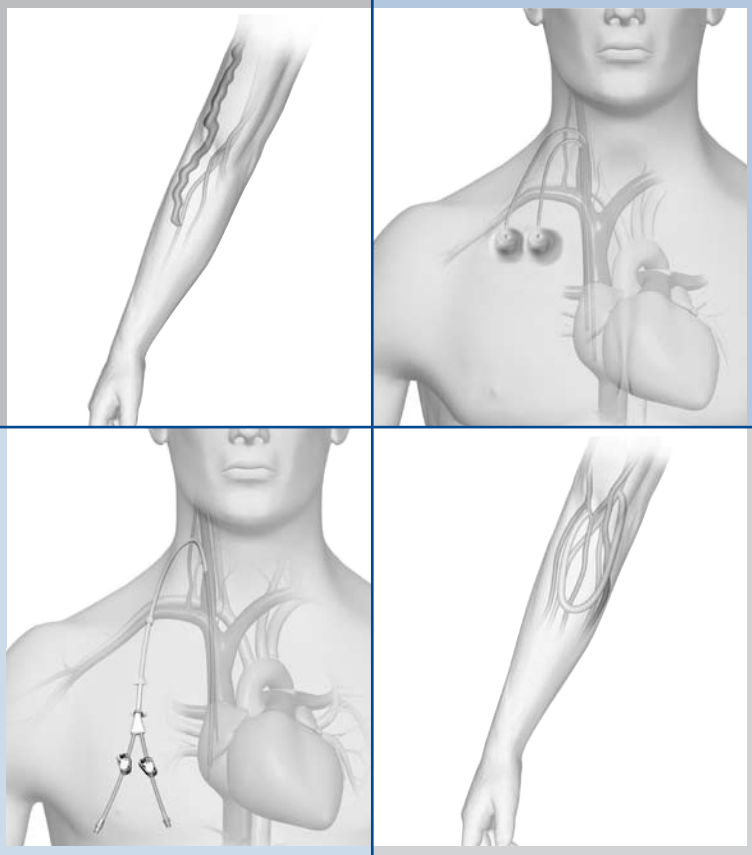
Understanding Your Hemodialysis Access Options



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American Association of Kidney Patients

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Overview

Hemodialysis, is the most often used treatment for end-stage renal disease (ESRD), more commonly known as kidney failure. During a hemodialysis treatment, a machine pumps blood from your body by way of a flexible, plastic tube, cleans it and then returns it to your body through a separate tube. In order to perform hemodialysis, an access must be created. An access is a site from which blood can be safely removed and returned to your body. The access site is often referred to as your "lifeline."

There are two types of dialysis accesses. The first kind involves the creation of a permanent connection between an artery and a vein under the skin. The two kinds of permanent accesses, fistulas and grafts, are used for patients with renal failure who are expected to need long-term dialysis treatment. Fistulas and grafts are usually placed in the arm, but they may also be placed in the leg. They are surgically placed a few months before dialysis is scheduled to begin in order to allow for the site to heal and develop properly.

The other type of access involves the direct placement of a tube into a large vein in the neck, chest or groin. As described in this brochure, catheters are most appropriately reserved for patients needing short-term dialysis or patients on long-term dialysis who no longer have a place to insert a fistula or graft.

This brochure contains a brief description of the most common types of accesses. It is divided into two sections covering permanent and temporary access options and provides information on how each type of access is placed, when they are used and the limitations of each.

The following guidelines can help keep all types of vascular accesses in good health:

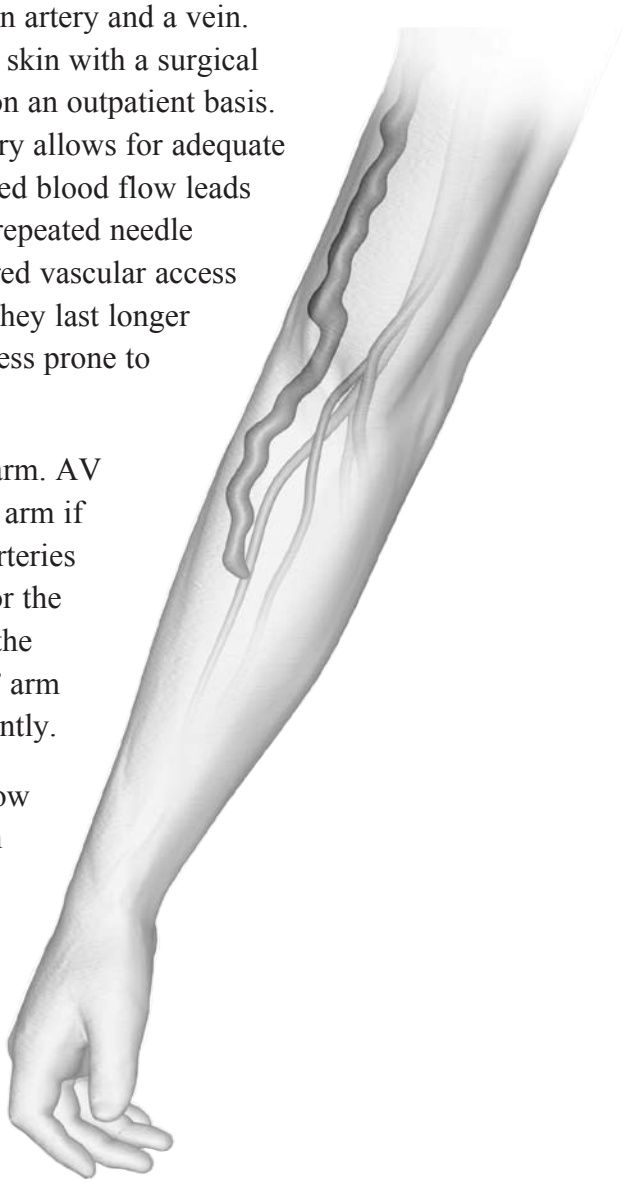
- Wear a Medical Alert bracelet to notify healthcare providers that you are on dialysis and the location and type of your vascular access. Also state that no blood pressures or vein punctures are to be done on your access limb.
- Pay attention to the machine during dialysis. Possible signs of access problems include: a) trouble maintaining good blood flow (above 300-350 ml/min), b) excessively negative pre-pump arterial pressure (greater than -200 to -250), or c) high venous pressure (causing the alarm to go off often).

"I was looking for something when I originally started dialysis that would be as pain-free as possible and easy to take care of."

Jamie – Ottawa, Canada

Permanent Access Options

The *arteriovenous* or AV fistula is a type of vascular access involving a direct connection between an artery and a vein. This connection is made underneath the skin with a surgical procedure that can often be performed on an outpatient basis. The connection between a vein and artery allows for adequate blood flow during dialysis. This increased blood flow leads to larger and stronger veins and makes repeated needle insertions easier. Fistulas are the preferred vascular access for long-term dialysis patients because they last longer than any other vascular access and are less prone to infection and clotting.



The fistula is usually placed in the forearm. AV fistulas may also be placed in the upper arm if an access in the forearm fails or if the arteries or veins in the forearm are unsuitable for the creation of a fistula. It is preferred that the fistula be placed on the "non-dominant" arm or the arm that you do not use as frequently.

A few months are usually needed to allow the fistula to properly develop, although it may take longer in some cases. Once the fistula has developed, you are ready for hemodialysis. A healthcare professional will insert two needles into the fistula, one for withdrawing blood from the body and the other to return dialyzed or filtered blood to the body.

The connection between a vein and artery allows for proper blood flow during dialysis.

Not everyone is eligible for an AV fistula. They can be difficult to create in some patients due to small veins and other conditions. Your surgeon may order a test of the blood flow in your arms or legs to determine if you are eligible for a fistula. The most common problem with the AV fistula after it has been successfully placed is a condition known as *stenosis*, which is a narrowing in the width of a blood vessel. In the case of fistulas, this narrowing involves either the vein or artery leading to the access. This may lead to a decrease in blood flow or clotting.

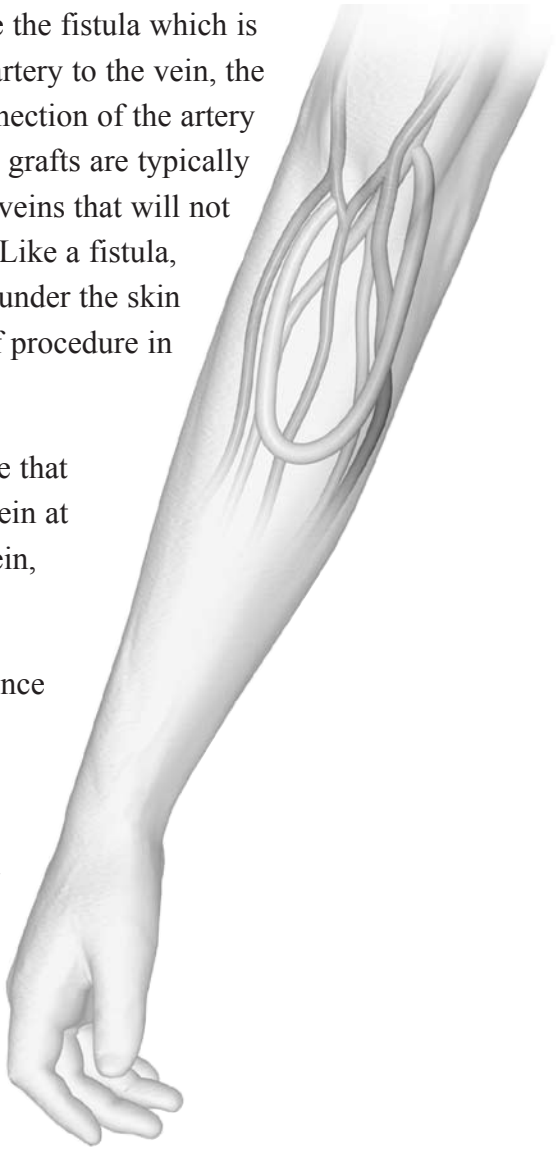
PROS	CONS
• Best overall performance	• Visible on the forearm
• Considered the best vascular access	• May take a while to develop
• Less chance of infection than other types of accesses	• May require temporary access while fistula matures
• Tend to last many years	• Not feasible for all patients due to other medical conditions
• Predictable performance	• Bleeding after the needles are removed
• Increased blood flow	• Fistulas may fail to mature

"I've had my fistula for 22 years, the entire time I've been on dialysis. I make sure to take care of it because it's my lifeline and allows me to receive dialysis. I have learned to put my own needles in because I like to be involved in my own care."

Tom – Dallas, TX
22-year hemodialysis patient

GRAFTS

Grafts are similar to AV fistulas. Unlike the fistula which is created by the direct connection of the artery to the vein, the graft is formed through the indirect connection of the artery to a vein by a synthetic tube. Therefore, grafts are typically used when patients have small or weak veins that will not properly develop into a suitable fistula. Like a fistula, this type of access is usually implanted under the skin in your arm. A surgeon performs a brief procedure in order to properly place the graft.



The graft is usually a soft, synthetic tube that connects to an artery at one end and a vein at the other. The tube acts like a natural vein, allowing blood to flow through it.

Following the surgery, you may experience pain and swelling in the area over the graft for three or four weeks. The arm should be kept elevated. After the swelling goes down, a graft can be used for hemodialysis. Grafts can be used repeatedly for needle insertion during dialysis treatment.

PROS	CONS
• Can be readily implanted	• Increased potential for clotting
• Predictable performance	• Increased potential for infection
• Can be used faster than an AV fistula (within 3 or 4 weeks)	• Does not usually last as long as a fistula

Care for Fistula and Grafts

Find out if your vascular access is a *native fistula*, moved vessel fistula or a synthetic graft. You need to know which way the blood is flowing within your access and which area is used for the *arterial* (red) and *venous* (blue) segments. You need to ensure the dialysis staff person inserts the needles in the proper orientation to the blood flow and then connects the bloodlines red to red and blue to blue.

Learn how to properly hold the patches after the dialysis needles are removed. Also learn how to hold pressure to a needle site in case it bleeds after dialysis. Have in your purse or pocket an emergency supply of gauze dressings and tape to reapply a clean dressing if the needle sites bleed on the way home from dialysis.

Wash the skin over the access with soap and water daily and before dialysis.

Make certain the staff is using proper techniques in preparing your skin before inserting the needles into the access. Ask what these techniques are for your particular unit.

Watch for signs of infection. These may include redness, tenderness or pus. Cleanliness is one of the most important ways to prevent infection. Any signs of infection should be reported to your doctor or nurse immediately.

Feel your access and check for a *thrill* (vibration) or pulse every day. Check also if you have experienced low blood pressure, dizziness or lightheadedness. If you cannot feel a pulse, listen to your access for a *bruit* (swishing sound). If you do not think your access is working, contact your dialysis unit or physician immediately. They can arrange to have the surgeon or radiology specialist examine you.

Try not to carry heavy items draped over the access arm or wear tight fitting clothing over the access arm or leg.

It is important to try not to sleep on the access arm or leg.

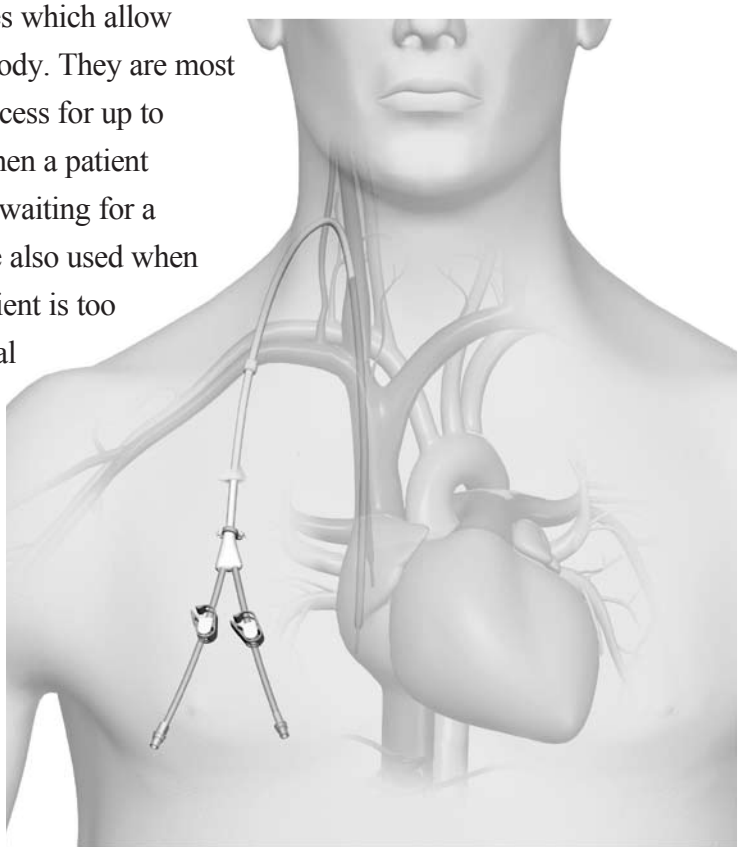
If your fistula or graft develops an *aneurysm* (looks like a small balloon), notify your doctor or nurse immediately. It may need surgery or simply to be closely monitored. Better rotation on needle sites must be used to prevent aneurysm formation or enlargement.

Develop a close relationship with your patient care technician and nurse. You can help remind them to rotate needle sites for each treatment. You can also learn a lot about caring for your access from them. You may even want to learn to put your own needles in for each treatment.

Temporary Access Options

CATHETERS

Catheters are flexible, hollow tubes which allow blood to flow in and out of your body. They are most commonly used as a temporary access for up to three weeks. This is often done when a patient needs dialysis immediately and is waiting for a fistula or graft to mature. They are also used when a permanent access fails and a patient is too unstable to delay treatment. Several different types of catheters exist.



Internal *jugular* catheters are inserted into the jugular vein on the side of your neck. *Subclavian* catheters are placed into the subclavian vein under the collarbone on the chest. *Femoral* catheters are placed in the large femoral vein in the leg near the groin.

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After a catheter has been placed, needle insertion is not necessary to receive hemodialysis treatment. Catheters contain an *exit site*, which is covered with bandages or other types of dressing. These dressings need to be changed and kept dry at all times. Many physicians recommend mupirocin ointment treatment at the exit site.

PROS	CONS
• Dialysis can be performed immediately	• Not ideal as a permanent access
• Readily inserted with an outpatient procedure	• High infection rates
• Easy removal and replacement	• Difficult to obtain sufficient blood flow to allow for adequate toxin removal
• Avoids needlesticks	• May cause narrowed veins
	• Swimming and bathing is not recommended

"I was told I needed to begin dialysis immediately after being rushed to the emergency room. Of course, I was really scared but the doctor assured me that he could begin dialysis immediately with a catheter. I was only required to keep the catheter in for a few weeks until my fistula was ready, but I was so glad to have it as an option during the emergency."

Margaret – Ashville, NC
1-year hemodialysis patient

Care of Catheters

Your catheter exit site should be cleaned with each dialysis treatment and clean dry gauze applied. You must wear a mask for the dressing change, on and off procedures for dialysis or any time your dialysis catheter is opened for use. Ask your dialysis staff what the unit specific dressing procedure is and how you are to care for the catheter at home. Specifically ask about mupirocin ointment.

For non-cuffed catheters, the *sutures* must remain in place for as long as you have the catheter. For tunneled cuffed catheters, the sutures should be removed once the catheter is healed into place to prevent infection from the sutures.

Your catheter caps must remain on the catheter and only removed by the dialysis staff. The clamps must remain closed at all times. Your dialysis catheter must only be used by the dialysis staff unless authorized by your nephrologist. If the clamp comes undone, close the clamp immediately. If a catheter cap becomes loose and falls off, make sure the catheter remains clamped and report to your dialysis center or emergency room for you are at risk for an infection or air entering your bloodstream and need urgent care. If any portion of the catheter develops a hole, leak or part separation, then you must ensure the catheter is clamped off above the problem area. The catheter clamp may be movable and can be slid up on the body of the catheter to close off the catheter, or you may need to kink the catheter with your fingers to *occlude* the catheter and then call 911. If blood leaks out, air can enter and cause an air embolism. You need immediate help to prevent serious injury.

Glossary

Aneurysm - An abnormal enlargement of a blood vessel. Aneurysms may occur around an access site in the form of what appears to be a small balloon.

Arterial - Characterized or related to the function of the arteries.

Arteriovenous - Term used in dialysis to refer to a connection between an artery and a vein. An arteriovenous connection is used to create fistulas for
hemodialysis treatment.

Bruit - Any of several abnormal sounds produced by an artery.

Exit Site - The site where the catheter emerges.

Jugular - Related to the jugular vein, located in the region of the neck or throat.

Native Fistula - A type of vascular access created by connecting a patient's own artery to his own vein using no artificial parts.

Occlude - To close or obstruct.

Stenosis - A narrowing in the width of a blood vessel.

Subclavian - Related to the subclavian artery or vein, located beneath the clavicle.

Suture - Material used to surgically close a wound or join tissues.

Thrill - A tremor or vibration in the circulatory system.

Tunneled Catheter - A specialized type of catheter that is "tunneled" or placed under the skin.

Vascular - Related to the arteries or veins.

Venous - Characterized or related to the function of the veins.

Notes

Notes

AAKP Membership

Membership Form

Please include my membership in AAKP at the following:

- ☐ Patient/Family Member ($25)
- ☐ Professional Member ($35)
- ☐ Sustaining/Physician Member ($100)
- ☐ Institutional Member ($150)
- ☐ Life Member ($1000)

For memberships outside the USA, please add an additional $30 for foreign postage.

Please return completed form and payment to:

American Association of Kidney Patients
3505 E. Frontage Rd., Suite 315
Tampa, Florida 33607
(800) 749-2257

Name

Street Address

City State Zip

Telephone

Enclosed in an additional contribution of $ _____ to assist AAKP with its many patient programs.

Method of Payment

☐ Check ☐ Visa, Mastercard, AmEx or Discover

Account #: _____

Expiration Date: _____

Signature: _____

Membership Benefits

A subscription to AAKP's magazines, *aakpRENALIFE and Kidney Beginnings: The Magazine.*

An opportunity to subscribe to *AAKP Renal Flash*, *Kidney Beginings: The Electronic Newsletter* and *Kidney Transplant Today*, Internet newsletters transmitted monthly.

Access to the AAKP Web site (***www.aakp.org***) which displays useful healthcare information and provides links to other renal related sites.

A membership packet filled with a wide range of informational brochures on issues affecting the care and treatment of kidney patients.

Access to special interest brochures that address changing medical technology.

Local AAKP Chapters (where available) that provide social and educational support to you and your family with meetings, newsletters and group activities.

An opportunity to attend our Annual Convention, a four-day event featuring seminars addressing treatment options, rehabilitation, and psychological and social concerns of renal disease patients.

How AAKP Helps You and Your Family

Assuring that your voice is heard and your interests are represented through actively defending the rights of kidney patients in Washington, D.C., and the renal community.

Focusing on issues such as treatment options, adequacy of care, access to rehabilitation and employment and many other issues that address the needs of patients and their families.

Encouraging the development of local patient and family support groups.

Conducting patient conferences and seminars that help patients and their families deal with the medical, psychological and social concerns associated with kidney disease.

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