



## VASCULAR ACCESS PROCEDURES for HAEMODIALYSIS in KIDNEY FAILURE

Information about your procedure from  
The British Association of Urological Surgeons (BAUS)

This leaflet contains evidence-based information about your proposed vascular access procedure. We have consulted specialist surgeons during its preparation, so that it represents best practice in UK urology. You should use it in addition to any advice already given to you.



To view this leaflet online, scan the QR code (right) or type the short URL below it into your web browser:

<http://rb.gy/nd58m>

### KEY POINTS

- Vascular access for haemodialysis is a relatively minor procedure to perform
- It involves creating an arteriovenous fistula or an arteriovenous loop graft, usually in your “non-dominant” arm
- A fistula provides the best form of vascular access for successful haemodialysis
- If your blood vessels are small, or if there has already been a failed attempt at vascular access, we may need to carry out the procedure in your leg
- We may assess your blood vessels with ultrasound before the procedure is performed
- After surgery, fistulas can take several months to mature but grafts can be used for dialysis slightly sooner
- Whilst waiting for a fistula or graft to mature, you may need to have your haemodialysis through a temporary central venous dialysis line
- Some of the long-term side-effects can be troublesome and may require further surgical intervention

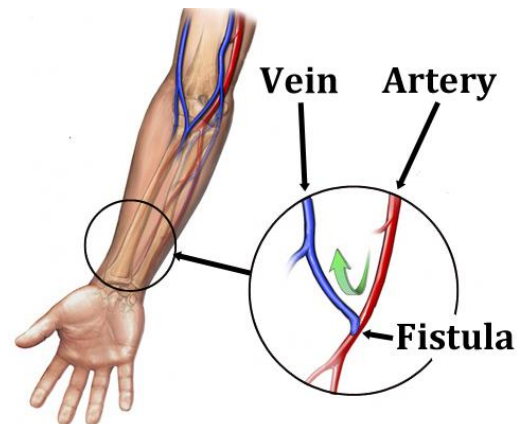
### What does this procedure involve?

Creating vascular access to allow haemodialysis is a relatively minor procedure. Your nephrologist will already have discussed which type of access is best for you. The procedure involves making a connection

between an artery and a vein to allow more blood to pass through the vein. The vein then becomes strong enough for large dialysis needles to be inserted easily.

There are two main types of vascular access:

- **An arteriovenous fistula:** created by joining an artery and a vein directly together with stitches. The fistula is usually created in the forearm of your “non-dominant” arm. If your blood vessels are too small, or a fistula in your forearm has already failed, we may create it in your upper arm.



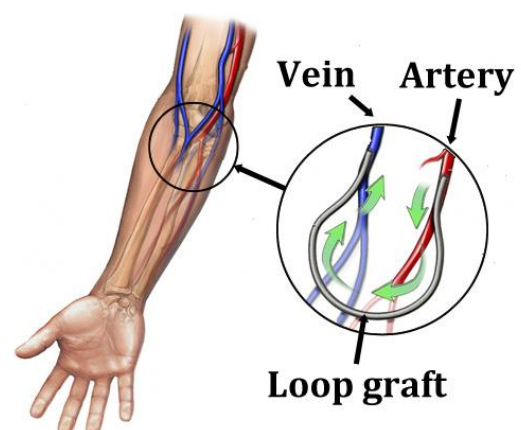
#### **Advantages**

- fistulas are considered the best form of vascular access
- they have good and predictable dialysis performance
- there is a low risk of infection
- they can last for many years

#### **Disadvantages**

- they can take 12 to 24 weeks to mature (so you may need a temporary dialysis line first)
- they are visible on your forearm (and can become “unsightly”)
- they can bleed after dialysis needles are removed
- they may fail to mature (and not be usable)
- they may result in poor circulation in your hand or arm

- **An arteriovenous loop graft:** creating by connecting together an artery and a vein using either a loop of synthetic material or a segment of your own vein. Grafts are usually put into the upper part of your “non-dominant” arm. If your blood vessels are too small, or an arm graft has failed in the past, we sometimes put the graft in your leg.



#### **Advantages**

- grafts are relatively easy to implant
- the graft materials are freely available

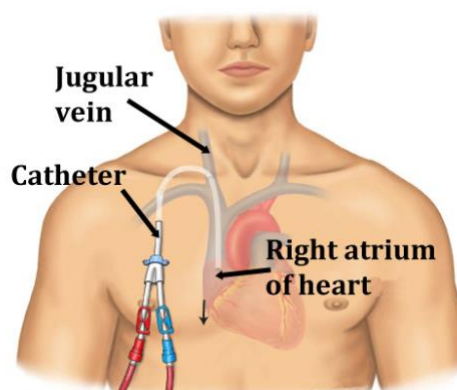
- they can be used for dialysis within three to four weeks of formation
- they have highly predictable dialysis performance

### Disadvantages

- they have an increased potential for infection (over a fistula)
- they have an increased potential for clotting (over a fistula)
- they have a shorter life-span than a fistula
- they may result in poor circulation in your hand or arm

## What are the alternatives?

- **A central venous dialysis line** (pictured) – using a large catheter put into your heart through a vein in your neck; often used as a temporary measure whilst waiting for a graft or fistula to mature
- **Medical treatment for kidney failure** – using drugs, fluid restriction & other dietary alterations to control your production of bodily waste products
- **[Peritoneal dialysis](#)** – using the lining of your abdominal (tummy) cavity to draw waste products out of your circulation by putting dialysis fluid into your abdominal cavity
- **[Kidney transplantation](#)** – using a healthy kidney (from a live or cadaveric donor) transplanted into your groin



## What happens on the day of the procedure?

Your surgeon (or a member of their team) will briefly review your history and medications, and will discuss the surgery again with you to confirm your consent.

An anaesthetist will see you to discuss the options of a general anaesthetic or spinal anaesthetic. The anaesthetist will also discuss pain relief after the procedure with you.

We may provide you with a pair of TED stockings to wear, and we may give you an injection to thin your blood. These help to prevent blood clots from developing and passing into your lungs. Your medical team will decide whether you need to continue these after you go home.

You may be advised to stop taking any drugs that have been prescribed for hypertension (high blood pressure). This is to stop them lowering your blood pressure so much that the flow in your graft or fistula is jeopardised.

## Details of the procedure


- we normally carry out the procedure under a general or local anaesthetic
- you may have an ultrasound scan before the procedure to assess the blood flow in the arteries and veins of your arm (or leg)
- we usually put the graft or fistula into your “non-dominant” arm (i.e. your left arm if you are right-handed, and *vice versa*)
- we expose the selected arteries and veins in your arm through one (or more) small incisions
- if you are having a fistula, we join the selected artery and vein together using fine, non-absorbable stitches
- if you are having a loop graft, the graft is tunnelled under the skin of your arm after one end has been stitched to an artery and the other to a vein using non-absorbable stitches
- we close the wounds with absorbable stitches which normally disappear within two to three weeks
- we put a loose dressing around your arm
- the procedure can take anything from 45 minutes to three hours, depending on its complexity
- you can expect to go home when the nursing staff are happy that your fistula or graft is working well











## Are there any after-effects?

The possible after-effects and your risk of getting them are shown below. Some are self-limiting or reversible, but others are not.

We have not listed very rare after-effects (occurring in less than 1 in 250 patients) individually.

The impact of these after-effects can vary a lot from patient to patient; you should ask your surgeon’s advice about the risks and their impact on you as an individual:

After-effect	Risk
The procedure does not cure the underlying condition that is responsible for your kidney failure	 All patients

Infection of the wound requiring antibiotics	 Between 1 in 10 & 1 in 50 patients
Failure of the fistula or graft to enlarge your veins sufficiently for haemodialysis	 Between 1 in 10 & 1 in 50 patients
Blockage of your graft requiring further surgery	 Between 1 in 10 & 1 in 50 patients
Bleeding from the wound requiring further surgery	 Between 1 in 10 & 1 in 50 patients
Formation of an aneurysm (over-stretched blood vessel) requiring further surgery	 Between 1 in 50 & 1 in 250 patients
Numbness and coldness of your arm	 Between 1 in 50 & 1 in 250 patients
Poor blood flow in your hand and fingers, often with pain or swelling	 Between 1 in 50 & 1 in 250 patients
Venous gangrene (skin death)	 Between 1 in 50 & 1 in 250 patients
“Steal” syndrome (reduced blood flow to your arm during exercise causing pain and numbness)	 Between 1 in 50 & 1 in 250 patients
Anaesthetic or cardiovascular problems possibly requiring intensive care (including chest infection, pulmonary embolus, stroke, deep vein thrombosis, heart attack and death)	 Between 1 in 50 & 1 in 250 patients (your anaesthetist can estimate your individual risk)

## What is my risk of a hospital-acquired infection?

Your risk of getting an infection in hospital is between 4 & 6%; this includes getting *MRSA* or a *Clostridium difficile* bowel infection. Individual hospitals may have different rates, and the medical staff can tell you the risk for your hospital. You have a higher risk if you have had:

- long-term drainage tubes (e.g. catheters);
- bladder removal;
- long hospital stays; or
- multiple hospital admissions.

## What can I expect when I get home?

- you will get some swelling and bruising that lasts for several days after the procedure
- a small amount of blood oozing from the wound is very common
- any discomfort can be relieved by simple painkillers such as paracetamol
- coolness and numbness in your hand are common and normally settle quickly; if they do not, you should contact your nephrologist immediately
- you should not soak or scrub the operation site until it is fully healed
- you should keep your forearm slightly elevated for the first few days but avoid lifting the affected arm above shoulder level
- you will be given advice about your recovery at home
- you will be given a copy of your discharge summary and a copy will also be sent to your GP
- any antibiotics or other tablets you may need will be arranged & dispensed from the hospital pharmacy
- your doctors will show you how to check that your fistula or graft is working by feeling for a “thrill” (buzzing sensation); you should check this at least three times each day
- exercising your arm, by squeezing a ball or clenching & relaxing your fist, can help your fistula to mature
- if you get progressive pain, redness, swelling or bleeding, you should contact your GP or nephrologist immediately

## Is there anything I can do to protect my fistula or graft?

Yes. Typically, we would expect a fistula to last three to seven years but a graft may only last one or two years. Grafts are also more likely than fistulas to become infected. Taking care of your graft or fistula by observing the precautions below can prolong its useful life:

- do not lie on the affected arm when sleeping;
- do not wear any clothing or jewellery which binds the affected arm;
- do not allow injections to be given directly into the graft or fistula;
- do not let anyone take blood from your graft or fistula; and
- do not let anyone take your blood pressure in the affected arm.

## **General information about surgical procedures**

### ***Before your procedure***

Please tell a member of the medical team if you have:

- an implanted foreign body (stent, joint replacement, pacemaker, heart valve, blood vessel graft);
- a regular prescription for a blood thinning agent (e.g. warfarin, aspirin, clopidogrel, rivaroxaban, dabigatran);
- a present or previous MRSA infection; or
- a high risk of variant-CJD (e.g. if you have had a corneal transplant, a neurosurgical dural transplant or human growth hormone treatment).

### ***Questions you may wish to ask***

If you wish to learn more about what will happen, you can find a list of suggested questions called "[Having An Operation](#)" on the website of the Royal College of Surgeons of England. You may also wish to ask your surgeon for his/her personal results and experience with this procedure.

### ***Before you go home***

We will tell you how the procedure went and you should:

- make sure you understand what has been done;
- ask the surgeon if everything went as planned;
- let the staff know if you have any discomfort;
- ask what you can (and cannot) do at home;
- make sure you know what happens next; and
- ask when you can return to normal activities.

We will give you advice about what to look out for when you get home. Your surgeon or nurse will also give you details of who to contact, and how to contact them, in the event of problems.

### ***Smoking and surgery***

Ideally, we would prefer you to stop smoking before any procedure. Smoking can worsen some urological conditions and makes complications more likely after surgery. For advice on stopping, you can:

- contact your GP;
- access your local [NHS Smoking Help Online](#); or
- ring the Smoke-Free National Helpline on **0300 123 1044**.

### ***Driving after surgery***

It is your responsibility to make sure you are fit to drive after any surgical procedure. You only need to [contact the DVLA](#) if your ability to drive is likely to be affected for more than three months. If it is, you should check with your insurance company before driving again.

### **What should I do with this information?**

Thank you for taking the trouble to read this information. Please let your urologist (or specialist nurse) know if you would like to have a copy for your own records. If you wish, the medical or nursing staff can also arrange to file a copy in your hospital notes.

### **What sources have we used to prepare this leaflet?**

This leaflet uses information from consensus panels and other evidence-based sources including:

- the [Department of Health \(England\)](#);
- the [Cochrane Collaboration](#);
- the [National Institute for Health and Care Excellence \(NICE\)](#);
- the [National Kidney Foundation](#); and
- the [Kidney Dialysis Information Centre](#).

It also follows style guidelines from:

- the [Royal National Institute for Blind People \(RNIB\)](#);
- the [Information Standard](#);
- the [Patient Information Forum](#); and
- the [Plain English Campaign](#).

### **DISCLAIMER**

Whilst we have made every effort to give accurate information, there may still be errors or omissions in this leaflet. BAUS cannot accept responsibility for any loss from action taken (or not taken) as a result of this information.



**PLEASE NOTE:** the staff at BAUS are not medically trained, and are unable to answer questions about the information provided in this leaflet. If you have any questions, you should contact your Urologist, Specialist Nurse or GP in the first instance.