Hemodialysis Access

Your doctor has scheduled you for hemodialysis access placement. Knowing what an access is and how to care for it will help your access work well and last a long time.

What is a hemodialysis access?
It is an entry into your blood stream needed to provide a safe place to connect you to the hemodialysis machine. Your blood moves through the entry tubing to a filter that removes waste products and extra fluids. Hemodialysis is needed when your kidneys do not remove enough waste and extra fluid from your body.

What are the different types of hemodialysis access?
There are two types, external and internal. The external access is for short term use or for patients who cannot have internal access. It can also be used as a bridge for internal access. The external access is called a dialysis catheter. The internal access is for long term dialysis use. It can be either a fistula or a graft.

Which type of access will I have?
You will meet with a doctor and discuss the best type of access for you. We will tell you which type is most likely to work well with your blood vessels and how long you will need hemodialysis.

What is an external access?
There are two types of external access. There is the straight hemodialysis catheter or the cuffed and tunneled hemodialysis catheter.

The Straight Catheter
The straight catheter is inserted into a big vein. It is used for a short time while you are in the hospital. You will not be sent home with this type of catheter because of the risks such as infection, bleeding or displacement. If you need hemodialysis after you leave the hospital, a cuffed and tunneled catheter will be placed.

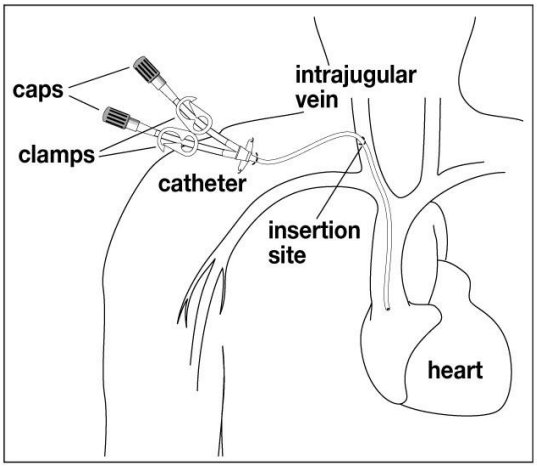


Figure 1. Detail of a right intrajugular temporary hemodialysis catheter.

The most common veins used for this type of catheter are the internal jugular vein (IJ) or the femoral vein. The catheter will be at your neck if the IJ vein is used. It will be at your groin if the femoral vein is used.

You will go to a dialysis room or the cardiac cath lab at the hospital to have the external catheter placed. A doctor will explain what will happen and answer any questions or concerns you might have.

For your comfort, your doctor will inject numbing medicine (lidocaine) under your skin and may give you something to help you relax. The external catheter will be placed into a large vein in your neck, or groin. A chest X-ray will check correct placement when it is placed in your neck.

Some people feel mild pain at the site. Your doctor may order pain medicine or you can take Tylenol®. Do not take other kinds of pain pills as they may cause bleeding.

How do I care for an external catheter?
An external catheter is at greater risk of infection. Careful cleaning and handling is required to protect it. Infection poses a great risk to your health and even to your life. Go to an ER or report to your doctor if you ever notice any sign such as redness, warmth, or chills.

After the catheter is inserted, a nurse will clean your skin and place a dressing over it. The dressing will help prevent infection. The staff will change your dressing during your dialysis treatment once a week or more often, if needed. The catheter dressing needs to be changed when it is wet or the edges of the dressing are peeling off.

Only trained dialysis staff may use it. It should never be used for routine blood draws or giving medicines.

Both you and your caretaker need to wear masks when the catheter caps are open or the dressing is being changed.

Your caretaker must wash his or her hands with soap and water or use alcohol hand sanitizer before putting on gloves. Never touch the catheter with ungloved hands.

Can I shower or take a bath?
Avoid baths since it can get the catheter hub or dressing wet which can cause infection. No swimming.

Take a shower only with the catheter dressing and hub completely covered with plastic wrap and with the edges secured with tape. Keep the site dry.

What should I do if blood comes from the catheter or dressing?

1. Apply steady pressure over the bleeding site for 20 minutes without lifting up your fingers to check.
2. If it is still bleeding, repeat the steady pressure for 20 minutes.
3. Call the dialysis unit or the ER if it is still bleeding after holding pressure on the site for 40 minutes.
4. If the clamp is open, close it. Call the dialysis unit.
5. If there is a crack or cut on the catheter, pinch off the catheter at the site of the crack or cut. Call the dialysis unit.

What should I do if the catheter seems to be coming out?

1. If it comes part way out, do not push it back in.
2. Do not pull on it.
3. Tape it to your skin.
4. Call the hemodialysis clinic if you have questions.

What should I do if a cap falls off?

1. Wash your hands.
2. Put on gloves.
3. Clean the open end of the catheter with povidone-iodine or alcohol and let dry. Do not touch the end of the catheter with your fingers.
4. If the clamp is open, close it.
5. Put a new sterile cap on the end of the catheter or cover it with sterile gauze.
6. Call the dialysis unit.

What clothing should I wear during my dialysis treatment?
A button-down shirt or blouse is best. Wear loose shorts, skirt, or pants with a large leg opening if you have a catheter in your groin. Wear clothing that is easy to clean near the access site.

Cuffed and Tunneled Hemodialysis Catheter

This type of catheter is designed to last longer than a straight catheter. The catheter is placed under your collar bone, through your skin. It is then tunneled or threaded under your skin for a short distance before going into a large vein in your neck.

The catheter has a small "cuff" on the catheter under the skin. Your skin tissue grows into the cuff to help prevent infection and anchor the catheter so that it will not fall out after it has healed.

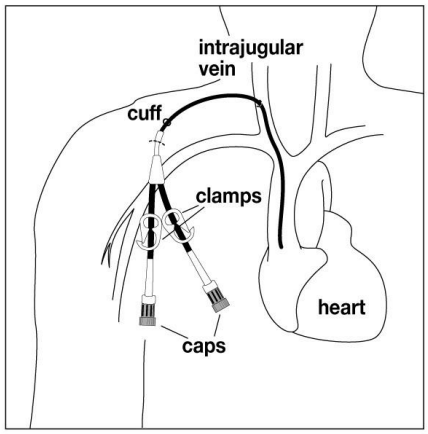


Figure 5. Detail of a right intrajugular permanent hemodialysis catheter.

Catheter Care

Care of the cuffed and tunneled catheter is like the care of the straight catheter. The cuffed and tunneled catheter will not require stitches. The staff will tell you when the site has healed. You will always need to have a dressing under your collar bone where the catheter comes out of your skin. It is called the exit site. Care of the exit site for your cuffed and tunneled catheter is the same as care for the straight catheter. Please refer to that section for details. Some people find it helpful to tape the ends to their chest to avoid pulling it out by accident and for comfort. Avoid pulling or putting tension on the catheter.

Changing the Dressing at Home

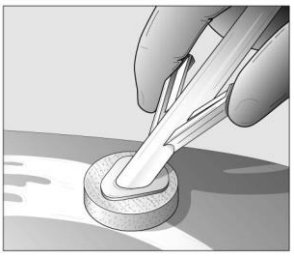
You should replace the dressing only if it becomes wet, loose, or comes off. Or else, reinforce it and let the dialysis staff change it at the next treatment.

Supplies needed:

- Clean gloves
- Face mask
- 2" X 2" sterile gauze or 4" X 4" sterile gauze or transparent adhesive dressing (Tegaderm®)
- ChloraPrep® stick
- Tape

How to change the dressing:

1. Remove the soiled, wet dressing. Do not touch the catheter where it enters the skin.
2. Wash your hands with soap and water.
3. Put on gloves and face mask.
4. Inspect the catheter site for redness, skin irritation, breakdown, or drainage. Call the doctor if new tenderness, redness, swelling, or pus appears at the site.
5. Clean the site with chlora prep stick. Start where the catheter comes out of the skin, this is called the exit site. Pinch the wings on the ChloraPrep® stick to release the liquid into the sponge pad. Do not touch the pad. Gently press the sponge against the skin at the exit site until you can see the liquid on your skin. Use a circular friction rub, starting at the catheter site to about 2 inches from the site.



6. Let air dry. Do not blot, wave at, or blow-dry the area. Place a 2" x 2" or 4" x 4" sterile gauze pad or Tegaderm® over the site.
7. If a gauze dressing is used, apply strips of tape to cover all edges of the gauze and hold it to the skin.
8. Avoid pulling or bending the catheter. Tape the free ends down to the skin so they won't get caught on clothing.

How is a catheter used during dialysis?
Dialysis staff will clean each port of the catheter then connect it to the hemodialysis tubing. Staff will wear gloves and masks. You will be asked to wear a mask to keep germs from the open ends of the catheter when they are being connected.

After the catheter is connected to the dialysis tubing, the hemodialysis machine is turned on. Blood will be pulled from one of the catheter ports, through the tubing and filter, and returned to the other catheter port after waste products and extra fluids are removed. This process takes 3-4 hours with 3 treatments per week. When the treatment is done, staff will return the blood in the tubing to you.

You will have a recliner and TV for your comfort. You may also sleep during treatments. Sometimes, side effects of fluid and waste removal may occur. Staff can help if you feel light headed or have leg cramps.

What is internal hemodialysis access?
An internal hemodialysis access is used when hemodialysis will be needed for longer than three months. The two types are the arterial-venous fistula and the graft. You need to know how to care for them.

How do I prepare for an internal access placement?

Begin to protect your arm -Your surgeon will tell you which arm to protect. Do not use that arm for IV's, lab work, or checking blood pressure.

Ultrasound mapping - Some patients may need studies to check the size of the blood vessels before the access placement. Ultrasound mapping of the arm helps the surgeon plan for access. There are no needles involved when mapping is done.

Venogram - You may need a study called a venogram. This study uses a needle to inject dye into your blood vessels.

Access clinic -. The access team will talk to you about the best type of access based on your exam and any tests you have had. You will then go to the Outpatient Surgery Center to discuss anesthesia. You will **not** have surgery on this day. Surgery will be within 30 days. You do not need to stop your medicines, insulin or skip breakfast for this visit.

Surgery - A fistula or graft is placed. This will take 1 - 2 hours. You can go home in 1-3 hours. You must have a ride to and from the hospital. You cannot drive after getting medicine for pain. You must also have someone who can stay with you during the first night.

After surgery teaching - Your nurse will give you a handout about how to take care of your new fistula or graft. It is helpful if your driver can be with you when the nurse reviews this handout. You may take your arm out of the sling after you get home. Prop it on a couple of pillows to decrease swelling when you are sitting in a chair or in bed.

You will be scheduled to come back to the Access Clinic after your surgery to have your new access checked.

The Arterial-Venous Fistula

The arterial venous fistula (A-V fistula) is a link between an artery and a vein. When this link is created, the high-pressure arterial blood rushes into the low-pressure vein. Over time the vein becomes larger and the vein wall thicker. The blood from these vessels can be used for dialysis.

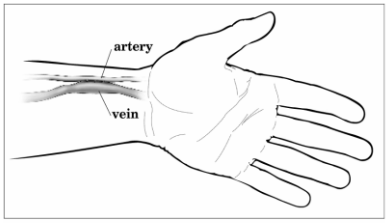


Figure 6. Detail of the connection (or anastomosis) between a vein and nearby artery forming the fistula.

In about 4-6 weeks, if the fistula matures, we can insert two needles for treatment. One needle will pull blood from your body through the dialysis tubing, filter it and then return it to the other needle which returns the cleaned blood to your body. The A-V fistula is the best access for hemodialysis. It is less likely to become infected or clotted, because it is flexible and made of your own tissues. It provides you with better dialysis and you will feel better. There is a risk that a fistula may not develop.

The Graft

A graft is like a fistula because it is internal and connects an artery to a vein. It is used for dialysis in the same way as a fistula. The graft is made of a thin, hollow, semi-rigid tube of a man-made material. The graft is placed in the arm or the upper leg. It may be straight or looped. Because it is larger and more rigid than a vein, needles may go in with less trouble than with a fistula. Because the graft is made of a material that is not part of your normal body tissue, it can become infected or clotted more easily than a fistula.

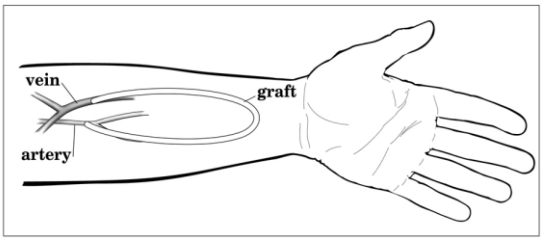


Figure 7. Detail of a loop graft in the lower arm.

If you have a loop graft, ask the surgeon which side, **thumb** or **pinky** (circle one), is the "arterial" side. You will need to relay this to dialysis staff so you receive the best treatment. You can begin using a graft about two weeks after it is placed.

How do I care for a fistula or graft?

You will have one or more incisions, each about two to four inches long. The edges will be held together with stitches or sterile strips and covered with a dry dressing. The dressing must stay on for three days or until all drainage stops. Change the dressing with sterile gauze and tape to keep it clean and dry to help prevent infection.

If your access is in your arm, rest your arm above the level of your heart on pillows for 24 hours or until the swelling is gone.

Figure 8. Elevate your arm above the level of your heart for a few days after fistula or graft placement.

If your access is in your leg, rest your foot on a stool or sit in bed with your leg level with your body for 24 hours or until the swelling is gone. Avoid extra movement.

Begin normal use of your arm or leg after 24 hours unless you still have swelling.

Wrap and tape the area with plastic wrap during the first three days when bathing. Remove plastic wrap after your bath or shower.

Preventing Infection or Damage
Make sure your access arm or leg is clean before coming to your chair. Wash the skin over your access with soap and water before sitting down. This helps to reduce **staphylococcus** (staph). on your skin. Staph is a germ that is on everyone's skin. It can make you very sick if it gets into your bloodstream.

Do not allow anyone to collect a blood sample or start an IV in the access arm or leg. Do not take your blood pressure on the access arm or leg.

Protect your access arm or leg from direct injury. Wear loose clothing. Don't rest heavy objects on the access arm or leg such as a purse or bag. Don't wear watch or jewelry.

Check with your doctor before you go back to work.

Avoid slowing the blood flow through the access.

Do not sleep or lie with the arm or leg bent.

Signs of Infection

- Redness, itching, tenderness, pain, warmth, or swelling at the incision site.
- Fever above 100°F, taken by mouth.
- Bleeding or drainage at the new access site that does not stop.
- Swelling, numbness, and tingling in access arm, hand, foot, or leg.
- Fluid that drains from the incision causing a constant wet dressing.

If you have any of these symptoms, contact the Access Clinic, your dialysis unit, or your local ER.

A scab or crust on the incision is part of the healing process. Do not remove the scab! Your stitches will be removed in two to three weeks during your dialysis treatment. The sterile strips do not need to be removed. They will fall off when the incision is healed.

Care
As long as you have a fistula or graft, you should check your access every day. Listen with a stethoscope or place your ear to the access**.** You should hear a whooshing sound called a **bruit** (Broo-ee).

Check your access for a pulsation and thrill. As your access develops, you will be able to feel it pulsating. By placing your fingers over the access, you will feel blood rushing through it. This is called a **thrill**.

If the bruit decreases, the thrill will also decrease. This means blood is flowing more slowly through your access which may lead to clotting. If your access has a clot, blood will not flow through it. It then cannot be used for hemodialysis. If you cannot hear the bruit or feel the thrill, call the Access Clinic and/or your local dialysis unit.

Starting one week after fistula surgery, you should start to exercise your access arm to develop your new fistula. Exercise will help the fistula to mature well and help to avoid problems. If the fistula is in your lower arm, squeeze a small rubber ball at least 3 times a day for 5 minutes at a time.

Figure 6. Squeezing a rubber ball will help fistula development.

If the fistula is in your upper arm, do lightweight (1 – 3 pounds) lifting by bending your arm up slowly at the elbow then stretching it out. If you have a graft, you do not need to do this.

Any chores that involve movement of the arm muscles, such as washing dishes, may also help the fistula develop.

Protect your access! Guard against infections and clots. Your access is your lifeline!

How are fistulas and grafts used with dialysis?
Most often, a fistula is ready to use in 4-6 weeks. A graft is ready to be used 2–3 weeks or sooner depending on the type of graft material being used.

After your fistula or graft is ready to be used, the nurse or technician will place two needles into the access before each treatment. Ask the nurse about numbing options for the skin before the needle is placed. The needles sites will need to be rotated to prevent damage to the area.

During dialysis you will sit in a recliner chair and rest your arm on a pillow or towel. You will be asked to limit movement of your access arm or leg. You can watch TV, talk with others, sleep, listen to tapes, and read.

When your treatment is over the staff will remove the needles, apply a bandage, gauze, and ask you to hold the gauze in place with your fingers until bleeding stops. If you cannot hold the gauze in place, then the plastic clamps can be applied to the access site.

Apply just enough pressure to stop the bleeding after the needles are removed. This can take from 5 to 20 minutes.

A dialysis nurse or technician will check to make sure the bleeding has stopped before you leave. You will go home with clean gauze taped over the needle site. Check your access area often within the 1st hour after treatment to be sure that the bleeding has not started again. Remove the gauze 4-6 hours after your dialysis treatment if there is no more blood oozing.

Watch for bleeding after you leave. If your access arm or leg feels warm or wet all of a sudden, check for bleeding at the puncture sites. If your access is bleeding:

1. Use gauze or a clean cloth to stop the bleeding.
2. Apply direct pressure with your fingers right to the bleeding site(s).
3. Keep steady, firm pressure on the bleeding site for 20 – 30 minutes**. Do not check the site during this time**. If it is still bleeding after 20 – 30 minutes, keep steady pressure on the bleeding site for another 20 – 30 minutes. If bleeding has not stopped, keep applying pressure and call the ER.

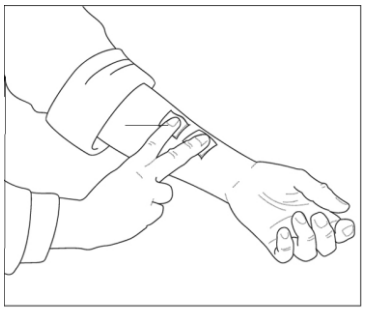


Figure 10. After dialysis apply pressure to the needle sites until bleeding has stopped.

4. If you feel that you have lost too much (more than a cup) of blood, have someone take you to the nearest clinic or ER.

Caring for Yourself on Dialysis Treatment Days

- Wear loose clothing on your access arm. A button-down shirt, short sleeves, or sleeveless top works well with an arm access.
- Wear loose shorts, skirt, or sweatpants with a leg opening if you have a leg graft.
- Wear pants or sweater or other warm clothing over your dialysis clothes in cold weather.
- Clothing should be easy to wash.

Prevent low blood pressure and be aware of the warning signs. Take blood pressure medicines as ordered, but **do not take blood pressure medicine right before or after your hemodialysis treatment** unless advised to by your nurse or doctor.

If you feel week, dizzy or light-headed after treatment, sit or lie down. Drink 1 – 2 cups of water. If symptoms do not improve, have someone take you to the nearest ER.

It is normal to feel tired after dialysis. Take it easy and allow time to rest after a treatment.

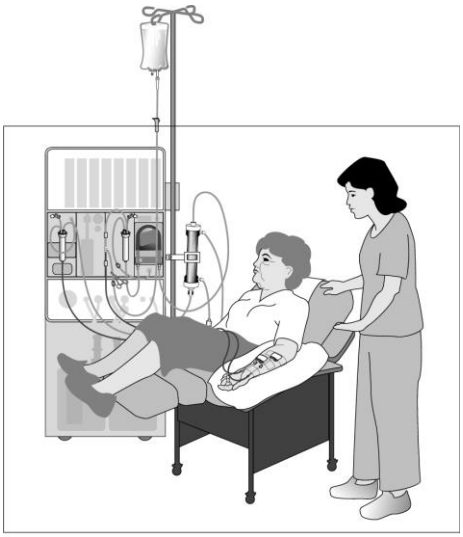


Figure 11. Hemodialysis using a left forearm fistula or graft.

Hepatitis B Vaccine

Since patients who receive dialysis are at risk for hepatitis B, we suggest a vaccine for all patients. Pre-end-stage renal patients or peritoneal and home dialysis patients should also get the vaccine. The vaccine is given into a muscle in the upper arm. Each series of hepatitis B vaccine includes a total of 3 doses. The first dose can be given anytime. The second dose is given one month later. The third dose is given 6 months after the first dose. Sometime after you receive the shots, you will be tested to be sure you have made antibodies to protect you from hepatitis B. If your antibody level is low, a second series of the vaccine will be needed for your body to respond. In this way, we will know that you are protected from the virus.

Pneumonia Vaccine

People with chronic kidney failure have compromised immune systems. They may be at risk for pneumonia. Dialysis patients should receive this vaccine.

Flu

We strongly suggest a flu vaccine for all people with chronic kidney failure. They are at increased risk for the flu.

When to Call

- Severe pain
- Swelling with numbness or tingling
- Redness and heat or drainage at the incision site
- Fever above 100° F
- Bleeding from the wound that doesn't stop
- Pale or purple cold fingers

Who to Call
Kidney Clinic
Mon. – Fri., 8 am – 4:30 pm
(608) 270-5656

After hours, weekends or holidays, please call and leave a message on the answering machine. If you cannot contact the doctor, go to the nearest ER.

UW Hospital Emergency Room
Open 24 hours
(263) 262-2398

UW Hospital Access Clinic
Mon. – Fri., 8 am – 5 pm
(608) 262-5420

UW Hemodialysis Inpatient/Hospital Unit
Mon. – Sat., 7:30 am - 9 pm
(608) 263-8748

UW Hemodialysis Outpatient Clinic
Mon., Wed., Fri. 7 am. - 11 pm
Tues., -Thurs., Sat.7 am - 5:30 pm
(608) 270-5600

UW Hospital Renal Clinic
Mon. – Fri., 8 am - 5 pm
(608) 263-6808

UW Hospital Access Clinic
Mon. – Fri., 8 am - 5 pm
(608) 262-5420

After clinic hours, **(608) 262-0486** will give you the paging operator. Ask for the hemodialysis doctor or nurse on call. Give your name and phone number with the area code. The doctor or nurse will call you back.

Other Phone Numbers
Your local dialysis unit _____
Your local hospital emergency room:
_____

If you are a patient receiving care at UnityPoint – Meriter, Swedish American or a health system outside of UW Health, please use the phone numbers provided in your discharge instructions for any questions or concerns.