Having denervation of the renal arteries for treatment of high blood pressure

The aim of this information sheet is to help answer some of the questions you may have about having denervation of the renal arteries to treat your high blood pressure. It explains the benefits and risks of the procedure, as well as alternative treatments and what to expect when you come to hospital. If you have any questions or concerns, please do not hesitate to speak to a doctor or nurse caring for you.

What is this procedure?
Denervation of the renal arteries is a relatively new procedure for treating high blood pressure (hypertension).

Over time, high blood pressure can cause damage to the arteries, heart, and kidneys. If it is not treated, it can increase your chance of having a heart attack or stroke, or your chances of developing other health problems.

The first thing that we advise you to do to help reduce your blood pressure is to make your diet as healthy as possible, exercise more and stop smoking (if you are a smoker). If these changes have not helped to lower your blood pressure significantly, your GP or a hospital doctor may prescribe medication.

Some patients are prescribed several medications but still have high blood pressure. This is called resistant hypertension. For these patients, denervation of the renal arteries may be recommended.

Nerves in the artery for the kidney (the renal artery) pass information between the kidney and the brain to control blood pressure. In this procedure, heat treatment is used on the nerves in the artery to reduce blood pressure.

What are the benefits of having denervation of the renal arteries?
Denervation of the arteries is a relatively new procedure. This means that there is not a lot of information yet about how well it works in the long-term, and which patients will benefit most from it. However, several hundred patients have had this procedure worldwide since 2009 and there is evidence to suggest that it works in the short and medium term.
Currently available research shows that this procedure can lower your blood pressure for at least two years. We believe that this lowering of blood pressure to normal or close to normal will decrease or slow down any long term damage to your arteries, heart, kidneys and other organs.

However, further information from longer-term research is required to show whether this procedure, and the resulting decrease in blood pressure, definitely reduces your risk of heart attack and stroke.

If you agree to have the procedure, all of your information will be confidentially recorded and kept on file at the hospital. This is so that we can assess how well the procedure is working, check that it is being carried out safely, compare results in this Trust to those in other centres and see what could be improved. This is referred to as an audit.

The results of your procedure and other patients who have had this procedure will be anonymised and may be published in medical journals.

**What are the risks?**

As this procedure is relatively new, its risks, especially in the long-term, are uncertain. The possible risks will be discussed with you and some of these are mentioned below. If you have any questions or would like any further information, please speak to your doctor.

Complications are rare but you may have bruising or a small swelling around the puncture site. This is due to slight bleeding into your skin. It should not be painful and will heal.

A small number of patients develop something called a **false aneurysm**. This is caused by a leaking artery. It can be treated by compression, an injection of thrombin (which causes it to clot and disappear) or by surgery to repair the hole in the artery.

Some patients have an allergic reaction to the iodine contrast dye used. This is usually a minor reaction, such as a skin rash, which will clear up on its own. Rarely, it can be a more serious allergy, which can be treated with steroids. Please tell your nurse or doctor if you have had a previous allergic reaction to iodine or seafood, or if you have any other allergies.

The iodine contrast dye can affect renal (kidney) function, particularly if there is already some kidney damage. Intravenous fluids and medication can be given before and after the procedure to reduce this risk. Your kidney function will be checked with a blood test before the procedure, if this has not been done recently.

Other side effects reported have included nausea, back pain, pins and needles, kidney infection and changes in blood pressure and/or heart rate.
In a trial comparing 52 patients having denervation of the renal arteries with 54 patients not having this treatment (but continuing with medications as usual), minor side effects reported included:

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number of patients with complication</th>
<th>Total number of patients having treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>False aneurysm in the groin needing compression only, not needing surgery</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Bladder/kidney infection</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Blood pressure change needing a change in medication</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Back pain or pins and needles</td>
<td>2</td>
<td>52</td>
</tr>
<tr>
<td>Change in heart rate during procedure, not causing any long term problem</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Nausea</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Significant change in blood pressure requiring treatment</td>
<td>2</td>
<td>52</td>
</tr>
</tbody>
</table>

The likelihood of stroke or heart attack around the time of the procedure was the same as or less than for patients who did not have the procedure, and kidney function did not change significantly after treatment.

**What experience of this procedure has there been in Guy’s & St. Thomas’s?**

Although denervation of the renal arteries is new to the Trust, the doctors who will carry out your procedure carry out similar procedures many times a day. The difference between this and other procedures for the kidney arteries is the tube device that delivers the heat energy to the artery. A technical expert from the manufacturer of this device is usually present to assist the doctors and nurses with this.

The doctors who will carry out this procedure have attended dedicated training courses. They have observed at least five of these procedures each. However, the first few times that this procedure is carried out in the Trust, a consultant doctor from a hospital experienced in this procedure will be present to assist.

**Are there any alternatives?**

The alternative to this procedure is to continue with your medications and sometimes to take another medication as well. Whether you have this procedure or not, you should continue to eat a healthy diet and exercise, and you should not smoke.

At the moment there is no other routine procedure that has the same effect of lowering blood pressure.

**Where can I find more information?**

The National Institute for Health and Care Excellence (NICE) has issued information and guidance about this procedure. A summary and explanation of the procedure and the guidance is available at the following link: [http://www.nice.org.uk/nicemedia/live/13340/57931/57931.pdf](http://www.nice.org.uk/nicemedia/live/13340/57931/57931.pdf) or we can provide you a hard copy.
How can I prepare for the procedure?

- Please let us know if you are taking any antiplatelet medicines (such as aspirin or clopidogrel) or any medicines that thin the blood (such as warfarin), as these may need to be stopped temporarily before the procedure. Call the x-ray department for advice as soon as you get your appointment letter on 020 7188 5573 (for Guy’s Hospital) or 020 7188 5477 (for St Thomas’ Hospital).
- If you are taking medicines for diabetes (for example, metformin) or using insulin, then these may need to be changed near the time of the procedure. Call the x-ray department on the numbers above for advice as soon as you get your appointment letter.
- Let your doctor know about any medicines you are taking. You can take your other medicines as normal, unless your doctor or nurse tells you not to.
- Avoid eating for six hours before the procedure. We may need to give you a sedative medicine, which may make you feel sick if you have just eaten. You may drink clear, non-milky fluids, such as black tea, black coffee or water up to four hours before the procedure.
- If you go home the same day, you will need to arrange for someone to take you home by car or taxi and to stay with you overnight.

If you are having this procedure while you are staying in hospital, your nurse will help you to prepare.

Giving my consent (permission)

The staff caring for you will ask your permission to perform the procedure. You will be asked to sign a consent form that says you have agreed to the procedure and that you understand the benefits, risks and alternatives. If there is anything you do not understand or if you need more time to think about it, please tell the staff caring for you.

Remember, it is your decision. You can change your mind at any time, even if you have signed the consent form. Let staff know immediately if you change your mind. Your wishes will be respected at all times. If you would like to read our consent policy, please tell a member of staff.

What happens before the procedure?

After you have arrived in the x-ray department, you will be checked by a nurse and given a hospital gown to wear.

The staff caring for you will ask your permission to perform the procedure, and if you have not already signed a consent form, you will be given one to sign. You will also be given the opportunity to ask the doctor any questions you may have.

What happens during this procedure?

If you have ever had an angiogram, you may find this procedure to be quite similar. It will be performed in the interventional radiology suite.

You will be asked to lie on your back on an x-ray table. Monitoring equipment will be attached to you to measure your blood pressure and heart rate. A small plastic tube (cannula) may be put into a vein in your arm. This means that we can give you medication into the vein (intravenously) during the procedure if you need it.
The skin around your groin area will be cleaned with an antiseptic skin lotion, and a local anaesthetic will be injected into your groin area. This will sting at first, but will then numb the area so that you do not feel any pain. If you do feel pain, tell the nurse or doctor so that pain relief can be given to you.

The doctor will find the artery in your groin and insert a tube called a catheter. An x-ray camera helps to make sure that the catheter is in the right position in your arteries.

Next, a special type of dye (called contrast dye) is injected into the catheter and will show up on the x-ray monitor. This is called an angiogram. The x-ray machine used is usually a large ‘C' shaped arm.

At intervals you might be asked to hold your breath so that static (still) x-ray images can be taken. This will help the radiologist to position the equipment as precisely as possible.

A tube is then placed in the renal artery on both sides and a generator causes the tip of the tube to deliver heat energy to the wall of the artery. This is done at several points along each artery. You will be given blood-thinning medication during the procedure. This wears off after a few hours.

The procedure takes approximately two hours in total. When it is completed the tube will be removed from your groin. The doctor will press on the puncture site in your groin for 10–20 minutes. This is to seal the site and stop it from bleeding. Sometimes a small plug or stitch is placed in the artery through the same small cut in the skin to help stop any bleeding. You might not be given a dressing to put on the site because your nurse and doctor might need to be able to see and check it.

**Will I feel any pain?**
The local anaesthetic injection can sting for a few minutes.

Occasionally you might feel the radiologist pressing on your groin. The position in which you will be asked to lie during the angiogram might be uncomfortable for a short period. If you feel uncomfortable, please tell the nurse so you can be given pain relief.

You might also experience a warm sensation when dye is being injected into your arteries but this wears off fairly quickly.

The heat treatment of the kidney artery usually causes some discomfort, so you will be given two types of medication into your vein (intravenously). One is a painkiller and one is a sedative to relax you. These medications very often cause you to forget most of the procedure, although some patients remember more than others.

**What happens after the procedure?**
You will be taken to the recovery unit or to the day unit where you will need to stay in bed for some time. Your blood pressure and pulse will be checked at regular intervals and a clip on your finger will measure the oxygen level in your blood. The staff will also check your leg where the tube was in your groin.

Everyone gets a bit of bruising where the artery was punctured. The bruising will normally be sore and uncomfortable for a few days.
We will provide light refreshment, such as tea or coffee, a sandwich and some fruit. If you have any special dietary requirements, you may wish to bring some food and drink with you.

If you are staying in hospital, you will be taken back to your ward where your nursing care will continue.

If you are a day patient (going home after your procedure), the nurse will tell you when you can get up and move around and when you will be able to go home. You will need a responsible adult to take you home by car or by taxi. If this is not possible, please let us know. We do not recommend that you use public transport, as it is less safe if you feel unwell.

**When will I find out how well the procedure has worked?**

You will receive an appointment to see your consultant in a follow-up clinic either by phone or in the post.

Your blood pressure will be monitored carefully in the weeks and months after the procedure usually with an overnight blood pressure monitor at home.

**If I am a day patient, what do I need to do after I go home?**

- Please rest for the remainder of the day and possibly for the next day, depending on the speed of your recovery.
- Keep a regular check on the puncture site where you had the procedure. To give the puncture site time to heal, do not drive or do any form of strenuous exercise for at least 48 hours after the procedure. You can resume your normal activities after 48 hours.
- Eat and drink normally.
- If you have any pain, take your usual pain relief, as prescribed or instructed on the packet.
- Continue with your normal medication as usual, but if you take any diabetes medicines containing metformin, please do not take them for the next two days.
- You can have a shower or bath the next day.
- Please phone the radiology nurse between 9am and 11am the day after your procedure on 020 7188 5525 at Guy’s or 020 7188 5477 at St Thomas’. This is so we can check on your recovery.

**Contact us**

Please contact the x-ray department at Guy’s Hospital on 020 7188 5525 or St Thomas’ Hospital on 020 7188 5477, Monday to Friday, 9am to 5pm if you need advice or if:

- your wound starts to bleed
- you feel unwell
- you develop any signs of an allergic reaction (for example wheeziness, difficulty in breathing or tightness in your chest, skin rash, swelling of your face, dizziness)

**Outside of these hours, contact your GP, or if it is urgent, go to your nearest Accident and Emergency (A&E) Department.**
Further information

Pharmacy medicines helpline
For information about any medicines that you have been prescribed at Guy's and St Thomas' hospitals, you can speak to the staff caring for you or call our helpline.

\texttt{t: 020 7188 8748 9am to 5pm, Monday to Friday}

Patient Advice and Liaison Service (PALS)
To make comments or raise concerns about the Trust’s services, please contact PALS. Ask a member of staff to direct you to the PALS office or:

\texttt{e: 020 7188 8801 at St Thomas’  t: 020 7188 8803 at Guy’s  e: pals@gstt.nhs.uk}

Knowledge & Information Centre (KIC)
For more information about health conditions, support groups and local services, or to search the internet and send emails, please visit the KIC on the Ground Floor, North Wing, St Thomas’ Hospital.

\texttt{t: 020 7188 3416}

Language support services
If you need an interpreter or information about your care in a different language or format, please get in touch using the following contact details.

\texttt{t: 020 7188 8815  fax: 020 7188 5953}

NHS Direct
Offers health information and advice from specially trained nurses over the phone 24 hours a day.

\texttt{t: 0845 4647  w: www.nhsdirect.nhs.uk}

NHS Choices
Provides online information and guidance on all aspects of health and healthcare, to help you make choices about your health.

\texttt{w: www.nhs.uk}