

Endovascular arteriovenous fistula (endo AVF) – image guided

Information for patients

This leaflet aims to explain endovascular arteriovenous fistula (endo AVF). It covers what to expect on the day of the procedure, as well as the benefits, the possible risks and the alternatives.

Before the endo AVF, a clinical member of staff will explain the procedure to you in detail. This leaflet is not meant to replace that discussion. If you have any questions or concerns, please do not hesitate to speak to the doctors or nurses caring for you. It is important that you feel well informed before agreeing to having the procedure and signing the consent form.

Confirming your identity

Before you have a treatment or procedure, our staff will ask you your name and date of birth and check your ID band. If you do not have an ID band we will also ask you to confirm your address. If we do not ask these questions, then please ask us to check. Ensuring your safety is our primary concern.

What is endovascular arteriovenous fistula (endo AVF)?

It is a procedure to create an arteriovenous fistula (AVF). We join an artery (a blood vessel that takes blood from your heart around the body) and a vein (a blood vessel that takes blood back to your heart) next to it in your forearm using a brief burst of radiofrequency energy. Once the two are joined and the AVF is created, the superficial veins closest to the surface of your skin will have a better blood flow and will get larger so needles can be put into them for haemodialysis.

Image guided means that we will use images from ultrasound scans and real time x-ray (fluoroscopy) to ensure we get good pictures of your blood vessels so we can create the AVF.

Why do I need this procedure?

We need regular access to your bloodstream so you can have haemodialysis treatment. This is known as vascular access. The AVF will join an artery directly to a vein, usually at your wrist or elbow. It enables more blood to flow through the vein, so it grows larger and stronger. This makes it possible to repeatedly put in the needles that you need for haemodialysis.

Your renal doctors, the renal vascular access nurse and the interventional radiologist have discussed your care and believe that this is the most appropriate next step.

What are the risks?

Endo AVF is generally a safe procedure. However, there are risks and possible complications with all procedures, even though every effort is made to prevent them.

During the procedure

- **Bleeding at the puncture (needle-entry) sites:** You may have some bleeding and minor bruising, either at the skin puncture sites or in the muscles of your arm.
- **Embolism:** There is a small risk the fistula may block off and fail in the first few weeks. Your endo AVF will need to be scanned 1 week, 4 weeks and 8 weeks after creation to ensure everything is working well.
- **Infection:** this risk is very small.
- **Electrical burns:** this procedure involves the delivery of a radiofrequency (RF) energy which may bring a very small risk of electrical burns
- **Problems cause by sedation or anaesthesia:** Nerve damage can occur because of direct injection into the nerve or because of bleeding or infection. Patients commonly notice areas of tingling and/or numbness in the arm, shoulder or hand. This occurs in around 1 in 20 patients and usually resolves itself within three weeks, or occasionally up to three months.
- **Allergic Reaction to the dye (contrast):** This is rare. Fewer than one in every 1,000 patients has a severe reaction to the dye.
- **Unable to complete procedure:** small risk
- **Procedure takes longer to complete than planned:** There is a slight possibility that the procedure may take longer than anticipated. If this happens, the radiologist will keep you informed, explaining what's happening and outlining the next steps.
- **You need additional procedures:** In some cases, a ballooning of the artery and the vein junction (anastomosis) might be needed to facilitate endo AVF maturity. This is usually done through a small tube inserted into the artery at the wrist under local anaesthetic.
- **Radiation risk:** In order to be performed safely, your procedure requires to be performed under x-ray guidance. X-rays are a type of ionising radiation. Studies have shown that people who have been exposed to high doses of ionising radiation have an increased chance of developing cancer many years or decades after they have been exposed. However, while more complex or

- difficult cases might require a slightly higher radiation dose, the radiation exposure associated with this procedure is moderate. It is the assessment of your doctor and the radiology doctor who will be performing the procedure that the benefit of the procedure outweighs the risk from the exposure to radiation. The specialist radiologist and radiographer will ensure that your radiation exposure is kept as low as possible during the procedure. If you have any concerns about the risk of exposure to radiation during this procedure, you can discuss this further during the consent process with the radiologist who will be performing your procedure. Please notify the clinical team if you think you may be pregnant.

After the procedure

- **Steal syndrome or ischaemia:** This is where too much blood travels through your fistula vein and reduces blood flow to your hand. As you will be having a low-flow fistula, the risk of this happening is very small and there have been no such cases recorded. But if should happen, it can cause pain, coldness or tingling in the fingers or hand of your fistula arm.
- **Venous hypertension (arm swelling):** Your AVF may become too large over a period of time. If this happens you may need an operation to try and reduce the size.
- **Blocked fistula:** The AVF may block and stop working. The fistula may develop a blood clot which may cause the AVF to stop working or the blood vessels which form the AVF may narrow over time. This can often be treated. You can check that your fistula is working each day, by placing your hand over it and feeling the 'thrill' or a buzzing sensation. This feeling is caused by the high flow of blood through your vein and is a sign that your fistula is working well.

Consent

We must by law obtain your written consent to any operation and some other procedures, including endo AVF beforehand. Staff will explain all the risks, benefits and alternatives before they ask you to sign a consent form. If you are unsure about any aspect of this procedure, please do not hesitate to ask to speak with a senior member of staff again. We will inform your GP that you have had this procedure, unless you specifically instruct us not to.

If you have any of these symptoms, please contact the renal vascular access nurse.

What are the benefits?

Unlike standard open AVF surgery, you do not need cuts or stitches with an endo AVF, so you will have no scarring.

It allows you to have a low-flow and low-pressure fistula, which is less visible than a fistula formed by surgery.

Are there any alternatives?

Endo AVF is an alternative to the standard surgical procedure. The vascular access team will assess your veins and tell you if you are suitable for endo AVF. You will then be able to choose which procedure you want. If the endo AVF procedure does not work, you can have your fistula created surgically at the same time or at a later date.

A fistula is the best option for haemodialysis access for most people. If you cannot have a fistula, you may need to have a long-term tunnelled dialysis line put in instead.

Where will I have the procedure?

You will have it in the Interventional Radiology Department, 1st Floor Denmark Wing, King's College Hospital (KCH), Denmark Hill.

When will I have the procedure?

Your renal vascular access nurse and/or renal doctors will request you have the procedure. The IR Coordinator team will offer you the next available and suitable slot.

How can I prepare the procedure?

Pre-assessment appointment: Your renal vascular access nurse will arrange for you to have a pre-assessment appointment. You will have this appointment in person so the nurse can assess your veins to see if you are suitable for endo AVF. They will ask you questions about yourself, your health and the medications you take.

They may take a blood sample to check that you are in good general health and how well your blood clots. You can have this in the Renal Outpatient Department at King's College Hospital.

Duplex scan: You will see your renal doctor in clinic and have an ultrasound duplex scan to get a picture of your blood vessels in order to plan the endo AVF.

Drugs and alcohol: Do not use any recreational drugs or drink alcohol for 24 hours before the procedure.

Medications: Please make sure the doctor or nurse knows if you are diabetic and are taking tablets such as metformin or insulin injections.

Also inform them if you are taking any of the following blood-thinning medications (anticoagulants): aspirin, clopidogrel, warfarin, apixaban, rivaroxaban, edoxaban, ticagrelor, prasugrel, phenprocoumon, acenocoumarol, dagibatran, argatroban, heparins, fondaparinux, enoxaparin.

They will tell you when to stop these medications and when it is safe to start taking them again.

If in doubt, please bring all the medications that you are taking, whether they have been prescribed for you or you have bought it over the counter at your local chemist store.

What type of anaesthesia will I have?

You will have a regional anaesthesia called a nerve block. The anaesthetist will inject some local anaesthetic numbing solution around the nerves of your arm. This 'blocks' the signals sent out by the nerves in your arms that allow you to feel things, including pain. Your arm will be temporarily numb and weak below the level where the block was injected. You are usually awake during the procedure, but you may also have sedation or general anaesthetic, if required.

Will I be admitted to hospital for the procedure?

You will be admitted to the hospital before this procedure. You might be asked to come in the night before or be asked to arrive early in the morning on the day of the procedure.

What happens before my procedure?

Eating and drinking: You must **not** eat anything for at least **six hours** before your endo AVF. You can drink clear fluids up to **two hours** before your procedure. It is very important that you follow these instructions because you will be lying flat on your back during the procedure.

Medications: Keep taking your regular medications, except for any blood-thinning ones (unless instructed otherwise). Remember to take your blood pressure medication on the morning of the procedure (if applicable). If your blood pressure is too high on the day of the procedure, you might need to have the procedure on another day.

What to bring with you: Please bring all your medications, something to read and a small overnight bag.

What not to bring with you: Do not bring valuables, jewellery or large sums of money with you. If this unavoidable, please ask a relative or friend to take them home for you. The hospital cannot accept liability for the loss of items that are not handed in for safekeeping.

What happens before the procedure?

On the morning of the procedure, your ward nurse will ask you to change into a gown. They will check your blood pressure, heart rate and temperature, and ask you some questions. They will put a small, thin tube called a cannula into a vein in your hand or arm so we can give you medications such as pain relief if you need them during or after the procedure. They will then take you to the Interventional Radiology Department.

What happens during the procedure?

An Interventional Radiologist – a specialist doctor trained in image-guided procedures who will carry out your procedure – will explain the procedure to you and ask for your consent. They will be assisted by interventional radiology nurse(s) and a radiographer who operates the special x-ray machine inside the procedure room.

You will be taken to the angiography suite or procedure room and asked to lie flat on your back in a special x-ray table.

We will attach you to a monitoring device to check your heart rate, breathing, oxygen level and blood pressure.

We will ask you to confirm your details before the start of the procedure and the doctor doing the procedure will confirm the procedure plan with the specialist team.

The anaesthetist will inject the nerve block into your arm, once it has taken effect, the skin where you are going to have the endo AVF will be cleaned with disinfectant and sterile covers placed over it. The radiologist will still inject a local anaesthetic on the area before creating the puncture. After that, the doctor will use an ultrasound machine to decide the best place to create a puncture.

They will put a needle, usually followed by a catheter, into the vessels and inject the dye. They may ask you to hold your breath for a few seconds while the x-ray images are taken. You may feel a warm sensation when the dye is injected. The dye shows up on x-rays and enables the doctor to get a good picture of the blood vessels as well as where they are placing the fine plastic tubes (catheters) that are used to create the AVF.

The doctor will use the x-ray images to guide the catheter to the correct area to create the AVF. The doctor will then put two catheters into the artery and the vein through the same small punctures. Magnets are used to line up the devices and a connection will be made between the vein and artery in your forearm with a sub-second burst of radiofrequency energy. You may feel a small 'shock' sensation for less than a second when the connection between your artery and vein is made.

Sometimes a deep vein may need to be blocked (embolised) to ensure enough blood flows through the more superficial veins in your arms. You may have this done during the same procedure or at a later date.

All catheters are taken out of your arm at the end of the procedure. The doctor will press over the blood vessels with their hand for 10 minutes to stop any bleeding. Sometimes you have a small compression device that looks like a wristband put around the puncture site for up to one hour to stop bleeding. This might cause some discomfort.

Will the procedure hurt?

The procedure can sometimes be uncomfortable or painful. Please let the team know if you feel any discomfort and they will give you pain relief medication.

How long will the procedure take?

It usually takes between one and three hours.

What happens after the procedure?

A dressing will be placed over the puncture site. You will be taken back to the recovery area on a trolley, where the nursing staff will monitor you for one – three hours.

You will be taken back to the ward once there is no bleeding at the puncture site and the nurses are satisfied that you are recovering well.

When can I go home?

When you and your renal team are ready for you to be discharged, you can return home and eat and drink as normal.

How do I care for the puncture site?

The area may be tender for a few days after your procedure. You can ease any pain with regular painkillers.

When can I exercise and go back to work?

You should be able to return to normal activities within one week. You will visit an access outpatient clinic a few weeks after the procedure to review your progress and may also undergo an ultrasound Duplex scan to assess if the fistula is ready to be used.

It usually takes four to six weeks for the vein to enlarge enough for the haemodialysis needles to be inserted.

When can I start taking blood thinners again?

If you are taking anticoagulants, your clinical team will let you know when it is ok to start taking them again. This will depend on how well the procedure went and the medication you are taking.

What should I do if I cannot come for my appointment?

Please let your Renal Vascular Access Nurse (see number below) or us know as soon as possible so we can arrange another date and time. This also enables us to offer your appointment time to someone else.

King's College Hospital Denmark Hill, Tel: **020 3299 3490, 020 3299 6730**
or **020 3299 3280**.

Who can I contact with queries or concerns?

If you have any questions about your procedure, please contact either:

King's Renal Vascular Access Nurses, Kings Renal Unit,
Denmark Hill: **020 3299 8510** or **020 3299 6776**, Mon to Fri, 9am – 5pm

or

Interventional Radiology Nurses, Denmark Hill: **020 3299 3490** or **020 3299 2060**,
Mon to Fri, 9am – 5pm.

More information and support

- King's College Hospital: www.kch.nhs.uk
- NHS: www.nhs.uk, tel: 111
- British Society of Interventional Radiology: www.bsir.org (click on Patients, click on patient information leaflets, select leaflet)

MyChart

Our MyChart app and website lets you securely access parts of your health record with us, giving you more control over your care. Visit **www.kch.nhs.uk/mychart** to find out more.

Sharing your information

King's College Hospital NHS Foundation Trust has partnered with Guy's and St Thomas' NHS Foundation Trust through the King's Health Partners Academic Health Sciences Centre. We are working together to give our patients the best possible care, so you might find we invite you for appointments at Guy's or St Thomas' hospitals. King's College Hospital and Guy's and St Thomas' NHS Foundation Trusts share an electronic patient record system, which means information about your health record can be accessed safely and securely by health and care staff at both Trusts. For more information visit **www.kch.nhs.uk**.

Care provided by students

We provide clinical training where our students get practical experience by treating patients. Please tell your doctor or nurse if you do not want students to be involved in your care. Your treatment will not be affected by your decision.

PALS

The Patient Advice and Liaison Service (PALS) is a service that offers support, information and assistance to patients, relatives and visitors. They can also provide help and advice if you have a concern or complaint that staff have not been able to resolve for you. They can also pass on praise or thanks to our teams.

Tel: **020 3299 4618**

Email: **kings.pals@nhs.net**

If you would like the information in this leaflet in a different language or format, please contact our Interpreting and Accessible Communication Support on 020 3299 4618 or email kings.access@nhs.net

Reference:

Endovascular-AVF-Creation-endoAVF-V1-07.2024.pdf

Nerve blocks for surgery on the arm or hand | CUH

WavelinQ™ EndoAVF System | BD United Kingdom

www.kch.nhs.uk