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**The Rogosin Institute Dialysis Access Program
is sponsored by an educational fund
established in the memory of Dr. George Balint.**

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Acknowledgements:

The authors thank Ms. Angella Clarke for her excellent assistance and technical support.

We also express our appreciation to Ms. Yvette Bayron, Mr. Ren Osborne and Mr. James Tramble for their suggestions in the preparation of this manuscript.

We are grateful to Albert Rubin, MD and Kurt Stenzel, MD for providing us with the opportunity to participate in this important project.

The Spanish version was made possible by the volunteer work and enthusiasm of Ms. Joan Acevedo, Rosa Cardenas, RD, Aida El-Amir, RN and Mrs. Yolanda Serrano.

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NOTES

PART 1: INTRODUCTION

Hemodialysis is the procedure during which the blood is circulating through a dialysis filter in order to clean the blood from uremic impurities and remove extra body fluid.

Why do I need a vascular access for hemodialysis?

A vascular access for hemodialysis must be created because the veins:

- Are not able to carry the necessary amount of blood that has to flow through the dialysis filter every minute during each treatment session.
- Are not strong enough to allow repeated needle punctures for the dialysis treatments.

What are the types of vascular accesses for hemodialysis?

- **A permanent vascular access** which is the preferable and most frequent one (please refer to part 2):
 - **An arterio-venous fistula (AVF)**
 - **An arterio-venous graft (AVG)**
- **A temporary dialysis catheter** (please refer to part 3).

Who will create the vascular access for dialysis ?

Before you start dialysis, an office visit with a surgeon specialized in dialysis access creation will be arranged. Based on the evaluation, a single surgical procedure will be scheduled and should result in a dialysis vascular access that can be used for several years.

PART 2: PERMANENT VASCULAR ACCESS FOR DIALYSIS

What is a permanent vascular access for dialysis?

A permanent vascular access for dialysis is a surgically created connection between an artery and a vein.

There are two types of permanent vascular accesses for dialysis:

- The arterio-venous fistula (AVF).
- The arterio-venous graft (AVG).

What are the differences between the AVF and the AVG ?

The AVF as well as the AVG have specific characteristics:

QUESTIONS	AVF	AVG
How are the artery and vein connected?	The artery and vein are directly sewn together.	The artery and vein are connected through a synthetic tube called graft.
Which one is the better?	First choice	Second choice
How long does it last?	5-10 years	2-3 years
Where is it placed?	Near the wrist or elbow	Near the wrist or elbow and rarely in the thigh
What kind of blood flows can be obtained?	Excellent	Excellent
Are there any chances of infection?	Small	Moderate
How good is the blood cleaning?	Excellent	Excellent
What are the chances of clotting?	Small	Moderate

Where will the vascular access be placed?

- A vascular access for dialysis is usually placed in the non-dominant upper extremity:
 - For right-handed individuals, this means the left arm.
 - For left-handed individuals, this means the right arm.
- Dialysis access is generally placed as close to the hand as possible.
- In patients with smaller veins (woman, elderly or diabetics) the upper arm may need to be used.
- When the vascular access cannot be created in the upper extremities, an arterio-venous graft may be placed in the thigh.

How should I protect my blood vessels before a permanent vascular access is created?

Once you know that you will need dialysis:

- The arm selected for access placement should be considered “off limits” for:
 - Blood pressure measurement.
 - Blood drawing.
 - Intravenous fluid or medication administration.
- Placement of intravenous lines in the veins of the upper part of the chest for longer than two weeks should be avoided if possible. These “central veins” can become narrowed, impairing blood circulation.
- Any type of exercise involving the arm is advisable since it will increase the blood flow through the vessels and strengthen them. Contact sports that could injure the arm should be avoided.

How long before I need dialysis should I have the dialysis vascular access created?

The dialysis access, either an AVF or AVG, should be prepared at least one to three months prior to being used for hemodialysis treatment.

An **arterio-venous fistula** requires at least 4-6 weeks to “mature” before it can be used for dialysis. As the blood flows through the AVF, the vein increases in size and the wall of the vein becomes stronger.

An **arterio-venous graft** requires at least 2-3 weeks to “mature” before it can be used for dialysis. As the blood flows through the AVG, the synthetic tube becomes coated with a layer of cells that help prevent damages that result from repeated needle punctures.

What type of evaluation should I expect prior to vascular access placement?

When you meet the surgeon, your evaluation will include:

- A complete review of your medical history, current medications and most recent blood tests. If necessary, new blood work will be performed.
- A thorough examination of the veins and arteries of your arm and the upper part of your chest.
- Detailed pictures of your arteries and veins, including sonograms or X-rays, may be requested.

Please be sure that you tell the examining surgeon if you have had prior surgical procedures or intravenous lines in your arms, chest or neck.

How do I prepare for surgery?

Within the week prior to the surgical procedure:

- You will meet the medical team who will provide the anesthesia during the surgery. Feel free to discuss any concerns regarding pain control.
- You will be asked to sign the consent form after a detailed explanation of the surgical procedure for the vascular access creation is provided.

- You will have blood tests, EKG and, in some cases, a chest X-ray.
- Your doctor will tell you if you have to:
 - Adjust the dose of insulin or other medications that control your blood sugar if you are diabetic.
 - Decrease the dose of blood thinners (this may include aspirin or other Motrin-like anti-inflammatory medications).
 - Hold some of your morning routine medications until after the procedure.
- You will be given the **date of the procedure** for the new vascular access creation. If you are already on dialysis using a dialysis catheter or had a vascular access that has failed, the surgery will be scheduled on your non-dialysis days.

The day before the operation:

- The surgical office will inform you regarding the **time of your procedure**. Please call if you have not been contacted by 5 p.m.!

The night before the procedure:

- Do not eat or drink after midnight.

The day of the surgery:

- Wear comfortable clothes and shoes.
- Leave any valuables, such as jewelry, wallets, etc., at home, with the person who accompanies you to the hospital or with the staff of the Surgical Center.
- Take your blood pressure or heart medication with a few sips of water.
- Your surgery is usually scheduled in the morning.
 - **The time given for your surgery is a general guide rather than a strict appointment .**
 - Sometimes the previous cases take longer than expected and your surgery may be delayed.
 - **On busy days your surgery may not occur until the afternoon and you may be asked to wait .**
 - When your operating room is ready for you, a staff member will take you inside.

What kind of anesthesia will I be given?

The operation should be pain free. The anesthesia you will be receiving consists of:

- **Local anesthesia with lidocaine.** Lidocaine is injected at the start of the procedure; you may feel a “pinch and burning” for a few moments.
- **Intravenous sedation,** which is safer than general anesthesia. With sedation, you will not remember much of the operative procedure.
- If you still feel pain, more anesthesia can be given until you are comfortable.

How will the AVF be created?

During the “Arterio-venous fistula (AVF) creation” the surgeon will:

- Make a small incision at your wrist or elbow (arm bend).
- Sew an artery and a vein together.
- Feel the pulsation and the vibration (thrill) of the blood flowing from the artery directly to the vein.
- Close the skin with sutures (stitches).
- Cover the incision with a dressing.

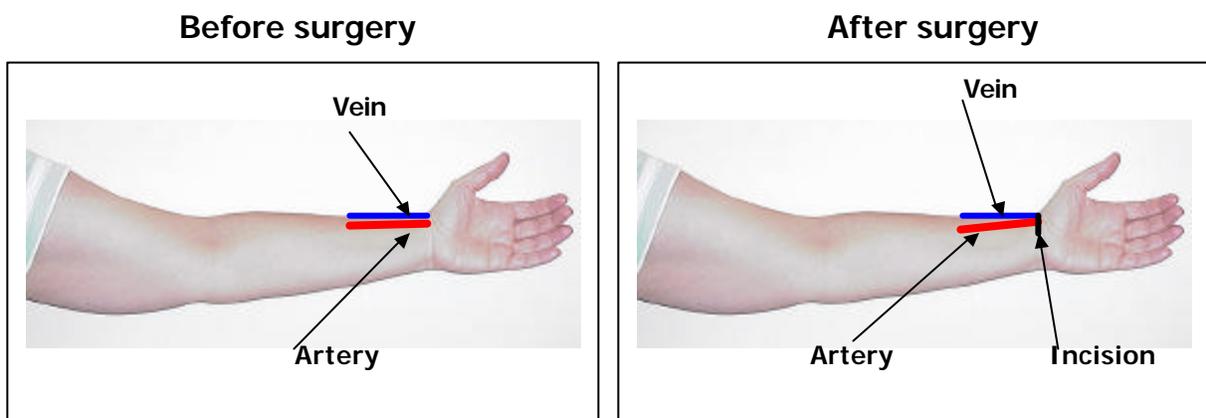


Figure 1: AVF created at the wrist

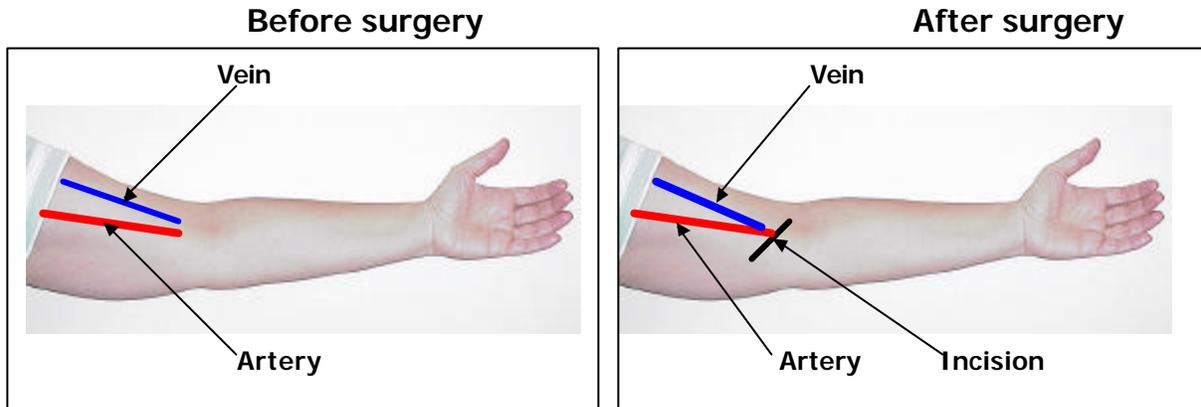


Figure 2: AVF created in the upper part of the arm

How will the AVG be created?

During an "Arterio-venous graft (AVG) creation" the surgeon will:

- Make 2 incisions:
 - One incision few inches below the axilla (under arm),
 - One incision at the level of the elbow (arm bend).
- Sew the vein at the axilla to a synthetic tube (the "graft") and place (tunnel) the graft underneath the skin towards the artery at the elbow.
- Then sew the artery to the graft.
- Close the skin with sutures (stitches).
- Cover the incisions with a dressing.

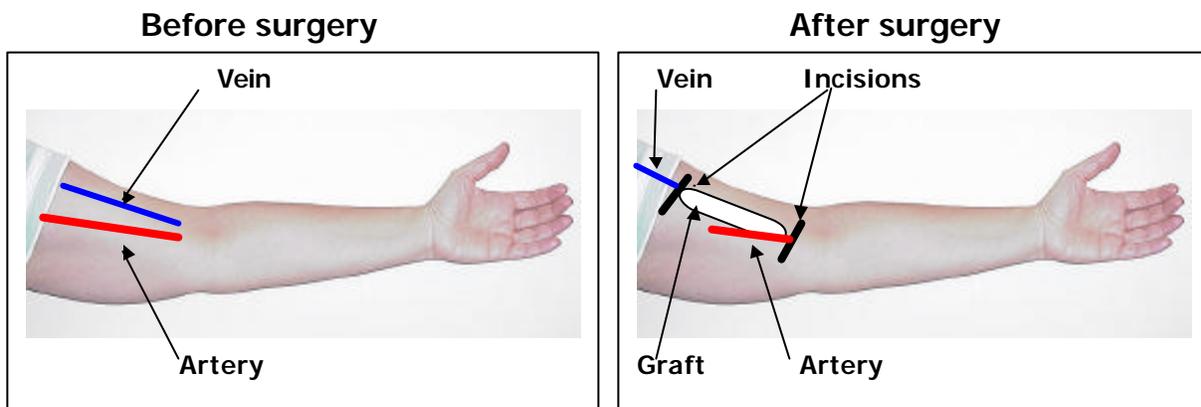


Figure 3: AVG created in the upper part of the arm

Will I be admitted to the hospital after surgery?

- **The surgical procedure for either AVF or AVG creation can last up to one hour.**
- **After surgery you will be transferred to the recovery room** where the doctors and nursing staff will monitor you. Your family/friends can meet and stay with you. You will be discharged home after few hours.

What should I watch for after surgery and report immediately?

- **Keep the arm elevated using a pillow to help any swelling go down.** If needed, you can take pain medication as prescribed by your doctor. These symptoms will usually go away within a few days.
- **After the surgery, the incision site will be covered with a dressing that should be left on for 2 days. Keep the dressing dry.** The dressing may have some stains of old, dry, dark blood. However, it is important **to watch for and report immediately:**
 - Large stains of clear yellow fluid or new blood on the dressing.
 - Expanding redness in the skin beyond the dressing.
 - Swelling of the entire arm.
 - Fever above 101° F and/or chills.
 - Severe pain not relieved by medication.
 - Presence of cold, painful and bluish fingers.
 - Numbness or tingling in your arm or hand.
 - Shortness of breath.
- **When the physician removes the dressing,** the incision may have:
 - Mild swelling or light redness.
 - Some numbness around the area.
 - Some pain.
- You may clean the incision with warm soapy water and then pat dry with a clean towel.
- The incision may be kept open to air or, if you prefer, loosely covered with dry gauze.

➤ **You need to continue to watch for and report immediately:**

- Any unusual bruising.
- Worsening arm swelling.
- Increased skin warmth or intense redness.
- Increased pain either around the incision area or the entire arm.
- Presence of cold, painful and blue fingers.
- Fever above 101° F and/or chills.
- Absence of the thrill (please refer to page 17).

When is my appointment for removal of the stitches?

Upon leaving the recovery room after the surgical procedure for the vascular access creation, you will be given:

- Routine discharge instructions including prescription for pain medications and phone numbers to use to contact your doctors in case of questions.
- An appointment for suture removal and evaluation of the vascular access (approximately 10-15 days later).

When can I restart to shower/bathe?

- During the first days after the surgery, you can **sponge bathe, but avoid wetting the dressing.**
- You can shower or start to bathe only after the surgeon evaluates the incision area, about **10-15 days after its creation.**
- After the access has matured, on non-dialysis days, let warm soapy water run for few extra minutes over the access arm while in the shower.

When can I start exercising?

After surgery you should move and use the arm with the newly created dialysis access in your normal way so that the arm will not become stiff and the muscles will not become weak. When the pain has completely disappeared, you will need

to start an exercise program to help enlarge the veins of the arm and bring any swelling down.

- **Do rhythmic movements with the arms for a few minutes 5-10 times each day.** For example: squeeze a rubber ball, stress ball, tennis ball, hand grip or even a rolled wash cloth for approximately 5 seconds (count to five) then relax (count to five) and start again. **Exercise anytime.**
- No heavy exercise or lifting of more than 5 pounds should be done for at least 2 weeks after surgery.
- Do not swim in pools or the ocean before consulting your physician.

When can my vascular access be used for dialysis?

Follow-up visits after surgery are “**key moments**” for evaluating when the vascular access is “mature” and ready to be used:

- The surgeon will give the “green light” when the access is ready to use.
- A “ map of your access” will be provided by the surgeon to the dialysis center to serve as a guide for needle placement for the nurses and technicians. A copy will be given to you to keep. This will be updated after each follow-up visit with your surgeon to avoid difficulties in using your vascular access.

What do I do if I need dialysis before my vascular access is ready?

Until the AVG or AVF is “mature” and can be used, a temporary dialysis catheter may be placed in a vein either in the upper part of the chest or in the groin.

PART 3: TEMPORARY ACCESS FOR DIALYSIS

What is a temporary dialysis access?

A temporary dialysis access is a small flexible tube, called catheter that is inserted in a vein. The outside end of the catheter has two channels that are connected at the time of dialysis to the dialysis lines without needles. During the dialysis session, the blood flows through the catheter simultaneously to and from the dialysis machine.

A temporary dialysis access is put in if dialysis has to be done and your permanent vascular access has failed, is not ready to be used or cannot be created.

The temporary dialysis catheters are inserted either in the veins of the in the upper chest or groin area. The groin catheter (femoral catheter) is used only if you need dialysis immediately and the placement of a chest catheter is not available. Only specialized physicians do the placement of these catheters.

The preparation for each type of catheter is different and your physician will tell you in detail about that.

QUESTIONS	Upper chest catheters	Groin catheters
Where will the placement of the catheter be done?	In the Interventional Radiology or Surgical Department	In The Rogosin Institute's Hospital Hemodialysis Center
When will the catheter be put in?	The day before or same day you have dialysis	Before each dialysis session
Do I need to be scheduled for this procedure?	A few days before	Not needed
Do I need blood tests?	Within one month prior to the procedure	Not needed
What kind of anesthesia will I need?	Local with "lidocaine" and sedation	Local with "lidocaine"
When can the catheter be used?	Immediately after placement	Immediately after placement

How long will I be using a temporary catheter?

The temporary dialysis catheters, either the chest catheters or the groin catheters, will be used for dialysis until the permanent vascular access has been successfully used at least 2-3 times.

QUESTIONS	Upper chest catheters	Groin catheters
How many times can I use same catheter?	Multiple times	Once
When will the catheter be removed?	When it fails to work properly	After each dialysis session
What are the chances of infection?	Variable, but more frequent than the permanent vascular access	Low

If you are being dialyzed through a temporary dialysis catheter, your dialysis treatment will be longer since catheters cannot provide the same blood flows as the arterio-venous fistula or graft.

What are “chest catheters”?

They are dialysis catheters placed in the upper part of the chest, which:

- Are usually placed on the side opposite to the arm in which the permanent vascular access is located or will be created.
- Can interfere with daily routines, including grooming habits, exercise, etc.
- Can limit the neck movements and ability to find a comfortable sleeping position.
- May function for dialysis only in certain positions that may be uncomfortable.
- Should not get wet since they can easily become infected:
 - You will not be able to take showers, swim or enjoy a Jacuzzi or sauna.
 - Excessive sweating during the hot summer days can increase the risk of infection.

- Should not be used for any routine blood work or intravenous medication administration.
- Are not long-term options. There are a few exceptions:
 - You cannot have surgery or tolerate the anesthesia necessary for creation of a vascular access because you have a complex medical condition.
 - A vascular access can no longer be created in either arms or thighs because of scar tissue and/or narrow blood vessels or because of multiple dialysis accesses that no longer work.

There are two types of catheters that can be inserted in the upper chest:

- **“perm-cath”** that is preferable since it:
 - Is inserted first under the skin for approximately 1-2 inches and is then introduced into the vein. The part of the catheter lying underneath the skin, called “tunnel”, creates a barrier against infection.
 - Can stay in up to 6-12 months.

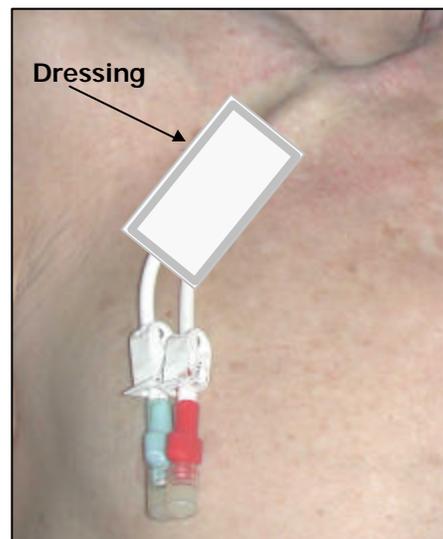
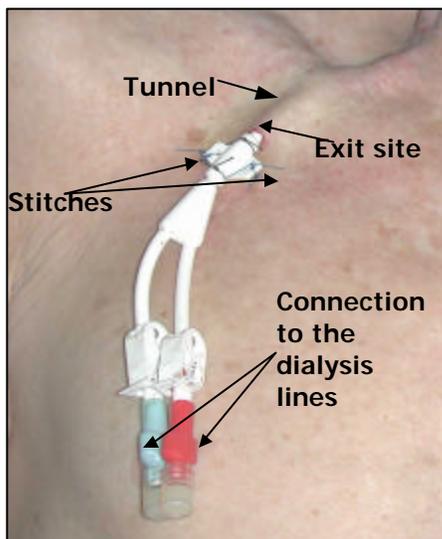


Figure 4: Perm-cath for dialysis

- **“vasc-cath”** that:
 - Is introduced directly into the vein.
 - Can stay in up to 3-4 weeks after which it needs to be replaced with a new one.
 - Has a high chance of infection.

- **Only dialysis personnel will provide the dialysis catheter care. You should never touch, open or change the dressing covering the catheter.**
- The dialysis personnel, **wearing mask and sterile gloves** will:
 - Make sure that the catheter's stabilizing sutures are intact.
 - Look for any signs of irritation or infection.
 - Clean the area around the catheter using different cleansing agents and sterile gauze, as per dialysis center protocol.
 - Make sure that the catheter is not bent or kinked.
 - Change the dressing covering the catheter.
 - Will connect and disconnect your catheter from the dialysis lines at the beginning and the end of the dialysis session. You will also be required to put on a mask at these times.
 - Will completely fill each channel of the dialysis catheter, at the end of each dialysis, with a small amount of a blood thinner called heparin. At the beginning of the next treatment, this blood thinner is recovered and discarded.
 - Will place a small cap at the end of each port of the dialysis catheter.

How should I prepare for a dialysis catheter insertion in the upper chest?

- **Do not eat or drink at least 6 hours prior to the procedure:**
 - if you are scheduled in the morning, do not eat after midnight.
 - if your are scheduled in the early afternoon, do not eat after 6 am.
- Take your blood pressure or heart medication with a few sips of water.
- Discuss with your doctor about reducing or stopping blood thinners.
- Ask your doctor about which type of pain relievers you can take if needed.
- If you are diabetic, talk with your doctor regarding the dose of insulin or the diabetic pills you should take before the procedure.

How is the temporary chest dialysis catheter inserted?

Doctors from the Interventional Radiology Department or the Surgical Department will insert the temporary chest dialysis catheters.

➤ **Before the procedure:**

- A complete review of your medical records including allergy history, medications and the most recent blood work results will be done.
- A detailed description of the procedure and the anesthesia for the temporary catheter insertion in the upper chest will be provided after which you will be asked to sign the consent form.

➤ **During the procedure:**

- Local anesthesia and some intravenous sedation will be given. You will be awake during the entire procedure. Feel free to discuss any concerns regarding pain control.
- The veins in the upper part of the chest vein will be localized using a sonogram.
- Skin will be cleansed with betadine.
- The catheter will be directly placed in the vein and, if it is a "perm-cath", will be first inserted under the skin and then inserted into the vein
- Stitches to stabilize the catheter will be placed at the site of the exit of the catheter from the skin.
- Dressing will be applied.

➤ **After the procedure:**

- You will be observed for approximately 2-4 hours in the Recovery Room.
- You will need to be accompanied home by an adult family member or friend when discharged home.
- **If you notice oozing of blood around the area where the catheter was inserted**, do not panic: sit up and gently press over the dressing. If oozing continues or becomes more obvious, please go to the closest medical facility.
- **If you have pain or the area feels sore**, you may take pain medication as prescribed by your doctor.
- **If the dressing becomes loose or is not properly covering the exit site of the catheter**, please call your doctor or the dialysis unit.

What should I do if the chest catheter falls out?

➤ If the catheter accidentally falls out:

- **Immediately apply pressure over that area using sterile gauze.**
- **Call 911 or go immediately to an emergency medical facility.**
- Maintain pressure over the exit site using sterile gauze until medical care is available.
- Sit upright; do not lie down.

➤ If the catheter is partially out:

- Do not pull the catheter out or push it back in.
- Place extra tape over the catheter to try to secure it.
- Sit upright; do not lie down.
- **Get to the emergency medical facility or the dialysis unit closest to your home.**

What are the potential complications if I have a temporary dialysis catheter?

The most common complications are:

- Clot formation inside the catheter.
- Inadequate blood flow.
- Infection which most times requires removal of the catheter and/or prolonged antibiotic administration to prevent infection from spreading into other organs. **The longer the temporary catheter stays in, the higher the chances of infection.**
- Narrowing of the vein in which the catheter is inserted (venous stenosis).

In most of these situations the dialysis catheter is removed and replaced with a new one.

PART 4: PROTECTING MY VASCULAR DIALYSIS ACCESS

How should I prepare each time for my dialysis treatment?

➤ **Examine the arm and watch for:**

- Swelling, redness or increase in skin temperature.
- Abnormal enlargement of the fistula or graft at the site of the previous needle holes.
- Cold, bluish, painful fingers.

➤ **Feel the “thrill”.**

- The thrill is the vibration or buzzing sensation of blood flowing through a vascular access, indicating that the access works well.
- You should learn to feel the thrill over the access as soon as the vascular access is created.
- To feel the thrill, lightly touch the skin approximately one inch above the surgical scar, just above your elbow or wrist depending upon where the vascular access was created.

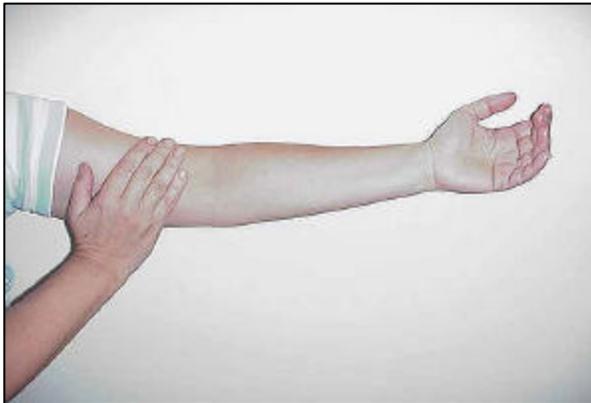


Figure 4: Best way to feel the thrill

- **Wash your “dialysis access” arm, before you sit in the dialysis chair.** Sinks and bactericidal liquid soap are conveniently located for this purpose in the dialysis center.

What should I know about the insertion of the dialysis needles (cannulation)?

Preparation for dialysis needles insertion:

- Local pain medications can be applied if needle insertion is extremely uncomfortable. Please discuss the options with your doctor.
- A dialysis nurse or technician will disinfect the skin according to the dialysis center procedure protocol.
- Do not touch, cough or sneeze towards the area just cleaned and made ready to be cannulated.

Insertion of the dialysis needles (cannulation):

- **Two needles** are required for each dialysis treatment if you have an AVF or an AVG:
 - The “arterial needle” that pulls the blood from your circulatory system and sends it into the dialysis filter.
 - The “venous needle” that returns the blood from the dialysis filter into your circulatory circulation.
- Needles used for cannulation have different widths.
 - The larger the needle diameter, the higher the blood flow that can be obtained.
 - When the access is "new", the needles used are smaller than the ones used later on. This allows the vascular access walls to strengthen and to tolerate the pressure resulting from the blood flowing through the vessels.
- Approximately 4-8 inches of the venous part of the AVF is accessible for cannulation. The graft of the AVG has a similar length that can be used for cannulation.
- The needles should be inserted at least 1/4-1/2 inch away from the last cannulation marks since the previous puncture sites need to heal before they are used again and this usually takes up to 7 days.

What should I do after a dialysis treatment is completed?

If you have a fistula or a graft:

- After the completion of your treatment, the nurse or technician will remove both needles.
- Using sterile gauze, you or the dialysis personnel will apply firm pressure directly over each needle hole, one by one, to stop the bleeding. This takes approximately 10-15 minutes.
- **Do not apply excessive pressure since it:**
 - Will not stop the bleeding faster.
 - Can completely block the blood flowing inside the dialysis access.
 - May cause the dialysis access to clot.
- **Clamps are an alternative for applying pressure only if nobody is available to apply manual pressure over the needle holes.**
- Bleeding longer than 30 minutes is considered abnormal and needs to be reported to your doctor.
- **There is no need for a large dressing to cover the cannulation area.**
 - A bandage or small gauze will be placed at both sites of needle insertion.
 - The dressing should be left intact and kept dry for 8-10 hours or until the next day when you can remove it.
- **The dressing should never be taped around the arm.**
- **If bleeding occurs after you leave the dialysis center:**
 - Do not panic: apply pressure over the bleeding site and report to the closest medical facility.
 - It is a good idea to carry 1 or 2 gauze pads in your pocket.

How do I know if my dialysis access is functioning well?

- Both the AVF and AVG can be malfunctioning without your knowing it, even if they can still be cannulated and used for dialysis. Therefore, it is extremely important to detect when and why the AVF or AVG is not working properly.
- The most common situations, which can raise **suspicion of malfunction of your vascular access**, are:
 - **Difficulties in cannulation.**
 - **Clots removed from the access during the cannulation.**
 - **Inability to obtain the prescribed blood flows during dialysis.**
 - **High pressure in the dialysis lines.**
 - **Prolonged bleeding after the needles are removed.**
 - **Inadequate blood cleaning as reflected in the monthly blood tests.**
 - **Abnormal blood flow or shape of the dialysis access detected by sonogram.**
- The improper functioning of the dialysis access is most often due to the presence of a narrowing (stenosis) which can slow down or block the blood flowing through the dialysis access, predisposing for clot formation.

What is a fistulogram ?

A fistulogram is a special X ray that can be performed to show the cause of the malfunction.

- Doctors in the Interventional Radiology Department will perform the test.
- The preparation for a fistulogram is similar to the ones for surgical procedures or temporary catheter insertion (please refer to page 12).
- Local anesthesia and some sedation will be used. You will be awake during the entire procedure. Feel free to discuss any concerns regarding pain control.

During the fistulogram:

- The skin over the dialysis access will be cleansed with betadine.
- A needle similar to a dialysis needle will be inserted into the dialysis access.
- A small amount of a special X-ray dye will be introduced through the needle.
- Several X-ray pictures of the vascular access, either AVF or AVG, will be obtained.
- Narrowing (stenosis) of any part of the vascular access, either AVF or AVG, can be detected.
- Widening of the narrowed area will be immediately done if necessary by ballooning (angioplasty).
- Insertion of a stent is sometimes necessary in order to prevent the reappearance of the abnormality just corrected. This can be introduced through the same needles.
- Special blood clot solvents can be introduced if needed.

The fistulogram takes approximately 1.5 hours.

After the procedure:

- You will be observed in the Recovery Room for a short period of time and then sent for your routine dialysis since the dialysis access can be used immediately after the procedure.

Taking care of your vascular access for dialysis is a major contribution to your health.

PART 5: WHAT TO DO IF...

The dialysis access stops working ?

- If there is no buzz or vibration (thrill), most likely a blood clot has formed and the blood has stopped flowing. Do not be alarmed: this is not an uncommon situation.
- **The faster you report the absence of the thrill, the greater the chances of saving the vascular access.** This is why it is so important to check your access vibration (thrill) every day.
- An urgent evaluation to remove the clot will be arranged.
- You may require a dialysis session through a groin (femoral) catheter before the procedure.

The removal of the clot is called thrombectomy and can be done:

- By intravenous medication to dissolve the clot called a **chemical thrombectomy**.
- By pulling out the clot called a **surgical thrombectomy**.

During the procedure the surgeon:

- Will make an incision over the center of the dialysis access.
 - Will insert a small catheter into the graft and pull the clot out.
 - Close the skin with stitches.
 - Place a dressing over the incision.
- **These procedures are successful most of the time for the AVG. Your dialysis access will be salvaged and you will be able to continue using it immediately.** If not, until a new dialysis access is created and ready to be used for dialysis, you may need to have a temporary catheter.

The vascular access becomes “infiltrated” ?

Infiltration occurs when needles penetrate through the wall of the dialysis access or come partially or completely out. A variable amount of blood will accumulate in the area outside the dialysis access. The surrounding tissues will distend and form a bruise, also called a hematoma.

The **most common causes for infiltration** are:

- **Vascular access is not completely mature.**
 - Blood vessels are still too frail.
 - Blood is flowing faster than the vessel wall can tolerate.
 - Several needle sticks are needed to cannulate the dialysis access.

- **Needles fall out of the vascular access.**
 - Needles are not well taped in place by the dialysis personnel.
 - Needles are dislodged because you are moving your arm around when trying to reach particular things like ice cups, food, tissues, handbags, cellular phones, etc. **Please try to keep your arm still after the needles are inserted.**

Always keep the arm with the vascular access uncovered during the dialysis session. Any movement of the needles or bleeding must be immediately visible.

If the dialysis access becomes infiltrated:

- You may have swelling of the arm and hand causing pain, numbness or tingling and changes in the color of the overlying skin from bright red to burgundy, to green and yellow over a few days before returning to normal.
- Apply **ice cold compresses** during the first 24 hours after the infiltration. The day after infiltration, **dry, warm compresses** should be applied for 30 minutes for 2-3 times each day to help the swelling to go down. The compresses should not be **too hot** to avoid burns or damage to the skin.
- Resolution may take 1-2 weeks depending on the extent of the infiltration.
- The access may not be able to be used until it returns to normal and, in the meantime, your dialysis may have to be performed through a temporary catheter.

The dialysis access feels hot and is sore ?

- Increased skin temperature, soreness, pain and/or redness of the skin are signs of infection that need immediate attention and care by the medical personnel.
- **Do not wait for your regular dialysis day to report these symptoms.**
- Your vascular access and/or your temporary catheter as well as your blood will be checked for infection. Antibiotic treatment will be started.

The access looks like a balloon which could burst (rupture)?

- If the dialysis needles are repeatedly placed in the same area, the dialysis access walls become thin, bulge and will pulsate (may appear like a balloon, also called "aneurysm").
- This situation should be immediately presented to your surgeon who may have to perform a revision of your access and relieve the pressure from that particular area. You may require a new access creation.
- **In the unfortunate event of rupture of the vascular access, apply tight pressure over the bleeding area and immediately call 911. This is a very serious emergency!**

PART 6: PROBLEM SUMMARY

I NEED TO LET MY DOCTOR OR THE DIALYSIS NURSE KNOW IMMEDIATELY IF I NOTICE:

- **An infiltration or a bruise at the dialysis access site.**
- **Swelling of the arm.**
- **Fever and/or chills.**
- **Soreness, pain, redness or increase in skin temperature of the access arm.**
- **Decreased or absent thrill or buzzing.**
- **Dialysis access seems ready to burst.**
- **Prolonged bleeding after the needles are removed.**
- **Cold, painful hand or bluish fingers during or after dialysis.**
- **Pain in the area of the dialysis catheter.**
- **Bloody or foul smelling spots on the dressing covering the catheter.**
- **Open or wet dressing over the catheter.**

PART 7: DO'S AND DO NOT'S FOR DIALYSIS ACCESS

DO:

- Check your access every day, in the morning and at bedtime.
 - Note if the thrill (buzzing or vibration) is present.
 - Observe for any swelling or skin color changes.
- Keep the skin over the dialysis access clean at all times.
- Wash hands frequently.
- Continue all your daily activities but take extra precaution not to bump or cut your access.

NEVER:

- **Never** sleep with your access arm under head and body.
- **Never** scratch or massage the skin around the dialysis access.
- **Never** bump your access.
- **Never** keep the arm, where you have the access, bent for a long period of time.
- **Never** use sharp objects near the dialysis access.
- **Never** have the dialysis access used for blood drawing or intravenous medication administration.
- **Never** have blood pressure taken on the arm with the dialysis access.
- **Never** shower after you return from dialysis.
- **Never** practice contact sports.
- **Never** place your watch or any jewelry around the access.
- **Never** wear tight clothes over your vascular access.
- **Never** carry your shoulder bags or back bags over the arm with the access.
- **Never** place heavy objects over the arm with the vascular access.

References

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