blood pressure monitor (ABPM) and the patient should be given advice on aspects of their lifestyle which they might be able to address to bring their readings down.

Guidelines tend to vary between countries, and more recently issued guidelines from the US (2017) advocate lower blood pressure still - less than 130/80 mmHg - and it may be that the UK will also adopt similar targets in due course.

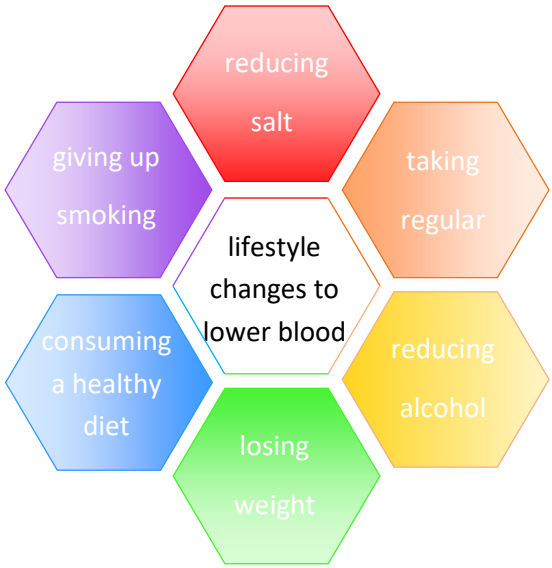
Ambulatory/24 hour blood pressure monitoring (ABPM)

An ambulatory blood pressure monitor is programmed to take a patient's blood pressure at regular intervals throughout the day and night over a 24 hour period, to allow the doctor to assess the reliability of readings obtained in their clinic . The blood pressure cuff is fitted to the non-dominant arm and will inflate every 30 minutes during the day, and every hour at night. The patient will also be asked to keep a diary over the 24 hours, to help the doctor make sense of any particularly high or low readings.



Lifestyle modification

Anyone with raised blood pressure should be offered advice about lifestyle changes that can help to lower readings, such as:



The single most important dietary change one can make in the presence of hypertension is to reduce salt intake, since this has a significant effect on blood pressure. A diet high in salt alters the balance of fluid either side of the blood vessel walls, leading to an increased volume of fluid in the blood, increasing the pressure exerted against the walls of the blood vessels.

a reduction in daily salt intake
from
10g to 6g
would result in
2.6 million fewer deaths
per year worldwide
from
stroke and coronary heart disease

6g of salt is about one teaspoonful to look at. On nutritional labelling there is often only a figure for sodium rather than salt *per se*, but the true salt content of a dish is 2.5 times its sodium content, so working from labels alone the goal is a sodium intake of 2.4g or less per day. Thankfully these days many foods have a "traffic light" coding system on the packaging to make it easier to determine which foods to restrict:

High = 1.5g salt or 0.6g sodium per 100g

Medium = 0.3-1.5g salt or 0.1-0.6g sodium per 100g

Low = 0.3g salt or 0.1g sodium per 100g

Some foods have actually been identified as having blood pressure lowering properties, and indeed in the USA there is a diet known as the DASH diet - Dietary Approaches to Stop Hypertension.

Beetroot and garlic in particular have consistently been demonstrated to produce a drop in blood pressure. A 2010 study in the medical journal *Hypertension* found that drinking beetroot juice reduced systolic blood pressure by up to 5.4 mmHg compared to drinking water, and a meta-analysis published in *BMC Cardiovascular Disorders* reviewed 11 studies looking in to the blood pressure lowering effects of garlic and found that there was an average reduction in systolic blood pressure of 4.6 mmHg compared with placebo.

Treatment for hypertension

There are a number of different drug classes which can lower blood pressure. Most patients need more than one drug to lower blood pressure adequately and treatment is usually for life. Patients respond differently and often unpredictably to antihypertensive drugs; one drug class may have no effect on one patient's blood pressure, whereas a different drug class may lower the blood pressure significantly.

Age and racial origin are important determinants of response to therapy; for example, patients over 55 years and those of black ethnic origin will usually respond best to calcium channel blockers (e.g. amlodipine or diltiazem).

Other classes of drug include ACE inhibitors (e.g. lisinopril or perindopril) and angiotensin receptor blockers (ARBs) (such as candesartan, losartan and valsartan) as well as diuretics (e.g. bendroflumethiazide); beta blockers (e.g. bisoprolol and atenolol) are less frequently used these days.

For more resistant blood pressure alpha receptor blockers (e.g. doxazosin), spironolactone and centrally acting drugs may be prescribed.

Each drug class has a specific mechanism of action; many drugs have additional beneficial effects beyond blood pressure lowering, such that the choice of drug will, in part, be influenced by any other co-existing conditions. For example, a patient who has suffered a previous heart attack would benefit from an ACE inhibitor, ARB and beta blocker, while a patient with angina would benefit from a beta blocker or calcium channel blocker.

An important point of note is that once an effective regime has been established to lower blood pressure it should be continued; if the drugs are stopped the blood pressure will swiftly rise to pre-treatment levels or higher, since these drugs work by suppressing high blood pressure, not curing it.

Home blood pressure monitors

It is important to keep an eye on home blood pressure readings to ensure that blood pressure is consistently being treated to target.

Home blood pressure monitors range in price and functionality, and there is a large selection available, both online and in stores such as pharmacies. Generally speaking arm monitors tend to be more accurate than wrist monitors, but make sure that the cuff fits the arm comfortably otherwise this will affect the readings.

The British and Irish Hypertension Society has a list of monitors which have been validated for home use, which you can find by visiting their website - www.bihsoc.org

Home blood pressure monitoring

Blood pressure is best taken:

- ✓ After 5 minutes rest and 30 minutes without smoking or caffeine
- ✓ When seated with the arm supported at heart level
- ✓ When immobile and relaxing, not talking and with legs uncrossed

To record your blood pressure:

- Write down the results in the table below/overleaf
- Record 3 consecutive measurements, at least 1 minute apart
- Record your blood pressure twice a day, ideally in the morning and evening
- Record your blood pressure for at least 4 days, and ideally for a week

You can keep a note of your readings in the table below/overleaf and detach this page to take along to your next appointment

Target:

<135/85 mmHg

DATE	TIME	SYSTOLIC	DIASTOLIC	PULSE	COMMENTS

DATE	TIME	SYSTOLIC	DIASTOLIC	PULSE	COMMENTS