

Vascular Access: Your Lifeline to Hemodialysis

“The access allows the patient’s blood to travel to and from the dialysis machine.”

Before beginning hemodialysis treatment, a person needs an access to their bloodstream, called a “vascular access.” The access allows the patient’s blood to travel to and from the dialysis machine at a large volume and high speed so that toxins, waste and extra fluid can be removed from the body.

There are Three Types of Vascular Access:

1. The Arterio Venous (AV) fistula
2. The Arterio Venous (AV) graft
3. The central venous catheter

Each access is created surgically. There are a limited number of places on the body where an access can be placed—the arms, legs, neck or chest.

The fistula and graft are considered to be permanent accesses because they are placed under the skin with a plan to use them for many years. When patients find out they are in the advanced stages of chronic kidney disease and will be starting dialysis in the future, their nephrologist will advise them to get a fistula or graft.

Having the access in place well before beginning dialysis will give this lifeline time to “mature,” so it can be ready to use.

When patients suddenly discover they have kidney failure, a catheter may be placed to allow for immediate dialysis treatment. The catheter will be used until a fistula or graft has time to mature. A catheter can also be used on a permanent basis if the patient is unable to have a fistula or graft—but a catheter is always a last resort.

AV Fistula

An AV fistula is created by directly connecting a person’s artery and vein—usually in the arm. This procedure may be performed as an outpatient operation using a local anesthetic. As blood flows to the vein from the newly connected artery, the vein grows bigger and stronger. The patient is taught to do exercises—such as squeezing a rubber ball—to help the fistula strengthen and mature to get it ready for use. This takes anywhere from six weeks to four months or more.



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Once the fistula has matured, it can provide good blood flow for many years of hemodialysis.

Kidney and hemodialysis experts, including the National Kidney Foundation (NKF), Centers for Medicare and Medicaid Services (CMS), the American Association of Kidney Patients (AAKD) and others consider the fistula the “gold standard” access choice. Research studies have proven patients with a fistula have the fewest complications, such as infection or clotting, compared to all other access choices.

Currently, an access improvement initiative known as “Fistula First” is being sponsored by CMS throughout the United States to support an increase in the use of fistulas for hemodialysis patients.

The Fistula is Considered the “Gold Standard” Access Because It:

- Has a lower risk of infections than other access types
- Has a lower risk of forming clots than other access types
- Performs better than other accesses
- Allows for greater blood flow
- Lasts longer than the other access types
- Can last many years, even decades, when well red for

Some Issues People May Have With Fistulas Include:

- The appearance of bulging veins at the access site
- Taking several months for a new one to mature
- Not maturing at all in some cases

Not everyone may be able to have a fistula due to weak arteries, veins or other medical conditions; it is best to discuss your access options with your doctor, but ask for a fistula first.

AV Graft

The AV graft is similar to a fistula in that it is also an under-the-skin connection of an artery and vein, except that with a graft, a man-made tubing connects the artery and vein. The soft, plastic-like tube is about one-half inch in diameter and is made from a type of Teflon® or Gore-Tex® material.

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Transplanted animal or human vessels may also be used as grafts to connect an artery and vein. Grafts are usually placed in the arm, but can also be placed in the thigh.

Grafts do not require as much time to mature as fistulas because the graft does not need time to enlarge before using. In most cases, a graft can be used about two to six weeks after placement. Because grafts are created from materials outside of the body, they tend to have more problems than fistulas due to clotting and infections. Grafts may not last as long as a fistula and could need to be repaired or replaced each year.

Caring for a Fistula or Graft

Taking good care of your fistula or graft will help keep it working properly. There are a few things you can do to help prevent infections, clotting and damage to your access.

Cleanliness is Important to Keep Out Infections

Keep your access area clean and free of any trauma. Look for signs of infection including: pain, tenderness, and swelling or redness around your access area. Also, be aware of any fever and flu-like symptoms. If you do get an infection and catch it early, it can usually be treated with antibiotics.

Your dialysis care team will teach you how to carefully wash your access arm before each dialysis treatment. Make sure to wash thoroughly and be sure the care team member specially prepares your access site to prevent infection.

Unrestricted Blood Flow Helps Lower the Risk of Clotting Protect Your Access From Any Restriction or Trauma By:

- Avoiding tight clothes, jewelry or anything that may put pressure on your access
- Not sleeping on top of or resting on your access area
- Not carrying purses, bags or heavy items across your access area
- Always requesting that blood be drawn from your non-access arm
- Always requesting that blood pressure be taken on your non-access arm

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Call your vascular access surgeon immediately if the flow stops or changes. This could mean a blood clot. With quick action, many clots can be dissolved or removed.

Learn to listen with a stethoscope to the sound (called “bruit”) of blood flowing (“whooshing”) through your access. If the sound of the bruit changes to a higher pitch, like a whistle, it could be an indication that blood vessels are narrowing (called stenosis), which may slow or stop blood flow through your access. If you do not hear the bruit at all, or only hear your pulse, you may have a blood clot in your access. Call your vascular access surgeon if you notice any change in your access.

Good Needle Sticks (Cannulation) Can Help Keep Your Access Working Well

To prevent tearing or damage to your access, it’s recommended that you pay attention to the needle stick locations when you’re being put on dialysis. The arterial and venous needle tips should be at least two inches apart from each other, as well as away from access surgical scars. The new needle stick sites should be at least one-fourth inch from the sites used the time before. Allow about two weeks for healing of previous sites to help maintain the health of the access.

Many people are nervous about having needles placed; however, there are numbing creams that can be used to reduce the pain and fear of needle sticks. Talk to your nephrologist and dialysis care team about ways to decrease pain and to calm anxiety.

Have you ever considered learning how to stick your own access (called self cannulation)? Many patients find they prefer having control of the needle stick process. When you self-cannulate, you can control and participate in this part of your vascular access care and treatment. If you’d like to learn how to self-cannulate, ask a dialysis team member. You can receive education and training.

After dialysis treatment, your needles will be removed and you will need to apply pressure with sterile gauze over your needle sites to stop the bleeding.

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Your dialysis team will provide you with clean gloves and teach you the proper procedures to stop bleeding as well as prevent infection.

Catheters

A catheter is a narrow tube that is placed into a large central vein, usually in the patient’s neck, chest or groin. Placement of the catheter usually takes less than a half hour. Usually, two tubes extend out of the body from the catheter: one allows blood out of the body (arterial port) and one allows blood back into the body (venous port).

Catheters can be used for dialysis immediately after placement. A catheter may be used when one must begin dialysis before a fistula or graft has time to mature.

Some patients use permanent catheters, however, kidney and hemodialysis experts, including the National Kidney Foundation (NKF), Centers for Medicare and Medicaid Services (CMS), the American Association of Kidney Patients (AAKD) and others do not recommend catheters for long-term hemodialysis or may consider them as a last resort.

Concerns with catheters include:

- A greater likelihood to become infected, clotted or fail
- A slower blood flow so dialysis may not clean the blood as thoroughly as with a fistula or graft
- Inferior access for long-term hemodialysis

Caring for a Catheter

Catheters will require care to keep them protected, free of infections and working well.

Cleanliness Helps Prevent Infections

It is very important to always keep your catheter exit site clean and dry. This may mean you cannot swim, take showers or soaking baths. You will need to carefully wash without getting your unhealed catheter exit site wet. Your physician may allow you to shower once your catheter exit site is well healed.

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“Your dialysis care team members will also wash their hands and wear clean gloves when caring for your access.”

Your dialysis care team will teach you how to protect your catheter when it is not being used for dialysis. You will be taught the importance of making sure your catheter clamps are clamped and end-caps are on securely when you're not dialyzing. These will help decrease your risk of infection and avoid air from getting into your catheter. You will also be taught to check regularly for signs of infection such as redness, swelling, pain, pus or fever. Call your dialysis care team right away if you think you may have an infection.

Special precautions such as wearing a nose and mouth covering masks whenever your catheter is being accessed will help prevent any germs from your nose or mouth from contaminating the catheter or exit site. Your dialysis care team members will also wash their hands and wear clean gloves when caring for your access.

Protect Your Catheter

Because your catheter exits and extends from your body, you'll need to be careful not to pull on or tug it, or the protective dressing. Take care to be gentle around your catheter when getting dressed and undressed or removing a blanket or covering. Always keep sharp instruments, such as scissors, away from your catheter.