Focus on: Fistula Care
Protecting your "lifeline"
NephroCare
Fresenius Medical Care’s Way of Caring
NephroCare Patient Training

As a service of Fresenius Medical Care, NephroCare is dedicated to providing the best possible renal replacement therapy at the point of care. We strive at supporting you to achieve a better quality of life. For us this means working with advanced technologies and products which enable excellent therapies, while at the same time listening to you to understand your needs.

We are committed to providing you with all the important information you need to learn about the status of your own health and how to improve it. We are here to assist you in finding out what is best for you as a dialysis patient and how to take the best possible care of yourself.
The arteriovenous fistula, or fistula for short, is also called a patient’s “lifeline”. The name lifeline stands for the essential connection between your body and the artificial kidney. Keeping it in good condition is of utmost importance for your wellbeing and to ensure that your dialysis treatment can be performed without complications.

**Why do you need a fistula?**

Our blood vessels are not well suited to providing a sufficient and constant blood flow for dialysis. We have two types of blood vessels: veins and arteries. Our veins are located just beneath the skin and we can often see them with the naked eye. They can be punctured quite easily, but the blood flow in veins is too low for dialysis treatment. In the arteries, blood flows with a higher pressure than in the veins, but they are “hidden” much deeper under the skin, and are hence much more difficult to puncture. Furthermore, arteries have a very strong pulse and high pressure, which is not ideal for dialysis treatment. Therefore we need a special blood vessel called fistula.
A fistula is created during a short surgical intervention by joining an artery with a vein – that is why it is called “arteriovenous”. Fistulae are usually located in the forearm. The newly created blood vessel combines the properties of arteries and veins: the blood flow and blood pressure is higher than in a vein and the blood vessel has a palpable thrill, similar to what you can feel when touching an artery. During the maturation process the diameter of the blood vessel grows making it easier to insert a needle, and the wall thickness of the fistula increases. This "maturation process" takes approximately 6 weeks. After maturation the fistula can be cannulated, as it allows a high amount of blood to flow into the extracorporeal blood circuit, enabling effective haemodialysis.

**Arteriovenous fistula: combining the characteristics of an artery and a vein**

- “Arterio” comes from artery, which is a blood vessel that carries fast-flowing blood that is rich in oxygen from the heart to the tissues in the body
- “Venous” comes from vein, which is a blood vessel that carries the blood away from the tissues back to the heart to collect more oxygen from the lungs
- “Fistula” refers to a connection between two blood vessels that normally do not connect
Maturation time

During the maturation time you need to pay special attention to your vascular access site. For this period the operated area may be covered with a bandage to protect it from infection and to keep it safe. From time to time the doctor or nurse will examine the status of your fistula.

After the surgery, it is very important that you follow your doctor’s recommendations on how to care for your fistula arm. You should also help the fistula to develop by following an appropriate exercise programme; your doctor or nurse will give you indications and tell you when to start. By exercising your fistula arm, you increase the blood supply to the fistula. This makes the fistula enlarge and prepare it for cannulation.

Please ask your healthcare team for more advice if your fistula is not yet completely matured. Here are some simple exercises you can do even while watching television or reading:

**Grab a clothes peg**
- Take a normal clothes peg
- Squeeze it open with your index finger and thumb, allowing it to close again
- Repeat this exercise for 5 minutes, 6 times a day
These simple exercises help the development of the newly created blood fistula, allowing it to become larger and stronger. Remember to stop the exercises if your arm becomes tired or the exercise is painful for your arm.

**Squeeze a soft ball**
- Hold the ball in the hand of your fistula arm
- Let your arm hang down beside your body
- Squeeze the ball by opening and closing your hand repeatedly for about 5 minutes

**Touching the fingertips**
- Touch each finger "to" the tip of your thumb, repeating this action for 5 minutes
  - Remember to open your hand after each touch
- Touch fingertips to thumb repeatedly for 5 minutes, 6 times a day
Things to consider in your daily life

Given that the fistula plays a key role in a successful dialysis treatment, it is really important to keep it in good condition. Your fistula needs checking every day! You should use your eyes, ears and fingers to check that everything is OK.

When looking at your fistula arm, be aware of any signs of redness or swelling.

One way to check if there is a good blood flow through the fistula is to use a stethoscope in order to hear a sound called “bruit”. Ask your dialysis team to show you how to do this.

The easiest way is to put your hand on your fistula. You should feel a rhythmic vibration / buzzing sensation called a “thrill”. When palpating your fistula, pay special attention if it feels sore or warmer than usual.
Please follow a couple of simple rules to minimise the danger of infection or thrombosis, which are the most common dangers for your fistula:

**Let the blood move freely**

Avoid pressure of any kind on your fistula arm, as it can lead to thrombosis, especially in a condition of low blood pressure. You should avoid the following:

- Wearing tight clothing or restricting objects such as watches or bracelets which could cause a compression of the fistula.
- Sleeping on your access arm, as it can lead to transitory fistula kinking and a reduction of the blood flow.
- Strong bending of your fistula arm.
- Measuring your blood pressure in the fistula arm with a blood pressure meter, as inflating the cuff induces a compression of the blood vessels.
- Drawing blood or injections, as afterwards haemostasis has to be performed. In addition, unqualified personnel could potentially damage the fistula.

If you notice any of these **disturbing symptoms:** redness, swelling, soreness, increased temperature in the fistula area or you cannot hear the bruit or feel a thrill, please contact your doctor or dialysis team.
Keep it clean

In order to avoid any possible bacteria migrations from the skin to the blood circulation system, which could lead to infection, always remember to:

- Wash the access site with water and soap reserved for that purpose only every day and before each dialysis session.
- Avoid coughing or sneezing in the direction of the fistula.
- Refrain from scratching the fistula area and particularly the access sites.
Protect it from injuries

- Avoid activities that might cause injuries to the fistula such as lifting heavy objects like suitcases or packing cases. For instance, when shopping take a trolley instead of a basket and don’t use your fistula arm to carry your heavy grocery bags home.
- Do sports which do not over-burden your fistula arm, for example jogging or cycling.
Be careful of temperature extremes

Very high or low temperatures can also have adverse effects on your fistula and lead to thrombosis. It is recommendable not to expose yourself to:

- Excessive heat (e.g. sauna), as it induces vessel dilation and reduces the blood pressure and blood flow. If you want to be outside on a very hot day, try to stay in the shade.

- Excessive cold. This induces vessel constriction and with it reduced blood flow in the limbs, especially in the fistula arm. On extremely cold days, remember to wear appropriate warm clothes if you want to get some fresh air outside.
Normally, if we get injured a process of coagulation is activated. The body naturally uses platelets - also called thrombocytes - to form a layer which prevents blood loss.

If this happens internally the process is called thrombosis and means the formation of blood clots inside a blood vessel, which then interferes with the regular flow of blood in the circulatory system. The mechanism of thrombosis can be activated by so-called “haemodynamic mechanisms” such as low blood speed, change in temperature or changes in blood pressure.

The fistula arm of a dialysis patient is particularly vulnerable to these phenomena for a number of reasons. After repeated cannulations the fistula becomes sensitive and delicate. Additionally, when the plasmatic water is removed after each dialysis session, the concentration of blood cells increases, which means that the blood gets thicker. Sometimes the blood pressure drops, so the blood speed slows down.

**However, by taking good care of the fistula arm in your daily routine, you can keep the potential thrombosis activation factors down to a minimum!**
In the dialysis centre, the specialised professionals will take care of you and advise you about everything related to your treatment as well as your vascular access care. Here is some advice as well as a few aspects of your care you can play an active role in:

**Before treatment**

- Always wash your access arm directly before treatment.
- You may be prescribed a local anaesthetic. Your nurse or doctor will discuss the different options available to you.
- The nurse will always perform the skin disinfection before needle placement.
Cannulation and treatment time

Be receptive and open to all the information you receive from the care team about your puncture technique. There are two main techniques allowing for maximum protection of your fistula:

1. “Site-rotation” or “rope ladder”
Using this technique, for each treatment a new cannulation spot is selected, leaving some space (approx. 2 cm) from the previous one.

Usually, the nurse starts cannulating at the bottom of the access until the top is reached, and then starts over again at the bottom. The whole vascular line is used. If this technique is used for you, you can help by paying attention that puncture sites are not punctured again while they are still healing, in order to prevent weak spots in your fistula.
2. “Button hole” or “single puncture site”
With this technique, the needle is always placed in the exact same spot and at the same angle. In time, the needle tunnel heals, just like a pierced earring hole. This technique works best if the same person does it every time.

During treatment

- Hold your arm still and keep it relaxed, so the needles do not get dislodged.
- Always remember not to cover your access arm with clothes or a thick blanket, so the nurses can easily check if everything is OK.

If you are interested in being more active in the cannulation process itself, please talk to your care team about it!
Upon completion of treatment

If you are able you will need to hold the gauze on the needle sites until the bleeding stops – this process is called haemostasis. Holding your sites the right way will shorten bleeding time, prevent access damage and get you home sooner. Here is how:

- The nurse will put a glove on your non-access hand and give you a sterile swab.
- Hold firm pressure for 5 to 10 minutes with two fingers on the spots where the needles went in without peeking under the gauze. Don’t press so hard that you cut off the pulse – ask your healthcare team to show you the right pressure.
- The nurse will indicate when the bleeding has stopped, and your haemostasis is completed. A plaster/dressing will be put on and you can take off your glove.
- Before leaving the dialysis room, wash your hands.
- You should take off the plasters/dressing after 3-4 hours unless otherwise advised.
Your fistula is your lifeline and you can play an active role in keeping it in good condition. There are many things you can do in your daily life as well as during treatment to contribute to your long-term well-being and to make sure dialysis can be performed without complications. All of them are simple – just let them become a part of your daily routine. Of course every patient’s fistula is different and may require different care. Please discuss with your healthcare team what is right for you – we are here to give you all the advice and support you may need.

Together we can take care of your fistula