The Dudley Group
NHS Foundation Trust

The arteriovenous graft for haemodialysis

Department of Renal Medicine

Patient Information Leaflet

Introduction

The information contained in this booklet is for:

- Patients waiting to go on the haemodialysis programme.
- Patients with a temporary or permanent catheter already having haemodialysis.
- Patients on the continuous ambulatory peritoneal dialysis program (CAPD) transferring to haemodialysis.
- Patients waiting for another permanent vascular access device to be fitted.

It contains information on what an arteriovenous graft is, how one is fitted, how to look after it once it is in place and what to do if you have any problems.

Please note that the information in this booklet is only a guide. If you need any more information or have any queries, please speak to the Renal Unit staff.

Your graft is your lifeline. Please look after it.

What is haemodialysis?

People who have chronic kidney disease (CKD) have lost the normal functions of one or both of their kidneys. Usually the kidneys filter blood and remove waste produced by the activities of the body. When the kidneys no longer function correctly, the waste produced by the body cannot be removed by the affected kidneys. The build-up of these toxins can be fatal, if you are not treated.

One way of getting rid of the waste is to connect you to an artificial kidney machine. This process is called **haemodialysis**. It involves diverting your blood into an external dialysis machine, where most of the waste is filtered out. The purified blood is then returned to your body.

To achieve adequate dialysis, a minimum blood flow of 300 millilitres of blood (about a cupful) must flow through the dialyser every minute.

Most people need two or three sessions of haemodialysis a week, for an average of four hours each session.

In order for you to be connected to the dialysis machine, we need access to your bloodstream. The arteriovenous graft is one form of access. The graft is explained in more detail in the next few pages.

What is an arteriovenous (AV) graft?

It is a length of synthetic tubing and is very soft and pliable. The material has been produced specially for use inside the human body. This minimises the likelihood of the body rejecting it. The graft is used to connect an artery to a vein.

There are two types of graft, one is straight and the other is a loop (please see figure 1). The looped graft has a special reinforced ring to prevent it from kinking. One end of the graft is stitched to an artery and the other is stitched to a vein to form a loop.

Grafts have been in use for the last thirty years in renal units around the world.

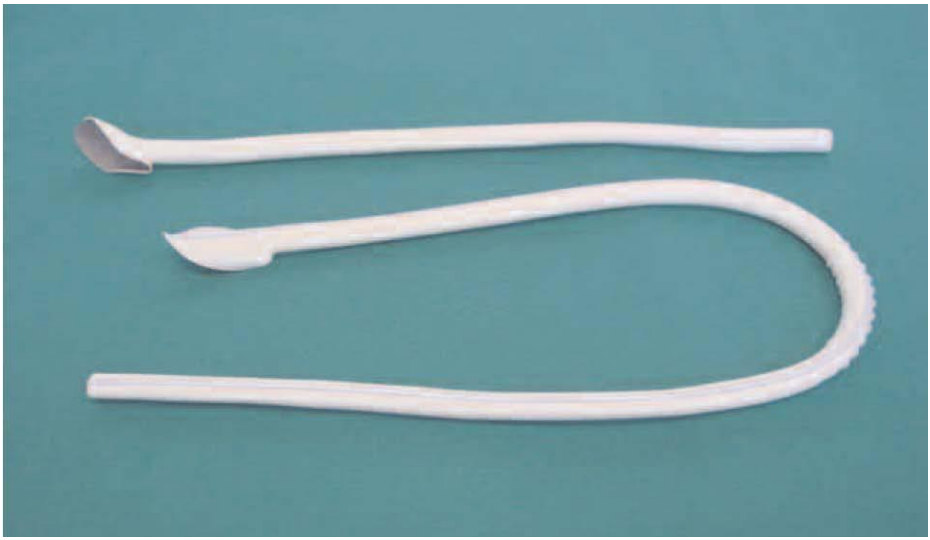

Figure 1 shows straight and loop grafts (image courtesy of Gore Medical)

Why do I need a graft and what are the alternatives?

Your consultant will have discussed with you the reasons why you need a graft.

The three main ways to access a person's bloodstream for long term dialysis are:

- an arteriovenous fistula
- a haemodialysis catheter
- an arteriovenous graft

The fistula is formed by joining an artery to a vein. If your blood vessels are too small, too far apart or affected in any way, the graft is then the best choice. The catheter is used for people who have problems with blood vessels in their arm or leg. Without access to your bloodstream, you cannot have haemodialysis.

Each person is assessed for the option best-suited to them.

Where is the graft placed?

The graft is usually put in the arm. The ideal site is in the forearm area. It can also be created in the upper arm or in the leg. Please see figures 2a and 2b.

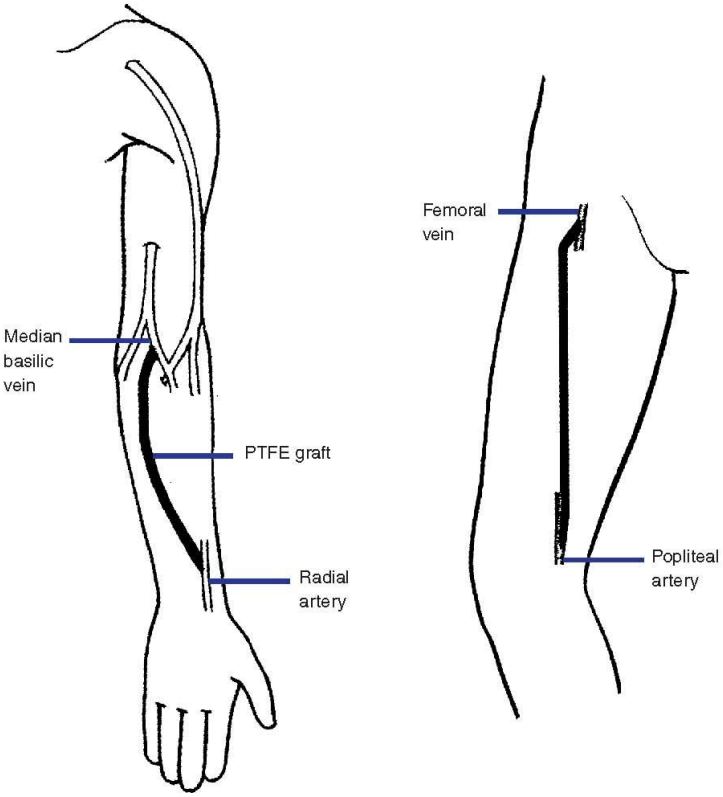

Figure 2a shows a straight graft in the arm and leg

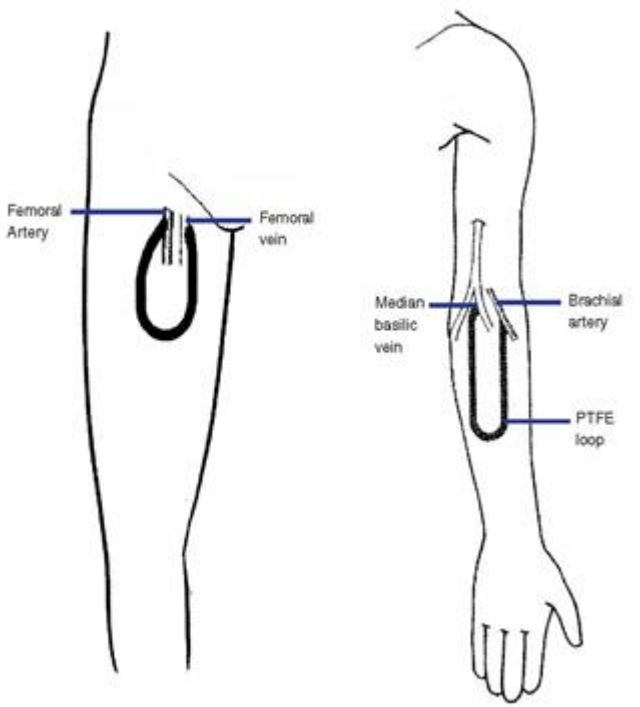

Figure 2b shows a loop graft in the arm and leg

How is the AV graft put in?

The AV graft is put in by a vascular surgeon in an operating theatre. The operation can be carried out using a local anaesthetic (the area is numbed) or general anaesthetic (where you will be asleep). This will depend on your general health at the time.

With local anaesthetic, the blood vessels tend to remain the same size during the procedure. When a general anaesthetic is used, the blood vessels become slightly smaller during the operation. This can make the procedure more difficult. Sometimes it is generally difficult to work with blood vessels that are in poor condition.

The surgeon will:

- Make a small cut of about six centimetres long (two inches) in the skin where the graft is to be inserted.
- Assess the best artery and vein to use and clamp the blood vessels shut.
- Make another cut (six centimetres long) on the side of the chosen artery and vein.
- Create a tunnel to thread the graft into the tissues. This will help to keep the graft steady when the wound is healed up.
- Stitch one end of the graft to the side of the artery and the other end to the side of the vein.

The surgeon will take off the clamps on the blood vessels and the blood immediately starts to flow straight into the graft.

A larger volume of blood can now flow from the artery directly into the vein. It is this shortcut that makes the graft buzz and vibrate when touched. This is also known as the buzz or the thrill.

The surgeon will test your blood flow while you are still in theatre.

How long does the operation take?

It takes about an hour.

How long does the graft last?

This will depend on the individual's general health. Generally, a trouble-free graft can last up to 10 years. If and when the graft fails, attempts will be made to place another one in either the same arm or the other arm. It can also be placed in the leg. This will depend on how good the other blood vessels are in the arms or legs.

If all attempts to put in another graft fail, there is the possibility of using a long-term catheter. This catheter is inserted into a vein in the neck. You can get more details on this type of access from the Renal Unit.

When can the AV graft be used for dialysis?

After a period of three to eight weeks, the graft will be ready to use for dialysis. At this point, we will put two thin needles into the graft (please see figures 3a and 3b).

For the arm graft, the needles are usually placed pointing upwards.

For the leg graft, the venous needle is placed pointing towards the groin and the other can be pointing either towards the groin or the foot. This will depend on the blood flow.

Figure 3a shows needles in an arm graft

Figure 3b shows needles in a leg graft

(Images courtesy of Gore Medical)

How do I care for the graft?

Once the graft has been put in, you will need to care for it to make sure that it works well and will last. The renal nurse will explain to you how to check and care for your graft.

The important thing is that the buzz must be strong, meaning that the blood flow is good. The renal staff will explain more about this to you before your operation.

Here are some tips to help you look after your graft:

Do:

- Feel the buzz of the graft as often as you can, especially before bedtime and after you wake up. This will tell you how strong the blood flow is. Use the palm of your hand lightly and gently place it on top of the operation site. If the buzz is strong, you should be able to feel it.
- In the first few weeks, wear well-padded but loose protection around the graft to protect it from knocks.
- Wear gloves in cold weather to keep your hand warm. This will increase circulation and will reduce the risk of your fingertips getting cold.
- Wear gloves when doing gardening. They will protect you from scratches and cuts which may cause an infection.
- Always use a protective leather pad or thick cloth on the graft arm if you are working in hazardous areas.
- Carry packs of gauze dressing and a roll of tape with you at all times, just in case the graft bleeds after a dialysis session.
- Contact the Renal Unit:
    - Immediately, if the graft becomes unusually painful, inflamed and hot to touch.
    - If you ever have a fever (high temperature).
    - If any discharge (fluid) comes out of the graft.
    - If you have any questions about the graft.

Do not :

- Wear tight sleeves above the graft. This may restrict the blood flow to the graft. If your blood flow is restricted for a long time, it can cause blood clots around the graft.
- Lift heavy objects or bags with the arm that has the graft in it.
- Allow anyone to take blood or put needles in your graft except Renal Unit staff.
- Keep your arm raised above your head for long periods e.g. working on ceilings. This will reduce the blood flow to the graft and may cause clotting.
- Allow anyone to take your blood pressure on the arm that has the graft in it.
- Scratch or pick scabs from the needle puncture sites.

Advice in an emergency situation

If the graft flow is slower or the buzz is weak or has stopped:
If at any time you feel that there is a change in the graft buzz, this may indicate that the blood flow is reduced. This is why the buzz becomes weaker.

What should I do?

- Call the Renal Unit immediately.
- Wrap your arm in a warm towel.
- Be prepared to come to hospital soon after the call.

If the graft bleeds and the bleeding will not stop:

- Try to stop the bleeding by wrapping your other hand around the bleeding point.
- Hold it tight and call someone for help. Ask them to contact the Renal Unit immediately.
- Try to keep calm as this will help you to think straight.

If no one is around:

- Dial 999 and say that you are a dialysis patient and you have a bleeding artery in your arm.
- Unlock the front door for the ambulance, ready for when they arrive.
- Sit down and rest until the ambulance arrives.

If the graft becomes hot and inflamed and you have a temperature:
Contact the unit as soon as possible as you may have an infection.

Contact the Renal Unit on 01384 244384
7.30am to 8pm, Monday to Saturday
9am to 5pm, Sunday

What risks are associated with the graft?

As with all operations, there are certain risks involved. We aim to reduce these risks as much as possible.

Here are some of the risks of having a graft:

- Temporary and/or partial loss of feeling in the fingers.
- The hand with the graft may feel colder than the other one.
- The skin colour of the hand or fingertips may be paler.
- The blood vessels in the graft arm will increase in size over a period of time.
- Occasionally, you may feel sharp pain in the graft.
- The graft may clot and may become unusable for dialysis.
- The graft may bleed a lot after the needles are taken out.
- A small swelling can appear anywhere on the graft. This can be caused by repeatedly having to put needles into it, and weakness of the graft material.
- The graft or/and the area around it could become inflamed and hot to touch.

- The graft may become infected and cause a blood stream infection called septicaemia. Infection may spread elsewhere such as the heart, joints or the brain.

Remember: the renal team is always willing to give help and advice. Please contact us, however small your query.

Frequently asked questions

Can I walk normally after leg graft surgery?

Yes but not immediately after the operation. The renal staff will tell you how soon after surgery you will be able to walk.

Can I jog and do exercise with a leg graft?

Yes as long as renal staff have told you this is OK.

Can I wear tights over the leg graft?

Yes but do not wear support tights or compression-type bandages as these may restrict blood flow to the graft.

Can I shave my leg with the graft?

Yes but please avoid shaving too close to the graft area.

Can I drive?

Yes but please carry a pack of gauze dressing and tape with you whenever you travel, in case of any bleeding.

Can I swim?

Yes as long as you have been told it is safe to do so by the renal staff. Please swim in a properly-managed pool to lessen the risk of catching an infection.

Can I do weight lifting with the graft arm?

This is not advisable.

Jargon explained

- **Access:** the term used to describe the site where you are connected to the dialysis machine.
- **Anaesthetic:** the drug used to numb the area of needle puncture. This would be a local anaesthetic.
- **Arterial needle:** the needle used to draw blood away from the graft.
- **Artery:** the blood vessel that carries blood from the heart to parts of the body.
- **Bruit:** the sound of blood flowing in the graft.
- **Cannulation:** the insertion of needles into the graft for dialysis.
- **Dialyser:** the artificial kidney.
- **Fistula:** the arteriovenous fistula is the joining of a natural artery to a natural vein to create a new blood access for dialysis.
- **Graft:** a synthetic or natural material used for access to the bloodstream for dialysis.
- **Haemodialysis:** the purification of blood by passing it over a special membrane to remove waste material and toxins.
- **Millilitre (ml):** a measurement of fluid (one litre = one thousand millilitres.) A can of drink usually contains 300ml.
- **Nephrologist:** a doctor who specialises in kidney diseases.
- **Thrill:** (also known as a buzz). The feel of the trembling movement in the graft.
- **Vein:** a blood vessel which returns blood from parts of the body to the heart.
- **Venous needle:** the needle used to return blood to the heart.

Contact information

The Renal Unit – 01384 244384

7.30am to 8pm, Monday to Saturday

9am to 5pm, Sunday

Ask to speak to a vascular access nurse (VAN) or a member of the haemodialysis staff, if a VAN is not available.

Out of these hours, ring the hospital switchboard number and tell them you are a renal patient. Ask to speak to the haemodialysis nurse on call.

Russells Hall Hospital switchboard number: 01384 456111

This leaflet can be downloaded or printed from:

http://dgft.nhs.uk/services-and-wards/renal/

If you have any feedback on this patient information leaflet, please email dgft.patient.information@nhs.net

This leaflet can be made available in large print, audio version and in other languages, please call 0800 073 0510.

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