Patient information

East and North Hertfordshire NHS Trust

Needling Arteriovenous Fistula (AVF) and Grafts for Haemodialysis

This leaflet is intended to provide you with information regarding the needling (also known as cannulation) of an arteriovenous fistula or graft.

Your vascular access

Patients with end-stage kidney disease (ESKD) often require haemodialysis, a life-sustaining treatment that relies on vascular access to the bloodstream. The preferred method of vascular access is the arteriovenous fistula, a surgical or a non-surgical connection between an artery and a vein that provides a reliable and long-lasting blood flow for dialysis.

Compared to other access options, arteriovenous fistulae have the lowest rates of complications, such as infection and clotting, and are associated with the best patient outcomes. However, fistulae and arteriovenous grafts (an alternative vascular access) require regular access surveillance and monitoring of a sustained needling technique to ensure their continued optimal function.

Gaining access to my fistula or graft

The nursing team will assess your fistula at 4-6 weeks after it has been created to see if it is suitable for needling. The arteriovenous graft has a shorter maturation time and can be needled between 2-4 weeks after it has been created.

Needling is the process of inserting a dialysis needle into the fistula or graft to allow blood to flow from the patient's body into the dialysis machine and back. This access point must be carefully selected and prepared to minimize the risk of complications. Proper needling technique is crucial, as improper needle placement or excessive trauma to the access site can lead to complications, such as bleeding, infection, clotting, and even loss of the vascular access.

There are several needling techniques that can be used, including rope-ladder, buttonhole, and area puncture techniques.

Rope-ladder technique:
This involves inserting each needle at a different site following a ladder type sequence along the length of the fistula or graft at each dialysis session. This is the gold standard in needling fistula and grafts. The rope-ladder technique, if carried out properly, will avoid long-term problems such as the development of lumps which are not aesthetically pleasing to look at.

Since this technique involves changing the needling sites every dialysis session, there is a slight risk that you might feel pain when the needles are inserted. This pain is temporary and should go away once the needles are secured.

Buttonhole technique:

This technique uses the same needle insertion site repeatedly to create a track. This approach may be associated with a slightly higher risk of infection as compared to the rope-ladder technique, but it can be more comfortable for the patient. The tracking takes about 2-4 weeks to develop using a sharp needle.

Once the tracks are developed, the needler will be able to use a blunt type needle to access your veins. This technique is only suitable for an arteriovenous fistula **and not** for arteriovenous grafts.

Area puncture technique:

In this approach, the needle is inserted into a general area of the fistula or graft. This technique is not recommended due to the higher risk of complications such as bleeding, infection and the development of aneurysms (lumps and bumps in the fistula or grafts).

In deciding what techniques to use, your healthcare team will consider factors like the condition and anatomy of your access, your risk of complications, and most importantly your personal preferences.

What if I have phobia of needles and I am scared of pain?

Needling a fistula or graft can be painful for some patients, so we have developed a comprehensive way to address pain associated with needling. These may include the use of distraction techniques to the application of analgesic spray or cream. To know more about your options, please ask a member of the nursing team. We can also help you get in contact with our renal counsellors to help you address your phobia of needles.

Distraction techniques:

This technique is proven effective in managing anxiety and pain associated with needling. The techniques include, but not limited to, breathing techniques, relaxation techniques, blowing bubbles and progressive muscle relaxation stories.

Topical analgesic sprays:

Topical analgesic sprays work as a fast-acting vapo-coolant when sprayed on the skin and creates a rapid analgesic effect. The analgesic spray can be used after the skin is cleansed using the recommended cleanser. Once sprayed on the patient’s skin, the needle is immediately inserted. This procedure is repeated for the second needling point.

Topical anaesthetic creams:

Anaesthetic creams work by numbing the skin surface for a short period of time. You will need to apply the cream and put a clear dressing on top of the cream for at least 30 minutes to 1 hour prior to needling. The anaesthetic cream is removed, and you will be asked to wash your fistula arms with soap and water, then your skin will be disinfected prior to needling.

Lidocaine injections:

A lidocaine injection is one of the last resorts to address pain associated with needling. The procedure involves injecting a medication called lidocaine through the skin directly into the area to be numbed. The injector will use a very small needle to inject the lidocaine, then follow by inserting the haemodialysis needle. The effect of the lidocaine wears off within 1-2 hours after injecting. The lidocaine injection itself may sting.

Buttonhole technique:
If all else fails in addressing the pain associated with needling, buttonholing your fistula can be helpful. It is proven that once the tracks are created, needling the fistula through the tracks is a lot less painful and can be more comfortable for the patient. Buttonhole **is not suitable** for patients with grafts and patients with existing infections such as Methicillin-resistant Staphylococcus Aureus (MRSA).

Care of your fistula or graft

We recommend the following actions to ensure that your fistula or graft remains healthy and working:

- **Do not** wear anything tight on your fistula arm, this includes watches and clothing.
- **Do not** carry anything heavy with your fistula arm, this includes carrying young children.
- **Never** allow blood samples or needles for infusions to be taken or placed in your fistula arm.
- **Do not** have your blood pressure taken from your fistula arm.
- Regularly check for the fistula's thrill or bruit (a buzzing sensation or a sound in the fistula and grafts) four times each day.
- Avoid sleeping on your fistula arm.

What are the possible complications of needling a fistula or graft?

With any medical procedure there is a risk of having a complication. It is important that you know what they are. Some of these are listed below:

- The most common complication of needling a fistula or grafts, especially if it is being needled for the first time, is bruising. Minor haematoma or bruising normally goes away without any treatment. You need to alert the nursing team if there is severe pain in the bruised area and it is warm to touch.
- Another possible complication is the risk of infection in the needling sites. This risk is relatively low as compared to having a haemodialysis line. To prevent this risk, it is vital that you wash your fistula arm prior to needling. Hand washing sinks are available in the haemodialysis clinical area. The nursing team will ensure that after you wash your fistula arm, they will disinfect the needling sites with the recommended skin disinfectants.
- A more serious complication of needling is infiltration and blowing of the vein of the fistula. Infiltration happens when the needle goes through and through the vein and a leak of blood occupies the surround structure of the fistula. This will cause swelling and severe pain which may potentially damage your fistula.

What if I have some questions about the fistula?

The renal access clinical nurse specialists (CNS) are available Monday to Friday, 8am – 4pm and can be contacted on 01438 284624 if you have any questions regarding your access. A message can be left on the answer phone.

Further information

NHS Website www.nhs.uk
Kidney Care UK www.kidneycareuk.org
National Kidney Foundation www.kidney.org
Kidney Patient Guide www.kidneypatientguide.org.uk
Vascular Access Society of Britain and Ireland www.vasbi.org.uk

Useful contact details

East and North Hertfordshire NHS Trust:
- Website www.enherts-tr.nhs.uk
- Telephone 01438 314333

Renal Access CNS:
- Telephone 01438 284624

Lister Haemodialysis Unit:
- Telephone 01438 284152

St Albans Haemodialysis Unit:
- Telephone 01727 897588

Chiltern Kidney Centre:
- Telephone 01438 288850

Bedford Renal Unit:
- Telephone 01438 286750

Harlow Renal Unit:
- Telephone 01279 278205

Leaflet information

You can request this information in a different format or another language; please speak to your doctor or nurse.

Date of publication: September 2024
Version number: 1
Author: R. Villanueva, J. Cloran
Reference: Renal
Review Date: September 2027