

Access Your Blood



Disclaimer

NxStage® has prepared this document as a supplement to existing labeling and training materials. It is not intended to replace the NxStage System One™, VersiHD™, or PureFlow™ SL user guides or the cartridge instructions for use. Patients, care partners, and providers must review and refer to the applicable user guides and cartridge instructions for use for all Instructions, warnings, and precautions.

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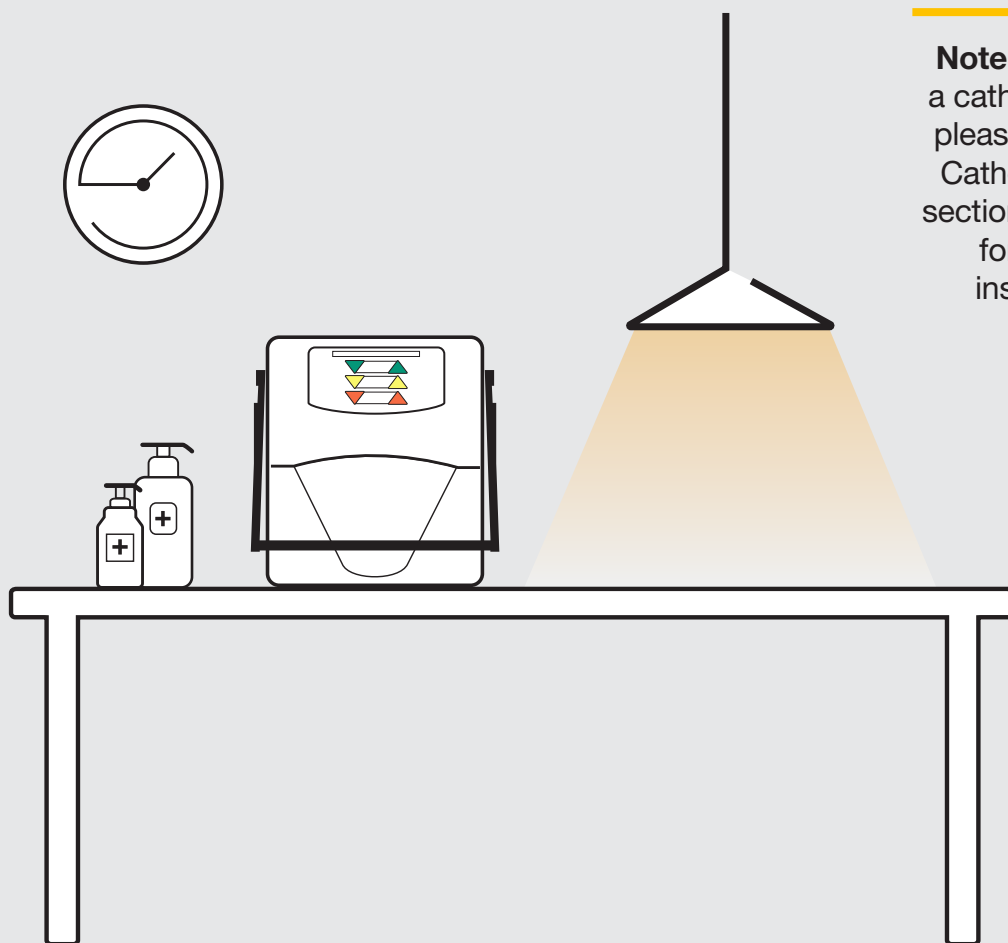
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Introduction

The ability to successfully access your blood is critical to effective home hemodialysis. Home hemodialysis treatments work best if you keep yourself and your environment calm.

Make sure you:

- Use aseptic technique and universal precautions.
- Keep your treatment area clean and free of clutter.
- Remove pets from the area.
- Use good lighting.
- Have your glasses on if you need them.



Note: If you have a catheter access, please turn to the Catheter Access section on page 15 for specific instructions.

Prepare the Access Site

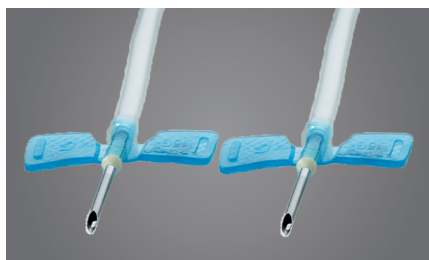


Latex gloves

1

Gather Supplies.

Wash hands and gather supplies.



Two fistula needles (sharps or blunt ButtonHole® needles)



Two 10 ml syringes



Disinfecting agent (Hibiclens®, Chloraprep™, Betadine®, ExSept Plus®, or alcohol)



Antibacterial soap or gel



Paper towels



Steripick™ (buttonhole only)



2x2 gauze pads, adhesive bandages, or vascular access leak device disposable



Medical tape (Micropore® or plastic)



Tourniquet (fistula only)

2 Evaluate your access site.

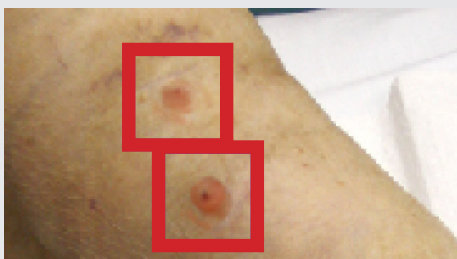
Before cannulating, it is important to evaluate the health of your access.



To do this, use the Look, Listen, and Feel technique.

- **Look** for an absence of bruises, redness, draining, or swelling.
- **Listen** for the bruit.
- **Feel** for the pulse and thrill.

◀ This healthy access shows no signs of infection. **Remember, you can always call the center with concerns about your access.**



Redness at the access sites

LOOK for signs of infection



- Swelling
- Color changes
- Elevated temperature at the access
- Redness
- Bruising
- Hematoma
- Rash
- Breaks in the skin
- Bleeding or drainage
- Aneurysm

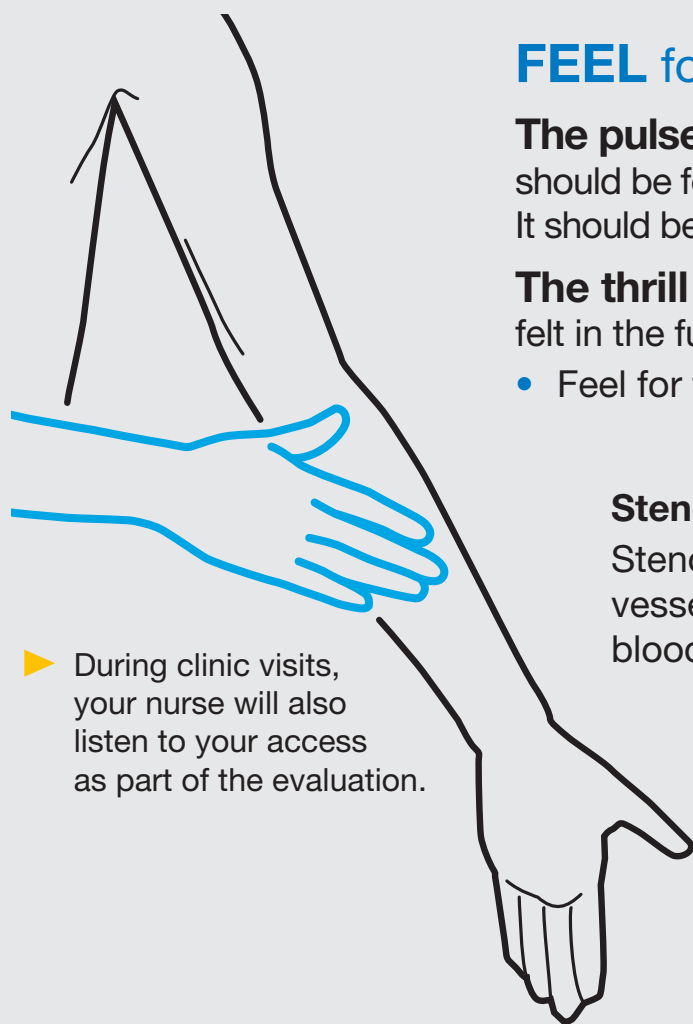
In addition, note any movement limitations or changes in function.



LISTEN for the bruit

A bruit (pronounced broo-ee) is an important sound and indicator of how well your dialysis fistula is functioning.

- Listen with a stethoscope or place your ear to your access.
- Your bruit should be low pitched, continuous, and sound like rumbling or whooshing.



FEEL for the pulse and thrill

The pulse (a slight beating like a heartbeat) should be felt throughout the outflow vessel. It should be easy to compress.

The thrill (a vibration or buzz) should be felt in the full length of the access.

- Feel for tenderness and pain.

Stenosis

Stenosis is a narrowing of the blood vessels and can slow the flow of blood through your access.

Signs of stenosis include:

- Thrill at the stenotic lesion.
- A bounding, forceful pulse with a rapid upstroke and descent.
- A high-pitched continuous bruit.

▶ During clinic visits, your nurse will also listen to your access as part of the evaluation.

3 Choose insertion sites (graft or non-buttonhole fistula only).

- Avoid recently used sites.
- Use the rope-ladder technique (rotating sites).

Note: If you are using lidocaine with prilocaine cream, apply it now.



4 Wash your access.

- Use antibacterial soap.
- Wash the access area for least 20 seconds (hum the “Happy Birthday” song 2 or more times).
- Dry well with paper towels.



5 Disinfect site(s).

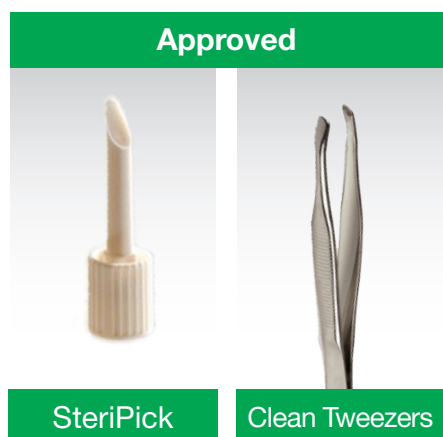
- Put on gloves.
- Use an approved disinfecting agent. Use a different swab or pad to disinfect each site.
- Allow site(s) to dry. Do not blow on the area to aid in drying.

Note: Do not touch the access area once it has been cleaned.

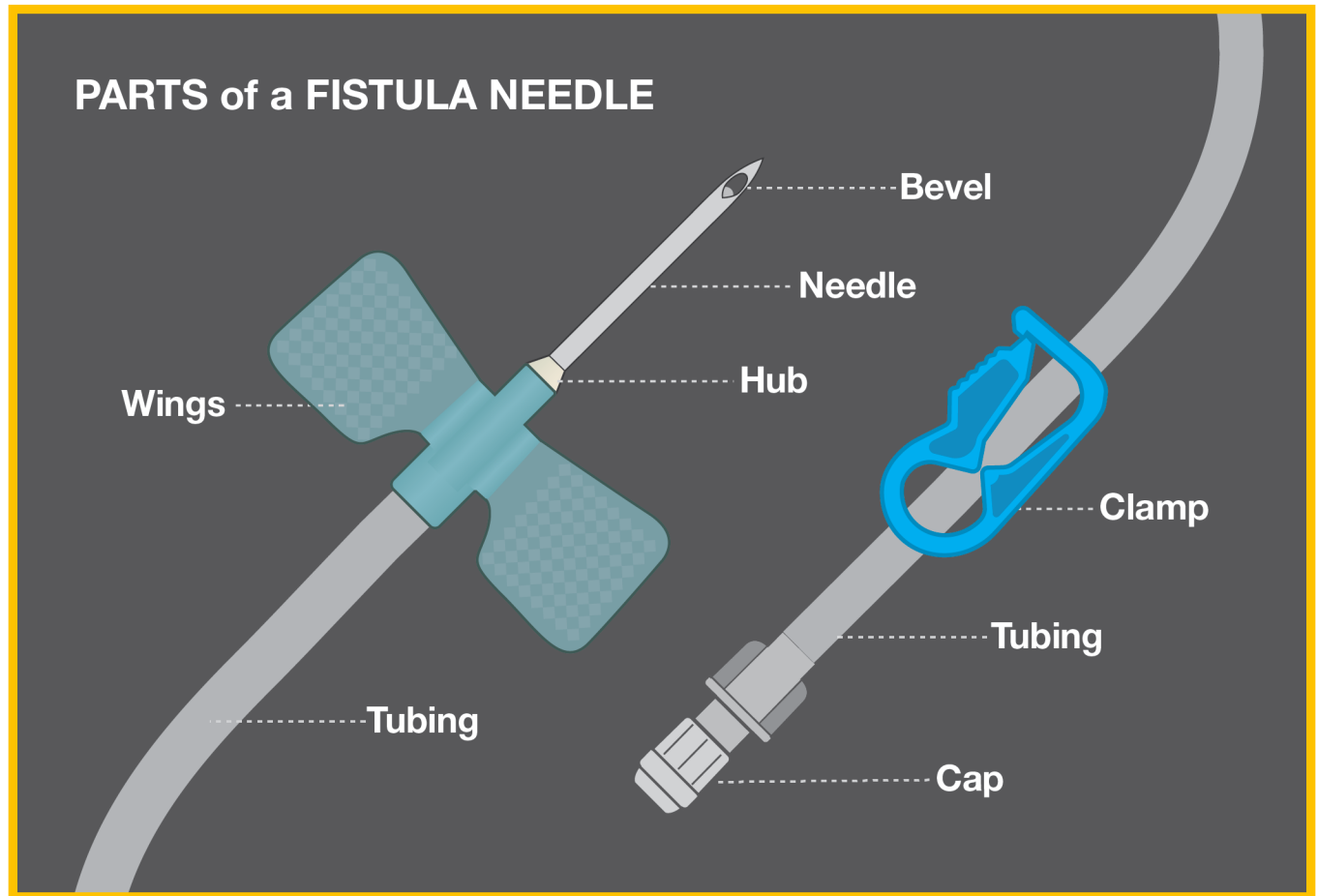


6 Remove scabs (buttonhole only).

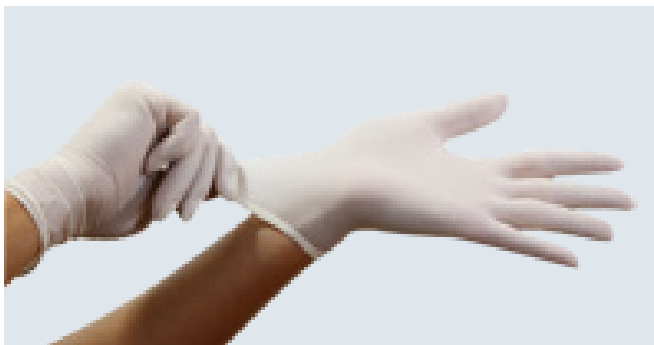
- Look for the loosened area; lift gently with gauze or SteriPick. If you have a buttonhole fistula, you should also try to loosen scabs as you wash the access sites. Gently scrub with clean gauze or a clean paper towel, then gently stretch the skin around the scab to loosen the edges.
- Or, remove the scab using an approved scab removal device (see below for approved and unapproved devices and follow your center's instructions).
- Disinfect both sites again following the instructions above.



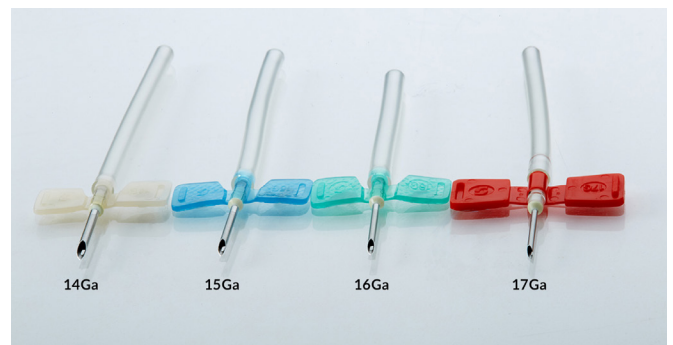
Access Your Blood: AVF and Graft



Before you begin:



Remember to put on clean gloves before inserting needles. Always follow proper aseptic technique.



Verify needle is the correct:

- Type
- Length
- Gauge

1 Prepare to insert the arterial and venous needles.

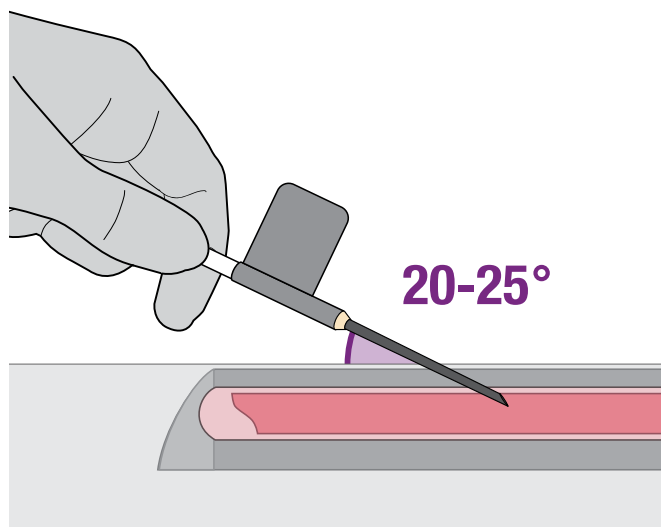


- Place the tourniquet above the selected puncture sites.
- For solo HHD patients, a 'quick release buckle type of tourniquet is helpful (see supply list on page 4).
- The tourniquet should be tight enough to enlarge the vessel, but not so tight it blocks blood flow.



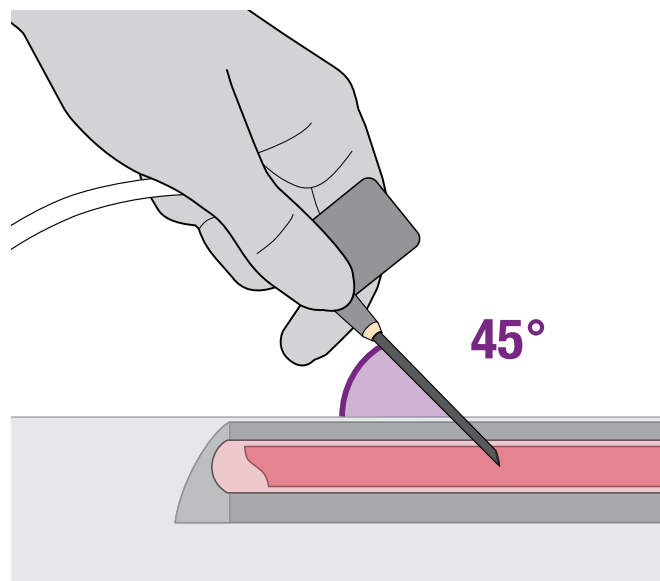
- Pull skin tight in the opposite direction of how the needle will be inserted.

2 Insert the arterial and venous needles at the proper angle based on your access.



Buttonhole and Non-buttonhole fistulas

Grasping the wings, insert the arterial needle into the established buttonhole track at **20-25 degrees**. Buttonhole cannulators can grasp either the wings or just behind the wings (for touch cannulation).



Graft

Grasping the wings, insert the arterial needle into the arterial portion of the graft at **45 degrees**.

Note: The degree of entry depends on where your access is located, what type of access you have, and who is doing the cannulation. Care partners may use a slightly different approach to the access than patients who cannulate themselves.



- Watch for blood flashback within the tubing.

Note:
See **Managing Complications**
(page 21) for tips on
what to do if you do
not observe a
flashback.



- Stabilize vessel with thumb and index finger.

- Lower the angle of insertion. (There is no strict guideline for this; you will get a feel for it as you gain experience.)
- Advance the needle using a smooth, continuous motion.
- Release the tourniquet (fistula only).
- Insert the venous needle following the same procedure.

3 Tape the arterial and venous needle.

Cover the puncture site with one of the following:

- an adhesive bandage,
- a 2x2 gauze pad folded into a square, or
- a vascular access leak detector disposable

Note: Be careful not to flatten the needle to the skin surface.

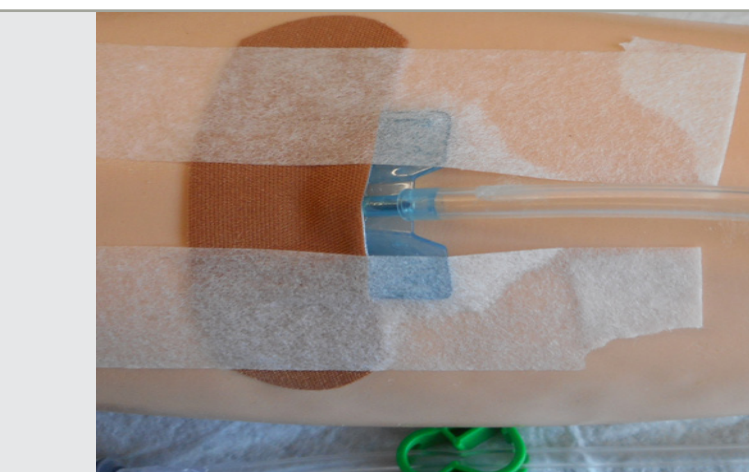
- Place one short piece of tape length-wise across each of the two wings on the arterial needle.

- Place a long piece of tape over the tubing just below the wings.
- Lightly pinch the tape together around and under the tubing.
- Secure the tape to the skin.
- Smooth out the remaining tape on each side of the tubing across the skin.
- Before adding more tape, check the needle placement by pulling back and forth on the syringe 2-3 times. If there is any resistance, you may need to adjust the needle.
- Tape the venous needle following the same procedure.

Standard Cannulation



Vascular Access Leak Detector Disposable



4 Secure the arterial and venous needles.

- Place another piece of tape across the wings of the arterial needle.



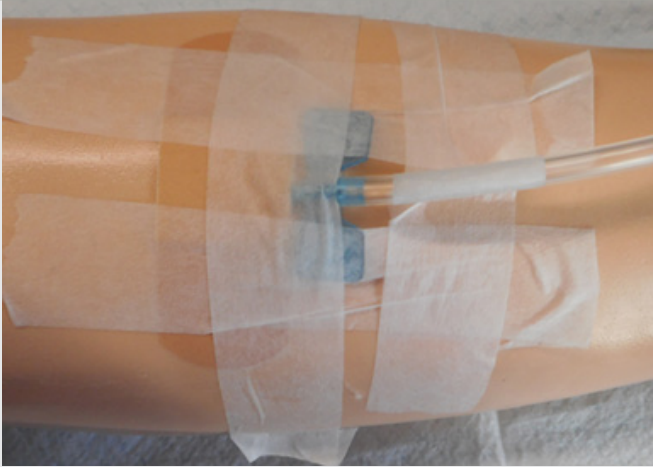
- If desired, loop the patient blood lines. Place another longer piece of tape over both the needle tubing and this loop.



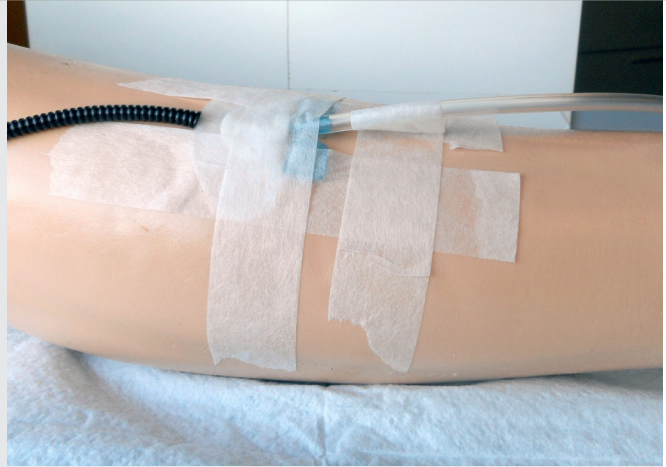
- Additionally, you can cover the entire needle area with a material that **allows you to clearly see the access and needles.** A length of nylon stocking with the foot section cut off works well.

- Secure the venous needle following the same procedure.

Standard Cannulation



Vascular Access Leak Detector Disposable



5 Verify flow in the arterial and venous accesses.



Don't waste your blood.
Be sure to push the blood back
into your access.

- Allow the blood to flow back to the end of the tubing by loosening the cap, then clamp when the blood reaches the end of the tubing length. Remove cap and place sterile syringe on the end of the tubing. Make sure no air enters your arterial line.
- Pull back and the push forward on the syringe plunger to feel how easily blood fills into the syringe. Blood should flow easily. Be sure no air is injected into the line.
- If you experience poor arterial blood flow, consult the *Needle or flow problems* section (page 21) for troubleshooting tips.
- Verify flow in the venous access following the same procedures

Note



Don't cover needles and access bloodlines during treatment.



Be sure to keep your access visible and uncovered for safety.

6 Give heparin dose as prescribed.

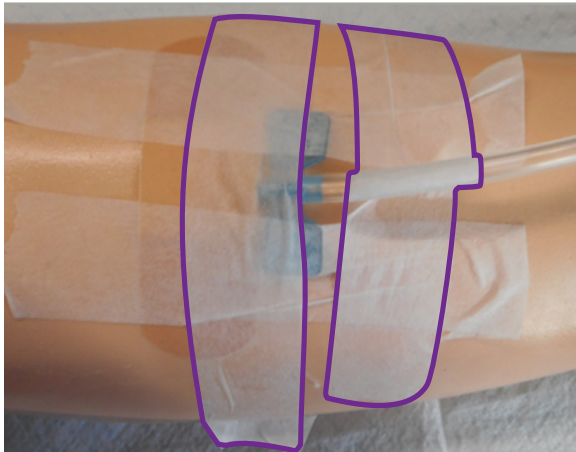
7 Connect to bloodlines following your dialysis center's instructions.

- Start treatment at 200 mL/min blood flow rate.
- Monitor access flow pressures, then increase to prescribed blood flow as directed.

Remove Fistula Needles After Treatment



- Put on a clean face mask, clean your hands with antiseptic soap/gel, and put on clean gloves.



- Carefully remove tape, beginning with the outermost pieces.



- When only the tape over each wing remains, slowly remove each piece of tape from the opposite direction that you will be pulling the needle out.

Note: Be careful when pulling tape so the needle is not accidentally dislodged.



- Place sterile gauze over the puncture site.
- Remove one needle at a time, following the angle of insertion.
- Using two fingers, apply moderate pressure to the access site. Remember, the skin and vessel are staggered; using two fingers allows you to apply pressure to both areas.
- Hold for at least 10 minutes.



- When the bleeding stops, apply antibiotic ointment (if prescribed) and a new dressing.

Note: Do not apply pressure over the needle site until the needle is completely out of the access. Apply enough pressure to stop blood flow but not so tightly you cannot feel a pulse.



- Dispose of needles in an approved sharps container.
- Repeat the process for the second needle.
- Leave the dressings in place as directed by your center. Dressings should be removed within 6-8 hours.

Managing Complications

▶ Needle or flow problems:



If during insertion a needle works its way down the track but does not go into a blood vessel (buttonhole only):

- Reassess vessel position.
- Correct the angle of insertion.
- Mate wings (as shown) to ensure bevel angle is headed toward the vessel flap.
- Check tourniquet placement.

▶ If during cannulation you do not get a flashback:

- **Buttonhole:** Hold the needle directly behind the wings and roll or slightly rotate the tubing between your thumb and index finger as you advance the needle.
- **Graft:** Mate wings and adjust bevel direction.

▶ If you experience poor arterial blood flow during treatment:

- Push **STOP** on the Cycler, then reposition the needle.
- Check that your blood pressure is not low.
- If the above measures do not work, consult your dialysis center for further instructions.

▶ Report any problems with blood flow, access pressure, or air alarms to your dialysis center.

Caring for Your Access

ALWAYS PROTECT YOUR ACCESS

It is your “lifeline”

- Avoid wearing anything tight on your access arm, such as tight sleeves, watches, or bracelets.
- Avoid sleeping on your access arm.
- Never allow a blood pressure cuff to be placed on the access arm.
- Do not allow an inexperienced person to draw blood from an access.



Changes could be caused by:

- **Infection:** Signs and symptoms include redness, swelling, elevated temperature, drainage, or pain upon touch or pressure.
- **Infiltration:** Signs include swelling near the needle tip, pain, and bruising.
- **Bleeding:** This is problematic if you are bleeding from the needle sites during treatment, or bleeding longer than normal after needles have been removed.
- **Aneurysm:** When aneurysm occurs, the access vessel enlarges, appears bumpy and may look “shiny” as it comes to the surface skin level.

Immediately
report any changes
to the look and feel
of your access or
access arm to your
dialysis center.

Access Pressure

Note: During treatment, you will view and monitor your pressures on the Cyclor status bar. Follow your dialysis center's instructions to correct pressures outside your expected range.

Arterial Access Pressure:

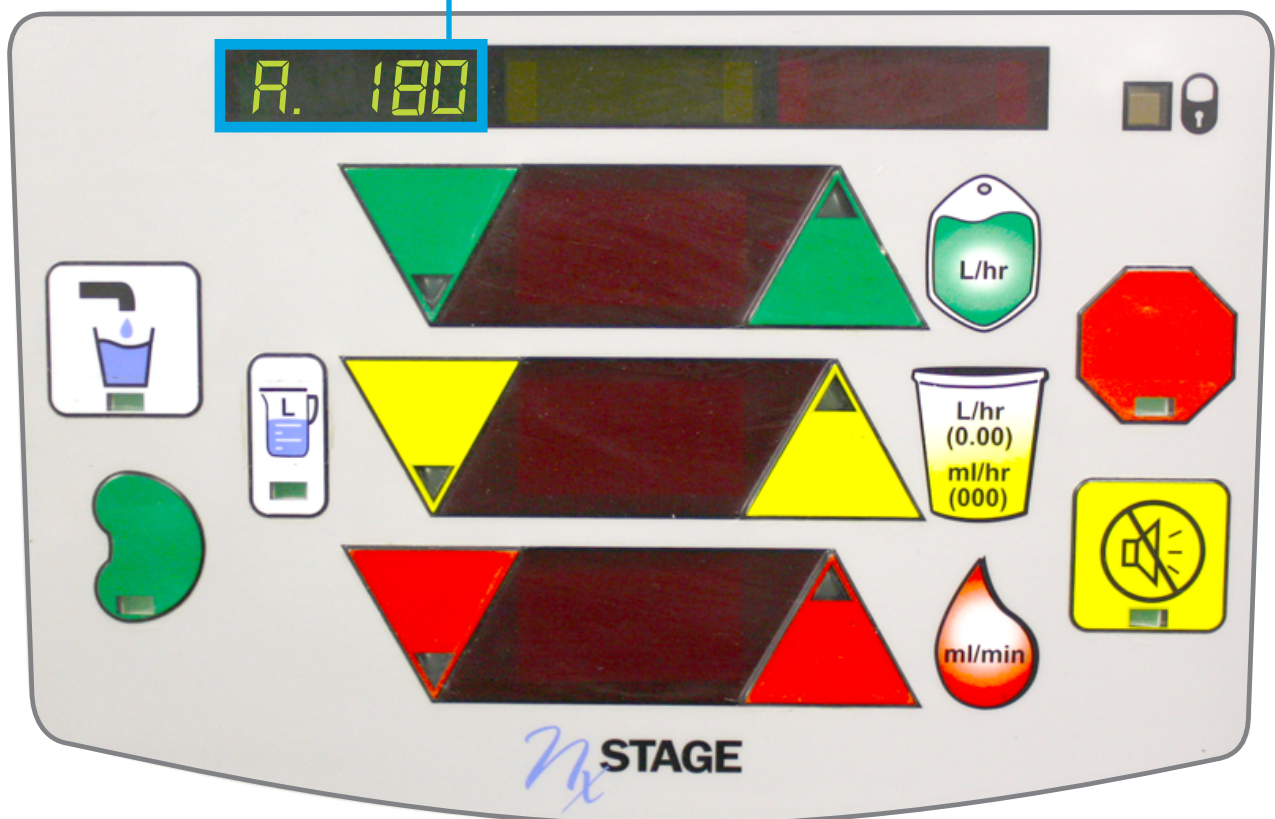
The pressure needed to “pull” blood out of your access.

- This is a negative pressure because your blood vessel resists the pull. The cyclor displays arterial access pressure without a negative sign.

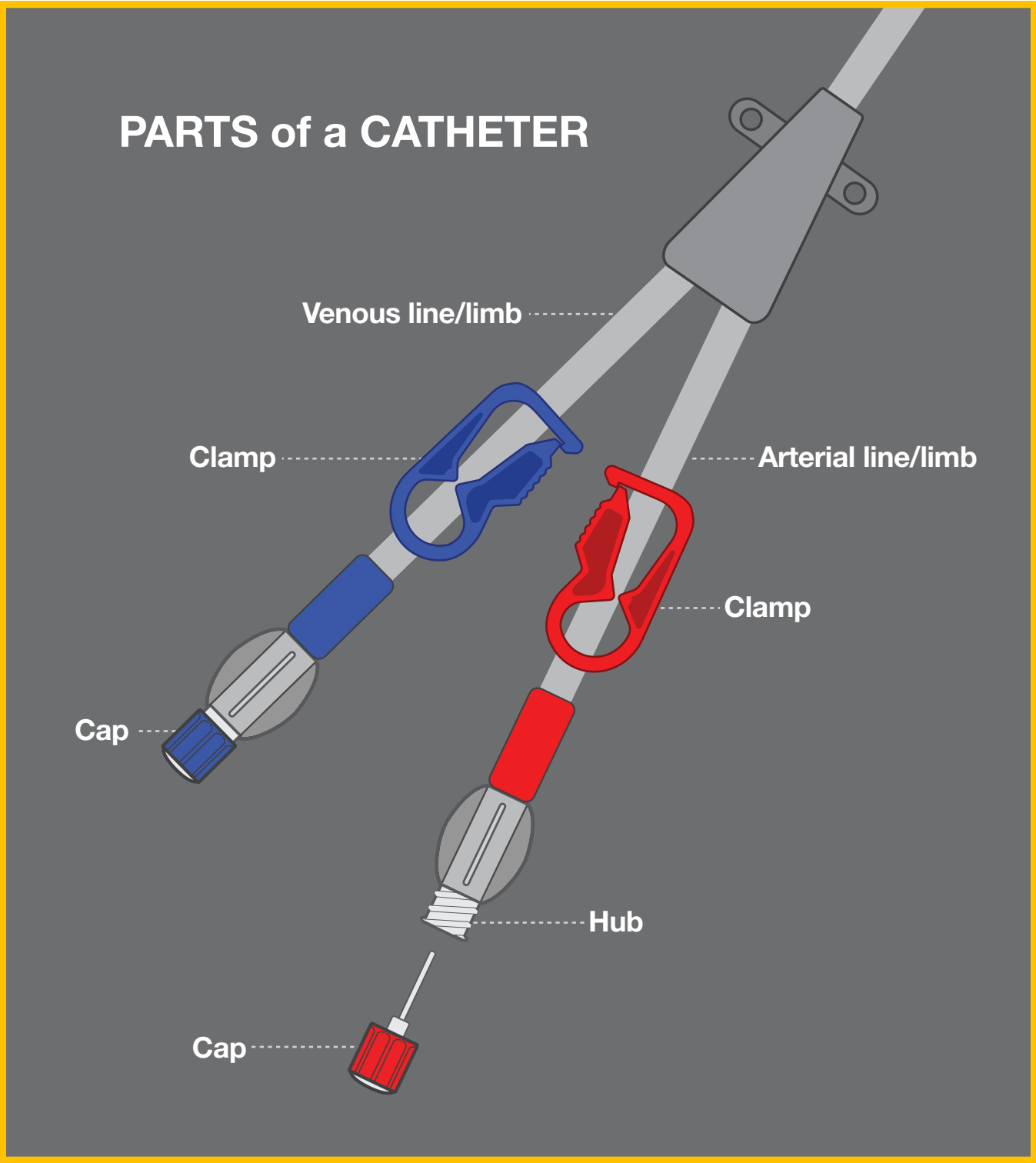
Venous Access Pressure:

The pressure needed to “push” blood back into your access.

- This is a positive pressure because the blood is being pushed back into your access.



Catheter Access





1 Wash hands and gather supplies according to your dialysis center's instructions.

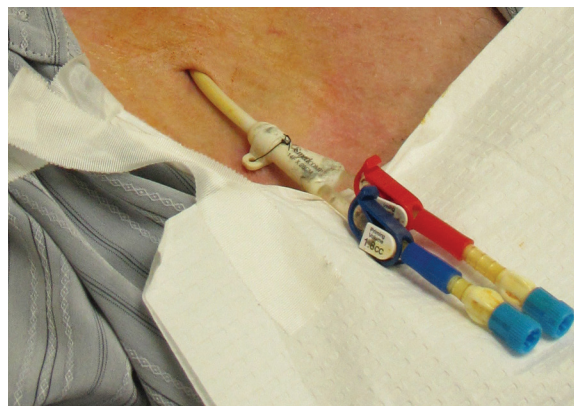


Note: Remember to always use aseptic technique and personal protective equipment (PPE).



2 Evaluate your access site and report any unusual appearance to your dialysis center.

- Look for signs and symptoms of infection at the exit site and any evidence of drainage on the dressing when removed.
- Ensure that the catheter is free of holes or cracks.
- Verify that the catheter “cuff” is not visible. A visible “cuff” indicates that the catheter has changed positions.



Note: NEVER push a catheter back into the tissue.

3 Follow your dialysis center's instructions for cleaning the catheter exit site.

- This can be done before, during, or after treatment.
- Use strict antiseptic technique, with everyone in the room wearing masks.
- Clean the exit site with an approved disinfecting agent.
- Clean twice, starting at the exit site and working outward in a circular motion. A diameter of 10 cm (4 inches) is appropriate.
- Let dry before applying dressing.



4 Apply a new dressing over the site.



5 Access your catheter: Prepare to connect to bloodlines following your center's instructions.

- Clean the catheter hub or connection with an approved disinfecting agent.
- Using strict aseptic technique, open the catheter. Make sure both catheter lines are closed, then connect a sterile 10 cc syringe.
- Withdraw locking solution and discard.
- Flush both catheter lines with saline. Be sure to assess for ease of flow.

Note: Connect securely but do not over-tighten.

6 Securely connect to bloodlines following your center's instructions.

- Start treatment at 200 mL/min blood flow rate.
- Monitor access flow pressures, then increase to prescribed blood flow as directed.

Note: Report any problems with blood flow or alarms during your treatment.

7 Maintain visibility of access and connections at all times.

8 After treatment: disconnect bloodlines, following your center's instructions.

- Use strict aseptic technique, with everyone in the room wearing masks.
- Clean the connections.
- Flush both catheter lines with saline.
- Fill catheter lines with heparin; follow your center's instructions for the procedure and the amount of heparin to according to the type of catheter you have.
- Verify with your care partner that both catheter line clamps are securely closed and caps tightly connected.
- Secure the catheter lines to your skin as directed.

notes

[illegible]

Access My Blood: My Info

Anesthetic type: _____

Disinfecting agent type: _____

Needles: Type: _____

Gauge: _____

Length: _____

Catheter: Type: _____

Lumen: _____

Additional supplies I need: _____

**Know your access pressures
& your dialysis center's maximum access pressures:**

Arterial Pressure

Average: _____

Venous Pressure

Average: _____

Do not exceed: _____

Do not exceed: _____

Glossary

Access pressure: Refers to both arterial and venous pressure readings. Force applied in a direction against resistance.

Aneurysm: An abnormal blood-filled dilation of a blood vessel caused by a weakening of the vessel wall.

Arterial: The segment of the vascular access from which the blood is pulled.

Bevel: The pointed slanted end of the needle that is inserted into the access.

ButtonHole needle: A fistula needle that is used only for cannulating established buttonhole tracks. It is less sharp and has a duller, noncutting edge.

Catheter: A soft tube device that is inserted into a large vein in the neck, chest, or leg to provide vascular access for dialysis.

Exit site: The location on the skin where the catheter exits through the skin surface.

Fistula: A surgically created connection between an artery and a nearby vein designed to create a bigger blood vessel that will allow needle cannulation and high blood flow for dialysis.

Fistula needle: A stainless steel needle that allows arterial and venous access for hemodialysis.

Flashback: When blood visibly pulses back into the needle line during cannulation.

Graft: A surgically implanted soft tube that joins an artery and a vein under a patient's skin to create a permanent vascular access for dialysis.

Lumen: The interior space within a vessel or tube, can be single or double lumened.

Needle hub: The part of the fistula needle that is at the end of the steel portion of the needle. The needle is inserted up to this point.

Rope ladder technique: A method of rotating cannulation sites so that the puncture sites resemble a ladder. The puncture sites are about ½ inch above or below the previously used site.

Scab: A crust of dried blood or serum that forms over a wound during healing. Scabs must be removed from buttonhole puncture sites before every cannulation.

Sharp needle: A fistula needle that has sharp cutting edges to be used for cannulating fistulas and grafts.

Sharps: Any dialysis supply that has a sharp edge or point.

SteriPick: A sterile, single-use tool that is supplied on the end of the Medisystems ButtonHole needle for use in scab removal.

Tourniquet: A length of tubing that is tied around the access arm to enlarge the vessel for cannulating a fistula.

Tunnel track: The scar formation pathway that occurs after repeated single-site insertion of a needle into a fistula.

Vascular access: The site at which blood is drawn from the body for circulation through a blood tubing set and filter.

Venous: The segment of the vascular access that the blood is returned into after cleaning.

Vessel flap: The cover that lifts open into the blood vessel as the buttonhole needle goes down the track and allows entry into the blood vessel.

Wings: The part of the fistula needle that extends out on each side of the needle. The wings may be used to grasp the needle for insertion.

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