

Vascular access for Haemodialysis

Information for patients, relatives and carers

Introduction

This booklet has been provided to help answer some of the questions that you, or those who care for you, may have. It is not meant to replace the consultation between you and your healthcare team, but to help you understand your kidney condition and the treatment options available to you. Please rest assured that you will be guided through all of the medical decisions that you need to make by knowledgeable and supportive staff.

Treatment options

Everyone with kidney disease is different and has different needs. Your physical and emotional health, as well as the amount of time and support that you have available, will all help determine which treatment options are most suitable for you.

When your kidney function reaches approximately 20 per cent, we will talk to you about future treatment options, known as **renal replacement treatments**. When your kidney function deteriorates to approximately 10 per cent, the chemicals that should have been filtered by your kidneys have accumulated in the blood to a level that will be increasingly harmful to your body. It is often referred to as end-stage kidney disease and starting a treatment to replace the work of your kidneys will be necessary.

One of the treatment options is haemodialysis. Haemodialysis treatment filters the blood to remove the harmful chemicals and any excess water not removed by the kidneys. To do this, blood is taken outside the body and passed through a filter on the dialysis machine. (See leaflet - Treatments for kidney disease reference 2389).

To undertake haemodialysis **vascular access** is required so that blood can be taken out of the body, filtered and returned back to the body. Normal veins (those used for blood tests) are not strong enough for the volume and speed of blood that is needed to perform haemodialysis. We will discuss with you the two types of vascular access that are available which are:

Fistula access



Dialysis catheter access



Choosing the right treatment for you

You will be referred to the **vascular access clinic** for an assessment to see which vascular access would be best for you. It is strongly recommended that anyone who can have a fistula should do so as there are many advantages – these will be discussed with you. Most people can have a fistula access but, if this is not possible, you will be advised to have a catheter access instead.

Please watch our short film about vascular access: www.imperial.nhs.uk/dialysis

Arterial - Venous Fistula Access - (AVF)

What is a fistula access and how is it made?

The fistula is made by connecting a vein to an artery, in either the wrist or elbow area. When this connection is created, fast flowing blood from the artery starts travelling up the vein. The vein adapts to this extra blood flow by slowly thickening and enlarging, developing into a 'mature' fistula which is ready for dialysis after about six to eight weeks.

How do I find out if I can have a fistula?

In your **vascular access assessment** we will decide this by examining your arm and performing 'duplex mapping'. This is a non-invasive ultrasound scan that gives precise measurements of your arteries and veins to see if your veins are suitable to have a fistula created. If we are unsure, you might be referred for further tests in the x-ray department. Once your veins have been examined, your options will be discussed with you and an access plan made. If your veins are suitable, you will be advised which arm would be best for the fistula. Where possible, this will be your non-dominant arm (the arm you do not write with).

Once we have decided that you can have a fistula, we will ask you to **save the veins** in that arm for the future fistula procedure. This means you **should not** have blood pressures or blood tests taken from that arm as this may damage the veins, **particularly those in the elbow crease and wrist area**. This is particularly important if you are not yet close to requiring dialysis and do not need the fistula made straight away.

Please tell staff as they won't necessarily know you are saving the veins in the designated arm. It is best if the arm is avoided altogether, but, if it is unavoidable, then taking blood from the back of the hand rather than the arm itself is advised.

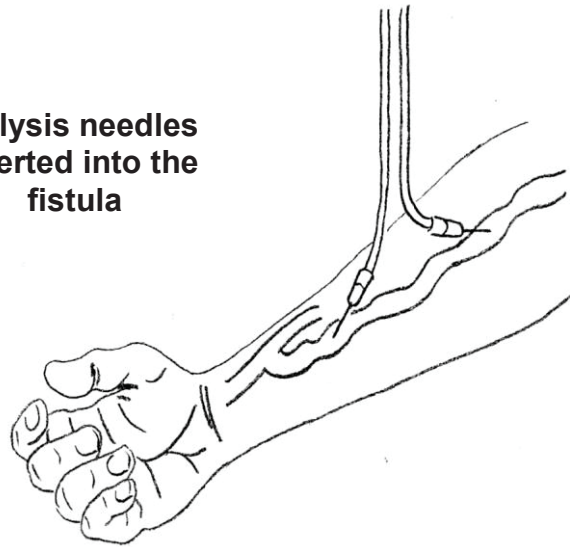
When should I have the fistula operation?

Ideally, a fistula should be created six months before starting dialysis. Often, this is when your kidney function has fallen to less than 15 per cent. Sometimes it is necessary to start dialysis urgently if someone suddenly becomes unwell. In this situation, a dialysis catheter access is created first and a fistula access created later on.

What should I do next if I want to have a fistula made?

When you are referred for a vascular access assessment, the team will make an access plan with you. This may mean that a date is set to form the fistula, or you may be advised to wait until your kidney function falls to less than 15 per cent.

**Dialysis needles
inserted into the
fistula**



What does the fistula operation involve?

To make a fistula, we create a connection between an artery and vein, which requires a small operation. It is performed under local anaesthetic which means you are awake during the operation, but will be unable to see your arm. The operation takes roughly one hour and is usually performed as a day case, meaning you arrive in the morning and go home in the evening.

How do I care for my fistula immediately after the operation?

Once the fistula is created there will be a 'buzzing' sensation in the vein. This is due to the arterial blood rushing into the vein. The surgeon will show you how to feel this buzzing and it is your way of checking that the fistula is working.

The fistula wound is covered with a wound seal (Aquacel®) and a see-through occlusive (air tight) dressing (Tegaderm®). We will make an appointment for you to return to the hospital or clinic within three to four days so that the wound can be observed and the dressing changed.

Before you go home, the ward nurses will advise you about post-operative care and will explain any side effects or potential complications. Your arm may be uncomfortable for a few days after the operation. If you work, discuss this with the surgeon as it would be advisable to take some time off after the operation, depending on the type of work you do. You will be advised to:

- refrain from heavy lifting using the affected arm
- avoid driving until your arm is more comfortable
- avoid tight sleeves that may restrict the blood flow

What complications might occur and what should I do if I'm concerned?

Complications are not common but the types that might occur fall into three categories:

1. **Minor:** uncomplicated wound infections requiring oral antibiotics. These clear up in a few days.
2. **Moderate:** wound infection or bleeding occurs in about two per cent of cases. These may require a short admission for intravenous (through a vein) antibiotics. A second operation may be required.
3. **Persistent:** nerve damage is rare and occurs in less than one per cent of patients.

If you are concerned you should come into hospital and seek advice from the renal surgical team. Please come in if you experience any of the following:

- **excessive pain or infection:** the wound will be sore for a few days and will then settle down. If the pain is more than you would expect, is throbbing in nature and/or there is extensive redness developing around the wound, then you may have an infection
- **bleeding:** there is likely to be some blood oozing from the wound onto the dressing. If the wound is bleeding so that it leaks outside of the dressing this may need to be investigated
- **numbness or cold fingers:** blood from one artery and one vein has been directed away from your hand, so this may have a minor effect on the blood flowing to your hand. If the hand of your fistula arm becomes numb and very cold then a problem may have occurred
- **no 'buzz':** if you cannot hear the 'buzz' this may mean the fistula has stopped working. Please come straight to hospital to see if it can be rescued

What should I do if my fistula is causing problems?

Most problems should be discussed first with your clinic or dialysis nurse or doctor. For **urgent problems** you should phone or come into the renal unit (F block) at Hammersmith Hospital.

Contact: **Renal assessment unit (RAU): 020 3313 6603 / 6604**
(Monday to Friday 10.00 – 19.00, Saturday 10.00 – 13.00, Sunday closed)
De Wardener Ward: 020 3313 6690 (Evenings)

Or go to: **The urgent care centre, Hammersmith Hospital** (located at the front of the hospital, open 24 hours a day, seven days a week)

What should I do to look after my fistula?

Some simple exercises can help the fistula to develop. Exercise your fingers and hands (on the same arm as the fistula) by squeezing a pair of socks or a rubber ball – aim for around five minutes, five times a day.

In the first few days after the operation it is a good idea to elevate the arm while relaxing at home. Do not use it for lifting heavy bags or weights.

Other problems which may occasionally occur include bruising and infections - these can usually be treated with antibiotics. Rarely, the fistula becomes too large which can cause pain further down the arm. If this happens, an operation is usually carried out to reduce the size of the fistula.

When is the fistula ready to use for dialysis?

It is usual for a fistula to take eight weeks to 'mature'. Being 'mature' means that the blood diverted from the artery has enlarged the vein sufficiently enough for it to be used for dialysis. Some people will find their fistula develops quickly but for others it may take longer.

What should I expect when the fistula is used?

Before your first dialysis session, one of the dialysis nurses will check to see that your fistula has matured and is ready to be used. Sometimes, if dialysis is required because you are unwell with lots of symptoms but the fistula has not matured, a temporary dialysis catheter may be needed to allow the fistula more time to mature.

Once your fistula is ready, each time you come for dialysis you will be given a local anaesthetic before the needles are inserted. The anaesthetic can either be given as a spray on the skin or an injection just under the skin. Alternatively, you can request a topical anaesthetic cream from your GP. Ask the nurses to show you where to apply the cream. It should be applied one hour before dialysis.

Initially, using the fistula can be problematic as your blood vessels are soft and not used to the demands of the large needles and dialysis process. You may experience significant bruising, especially if the needle dislodges, which can result in bleeding into the tissues. This is referred to as a 'blow'. Bruise-relieving cream can help with this.

You may also experience clotting and may require anti-platelet therapy, such as aspirin, to thin the blood and prevent clotting. These effects can be upsetting and stressful in the beginning but will usually settle after the first few weeks. If they don't and the nurses are concerned, they will refer you back to the vascular access clinic for advice.

There are various techniques used to insert needles for haemodialysis treatment. The one we believe is best and that we advise is called the 'rope ladder' technique. The nurses will explain and demonstrate what this technique involves during your treatment. It entails changing the position with each dialysis as this helps to both develop and preserve the life of the fistula access. This also helps to prevent aneurysmal fistulas developing. Aneurysmal fistulas are where very large bulges develop and they can be caused by repeatedly inserting the needles into the same place over a long period of time. This results in a stretched and bulging blood vessel wall which can be problematic.

Dialysis catheter

What is a dialysis catheter?

The main dialysis catheter we use is known as a Tesio® catheter and consists of two soft plastic tubes that are inserted into the chest area. The tubes are usually tunneled under the skin up towards the neck, then down into the central veins near to your heart. This is generally performed under a local anaesthetic which is x-ray guided to ensure correct placement. You are awake during the procedure but should not feel any pain, although you may experience slight discomfort.

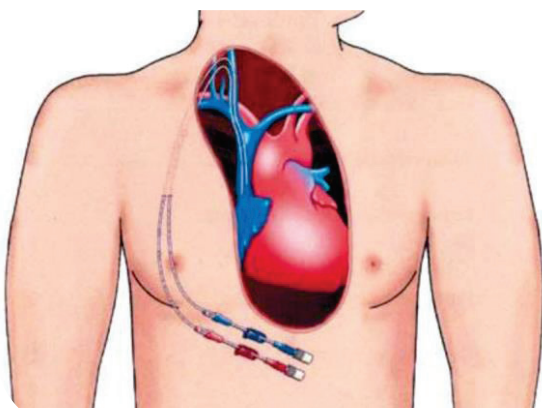


Diagram showing the external and internal position of a Tesio® dialysis catheter



External position of a Tesio® dialysis catheter

The Tesio® catheter is designed to safely stay in the body for long periods of time (from weeks to months or years, as required). Large volumes of blood can be removed from the body by one tube and filtered via the haemodialysis machine, then returned to your body via the second tube.

The usual placement position is in the chest area, although a dialysis catheter can be placed in the neck or groin area in an emergency situation. A dressing will be placed over the site where the catheter enters the body to keep this clean and limit the risk of infection. This is known as the 'exit site'. The catheter tubes are covered with a gauze bandage between dialysis to keep them clean and comfortable. The doctor carrying out the procedure will decide on the position and lengths of the catheter but, if you have any particular requirements, please discuss this beforehand.

How do I care for my Tesio® dialysis catheter?

Precautions:

- **keep** the catheter site clean and dry at all times. A damp, moist or dirty exit site is the perfect environment for bacteria growth
- **never** allow your catheter to become wet. In the first two weeks after the catheter has been inserted we advise that you only shower or bathe the bottom half of your body. Use a warm, dry flannel to wash the top half of your body, avoiding the catheter exit site and dressing. The nurses will clean the skin around the catheter exit site when they change your dressing. After the catheter exit site has settled and healed, your dialysis nurse will advise you about dressings to cover the catheter so that you can bathe or have a full shower. If you do get the catheter or dressing wet please inform the nurses so they can change it as soon as possible afterwards. Alternatively, we can teach you how to clean and redress the catheter exit site using our infection prevention procedure. Please discuss this with your dialysis nurse
- **avoid** touching or scratching the exit site or catheter unnecessarily
- **avoid** moving the catheter unnecessarily
- **never** pinch or pull the catheter as this can increase the risk of infection, cause damage or dislodge the position and prevent it from working
- seek advice **immediately** if you experience any of the following; **pain, swelling, redness or bleeding**
- **never** use sharp objects near the catheter. Do not cut the dressing that covers the catheter tubes as you seriously risk cutting the catheter tubes. A pair of blue clamps will be given to you as a precaution
- if there is bleeding from the catheter tubes due to a cut, a hole or split occurring, clamp **above (or nearest to the body)** the bleeding point to seal the catheter. Then call the emergency services so this can be dealt with as soon as possible

What should I do in an emergency?

You should contact your dialysis unit straight away if:

- you feel unwell, feverish or shivery
- there is redness or swelling around the catheter site
- you feel unusually tired or experience nausea and vomiting

If the dialysis unit is shut then please phone Hammersmith Hospital switchboard on the number below and ask to speak to the on-call renal registrar.

Key information about your Tesio® dialysis catheter

1. The Tesio® catheter is made of polyurethane and is latex free.
2. The catheter can be used for dialysis straight away after insertion once a chest x-ray is taken to check it is in the correct position.
3. The catheter is tunnelled under the skin for two reasons; firstly to anchor it and prevent it from falling out, and, secondly, to reduce infection.
4. The Tesio® catheter can stay in your body indefinitely providing it is well looked after and there are no problems, such as infection or cracks in the line.
5. If your catheter becomes blocked, we have protocols to deal with this using medicines such as Urokinase® which can be instilled or pumped into the catheter to dissolve clots that cause blockages.
6. The catheter has blue clamps attached to seal the catheter and white caps to prevent any leakage.
7. The white caps are changed every time the catheter is used.

Useful contacts

- Hammersmith Hospital switchboard: 020 3313 1000
- Renal outpatients Hammersmith Hospital: 020 3313 8333

Hammersmith Hospital renal wards

- De Wardener Ward: 020 3313 6690
- Handfield Jones Ward: 020 3313 6676
- Planned investigation unit (PIU): 020 3383 6682 (Monday to Friday 07.30 – 19.30)
- Renal assessment unit: 020 3313 6603 / 6604 (Monday to Friday 10.00 – 19.00, Saturday 10.00 – 13.00, Sunday closed)

Dialysis units

- Hammersmith Auchy dialysis unit: 020 8383 6627
- Hammersmith dialysis unit (based at St Charles Hospital): 020 8962 5192
- Central Middlesex dialysis unit: 020 8453 2017
- Charing Cross dialysis unit: 020 8846 1752
- Hayes dialysis unit: 020 8383 9800
- Ealing dialysis unit: 020 8967 5737
- Northwick Park dialysis unit: 020 8869 3245
- St Charles dialysis unit: 020 8962 4810
- Watford dialysis unit: 01923 217243
- West Middlesex dialysis unit:
020 8321 2543

Who should I contact?

Clinic / unit nurse:

Telephone:

Doctor:

Dialysis unit:

Chronic kidney disease nurses

- Charing Cross/Ashford hospitals: 020 3313 0984
- Central Middlesex Hospital: 020 8453 2693
- Ealing/Chelsea hospitals: 020 3313 5240
- Hammersmith Hospital: 020 3313 5247 / 5249
- Northwick Park Hospital: 020 8869 5027
- St Mary's Hospital: 020 3312 1267
- Watford Hospital: 01923 217850
- West Middlesex Hospital: 020 3311 1972

Websites

- www.imperial.nhs.uk/dialysis
- www.imperial.nhs.uk/renal
- www.westlondonkpa.co.uk
- www.sdm.rightcare.nhs.uk – Patient Decision Aids
- www.nhs.uk/conditions/kidney-disease-chronic
- www.britishkidney-pa.co.uk
- www.kidneypatientguide.org.uk
- www.kidney.org.uk
- www.britishrenal.org
- www.kidneyresearchuk.org/health-information/resources

How do I make a comment about my visit?

We aim to provide the best possible service and staff will be happy to answer any of the questions you may have. If you have any **suggestions** or **comments** about your visit, please either speak to a member of staff or contact the patient advice and liaison service (**PALS**) on **020 3313 0088** (Charing Cross, Hammersmith and Queen Charlotte's & Chelsea hospitals), or **020 3312 7777** (St Mary's and Western Eye hospitals). You can also email PALS at pals@imperial.nhs.uk. The PALS team will listen to your concerns, suggestions or queries and is often able to help solve problems on your behalf.

Alternatively, you may wish to express your concerns in **writing** to:

Chief executive – complaints, Imperial College Healthcare NHS Trust, Trust Headquarters
The Bays, South Wharf Road, London W2 1NY

Alternative formats

This leaflet can be provided on request in large print, as a sound recording, in Braille, or in alternative languages. Please contact the communications team on **020 3312 5592**.

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Renal division
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