

Vascular Access Planning Guide for Professionals



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Introduction

The majority of dialysis patients use hemodialysis (HD) for renal replacement therapy. At any given time, a patient will have one or more vascular access in place. The renal community, the ESRD Networks, stakeholders and patients have contributed to the significant improvements in vascular access outcomes. Still a large percentage of patients start dialysis with a dialysis catheter in place and, often times, no other vascular access.

An organized approach to the management of vascular access has been found to be effective in reducing the amount of time a patient has a catheter in place. Creating a plan for vascular access management is the best way to ensure an organized approach that will lead to catheter freedom for your patients. While the primary focus of vascular access planning is for patients who are new to hemodialysis, it is also important to work with all patients on HD who do not have an access plan or are dialyzing with a catheter. We suggest that the dialysis care team (DCT) create an access plan and then check the access, using routine access monitoring that supports early intervention when access problems are identified. This will decrease the use of HD catheters and preserve existing accesses for continued use.

An access event requiring intervention or changes to the access plan may provide an opportunity for the DCT to explore different treatment options with the patient. Health status and other factors may limit the options available for an individual patient, but taking the time to evaluate these choices is recommended. Choices may include:

- Peritoneal dialysis (PD) - a home dialysis method.
- Kidney transplant- receipt of a kidney from a living or deceased donor.

The DCT should provide information and arrange for the necessary referrals in support of patients who want to explore other options.

If hemodialysis is the treatment of choice ...

This guide is designed to provide the DCT with information that will help identify resources and barriers that may need to be addressed in order to have an organized approach to access management. At any given time, the hemodialysis patient's access status will determine where he or she is on the access timeline and continuum. It is important to identify your patient's progress and create an access plan to meet his or her specific care needs.

The eight steps in an access plan.

Eight discrete steps have been identified as key components of any access plan:

1. Develop an individualized access plan for each patient.
2. Refer the patient for vessel mapping.
3. Coordinate an appointment with a surgeon.
4. Coordinate access surgery and follow up.
5. Assess AVF maturation/AVG readiness.
6. Apply cannulation protocol.
7. Arrange for catheter removal.
8. Monitor the access.

DCT members working together with the patient offer the best approach to help the patient achieve catheter freedom. For those who continue to use catheters, the DCT must be vigilant in promoting safe practices.

The “Vascular Access Planning Guide for Professionals” is the companion document to the patient guide, “Planning for Your Vascular Access,” and it is important to use both together. The patient guide is designed to meet the information needs of patients and to reinforce the central role they play in the access planning process.

The timelines on the following page display the steps in the access plan as well as the timing for the most common access plans.



These timelines apply to most AVFs and AVGs. They do not apply to complex AVFs. If a complex AVF is created, the vascular access surgeon should provide a defined timeline for that AVF.

For those patients with a hemodialysis catheter who are planning for an AVF

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Develop access plan	Refer for vessel mapping	Coordinate surgeon appointment	Access surgery and F/U	AVF maturation	Cannulation protocol	Catheter freedom	Access monitoring
Week 1	Weeks 2-3	Weeks 4-5	Weeks 6-9	Weeks 10-13	Weeks 14-19	Weeks 20-21	On-going

For those patients with a hemodialysis catheter who have a maturing AVF

				Step 5	Step 6	Step 7	Step 8
				AVF maturation	Apply Cannulation protocol	Catheter freedom	Access monitoring
				Weeks 1-6	Weeks 7-10	Weeks 11-12	On-going

For those patients with a hemodialysis catheter who are planning for an AVG

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Develop access plan	Refer for vessel mapping	Coordinate surgeon appointment	Access surgery and F/U	AVG healing and readiness	Cannulation protocol	Catheter freedom	Access monitoring
Week 1	Weeks 2-3	Weeks 4-5	Weeks 6-9	Weeks 10-11	Week 12	Week 13	On-going

For those patients with a hemodialysis catheter who have a healing AVG

				Step 5	Step 6	Step 7	Step 8
				AVG healing and readiness	Cannulation protocol	Catheter freedom	Access monitoring
				Weeks 1-2	Week 3	Week 4	On-going

Step 1: Develop Vascular Access Plan

Every hemodialysis patient has one or more vascular access in place, so having a vascular access plan is beneficial to everyone. Developing, executing, and managing an access plan across the access continuum is vital to maintain each patient's lifeline for a lifetime.

What is a vascular access plan?

- A description of the steps necessary to achieve catheter freedom and maintain a working fistula or graft.
- Individualized for each patient based on the clinical status and options available to the patient at the time.

What is a plan?

Webster's Dictionary defines a plan as:

- A method for achieving an end.
- An orderly arrangement of parts of an overall design.

Why have a vascular access plan?

A vascular access plan provides an organized approach for the management of a complex clinical condition. Patients on hemodialysis will have multiple encounters with the healthcare system over their lifetime. These encounters are likely to include:

- Dialysis treatments;
- Primary care visits;
- Specialist visits;
- Hospitalizations; and
- Out-patient procedures.

Because these encounters take place in various sites of care, they provide challenges and potential turning points in the patient's plan of care. The existence of an access plan that guides practitioners and patients in every setting can minimize the risk of disrupting long-term access planning options for the patient and promote patient safety.



Developing the vascular access plan.

Determining where your patient is on the continuum will guide you in working with him or her to develop an individualized plan.

Patients who are initiating renal replacement therapy will fall into one of these categories:

- Catheter only;
- Catheter with maturing arteriovenous fistula (AVF);
- Catheter with healing arteriovenous graft (AVG);
- AVF in use; or.
- AVG in use.

This guide will help you identify the actions needed to achieve catheter freedom and/or maintain a working access.

Reminder: Tell your patients about the “Planning for Your Vascular Access” guide.

Information to help guide patients through the access planning process is available in this guide and follows the step-by-step approach for the patient, starting with Step 1: “Making an Access Plan.”



Step 2: Refer for Vessel Mapping



What is vessel mapping?

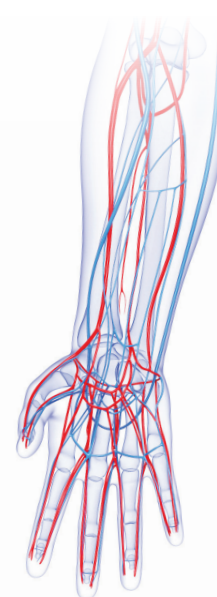
Vessel mapping is a simple test done with an ultrasound machine. No needles are used unless there is a need to look at the central veins. The test is used to determine arterial inflow and venous outflow and to assess the adequacy of the venous system to support an AVF or AVG in the extremity.

Most surgeons perform vessel mapping in their offices. This can decrease the access timeline by two weeks for a new AVF or AVG. In advance of the surgery appointment, it is important to know whether a surgeon does vessel mapping. If he or she doesn't do vessel mapping, the patient should be referred to other vessel mapping services before he or she has the surgery appointment.

Identifying vessel mapping services.

First, find out if the surgeon who will do the access surgery also does vessel mapping:

- The DCT members will need to communicate with their surgeons to learn who does and does not perform their own vessel mapping.
- If a surgeon does not do vessel mapping, the DCT will need to identify other vessel mapping services. Vessel mapping done by someone other than the surgeon can add up to two weeks to the timeline.



Key questions:

Key questions to ask when identifying and evaluating vessel mapping services:

- Do they perform comprehensive mapping of the upper extremities?
- When requested do they map the lower extremities?
- Do they map the arteries to assess inflow?
- Do they map the venous system to assess outflow?
- How do they assess the central veins?
- How will the vessel mapping results be communicated to the ordering practitioner?
- If vessel mapping services are being offered by a vascular lab, is the lab accredited by the Intersocietal Accreditation Commission?

Some radiologists may work in a setting that is not accredited as a vascular lab but may do adequate vessel mapping. You may want to consult with the surgeon and/or nephrology practitioner about the reliability of these radiologists in performing vessel mapping.



What do I need to do to schedule vessel mapping?

If the surgeon requests the DCT to schedule a vessel mapping appointment for the patient, the team will need to:

- Schedule the appointment prior to the visit to the surgeon;
- Adjust the patient's dialysis schedule if there is a conflict;
- Ensure that the referral includes the essential components for optimum vessel mapping; and
- Communicate the results to the surgeon prior to the scheduled appointment.

Once your patient has his or her vessel mapping scheduled it is time to plan for the next step in the process:

- Educate and prepare the patient for the visit to the surgeon.

Reminder: Tell your patients about the "Planning for Your Vascular Access" guide. Information to help guide the patient through the process of vessel mapping is available in Step 2: "Finding the Best Place for My Access."

It is important for everyone to focus on vein preservation. There are specific instructions for the patient in the patient guide. The Appendix includes an information sheet, "Vein Preservation and Hemodialysis Fistula Protection," which provides more information about the role professionals play in preserving veins that may be needed for future access placement.

Vein Preservation and Hemodialysis Fistula Protection

Patients should be taught to protect their veins.

- Veins in both arms that could be used for hemodialysis vascular access **MUST** be preserved.
- Venipuncture or intravenous (IV) placement could damage these veins, which may make them unusable for hemodialysis access.

If a patient has or will have a hemodialysis access placed:

Do

- Rotate venipuncture sites.
- Use the dorsum of the hand of the non-access arm for venipuncture and IV infusions.
- Draw labs at the time of hemodialysis when possible.
- Coordinate with the surgeon and anesthesiologist when the non-access arm is the primary surgical site, to avoid using the patient's hemodialysis vascular access.

Do Not

- Use the hemodialysis access limb for blood pressure readings. (Use the other arm or a thigh or ankle cuff for blood pressure readings.)
- Use the hemodialysis access limb for blood draws, IV therapy, or an arterial line.
- Use the hemodialysis access for diagnostic studies or treatments.
- Use the cephalic veins of either arm for blood draws, IV fluids, or IV drug infusions.
- Place a subclavian catheter or a peripherally inserted central catheter (PICC). (Place an internal jugular line instead.)

Step 3: Coordinate The Surgeon Appointment

Working with the surgeon.

The appointment with the surgeon can be made as soon as the patient agrees to see the surgeon. If the surgeon performs the vessel mapping, that will be done at the time of the appointment. It is important for the members of the DCT to know what surgical services are available in their area. The list of questions shown below points to important information members of the DCT should know in order to assess the surgical services offered.

Most nephrology practitioners have identified surgeons to whom they refer their patients for vascular access surgery and follow-up. It is very important for the DCT to obtain this information from each surgeon in their area in order to work more efficiently with them and their staff members. Information is essential for coordinating access services among the DCT, nephrology practitioners, surgeons and patients to ensure that the patient can navigate the access process and potentially have an AVF created or an AVG placed.

The DCT should gather the following information from each of the vascular access surgeons in their area:

- Do they create AVFs?
- Do they place AVGs?
- Do they place hemodialysis catheters?
- Do they place PD catheters?
- Where do they perform access surgery?
- During what office hours do they schedule appointments to evaluate patients for access surgery?
- What days of the week and during what time periods do they perform vascular access surgeries?
- Will they send the DCT a drawing of the access anatomy and structure?
- What is the usual protocol for follow-up after access surgery for an AVF?
- Does the protocol differ based on the type of AVF?
- What is the usual protocol for follow-up after access surgery for an AVG?
- How do they assess and treat an AVF that is failing to mature?
- How do they assess and treat an AVG that is not healing as it should?
- What information do they want from the dialysis clinic and/or nephrology practitioner?

It is also important to establish a communication protocol with each surgeon to facilitate the exchange of essential information and provide patients with continuity of care. The protocol should include:

- How they wish to receive patient information (phone, fax, e-mail).
- What information they want from the dialysis clinic.
- Whether they have standard vascular access forms or use forms you supply.
- What post-surgery information they send to the dialysis center.
- Whether they have a vascular access coordinator who arranges the schedule and provides follow-up to the patient after access surgery.

If the surgeon fails to provide essential information, or if there are recurrent issues that cause delays in the access surgery, the DCT should work collaboratively with the patient's nephrology practitioner to determine how to best address these issues with the surgeon. The nephrology practitioner may choose to speak with the surgeon privately or facilitate a meeting with the surgery practice and the DCT to explore issues. These may include delays in obtaining surgery appointments, poor communication or follow-up on the part of the surgeon's office, lower than expected AVF rates, and prolonged timelines for AVF maturity and AVG healing.



Planning for surgery.

Every patient should return from his or her surgeon visit with a clear understanding of the plans for vascular access surgery. In addition, the surgeon should communicate to both the DCT and the nephrology practitioner information on the type of surgery being planned and the follow-up plan. The communication should include:

- Access type and site,
- Clinical explanation for access choice and site,
- Possible identification of secondary sites for future access placement.

If the choice is made to continue use of the tunneled catheter as the primary access, the surgeon should provide the nephrology practitioner a detailed explanation and offer advice and suggestions for other access options.

The dialysis clinic should have established processes for communication to and from the surgeon to make sure the access planning process is progressing as it should.



Working with the patient.

The DCT should work with patients to make sure they understand the purpose and importance of their visit to the vascular access surgeon. It is important to convey that their access surgery will not be performed during that visit. It may be helpful to review with the patient the information contained in the “Planning for Your Vascular Access” guide. He or she may need help in understanding how to prepare for the appointment or to address concerns about what to expect. *See Appendix for a list of questions you can review with the patient to help prepare for the surgery visit.*

When is the visit scheduled?

- If the visit is scheduled on the patient’s dialysis day, the DCT may need to change the patient’s dialysis schedule.
- The patient needs to attend both.
- The DCT may need to assist the patient in making transportation arrangements to go to and from the appointment.

Generally surgeons have little flexibility in their office schedule, so the DCT will need to work with the patient to adjust the dialysis schedule to accommodate such important events in the patient’s vascular access plan. If the appointment is scheduled on the patient’s dialysis day, the patient needs to know that both the surgeon’s appointment and dialysis appointment should be kept.

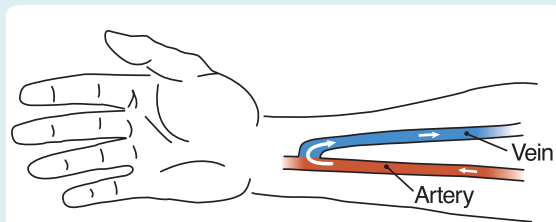
Reminder: Tell your patients about the “Planning for Your Vascular Access” guide.

Once your patient has seen the surgeon and the surgeon has determined an AVF can be created or an AVG placed, it will be important to help your patient get ready for surgery. Step 3: “Going to see the surgeon” has information that you and the patient can use to prepare for the surgeon visit.

Step 4: Access Surgery and Follow-up

Delays may occur and barriers may arise in this stage. It is important to manage this step carefully to ensure the best outcome for the patient. The surgeon should have a specific approach for each access type, with a predictable timeline for AVF maturation and AVG healing. If there is a delay in these timelines the surgeon should be asked to articulate his or her approach to evaluation, intervention, and follow-up.

It is important for the DCT to start this process by understanding the scope of a surgeon's vascular access expertise.



Does the surgeon create fistulas?

Does the surgeon create the more common types of fistulas?

- Using superficial vessels in the lower arm?
- Using superficial vessels in the upper arm?

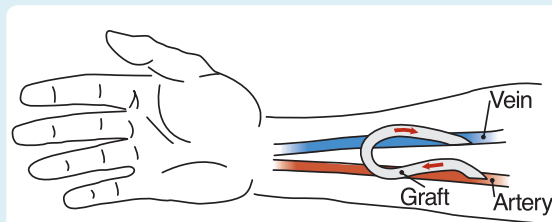
Does the surgeon create complex fistulas, such as transposition of vessels in the upper arm?

Does the surgeon use a one-step procedure?

- What is the surgeon's projected timeline for fistula maturity?

Does the surgeon use a two-step procedure?

- What is the surgeon's projected timeline for fistula maturity?



Does the surgeon place grafts?

What types of grafts does the surgeon place?

- Straight
- Looped
- Graft/catheter hybrid

What types of graft materials does the surgeon use?

- PTFE (most common)
- "Early stick"
- Bovine
- Genetically modified
- Cadaver
- Other

As noted, this step in the vascular access planning process is complicated and can result in barriers to the creation of an AVF or placement of an AVG, and ultimately may delay catheter freedom. The Fistula First Change Concept 4 includes resources to assist the DCT and nephrology practitioners in working through barriers that may arise.

Communication and referral.

For the access planning process to be successful, the nephrology practitioner and the DCT should have a referral process for bi-directional communication with the surgeon. It is important that the DCT and the nephrology practitioner are provided information immediately after the access surgery. This information should outline the type and site of surgery, an anatomical drawing of the AVF or AVG, plans for follow-up and a projected timeline for AVF maturity or AVG healing. These communications are integral to the access planning process and will ensure that the patient moves along the vascular access continuum toward catheter freedom.

Fistula First Change Concept 4: Surgeon selection based on best outcomes, willingness, and ability to provide access services

- Nephrologists communicate standards and expectations to surgeons performing access, e.g., KDOQI minimal standards for AVF placement, and training in current techniques for AVFs. The patient needs to attend both.
- Nephrologists refer to surgeons willing and able to meet the standards and expectations.

Surgeons are continuously evaluated on frequency, quality and patency of access placements. Data collection ideally is initiated and reported at the dialysis center as part of an ongoing continuous quality improvement (CQI) process and can be aggregated at the Network level.

When is the surgery scheduled?

- If the surgery is scheduled on the patient's dialysis day, the DCT may need to change the patient's dialysis schedule.
- The DCT should coordinate schedules to ensure that the patient keeps both appointments.
- The DCT may need to assist the patient in making transportation arrangements to go to and from the appointment.

Reminder: Tell your patients about the "Planning for Your Vascular Access" guide.

Facing surgery is a very stressful experience. Step 4: "Going for Surgery" guide includes information to help the patient prepare for surgery and explains what to expect after the surgery. Working with your patients prior to surgery will help allay their concerns and prepare them for the surgery experience and follow-up.

Step 5: Assess Fistula (AVF) Maturation; Graft (AVG) Healing and Readiness

“Ready, Set, Go” the Steps to Catheter Freedom is a process and timeline based on nationally accepted standards for vascular access placement and development. This provides a consistent and coordinated approach for the DCT and patient to check the new fistula for maturity or the new graft for healing. By performing the checks outlined in this week by week process, the team will help to ensure the readiness of a new vascular access for use in hemodialysis. Studies document that it is not uncommon for there to be a delay to achieving “catheter freedom” because problems with a newly created vascular access are not identified and acted upon in a timely manner. This increases the overall time of catheter exposure and poses a safety risk to the patient.

The “Ready, Set, Go” AVF and AVG checks can identify access maturity/healing problems early so action can be taken. Most AVFs that “fail to mature” can be fixed if referred for intervention. AVGs that “fail to heal” must be addressed promptly to find the cause and treat appropriately. Here are the questions the DCT should ask and get answers to with each check.

- **“Ready”** - Is the access maturing or healing as it should?
- **“Set”** - Are we moving toward cannulation and catheter freedom?
- **“Go”** - Are the “Go” signs checked off for each step on the timeline?

When should we start to do the “Ready, Set, Go” checks?

The “Ready, Set, Go” checking process should begin the first day your patient returns to the clinic for dialysis following access surgery.

The surgery team should send as much information as possible about the new access to the DCT so the team and the patient can begin performing the AVF maturity/AVG healing checks. If no information has been sent, the DCT should request it from the surgeon and the nephrologist. Here are examples of the information that is most often needed:

- Patient post-surgery instructions.
- Post-surgery instructions for the DCT.
- Indication of whether the access is a fistula or a graft, as well as information on the type and location of the access.
- Access diagram.
- Plan for surgical follow-up.



Who should do the “Ready, Set, Go” checks?

Members of the DCT who perform the new AVF/AVG checks should be selected from those already regarded as vascular access experts within the clinic environment. These individuals provide an advanced level of vascular access expertise to the DCT, and when problems are identified they are asked to check the findings. They are distinguished by their ability to:

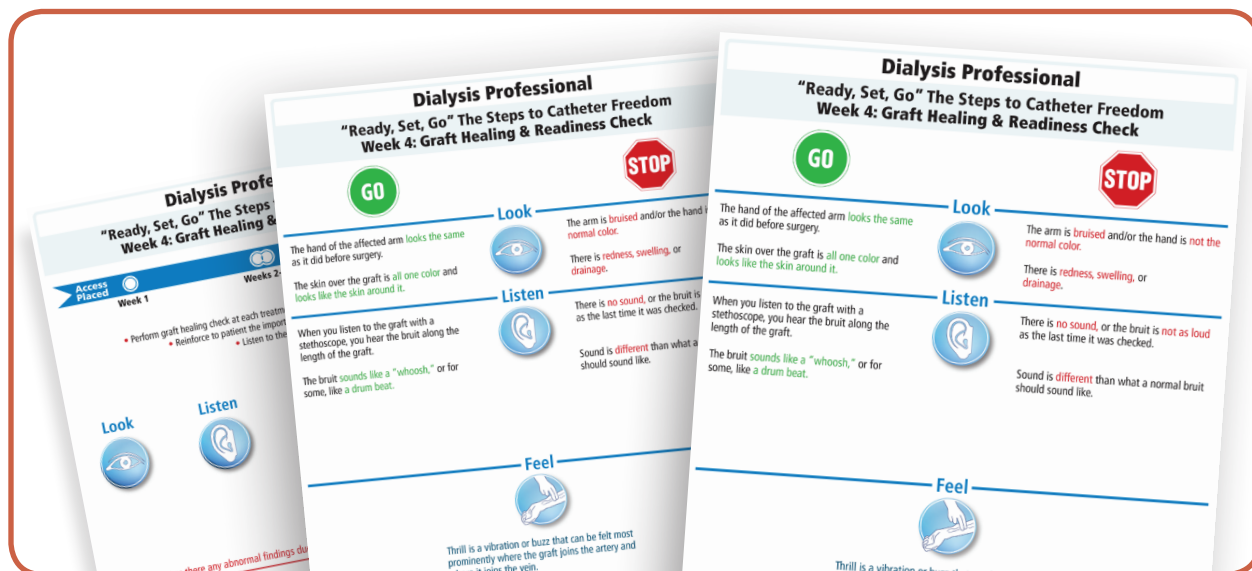
- Perform a comprehensive access check that is more advanced than the “one minute access check.”
- Differentiate between normal and abnormal findings and identify access problems and dysfunction.
- Determine whether the patient needs referral for further evaluation.
- Participate in establishing the post-intervention baseline for the access.
- Work with the other members of the team to modify the access plan.

- Show competence in evaluating a new AVF/AVG for maturity/healing.

What characteristics do these experts have? They:

- Reliably and consistently identify problem accesses.
- Are recognized by peers and patients as someone with a higher level of knowledge and expertise in access assessment and management.
- Are regarded as a “go to” person for matters related to vascular access.
- Inspire patient and staff confidence.
- Maintain a good attitude.
- Are respected by their colleagues.

Most hemodialysis clinics know who these individuals are and should rely on them to check the new AVF/AVG until the patient is catheter free.



How do I use the “Ready, Set, Go” Steps to Catheter Freedom toolkit?

There are four components in the toolkit. Each includes a separate tool for the DCT and the patient addressing the specific type of access, and the checks they should conduct depending on the patient’s progress on the timeline from creation/placement to catheter freedom. The individual components can be used separately and/or together as a teaching guide for staff.

New AVF Components:

- Staff AVF Maturity Check
- Patient AVF Maturity Check

New AVG Components:

- Staff AVG Healing and Readiness Check
- Patient AVG Healing and Readiness Check

When the patient returns to the surgeon for the follow-up appointment, the DCT should provide precise information based on the findings from “Ready, Set, Go”.

Reminder: Tell your patients about the “Planning for Your Vascular Access” guide. Step 5: “waiting for my access to mature or heal” has information to help the patient understand the maturity and/or healing process. “Ready, Set, Go” tools are designed to help patients monitor the access while waiting for it to mature or heal.

Step 6: Cannulation

The technique and process for cannulating an arteriovenous fistula (AVF) is different from the technique and process for cannulating an arteriovenous graft (AVG). It is important for the dialysis care team (DCT) to understand the differences. The dialysis clinic should have a policy and procedure for cannulating each type of access.

AVFs are created by joining a native artery to a native vein. During the maturation period, the vein will grow larger and take on the characteristics of an artery. Often this is referred to as the vein becoming “arterialized.” The result of the vein becoming arterialized is that the bloodflow through the AVF is high enough to deliver the dialysis prescription. For most AVFs, this takes about four to six weeks.

Once it is determined that the AVF has reached maturity, the DCT will begin cannulation of the AVF based on the Policy and Procedure specified by the clinic. As cannulation progresses, it is important that the DCT be diligent to avoid complications. If there are complications, the DCT may need to let the access rest and resume use of the catheter until given orders to resume the cannulation process.



AVGs are created by joining an artery and vein together with a piece of graft material. There are a variety of materials in use today but most commonly grafts are made from polytetrafluoroethylene or PTFE. AVGs are made from materials that are not native and have a fixed length and diameter so they don't mature, they heal. AVGs are either straight or looped and may be in the forearm or the upper arm. Today most AVGs can be cannulated two to three weeks after placement. Occasionally there may be complications during the cannulation process. If there are complications, the DCT may need to let the access rest and use the catheter until they are given orders to resume the cannulation process.

Once cannulation is progressing smoothly, the DCT should schedule an appointment for catheter removal. The clinic's Policy and Procedure should specify the number of treatments necessary to deliver the full prescription before the catheter is removed. In most cases it takes four weeks for completion of the AVF cannulation protocol and two weeks or less for the AVG protocol.

Here are a few tips to help guide the DCT and the patient toward safe and effective cannulation of all AVFs and AVGs.

Arm preparation by patient prior to dialysis.

Whenever possible the DCT should provide the resources and opportunities for patients to wash their access arms before going to the dialysis chair for a treatment. Most experts recommend a gentle scrubbing with an antibacterial soap. It is essential for both patients and DCT members to practice good hand hygiene in order to prevent healthcare - acquired infections.



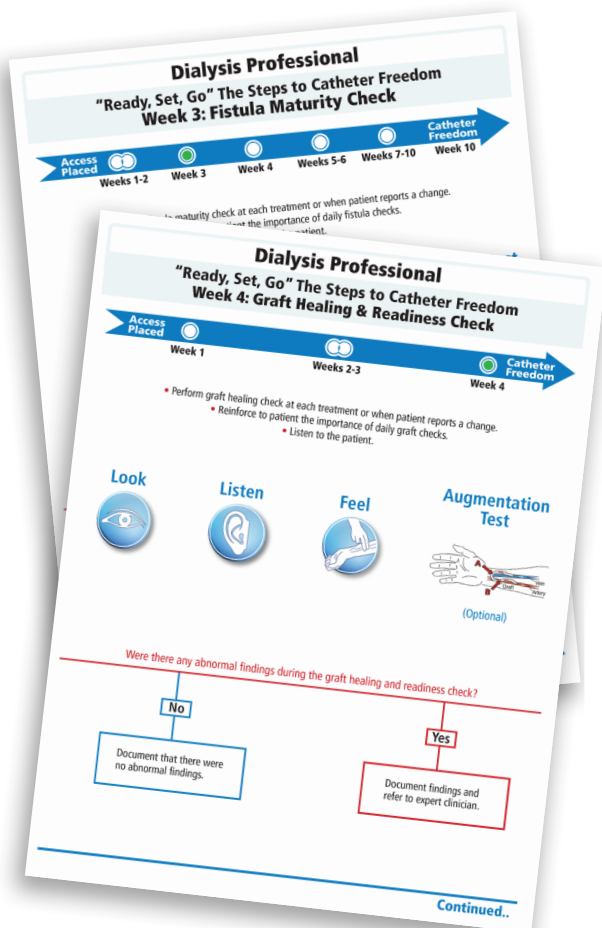
Do the "One Minute Access Check"

The cannulator should perform the access check prior to cannulation. Any changes in the Look, Listen, Feel and Arm Elevation (AVF only) checks should be evaluated by the on-site vascular access expert before proceeding with cannulation and if indicated, referred to an expert clinician.

When to use a tourniquet.

- AVF—A tourniquet must be used when cannulating an AVF.
- AVG—With rare exception, a tourniquet is not used when cannulating an AVG.

It is recommended that the DCT refer to the clinic's Policies and Procedures.



Rope ladder cannulation: Avoid “one-site-itis”.

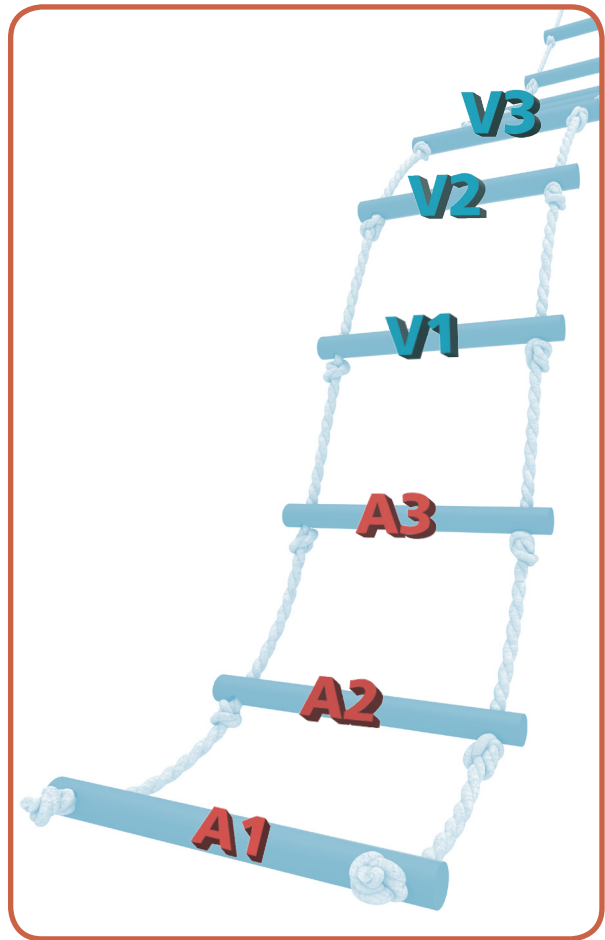
The DCT can identify potential areas for cannulation when performing the “One Minute Access Check” and avoid area cannulation, also called “one-site-itis.” This problem occurs when an access is repeatedly cannulated in the same small area. One-site-itis can lead to loss of access integrity, aneurysms, pseudo-aneurysms and stenosis. Rotating sites or using the rope ladder technique is the preferred cannulation method for AVFs and AVGs. This approach should be adopted and embraced by both the patient and the DCT. The DCT should educate the patient about the importance of rotating cannulation sites.

Needle flipping or repositioning.

Flipping needles can damage the access by scooping away part of the vessel lining. Repositioning, propping or re-taping a needle may help if a needle is sucked against the wall of the access. If the cannulation technique is correct, there should be no reason to consider flipping needles and risk damage to the access.

Self-cannulation.

Self- cannulation training should be offered to patients in all dialysis settings. Self-cannulation may help patients gain a greater feeling of control, overcome needle fear and concerns about cannulation, and increase access longevity.



Buttonhole cannulation.

Constant-site or buttonhole cannulation involves cannulating at exactly the same angle for approximately eight to ten treatments in a row, until a scar tissue tunnel tract forms. The buttonhole technique may reduce the patient's pain and fear of cannulation. It also reduces the risk of aneurysm formation.

The buttonhole technique can be used to cannulate an AVF but NOT an AVG. Why the difference? AVFs are arterialized native veins, which have muscle fibers in their walls that snap shut after a needle is removed. AVGs are made of non-native material and don't have the same characteristics as AVFs. Cannulating repeatedly in the same place could damage the AVG and lead to rupture or other complications.

The buttonhole technique must be governed by strict protocols and performed by only those who have been taught and can demonstrate the proper technique and who maintain competency in use of this technique.

Reminder: Tell your patients about the "Planning for Your Vascular Access" guide.
Step 6: "Using my access" has helpful information to help the patient better understand the cannulation process.

How I help the patient prepare for cannulation?

It is important for the DCT to spend time talking to patients about preparing to use their AVF or AVG. Some patients may wish to delay the process, wanting more time for the access to heal or wanting to postpone having needles inserted at every treatment. The DCT should describe the cannulation process and the clinic policy and procedure for an AVF or AVG.

There are a number of approaches that can ease the patient into readiness for this step. It's very important to help patients identify whether they are scared or nervous about using their access. The patient guide provides information to help them work through their concerns and offers suggestions for how patients may prepare for the cannulation process. Starting these discussions earlier in the access planning process will allow time for the DCT to work with the patient to help prepare them for this important step. Don't forget to highlight the "What should I expect when the needles are put in and taken out?" sheet in the Appendix in the patient and professional guides.

Once your patient's vascular access is being cannulated successfully, it is time to turn your attention to the last two steps in the vascular access plan – "Catheter removal" and the "One minute access check."

Step 7: Arrange for Catheter Removal and Celebrate Catheter Freedom

Catheter removal.

The DCT should make an appointment for the patient to have the catheter removed within one to two weeks, once the AVF or AVG:

- Has been cannulated successfully with two needles for a prescribed number of treatments;
- Delivers the full dialysis prescription;
- Provides adequate dialysis; and
- Shows no signs or indications of complications.

Most dialysis providers include these criteria as a stand-alone Policy and Procedure or a component of their Cannulation Policy and Procedure. Actions that delay catheter removal extend the time of catheter exposure and can result in morbidity and in some cases, mortality. Catheter safety checks should be continued even when the catheter is not in use and the patient is awaiting the removal procedure.

Celebrate catheter freedom.

The patient and the DCT have worked hard to achieve catheter freedom. Often there are detours along the way that delay the process. It is important to celebrate the removal of the patient's dialysis catheter with the same intensity that you would celebrate important milestones in a person's life. Both the DCT and the patient have worked through the necessary steps to achieve catheter freedom. Some clinics hold a celebration ceremony to recognize this important milestone.



Congratulations on achieving catheter freedom!

Reminder: Tell your patients about the “Planning for Your Vascular Access” guide. Make sure the patient knows the importance of catheter removal. Step 7: “Getting My Catheter Out” will help reinforce the importance of catheter removal.

Step 8: "One Minute Access Check"

How does the dialysis care team (DCT) make sure the access is working as it should?

The DCT should perform the "One minute access check" at each dialysis treatment to save the patient's *lifeline for a lifetime*. The one minute access check provides a systematic and consistent approach to access monitoring. The goal is to identify problems early and arrange for the appropriate assessment and referral for intervention, if needed. This will help maintain the health and function of the working AVF or AVG and decrease the need for placement of a hemodialysis catheter.

What if there is a problem with the access?

It is important to make sure the *lifeline for a lifetime* keeps working as it should. Sometimes problems will occur in the access that may require evaluation and referral. If a problem is identified it may be corrected with an interventional procedure or, if more complex, it may require surgical intervention.

In a new fistula or graft, problems that slow the maturation or healing process may occur. Additional problems may arise when the access is cannulated. It is important to act on these findings in a timely manner since many can be remedied with the appropriate intervention.

A problem requiring evaluation and intervention may occur in an established fistula or graft. In addition to conducting the one minute access check prior to cannulation, the DCT should teach the patient to perform the one minute access check every day. The goal is to maintain the existing AVF or AVG and avoid the placement of an HD catheter.

Reminder: Tell your patients about the "Planning for Your Vascular Access" guide. The DCT should teach the patient how to do the "one minute access check." Step 8: "Taking Care of My Lifeline for a Lifetime" will support and reinforce the teaching and learning processes.

Look



Listen



Feel



Appendix A

Patient Materials

My Access Plan

Use the table on the next page as a guide through the eight steps of your access plan. You can keep track of the steps along the way.

- A.** Review all the steps, and pick which step you are on.
- B.** Check with your care team to make sure you picked the right step.
- C.** Work together with your care team to get things scheduled.
- D.** Put the dates on the checklist.
- E.** If you miss a date or it changes, your care team will work with you to make sure you stay on track.
- F.** Each time you complete a step, write in the date it was done.
- G.** When you are on step 7, you can start doing your daily one minute access check.
- H.** Keep up the good work!

Notes

MY ACCESS PLAN

Step #	Step Name	Date Scheduled	What Does This Step Mean For Me?	Date Step Completed
Step 1	Making an access plan		This step shows you what is in an access plan. Once you review it, you will see what step you are on.	
Step 2	Finding the best place for my access		This step tells you how the surgeon will find the best place for your access to go.	
Step 3	Going to see the surgeon		You will need to go see the surgeon before you get scheduled for your surgery. This step tells you how to prepare for the visit and what will happen on the visit.	
Step 4	Going for surgery		This is a big step, so make sure you read it carefully. You will learn what will happen when you go for surgery and about going back to see the surgeon.	
Step 5	Waiting for my access to mature or heal		How long this step takes will depend on what kind of access you have. Your dialysis care team will help you understand what this means for you.	
Step 6	Using my access		This step tells you what to expect when the dialysis care team starts to use your access for your dialysis. They will have a plan for how to do this.	
Step 7	Getting my catheter out		Once you are using your access without any problems, you will need to go to have your catheter taken out.	
Step 8	Taking care of my lifeline for a lifetime		This step tells you how to do your daily one minute access check. Your care team will teach you how to do the check.	

These are questions most people have about their surgery. Your surgeon can answer these for you:

- Should I take all my medicines before I come in for my surgery?
- How long will I be at the hospital or surgery center when I have my surgery?
- Will I need to be put to sleep for the surgery?
- Will I have to stay in the hospital overnight?
- Should someone come with me?
- Can I drive myself home after my surgery?
- Will you give me something for pain to take home with me?
- Can I use my arm after I have surgery?
- Will the arm with my access look different?

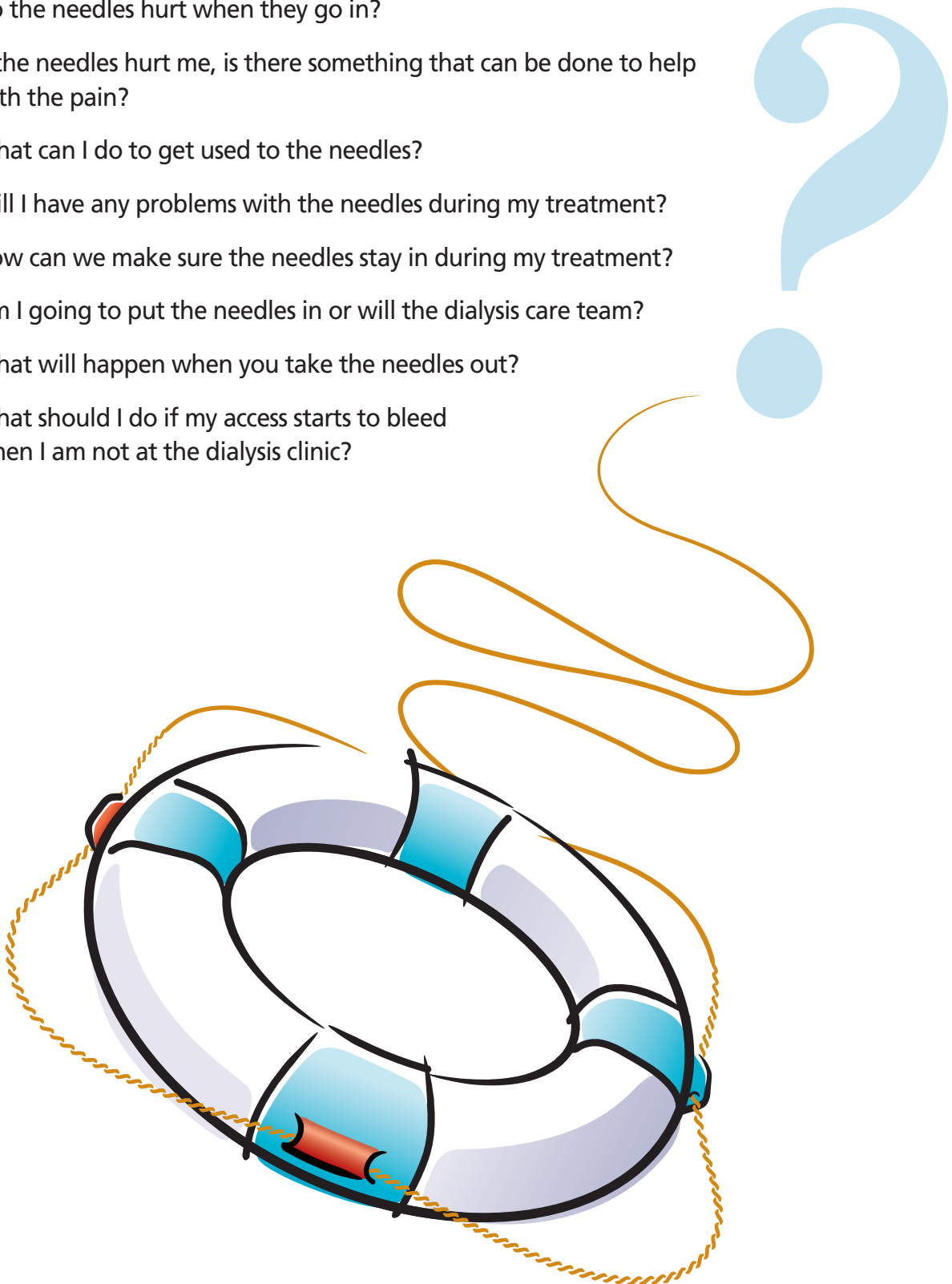
Ask your surgeon to:

- Talk with your dialysis care team so they know the plans for your surgery.
- Send your care team a report from your visit.
- Give you a copy of the report.

What should I expect when the needles are put in and taken out?

Many patients have questions about the needles when they start using their access. Ask your care team if you have any questions. Here are some of the questions you may want to ask them:

- Do the needles hurt when they go in?
- If the needles hurt me, is there something that can be done to help with the pain?
- What can I do to get used to the needles?
- Will I have any problems with the needles during my treatment?
- How can we make sure the needles stay in during my treatment?
- Am I going to put the needles in or will the dialysis care team?
- What will happen when you take the needles out?
- What should I do if my access starts to bleed when I am not at the dialysis clinic?



Appendix B

Professional Materials

Vein Preservation and Hemodialysis Fistula Protection

Patients should be taught to protect their veins.

- Veins in both arms that could be used for hemodialysis vascular access **MUST** be preserved.
- Venipuncture or intravenous (IV) placement could damage these veins, which may make them unusable for hemodialysis access.

If a patient has or will have a hemodialysis access placed:

Do

- Rotate venipuncture sites.
- Use the dorsum of the hand of the non-access arm for venipuncture and IV infusions.
- Draw labs at the time of hemodialysis when possible.
- Coordinate with the surgeon and anesthesiologist when the non-access arm is the primary surgical site, to avoid using the patient's hemodialysis vascular access.

Do Not

- Use the hemodialysis access limb for blood pressure readings. (Use the other arm or a thigh or ankle cuff for blood pressure readings.)
- Use the hemodialysis access limb for blood draws, IV therapy, or an arterial line.
- Use the hemodialysis access for diagnostic studies or treatments.
- Use the cephalic veins of either arm for blood draws, IV fluids, or IV drug infusions.
- Place a subclavian catheter or a peripherally inserted central catheter (PICC). (Place an internal jugular line instead.)

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Access Planning Timelines

For those patients with a hemodialysis catheter who are planning for an AVF

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Develop access plan	Refer for vessel mapping	Coordinate surgeon appointment	Access surgery and F/U	AVF maturation	Cannulation protocol	Catheter freedom	Access monitoring
Week 1	Weeks 2-3	Weeks 4-5	Weeks 6-9	Weeks 10-13	Weeks 14-19	Weeks 20-21	On-going

For those patients with a hemodialysis catheter who have a maturing AVF

Step 5	Step 6	Step 7	Step 8
AVF maturation	Apply Cannulation protocol	Catheter freedom	Access monitoring
Weeks 1-6	Weeks 7-10	Weeks 11-12	On-going

For those patients with a hemodialysis catheter who are planning for an AVG

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Develop access plan	Refer for vessel mapping	Coordinate surgeon appointment	Access surgery and F/U	AVG healing and readiness	Cannulation protocol	Catheter freedom	Access monitoring
Week 1	Weeks 2-3	Weeks 4-5	Weeks 6-9	Weeks 10-11	Week 12	Week 13	On-going

For those patients with a hemodialysis catheter who have a healing AVG

Step 5	Step 6	Step 7	Step 8
AVG healing and readiness	Cannulation protocol	Catheter freedom	Access monitoring
Weeks 1-2	Week 3	Week 4	On-going

Notes

[illegible]

***The ESRD National Coordinating Center and the
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