

Kidney Health Information

Blood Pressure and Kidney Disease



What is blood pressure?

- Blood pressure is a measurement of the force or pressure the heart needs to push the blood around the body.
- It is a measure of the maximum and minimum blood pressure with each heart beat.
- The maximum pressure is known as the 'Systolic' and the minimum is known as the 'Diastolic'. When blood pressure is measured, both readings are taken and are written like this: 120/80mm/Hg
- mm = Millimetre and Hg = Mercury.
- The instrument used to take the reading

is known as a Sphygmomanometer, but you can just call it a blood pressure machine.

What is normal blood pressure?

- A desirable 'target' reading is often given as 120/80 mm Hg.

- Blood pressure decreases during sleep and increases during the day and at times of stress.
- It rises during exercise and returns to usual values (or slightly less) after exercise.
- Blood pressure can change with age. It can rise, occasionally it can go down.
- If blood pressure becomes too high, risks to health such as heart attacks and strokes increase. High blood pressure may also damage the kidneys.
- Treating those with high blood pressure minimises these risks.
- People with consistently raised blood pressure have 'Hypertension'.
- Most of those with hypertension have no obvious cause for it.
- Some groups, for example those from Afro-Caribbean racial backgrounds, are more prone to developing high blood pressure.

What is the link between blood pressure and kidney disease?



High blood pressure and kidney disease go hand in hand

As well as removing waste products from the blood, the kidneys play a key role in controlling blood pressure. Exactly how remains the subject of ongoing research studies, but contributory factors include:

- Their ability to regulate hormones which influence the tension in blood vessels.
- Their role in controlling the amount of salt and water in the body.

So high blood pressure is particularly common in patients with kidney disease.

High blood pressure harms damaged kidneys. In many patients with kidney problems controlling high blood pressure is the most important step towards reducing the risk of further kidney damage. It also reduces the risk of cardiovascular problems such as heart attacks and strokes that can occur in anyone with high blood pressure. Hypertension is both an important cause and consequence of kidney disease. In some patients it can be difficult to determine which came first.

What are the symptoms?

One of the biggest problems is that you cannot usually “feel” high blood pressure; it is a silent disease. The only reliable way of finding out your blood pressure is to have it measured.

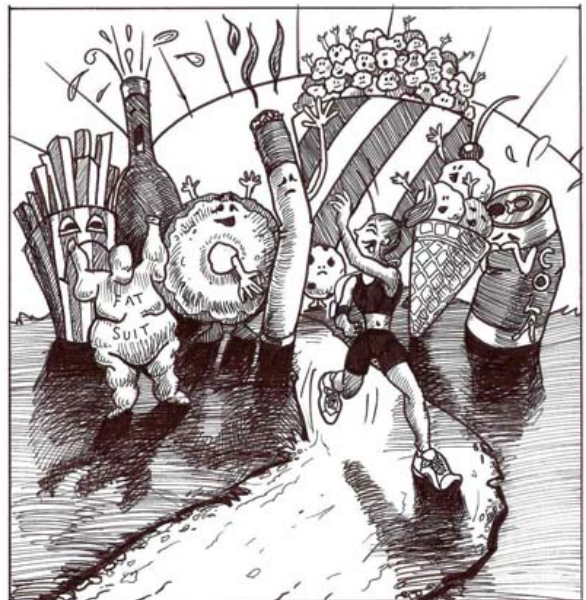
Only rarely does very high blood pressure cause symptoms such as headaches, shortness of breath, nosebleeds, and blurred vision.

How important is it to treat high blood pressure?

- If high blood pressure goes unnoticed and treatment is not given, patients with kidney disease are more likely to develop progressive kidney failure.
- If left untreated, high blood pressure can increase the risk of a heart disease and stroke.

What Can I Do?

- Excess salt in the body may also increase blood pressure, so it is sensible to minimise the amount of salt taken in.
- Reduce weight if overweight (being overweight increases blood pressure).
- Exercise regularly.
- Quit smoking – raises blood pressure and adds to damage to arteries.
- Lower Cholesterol – high cholesterol also damages arteries.



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How can it be treated?

- A number of different drugs which lower blood pressure are available:
- Drugs known as “ACE inhibitors” and “angiotensin receptor antagonists” prevent the action of hormones which are regulated by the kidney and increase blood pressure. They are so important in kidney disease – there is more information about them in the next section.

- Diuretics (such as bendroflumethazide) reduce the amount of salt and water in the body
- Beta-blockers (such as atenolol) reduce the effects of hormones such as adrenalin. Beta blockers may also be used to treat angina as well as heart failure. See Finding out more (LINK to section)
- Calcium channel blockers (such as diltiazem, nifedipine) prevent contraction of blood vessels, reducing the tension in the blood vessel wall.
- Alpha-blockers (such as doxazosin) have a similar effect, but through a different mechanism.

Ace Inhibitors and Angiotensin Receptor Blockers (ARBs) in kidney disease

These medicines not only lower blood pressure, they also seem to be able to give extra protection to the diseased kidneys against further damage.

This extra value is particularly seen in patients who have protein in their urine (Proteinuria). Proteinuria that doesn't go away is usually a bad sign in kidney disease, but ACE Inhibitors and ARBs can reduce or prevent the extra risk. They also have protective effects on the heart and on blood vessels too.

- They are the first choice if you have Proteinuria.
- They may raise blood potassium, and this can be a problem in some kidney patients.
- Side effects are not usual, but if they occur, an ARB instead of an ACE Inhibitor avoids most of them (except high potassium.)

With many different treatment options available, it is likely that an effective tablet or combination of tablets can be found that will reduce blood pressure without untoward side effects.



Finding out more:

DVD: 'Kidney Disease – The Silent Killer'. This is available on DVD through Kidney Research UK for health care professionals. The management of high blood pressure and other risk factors are explained as well as other aspects of kidney disease. To view clips from the DVD online, go to:

<http://www.kidneyresearchuk.org/content/view/265/323/> 'Preventing kidney disease – the silent killer affecting you'.

Blood Pressure in kidney disease from EDREN

<http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/BPshort.html>

Information and links from the British Society for Hypertension

<http://www.bhsoc.org/default.stm>

Some of our recent research projects into hypertension:

2006 Dr Philip Kalra. The prediction of renal functional revascularization with Magnetic Resonance Imaging in renovascular disease.

Renovascular disease refers to the narrowing of the arteries that carry blood to the kidneys. It is associated with high blood pressure and heart disease. This study aims to see whether MR angiography can predict which kidneys with renal artery stenosis will improve following balloon angioplasty (stretching).

2001 Professor S Fleming Disease. Modifying loci and malignant hypertension.

The research involved the use of a novel model for blood pressure, which has confirmed there is a relationship between an ACE gene and a susceptibility to a severe form of kidney and heart disease caused by high blood pressure.

2000 Dr P Kalra. A Protocol that will be able to predict those that will benefit from angioplasty.

This work focused on patients with narrowing of the arteries to their kidneys, trying to identify those who could be helped by a procedure to stretch the narrowing. It also studied the changes to the kidneys beyond narrowed arteries that accounted for reduced kidney function.

1998 Professor J Mullins. Malignant Hypertension

Malignant hypertension is an uncommon but severe form of hypertension that causes severe damage to the kidneys and other organs. It can cause dialysis-requiring renal failure in weeks or less. The cause may be kidney disease, but it may be unknown. This work studied how this damage occurs in detail.

Please be aware that we have made every effort to ensure this information is accurate, however we cannot guarantee that there are no mistakes. Also, the best management plans for individual patients may vary from those outlined here. Only the doctors caring for the patient will be able to advise on this. Please consult your own doctor.

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