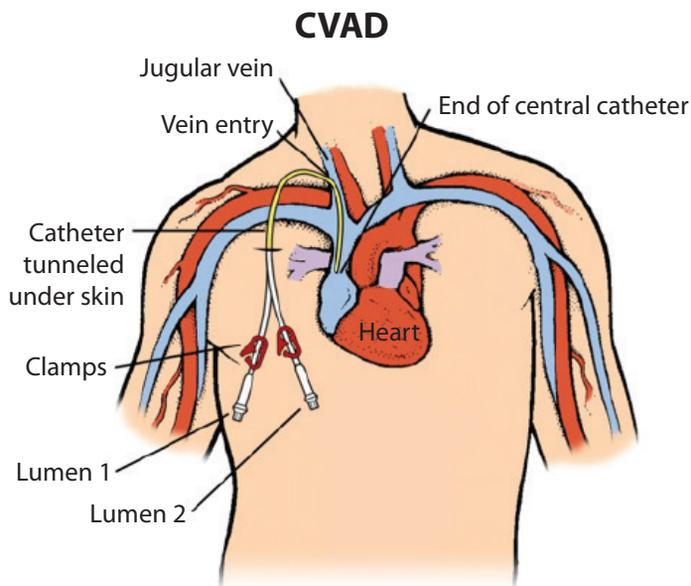


# What Is a Central Venous Access Device (CVAD)?

A central line, also known as a central venous access device (CVAD), is a thin, soft, flexible tube. This long tube, also called a catheter, is placed in a vein that leads to your heart. The other end of the CVAD catheter either exits near the surface of the skin or sits directly underneath the skin.

The CVAD contains a single or multiple channels. These channels are called lumens. Depending on your medical condition, your care team will determine how many lumens are needed for your CVAD.



## Who Needs a Central Venous Access Device (CVAD)?

Your doctor may suggest a central venous access device (CVAD) if a medical condition requires:

- ▶ Chemotherapy medication as part of your cancer treatment
- ▶ Long-term medications, such as antibiotics
- ▶ Frequent blood transfusions
- ▶ Hemodialysis
- ▶ Parenteral nutrition (PN) or total parenteral nutrition (TPN): nutrition given through a vein
- ▶ Frequent blood tests

CVADs are used for long-term delivery of medication, nutrition, and fluids. A CVAD can stay in anywhere from a few months to years. Most are threaded under the skin, and the delivery tip is in a central vein far from the skin insertion site. This helps decrease the risk of infection and protects it from minor bumps and tugs. Since the vein is large, medicine and fluids given through a central line typically do not irritate the vein lining.

While peripheral IV catheters are commonly used for most hospitalized patients, peripheral veins are smaller, lie close to the surface of the skin, and can easily be bumped or dislodged. Medicines can also irritate the lining of a peripheral vein. Peripheral IV catheters are best for short-term use.



# Central Venous Access Device (CVAD)

## Understanding Your Circulatory System

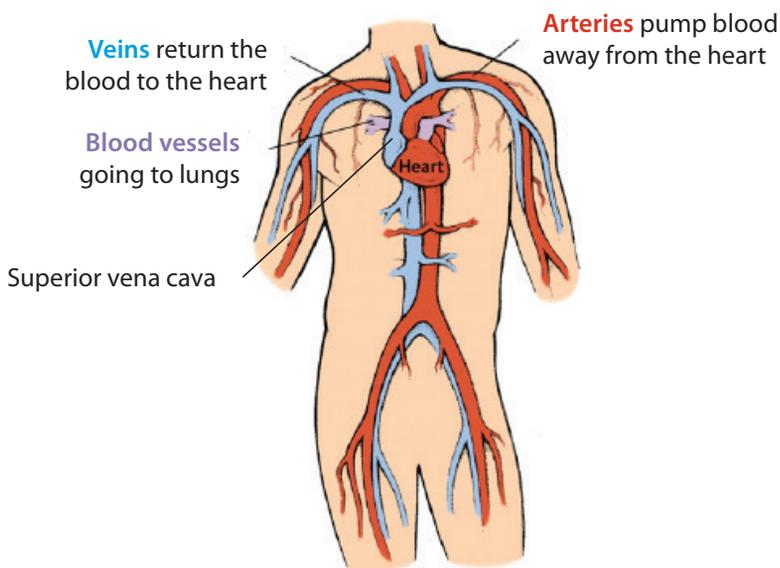
Since a central line goes into your vein and is placed near your heart, it's helpful to have an understanding about your veins and how your circulation works.

The movement of blood through the heart and around the body is called **circulation**. Your circulatory system is made up of your heart and blood vessels.

The heart pumps blood through tubes called **blood vessels**. There are two main types of blood vessels: **arteries** and **veins**. Arteries carry blood away from the heart and deliver oxygen and nutrients to all of the cells. Veins return the blood to your heart to be pumped through your circulatory system again.

A CVAD is a longer catheter with a tip that ends in a larger vein near the heart, usually the superior vena cava.

### Circulatory System



## Common Types of CVADs

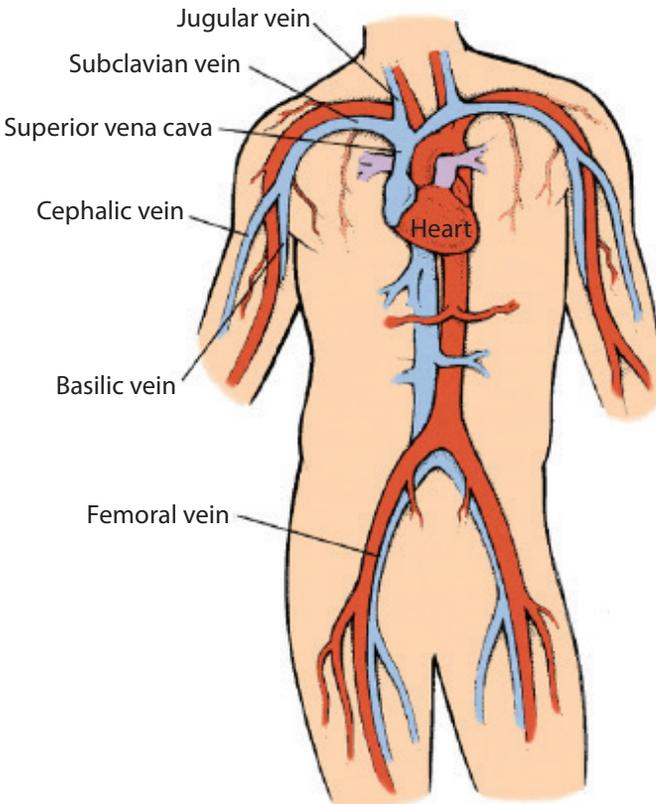
There are 3 common types of CVADs for home use:

1. Peripherally inserted central catheter (PICC)
2. Tunneled catheters (Broviac®, Hickman®, Leonard®, Groshong®)
3. Implanted ports (Port-a-Cath®)

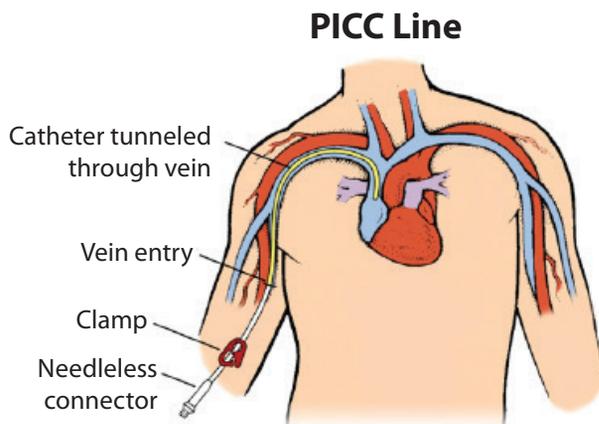
A hemodialysis catheter is another type of CVAD used only for patients receiving treatment for renal failure. It is used for dialysis access. See page 9 for more information.

The size, location of the vein, and type of CVAD will depend on the specific reason you need the line.

Let's briefly review each catheter type. This will help you understand the care involved and will help you talk with your doctor about what might work best for you or your family member.



## PERIPHERALLY INSERTED CENTRAL CATHETERS (PICC)



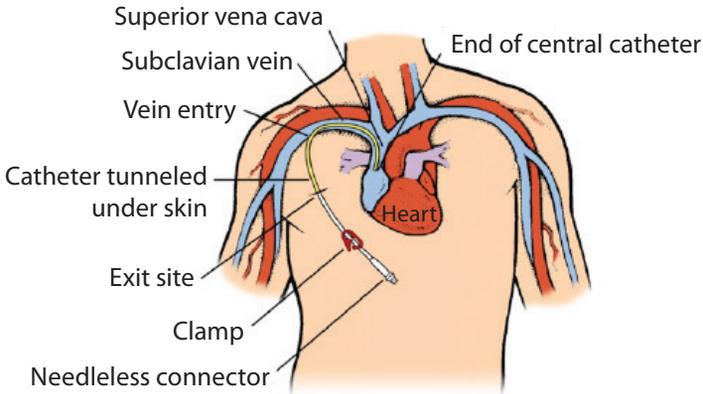
A peripherally inserted central catheter (PICC) is placed through a puncture into the vein. Typically, it is inserted into a vein in the arm. In infants, a leg vein may be used. The PICC is advanced through larger veins toward the heart. The tip sits near the entry of the heart or the superior vena cava. The line can have one or more lumens that sit outside the body. PICC lines can be left in for months, and most people find them comfortable.

The care of a PICC includes the following:

- ▶ Taking care of the tubing that lies outside your body.
- ▶ The entry site has to be covered at all times with a sterile dressing.
- ▶ The sterile dressing and needleless connector need to be changed at least every 7 days.
- ▶ The tubing has to be flushed regularly, sometimes daily.
- ▶ The entry site should not get wet—you must cover it during showering and bathing.
- ▶ The PICC can slip out, so you have to check it daily to make sure the tubing is secure and the length of the tubing has not changed.

## TUNNELED CATHETERS (BROVIAC, HICKMAN, LEONARD, GROSHONG)

### Tunneled CVAD Catheter



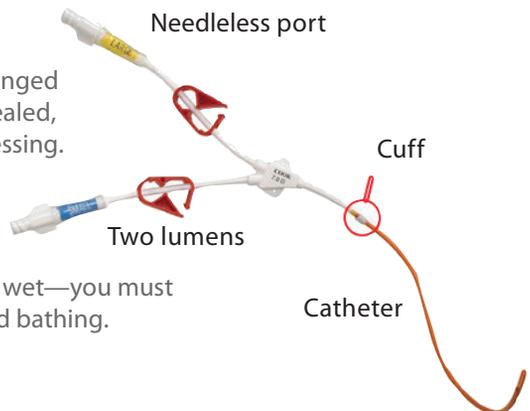
For a skin-tunneled catheter, a small cut is made on the chest, usually near the collarbone. The tip of the catheter is advanced into a large vein leading to the heart. The other end of the catheter is threaded under the skin and brought out through a small cut on the chest. Most catheters will contain a cuff that lies under the skin at the entry site. After placement, there will be a dressing over the insertion site. A tunneled catheter can be left in place for years with proper care.

The care involved with a tunneled catheter includes:

- ▶ The tubing lies outside the body on the chest.
- ▶ The cuff helps secure the catheter, so it rarely slips out.
- ▶ The sterile dressing and needleless connector are changed at least every 7 days. Once healed, catheters may not need a dressing.
- ▶ The tube has to be flushed regularly, sometimes daily.
- ▶ The entry site should not get wet—you must cover it during showering and bathing.

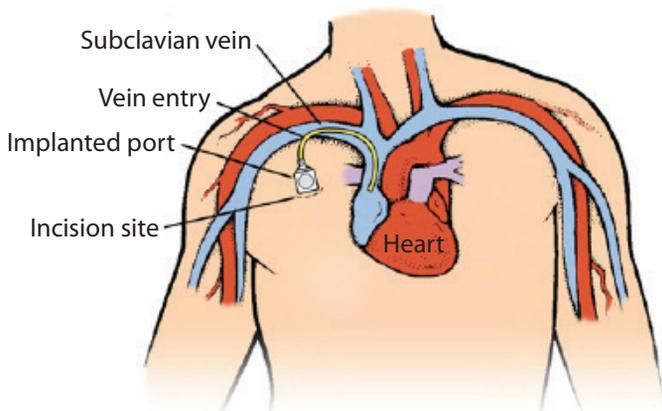


Broviac CVAD with dressing and tubing looped up and secured to chest

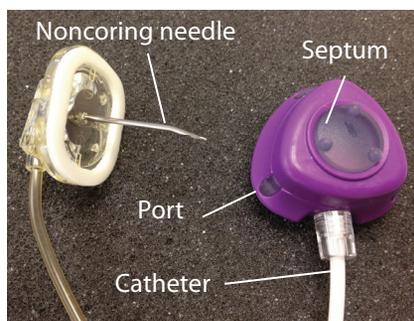
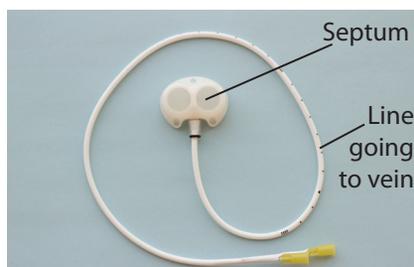


## IMPLANTED PORTS

### Implanted Port (Port-a-Cath)



An implanted port has an entry port that is a plastic or metal drum and a catheter that extends toward the heart. The port is surgically placed under the skin in the upper arm or chest wall. The catheter is in a large vein with the tip ending right outside the heart. The middle of the port has a soft, rubbery section where a needle can be inserted called the septum. Ports can have one or two septums. When your port is inserted, you will have stitches or a bandage over the site. Ports can stay in place for several years.



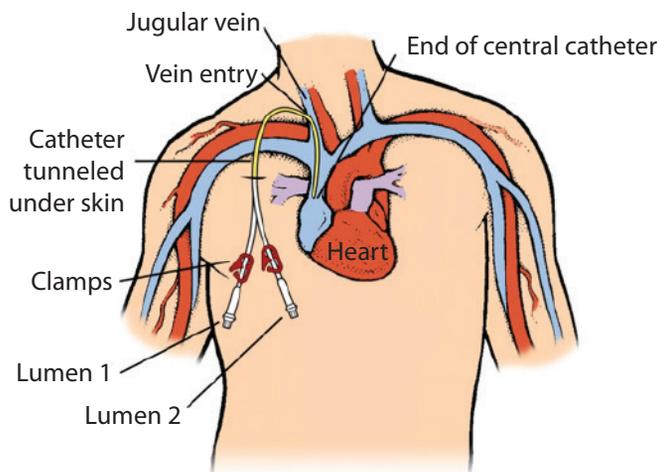
The care involved with a port includes the following:

- ▶ There may be discomfort at the port site or shoulder after insertion, which could last for several weeks. You will need to work with your surgical team to plan the best location for the port. Backpack use, bra lines, seat belt use, and port access should all be discussed.
- ▶ When not used, the port is completely under the skin, and only a small bulge is visible.
- ▶ A special angled needle has to be inserted through the skin to give medication or fluids. Numbing medication may be placed over the port site before the needle is inserted.
- ▶ When the needle is in place, a sterile dressing covers the port site.
- ▶ There are fewer activity restrictions with a port.
- ▶ You may swim or shower without protection when the port is disconnected from a needle and tubing.



Chest with noncoring needle inserted into the port and covered with a sterile dressing

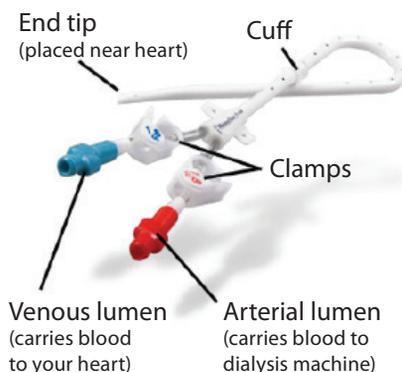
## HEMODIALYSIS CVAD



A CVAD can be used temporarily for dialysis access. A common site for a hemodialysis CVAD is the internal jugular vein, located on the side of your neck. The catheter has two lumens that are used at the same time. One allows blood to flow out of the body to be cleaned during hemodialysis, and the other allows clean blood to return to the body. A CVAD is used for short-term hemodialysis or while your permanent site is healing.

The care for a CVAD used for hemodialysis includes the following:

- ▶ Tubing sits outside the body, usually on the right side of your neck.
- ▶ Sterile dressings cover the site and are changed every 2 days if gauze is used and every 7 days for transparent dressings. Dressing changes are usually done during dialysis.
- ▶ Regular changing of the needleless connectors and flushing of the tubing are required.
- ▶ The entry site should not get wet—you must cover it during showering and bathing.



## CVAD Insertion

CVAD insertion will be different depending on the type of catheter and location.

No matter the type of catheter you are receiving, you can expect your care team will obtain consent and review the reason for the procedure. An ultrasound test may be done to help find the largest and healthiest vein.

A surgical safety check will be done to confirm the correct identification site and procedure.

Infection prevention procedures will be used:

- ▶ Your skin will be scrubbed with an antiseptic solution, and sterile cloths will be placed around the insertion site.
- ▶ All team members will wear sterile gowns, gloves, masks, and hats.

During the procedure, your medical team will make sure that you are comfortable. Numbing medication may be used around the placement site, and medicine may be given to help you sleep or relax.




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## AFTER THE PROCEDURE

The CVAD may be secured to your skin with a special holder, stitches, or glue. The CVAD or port site will be covered with a sterile dressing. An X-ray may be done to make sure the CVAD is in the correct location.



# Skills Training: CVAD Equipment

Now that we've reviewed the different types of central line catheters, let's discuss some of the specific parts and equipment you'll be using.

## Soap or Hand Sanitizer

If you use a hand sanitizer, be sure it is alcohol based. A hand sanitizer is only effective if it contains **at least 60% alcohol**. The alcohol evaporates within seconds as it dries.

## Gloves

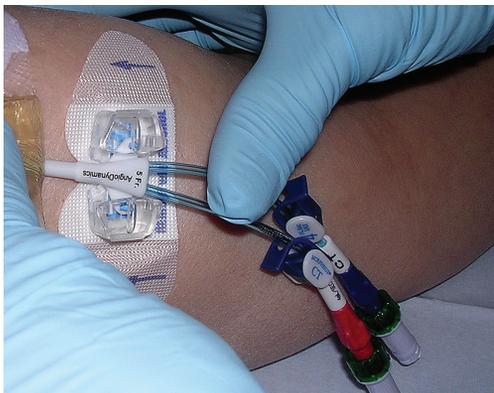
Use clean gloves each time you handle the needleless connector. You will use sterile gloves when doing dressing changes.

## Face Mask

A face mask is worn when doing specific tasks, such as changing the CVAD dressing.

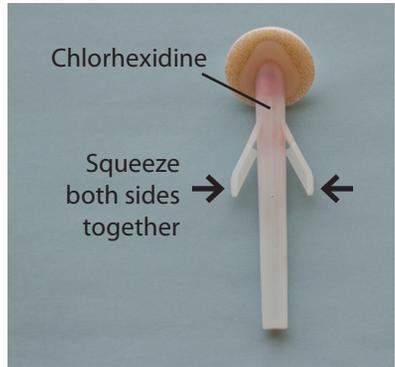
## Catheter Lumen and Needleless Connector

Your CVAD or access port can have one or more lumens or tubing. You may hear your CVAD referred to as a single lumen, double lumen, or triple lumen. Each lumen is covered by a needleless connector. The connector helps keep bacteria from entering the lumen. The lumen tubing will have a clamp that should be closed when fluid is not going through it.



## Antiseptic (Germ-Removing) Cleaning Solutions

An antiseptic wipe is used to clean the needleless connector during dressing changes. An alcohol wipe is routinely used to clean the needleless connector. Chlorhexidine gluconate with alcohol (CHG) is routinely used to clean directly around the CVAD insertion site during dressing changes. It is also used to clean the skin.



## Antibiotics and Fluid Bags

Some antibiotics are already mixed in a bag or bulb with sodium chloride or sterile water. Others come in a powder and you have to mix them right before you use them. That is because the medication is only effective for a limited time after it is mixed.



## Clamps

Clamps or clips are located directly on the CVAD tubing, usually right above the needleless connector and as part of the IV tubing. The clamp can be a clip clamp, rolling clamp, or sliding clamp.



Clip clamp



Rolling clamp



Sliding clamp

## Clamp for Emergency

You are often given an emergency clamp to use in case the tubing breaks above the clamp site.



Emergency clamp

## Dressing Change Kit

The supplies for changing a dressing are often available as kits. The kit routinely contains a mask, gloves, alcohol wipes, sterile barrier, gauze, and a transparent dressing.



Dressing change kit

## Flushing Syringes

Each syringe has a needleless tip on one end and a plunger on the other. The tip is inserted into the needleless connector, and you empty the fluid from the syringe by pushing on the plunger. The syringe is most commonly filled with sodium chloride, also called normal saline.



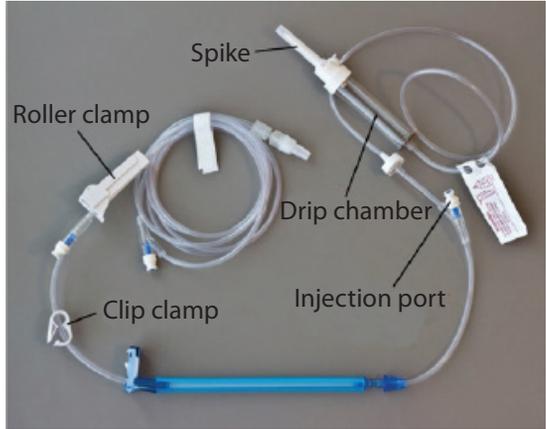
Flushing syringe

## IV (Intravenous) Fluids

Fluids are given through your CVAD through a fluid bag. Dextrose (sugar) with electrolytes or sodium chloride (saline) are common fluids.

### IV TUBING WITH SPIKE AND INSERTION END

IV tubing connects your fluid solution to your needleless connector. The tubing has 2 ends. The spike end is inserted into the bag of fluid. The other end is inserted into the needleless connector. All tubing includes a clamp that helps you control the flow of fluid. Some tubing contains a device so you can set how fast your fluid should flow.



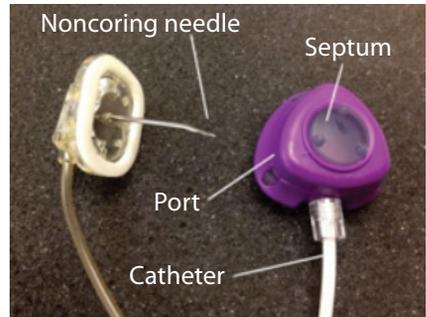
### MEDICATED/ANTIMICROBIAL SPONGE

A soft, circular medicated sponge pad (Biopatch®) may be placed around the tubing at the entry site.



### NONCORING INFUSION NEEDLE

A right-angle noncoring needle is a special needle used to access the port of an implanted catheter. Tubing is attached to each noncoring needle, and the tubing includes a clamp and a needleless connector covering the access port.



## PARENTERAL NUTRITION

Parenteral nutrition, also called PN or TPN, is liquid nutrition given when you are not able to eat by mouth or feeding tube. It is sometimes yellow in color because of the vitamins that are added. The PN is attached to IV tubing and a special filter.



## STERILE DRESSING

The access site is where the CVAD enters the body or where the angled needle enters the port. This should be covered with a sterile adhesive barrier or dressing. The barrier is water resistant and prevents bacteria from entering your site.



## SECUREMENT DEVICE

A securement device (sometimes called a StatLock®) is often used with a PICC line to hold it in place.



## IV PUMP

If the fluids are going to be given over several hours, you may be given an infusion (IV) pump. The pump allows you to program how much fluid you should be giving each hour.

## TOPICAL ANESTHETIC FOR IMPLANTED PORTS

Topical anesthetic can be placed over the port site to numb the area. The numbing agent can be a cream or given as an injection with a tiny needle. Place the cream on the skin over the port entry site with a gloved hand 15 minutes to 1 hour before entry. Place a sterile occlusive dressing on top of the cream. Injections can be given right before needle insertion.



# Flushing the CVAD Line SKILL

## Watch the Video

- ▶ Watch the DVD included in your kit or go to [facs.org/patienteducation](http://facs.org/patienteducation) to watch the video online.

## Overview

- ▶ Your PICC and tunneled catheter will have to be flushed to make sure the line stays open. How often you should flush depends on the type of catheter and the type of medications you are getting through your CVAD.
- ▶ Your CVAD should always be flushed before and after giving medications or fluids and after drawing blood. This will help prevent blood from clotting in the tube and blocking access.



Flushing the CVAD

## STEP 1: CLEAN AND PREPARE YOUR WORK AREA

1. Clean your work area—prepare a work area that is clean, clutter-free, and well lit. Minimize germs in the area—keep away pets and people with colds, and don't be in front of a blowing fan. Clean the work area with soap and water and dry with a paper towel. You can also cover the surface with a clean towel if the surface is not washable.
2. Gather your supplies:
  - Flushing syringes
  - Alcohol wipes
  - Clean gloves



Supplies

### 3. Wash your hands the right way

- Wet your hands with clean running water and apply soap.
- Rub your hands together to make a lather and scrub the backs of your hands, between your fingers, and under your nails.
- Continue rubbing your hands for at least 20 seconds. Need a timer? Hum the “Happy Birthday” song from beginning to end twice.
- Rinse your hands well under running water.
- Turn off the faucet using the back of your hand or a paper towel. Do not contaminate newly cleaned hands.
- Dry your hands using a clean towel or air-dry them.



Wash your hands the right way

#### How to use hand sanitizers as an alternative

- Apply the product to the palm of one hand.
- Rub the product over all surfaces of your hands and fingers until your hands are dry.
- Use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs.
- Hand sanitizers are not as effective when hands are visibly dirty.

## STEP 2: SCRUB THE NEEDLELESS CONNECTOR

1. Put on clean gloves.
2. Vigorously scrub for at least 15 seconds with an alcohol wipe. Use a fresh wipe for each needleless connector and for each time you access the connector.
3. Your health care team may have you scrub with chlorhexidine instead of an alcohol wipe. New data is just coming out about which solution is better at decreasing the risk of infection.



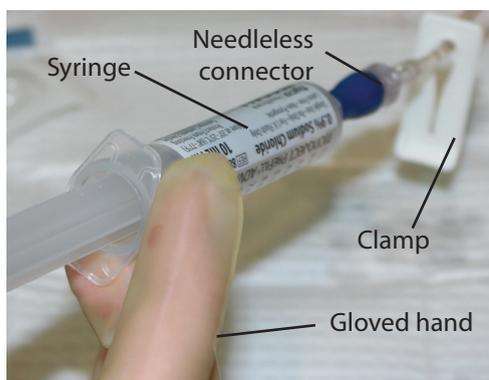
Scrub the connector

## STEP 3: PREPARE AND ATTACH THE SYRINGE

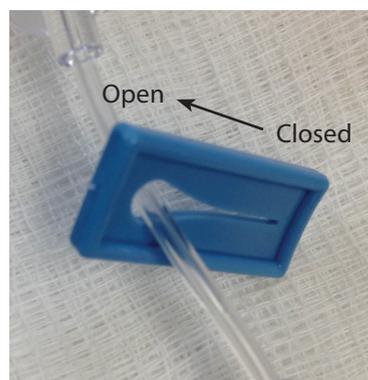
1. Prepare the syringe.
  - Uncap the syringe.
  - Hold it upright with the tip pointing to the ceiling.
  - Push out any air at the tip of the syringe.
  - Do not touch the clean tip with your fingers.
2. Attach the syringe to the needleless connector.
3. Unclamp the tubing.



Hold syringe upright



Attach the syringe and flush



Unclamp the tubing

## STEP 4: FLUSH THE LINE

1. Flush the fluids slowly. This is usually 3 mL of sodium chloride for infants and 10 mL of sodium chloride for adults.
2. Clamp the tubing.

**Stop here or continue to flush with heparin, if instructed.**

3. You will repeat these steps for each CVAD lumen. Remove your gloves and wash your hands when finished.

## Patient Alert: Use the Correct Size Syringe

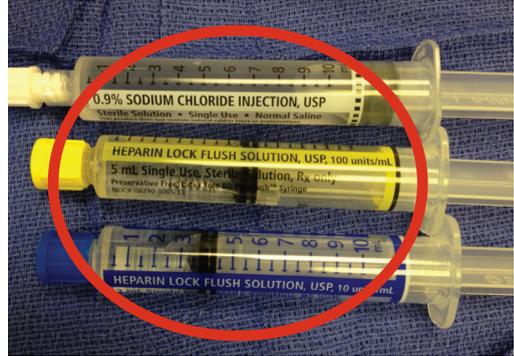
Only use 10 mL syringes when flushing or giving medications. This will prevent excess pressure on the CVAD.



10 mL syringe

## Patient Alert: Check the Heparin Dose

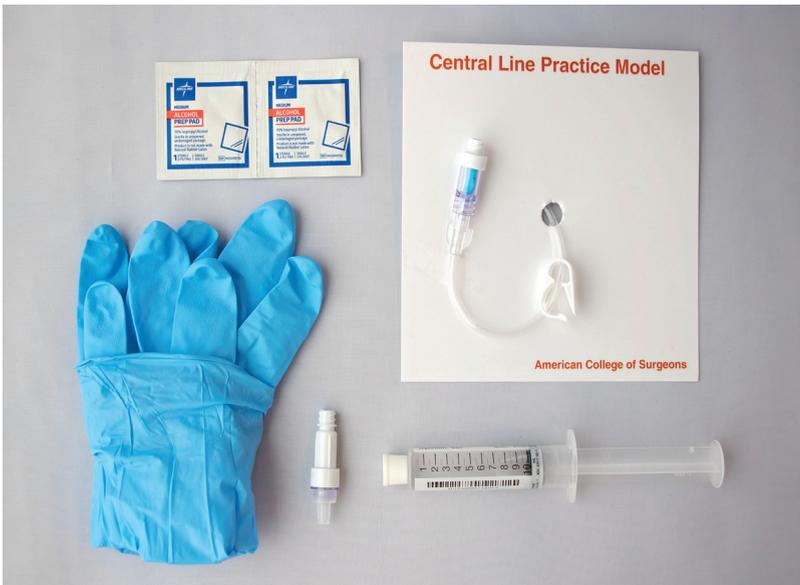
There are different forms of heparin syringes. Heparin syringes can be 10 USP units per mL and 100 USP units per mL. The 10 USP units per mL will be used for routine flushing. The 100 USP units per mL will be used when the CVAD is not being flushed frequently. Some heparin flush solutions also contain an antibiotic.



Different syringes

## To Practice

- ▶ Gather the supplies in your skill kit.
- ▶ Use the central line practice model and skills checklist to clean and flush the needleless connector.



# Administering CVAD Medication **SKILL**

## Watch the Video

- ▶ Watch the DVD included in your kit or go to [facs.org/patienteducation](https://facs.org/patienteducation) to watch the video online.

## Overview

- ▶ The two most common medications given through CVADs in the home are antibiotics and chemotherapy.
- ▶ When giving any medication through your CVAD, remember to always follow your steps and focus on cleaning the hub, double-checking that you have the correct medication and that there is no air in the line.

## Giving CVAD Medication

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### STEP 1: PREPARE YOUR AREA

1. Clean and prepare your work area (see page 17).
2. Gather your supplies:
  - Two (2) sodium chloride syringes
  - One (1) heparin syringe (not for all types)
  - Two (2) alcohol wipes
  - Clean gloves
  - Medication
  - Tubing
3. Wash your hands the right way (see page 18).

## STEP 2: MIX YOUR ANTIBIOTIC

- ▶ Some antibiotics are already mixed in a bag with normal saline.
  - ▶ Some antibiotics need to be mixed. They are effective for 24 hours or less after they are mixed. Those medications come as a powder attached to the fluids. You have to break a seal and mix them together.
1. Check the labels to be sure you are giving the right medication at the right time.
  2. Break the seal.
  3. Hold the IV fluids upright and squeeze the fluid down into the powder.
  4. Swirl the antibiotic container to be sure that the powder is totally mixed.
  5. Turn the antibiotic container so the antibiotic is on top and fluid is on the bottom.
  6. Squeeze the bag to push air into the antibiotic container.
  7. Release the bag and the negative pressure will pull the mixed antibiotic into the fluid mixture.



Break the seal



Squeeze the bag and swirl the container to mix



Flip the container upside down and squeeze the bag



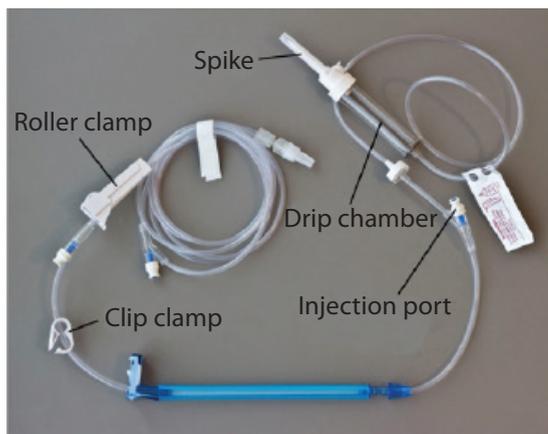
Release the bag



Check the label

## STEP 3: PRIME YOUR IV TUBING

- ▶ Priming the tubing means filling the tubing with fluid, which removes the air so that it can be safely connected to the patient. To do this, you need to attach a bag or syringe of fluid to the IV tubing and allow the fluid to flow through the tubing until it reaches the other end and all air bubbles are removed.



- ▶ Your infusion tubing will have a spike that goes into the solution bag, a drip chamber, and several clamps (roller clamp, clip clamp).
- ▶ If you will be using an infusion pump, your tubing will have a special section that will fit into the pump.
  1. Open the IV tubing supplies.
  2. Clamp the tubing.
  3. Remove fluid bag cap.
  4. Remove the spike cover and spike fluid bag.
  5. Squeeze the drip chamber and fill it halfway with fluid.
    - This will clear the line of air and get it started.
  6. Unclamp the tubing and prime (fill) to remove all air from the tubing. If you have a flow meter, set it to "prime."
  - Never prime the tubing over a trash can.
  7. Clamp the tubing after the priming is done.



Open your supplies



Clamp the tubing



Remove the spike cover



Spike the bag



Squeeze drip chamber



Set flow meter to prime

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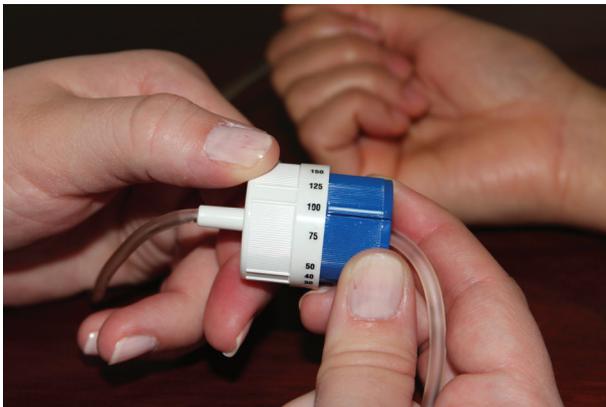
## STEP 4: FLUSH THE NEEDLELESS CONNECTOR

1. Put on clean gloves.
2. Prepare the syringe:
  - Uncap the syringe.
  - Hold it upright with the tip pointing to the ceiling.
  - Push out any air at the tip of the syringe.
  - Do not touch the clean tip with your fingers.
3. Attach the syringe to the needleless connector.
4. Unclamp the tubing.
5. Flush the fluids slowly.
  - This is usually 3 mL of sodium chloride for infants and 10 mL of sodium chloride for adults.
6. Clamp the tubing.

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## STEP 5: ATTACH FLUIDS

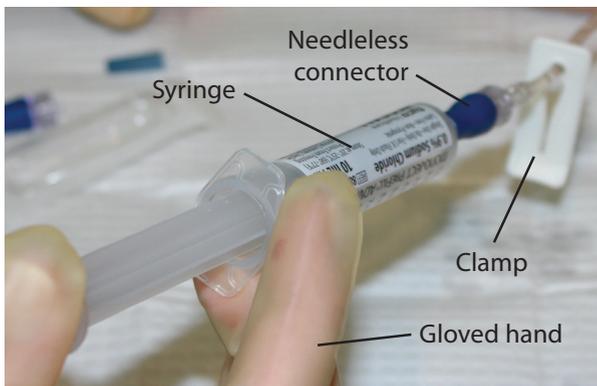
1. Attach the tubing to the needleless connector.
2. Set your rate using the flow meter (if you have one).
  - You will often have a flow meter that you can set to either the amount of fluid to be given or the time that it needs to be given.
  - Example: 100 mL to be given over an hour.
3. Unclamp the tubing.
  - This will allow the medication to flow.
4. Remove your gloves and wash your hands.



Set your rate

## STEP 6: REMOVE FLUIDS AND FLUSH THE LINE

1. Check to see that all the medication has been given (the medicine bag will be empty).
2. Wash your hands.
3. Put on clean gloves.
4. Clamp the tubing.
5. Detach the tubing from the needleless connector.
6. Recap the tubing if you are giving the same antibiotic again within a 24-hour time frame.
  - This will help it stay sterile for the next time you need it. The tubing can be used for 24 hours.
7. Flush the CVAD line through the needleless connector.
8. Remove your gloves and wash your hands.



# Changing the Needleless Connector SKILL

## Watch the Video

- ▶ Watch the DVD included in your kit or go to [facs.org/patienteducation](http://facs.org/patienteducation) to watch the video online.

## Overview

- ▶ The needleless connector on each lumen of your CVAD should be changed every 7 days. To help keep track, try changing the needleless connector the same day each week or every time you change your dressing.
- ▶ If you notice leaking, make sure to change the needleless connector right away.

## STEP 1: PREPARE YOUR WORK AREA

1. Clean and prepare your work area (see page 17).
2. Gather your supplies:
  - Sodium chloride (saline) syringe
  - Alcohol wipes
  - New needleless connector
  - Clean gloves
3. Put on a mask.
4. Wash your hands the right way (see page 18).



Supplies

## STEP 2: PREPARE THE NEW NEEDLELESS CONNECTOR

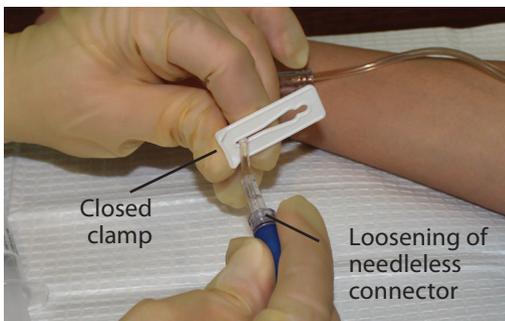
1. Put on clean gloves.
2. Remove the needleless connector from the package.
3. Attach a sodium chloride syringe to the new needleless connector.
4. Hold the syringe upright and push out a drop of fluid.
  - This will remove any air from the new needleless connector.



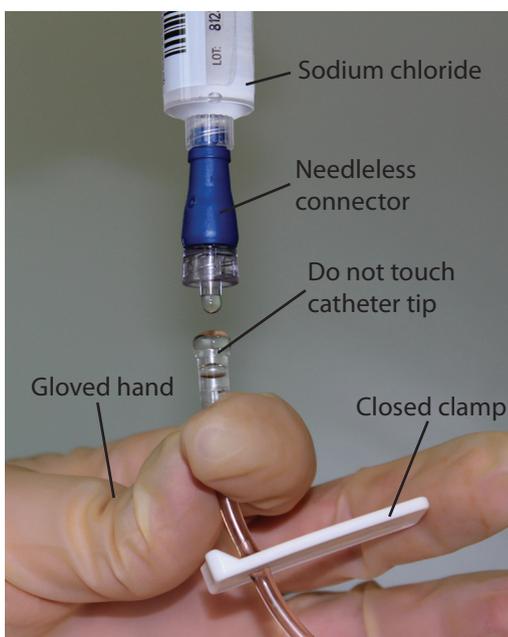
Remove connector from package

## STEP 3: REPLACE THE NEEDLELESS CONNECTOR

1. Clamp the tubing.
2. Scrub the old needleless connector (see page 18) and then remove it.
  - While holding the catheter tip in one hand, use your other hand to remove the old cap and set it aside.
3. Remove the cover and then attach the new needleless connector to the catheter tip.
  - You may need to add a drop of fluid to the catheter tip to make sure no air gets in the line.
4. Unclamp the tubing.
5. Slowly flush with sodium chloride.
6. Clamp the tubing.
7. Detach the empty sodium chloride syringe while leaving the new needleless connector attached.
8. Remove your gloves and wash your hands.



Clamp the tubing and remove the old connector



Attach the new connector



Unclamp the line and flush



Clamp the line and remove the syringe

# Changing the Dressing SKILL

## Watch the Video

- ▶ Watch the DVD included in your kit or go to [facs.org/patienteducation](http://facs.org/patienteducation) to watch the video online.

## Overview

Keeping your CVAD from getting infected is very important. You want to make sure no bacteria enter into your central line. One of the ways this is done is to keep a sterile dressing over the central line entry site. CVADs are covered with a transparent dressing. Some may have a transparent dressing only, some a gauze covering, and others may have an antimicrobial sponge (Biopatch). At the end of this booklet, your health care provider will check the type of dressing you have and how often your CVAD dressing needs to be changed.

The CVAD dressing should be changed every 7 days. It will need to be changed sooner if:

- ▶ It becomes wet or moist
- ▶ The transparent dressing is loose and no longer totally covers the CVAD entry site
- ▶ There is gauze under the dressing (in which case you will need to change the dressing every 48 hours)



Transparent dressing only



Transparent dressing with gauze



Transparent dressing with Biopatch

## STEP 1: PREPARE YOUR WORK AREA

1. Clean and prepare your work area (see page 17).
2. Gather your supplies. You may have a central line dressing kit that has all of the following supplies:

- Alcohol wipes
- Sterile gloves
- Mask
- Chlorhexidine (ChloroPrep™)
- Transparent dressing
- Gauze (optional)
- Antimicrobial patch (Biopatch optional)
- Tape (optional)



Supplies

3. Wash your hands the right way (see page 18).
4. Keep the site clean. Avoid breathing on the CVAD during a dressing change by wearing a mask or turning your head away. If this is not possible, place a mask on the patient.
5. Open your central line dressing change packet. The mask is often at the bottom or top of the kit.
6. Put on the mask.
7. Wash your hands again.



Dressing change packet—your mask is at the top or bottom

## STEP 2: REMOVE THE OLD DRESSING

1. Put on clean gloves.
2. Carefully remove the old dressing—lift from the edges.
3. Hold the catheter secure and be careful not to pull on the central line.



Hold the catheter secure

## STEP 3: CHECK THE ENTRY SITE

1. Look for any redness, skin irritation, or drainage.
2. Check the length of the catheter to make sure it has not moved farther out or in.
  - Look at the numbers or marks on the side of the catheter. If there are no markings, then measure the amount of catheter that exits the body with a tape measure.
3. Do not touch the skin around the insertion site.
4. Remove the clean gloves and fully open the central line dressing kit.

## STEP 4: PUT ON STERILE GLOVES

Putting on sterile gloves may seem like a simple or obvious task, but it is important to do it properly. Follow the steps below that show how to properly put on sterile gloves.

**Your ungloved fingers should never touch the outside of your gloves**



## STEP 5: CLEAN THE ENTRY SITE

1. Use chlorhexidine to clean the entry site.
2. Rub in a back-and-forth motion around the entry site.
3. Be sure to clean all areas that will be covered by the dressing.
4. Allow the chlorhexidine to dry for 60 seconds. Do not blow or fan the area.

## STEP 6: APPLY THE DRESSING

1. If used, place an antimicrobial sponge over the catheter site with the blue side up.
  - Sometimes dressings will have an antimicrobial sponge built in as one piece.
2. Cover the catheter site with a sterile transparent dressing. Place the clear dressing on the skin, covering the area where the catheter exits the body. Start with the top end, smoothing it across the area. Be sure that the dressing extends at least an inch around the exit site.
3. Secure the catheter in place.
  - If the line is long or exits from the chest, you may loop the tubing and secure it to the skin.
  - Some catheters may not be long enough to loop.
4. Remove your gloves and wash your hands.



Place antimicrobial sponge



Cover with sterile transparent dressing



# Giving Parenteral Nutrition through CVAD SKILL

## Watch the Video

- ▶ Watch the DVD included in your kit or go to [facs.org/patienteducation](https://facs.org/patienteducation) to watch the video online.

## Overview

- ▶ Parenteral Nutrition (PN) is nutrition that is given directly into the blood through the CVAD. PN is used when a person is unable to get their nutrition from eating.
- ▶ PN is usually given over 8 hours or more each day. The CVAD infection rate is higher when PN is given through the line than with other fluids.
- ▶ It is important to follow good technique, watch for signs of infection and keep all appointments with your health care provider. They will check and adjust your PN as needed.

## Medications and Vitamins

Tell your health care provider about any other medications, supplements, or vitamins you are taking. Also, let them know if you have allergies.

## Storing Your PN and Supplies

- ▶ Place the PN in a clean and dry area away from sunlight, children, and pets.
- ▶ If you are given a several-day supply of PN, place the extra bags in the refrigerator. Check with your PN supplier for proper storage instructions.
- ▶ PN should be administered at room temperature. Giving cold PN fluid can cause your body temperature to lower to dangerous levels. If you refrigerate your PN bags, take your next dose out of the refrigerator 4 to 6 hours before use to allow it to warm to room temperature.
- ▶ **Do not microwave the PN solution.**
- ▶ Only use a sharps container for disposing of needles and syringes.

## BEFORE GIVING, CHECK YOUR PN

- ▶ Look at the fluid to make sure it is clean and free from particles in the bag.
- ▶ Do not use the PN if it is discolored or has any materials floating in it.
- ▶ Squeeze the PN bag to make sure there are no leaks. Never use a PN bag that has leaked before use.
- ▶ If you need to add medications to the PN bag, make sure to add the correct amount. Add any medications or vitamins just before starting the PN.
- ▶ Your PN bag will have an injection port and spike port. The injection port is where you will add in medications, and the spike port is where you place the tubing.
- ▶ Check the medication label to make sure it is correct.

## Watch for Side Effects

Tell your health care provider if you experience any of the following side effects:

- ▶ Fever
- ▶ Difficulty breathing
- ▶ Rapid weight gain or loss
- ▶ Upset stomach, vomiting, or nausea
- ▶ Muscle weakness or cramps
- ▶ Swelling of your hands or feet
- ▶ Confusion or memory loss
- ▶ Heart palpitations or skipped heartbeats
- ▶ Skin rashes

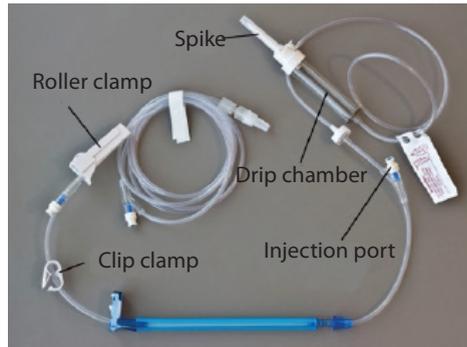
Institution/Pharmacy Name, Address and Pharmacy Phone number		
Name	Dosing Weight	Location
Administration Date/Time	Do Not Use After: Date/Time	
Base Formula	Amount/day	(Amount/L)
Dextrose	g	(g/L)
Amino acids*	g	(g/L)
IVFE*	g	(g/L)
Electrolytes		
Sodium chloride	mEq	(mEq/L)
Sodium acetate	mEq	(mEq/L)
Sodium phosphate	mmol of P (mEq of Na)	(mmol/L) (mEq/L)
Potassium chloride	mEq	(mEq/L)
Potassium acetate	mEq	(mEq/L)
Potassium phosphate	mmol of P (mEq of K)	(mmol/L) (mEq/L)
Calcium gluconate	mEq	(mEq/L)
Magnesium sulfate	mEq	(mEq/L)
Vitamins, trace elements and medications		
Multiple vitamins*	mL	
Multiple trace elements*	mL	
Insulin	Units	(Units/L)
H <sub>2</sub> antagonists*	mg	
Rate ____ mL/hour	Volume ____ mL	Infuse over ____ hours
Formulation contains ____ mL plus ____ mL overflow		
Discard any unused volume after 24 hours		
***Central Line Use Only***		

Medication label

## STEP 1: PREPARE YOUR WORK AREA

Follow the same instructions as giving medication through a CVAD.

1. Clean and prepare your work area (see page 17).
2. Gather your supplies:
  - Two (2) sodium chloride syringes
  - Two (2) alcohol wipes or chlorhexidine swabs
  - Clean gloves
  - Infusion bag
  - Infusion (IV) tubing
  - Medication additives
3. Wash your hands the right way (see page 18).



IV tubing

## STEP 2: PREPARE AND PRIME PN TUBING

1. Put on clean gloves.
2. Add in any medication to the injection port of the PN bag if needed.
  - Clean this injection port vigorously with alcohol or chlorhexidine before adding the medications.
  - Double-check the medication to make sure it is the correct additive.
3. Insert the IV tubing into the PN and flush the PN through the tubing.
  - Open the IV tubing supplies.
  - Remove fluid bag cover where the tubing spike will be inserted.
  - Clamp the tubing using the roller clamp prior to inserting the clamp into bag.
  - Remove spike cover and spike fluid bag.
  - Add the PN filter to the bottom of the IV tubing.



Fluid bag



Open supplies



Spike the bag

- Squeeze the drip chamber. This will clear the line of air and get it started.
- Unclamp the tubing and prime (fill) the tubing to remove all air. Never prime the tubing over a trash can.
- After priming is done, clamp the tubing using the roller clamp.



Squeeze the clip chamber

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### STEP 3: FLUSH THE NEEDLELESS CONNECTOR

See Pg. 24

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### STEP 4: ATTACH FLUID TUBING

1. Connect IV fluids to needleless connector. Be sure no air is in the line, and be sure not to touch the tip of the tubing.
2. Twist and secure the tubing to the needleless connector.
3. PN will run through an IV pump. Confirm the rate on the pump and hit start.
4. Taper down your PN. Your pump may be set to gradually decrease the PN fluids over the last hour. This is recommended for children less than 3 years old and patients with known glucose control issues.

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### STEP 5: REMOVE PN TUBING AND FLUSH LINE

1. Wash your hands and put on clean gloves.
2. Clamp and remove the tubing from the needleless connector.
3. Flush the CVAD line through the needleless connector (see page 17).
4. Uncover the heparin flush syringe and push out any air.
5. Flush the line with heparin if needed.
6. Remove the flush, and clamp the central line tubing.

**Discard the PN bag and tubing in the garbage. Do not re-use IV tubing after giving PN.**

# Implanted Port: Accessing and Removing the Noncoring Needle **SKILL**

## Overview

- ▶ When your port is accessed, it will be covered by a sterile dressing.
- ▶ It is recommended that an accessed port dressing be changed every 7 days or sooner if the dressing becomes loose and does not securely cover the entire cannulated port.
- ▶ You may wish to apply topical analgesic (pain-reducing) cream prior to cannulation.
- ▶ Cover with occlusive dressing.

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## STEP 1: PREPARE FOR PORT CANNULATION

1. Clean and prepare your work area (see page 17).
2. Gather your supplies:
  - Two (2) sodium chloride syringes
  - Heparin syringe
  - Chlorhexidine wipes
  - Sterile gloves
  - Two (2) masks
  - Noncoring needle with tubing
  - Transparent dressing
  - Medicated disc (Biopatch) if the port will be in place longer than 24 hours
3. Remove the occlusive dressing and topical medication (if used).
4. Put mask on you (care provider) and the patient.
5. Wash your hands the right way (see page 18).

## STEP 2: PREPARE THE TUBING AND NONCORING NEEDLE

1. Open a sterile drape, touching only the outside edges.
2. Open the supplies one at a time and let them fall onto the middle of the sterile drape.
  - Do not let the outside packaging touch the sterile drape.
3. Put on sterile gloves (see page 30).
4. Place the needleless connector cap onto the end of the port tubing.
5. Attach a 10 cc sodium chloride syringe to the needleless connector.
6. Flush until you see drops of fluid come through the noncoring needle.
7. Leave the sodium chloride in place.
8. Clamp the tubing.



Open the sterile drape



Open your supplies



Attach the syringe



Flush the line for air



Clamp the tubing

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## STEP 3: CLEAN THE PORT SITE

- ▶ Use the chlorhexidine applicator and clean back and forth and up and down for 30 seconds over the port site.
- ▶ Allow skin to dry completely. This could take a minute. Do not blow or fan.

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## STEP 4: INSERT THE NONCORING NEEDLE INTO THE PORT

1. Pick up the needle by the wings. Remove the cover from the needle.
2. With your other hand, hold the outer edges of the port steady. Do not touch the area where the needle will be inserted.
3. Firmly insert the noncoring needle into the port until you feel the needle touch the back of the port chamber.
4. Open the clamp of the tubing and see if there is blood return. If you see blood, gently flush 2 to 3 cc of sodium chloride using the attached syringe.
5. If you meet resistance when you try to push in the sodium chloride, check the needle to make sure it is in the center and in far enough. Try to flush again. If you cannot flush, stop and call your home care nurse or doctor.
6. Attach a new syringe and flush with 10 cc of sodium chloride.

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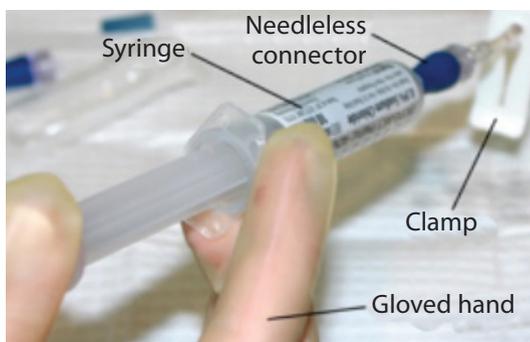
## STEP 5: SECURE THE DRESSING

1. If the needle will be in place for 24 hours, place an antimicrobial patch around the needle site.
2. Place a transparent dressing securely over the entire needle site and tubing. Sometimes a 2 x 2 inch gauze is placed under the wing of each side of the needle to help secure it in place.
3. You will need to take regular care of your supplies:
  - The tubing will have to be flushed daily through the needleless connector (see Step 4: Flush the Line on page 19).
  - The noncoring needle, tubing, and needleless connector will have to be changed every 7 days.
  - The dressing will have to be changed every 72 hours if gauze is used and every 7 days if no gauze is used.



## STEP 6: REMOVE THE PORT NEEDLE FROM THE SITE

1. Clean and prepare your work area (see page 17).
2. Gather your supplies:
  - One (1) 10 mL sodium chloride syringe
  - Heparin syringe
  - Alcohol
  - Sterile gloves
  - Gauze
3. Wash your hands the right way (see page 18).
4. Put on clean gloves.
5. Prepare to flush:
  - Open the alcohol and scrub the hub of the needleless connector for 15 seconds. Let it dry for up to 1 minute.
  - Prepare a sodium chloride syringe, attach it, and unclamp.
  - Flush with 10 to 20 cc of sodium chloride.
  - Take the syringe off the needleless connector, and without touching the tip, prepare and attach a heparin syringe.
  - Flush with heparin.
  - Clamp the tubing.
6. Remove the noncoring needle:
  - Loosen the dressing.
  - Hold the port with your nondominant hand.
  - With your dominant hand, hold the needle by the tip edges and remove. Pull it straight out.
  - Click the safety cover over the needle.
  - If bleeding occurs, hold gauze over your skin.





# Problem Solving

There are common problems that can occur with any CVAD. The most common are:

- ▶ Blockage or occlusion of the CVAD
- ▶ Infection
- ▶ Catheter tip movement or accidental removal
- ▶ Catheter breaks
- ▶ Air in the line

## Blockage of the CVAD

A blocked or occluded line means that you cannot give fluids or medication through the tubing. Sometimes you feel resistance when you try to flush or you can push fluids in but cannot withdraw blood.

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### BLOCKAGE CAN BE DUE TO:

- ▶ The line being kinked or clamped. Check your catheter to make sure all clamps are open.
- ▶ The catheter tip hitting against a vessel wall. Lifting your arm up can sometimes change the position of the CVAD tip slightly so fluid can be given. Even if this works, let your health care team know that you are having problems.
- ▶ Proteins and fibrin (fibrin is a sticky protein involved with blood clotting) in your blood can deposit near the tip of the catheter. This clot of proteins, also called a thrombus, can make it more difficult to flush your CVAD. Call your provider and they can give medication that can help dissolve the fibrous clot.
- ▶ Crystallization of total parenteral nutrition mixtures and drug incompatibilities.

## Blockage of the CVAD (continued)

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### WHAT YOU CAN DO:

- ▶ **Do not panic.**
- ▶ Inform your health care team with any signs of blockage or low flow so that medication can be given to dissolve any clots.
- ▶ Flush the catheter properly before and after giving any medication.
- ▶ Clamp the tubing when the CVAD is not being used. You may have a cap placed over the needleless connector to apply pressure and prevent blood from backing up into the tubing.
- ▶ Inform your health care team immediately if you notice any signs of a blood clot.

## Blood Clot

A blood clot (thrombus) can form in your vein around the catheter tip. In addition to blockage, a clot can be a site for bacteria to grow and lead to infection.

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### SIGNS OF A BLOOD CLOT INCLUDE:

- ▶ Swelling in the arm or leg where the CVAD is inserted
- ▶ Swelling of the neck or face
- ▶ Redness and tenderness in the arm, chest area, or neck
- ▶ Leaking of clear fluid from the insertion site
- ▶ Sudden chest pain, coughing, or difficulty breathing can mean the blood clot has traveled to the lungs—**call 911 for professional medical assistance, as this can be a life-threatening emergency.**

## Infection

Infection is caused by bacteria around or introduced into the CVAD. The most common cause of infection is from bacteria from around the insertion site or catheter hub that travel along the CVAD to the catheter tip.

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### WHAT YOU CAN DO:

- ▶ Complete formal and detailed education.
- ▶ Wash your hands the right way any time the catheter is touched (see page 18).
- ▶ Use gloves and masks as directed.
- ▶ Scrub the hub (needleless connector) with chlorhexidine or alcohol each time you flush or insert fluids.
- ▶ Keep the site covered with a transparent dressing (PICC and some tunneled catheters only).
- ▶ Check your insertion site daily for any signs of infection.

Call your health care team right away if you have any kind of fever higher than 100.5°F.

## Catheter Tip Movement or Accidental Removal

The CVAD can move or totally slip out. This can be due to severe coughing, arm movement, pulling on the tubing, or the CVAD not being secured properly.

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### WHAT YOU CAN DO:

- ▶ Secure the CVAD to your skin—this may decrease infections and other complications.
- ▶ Create an extra loop of tubing near the securement site.
- ▶ When fluids are attached, keep the tubing off the floor to prevent anyone from tripping and pulling on the tubing.
- ▶ Measure the length of the tubing with a measuring tape.
- ▶ **If you see that the line has moved or you can see the cuff of the tunneled catheter, notify your health care team. Do NOT use the CVAD until you hear from someone.**
- ▶ If the CVAD comes out, cover the site with gauze or a clean washcloth and apply pressure to stop any bleeding. **Call your health care team right away.**

## Catheter Breaks

A tunneled or PICC CVAD tubing can become damaged and break. This can be due to clamping or bending in the same spot.

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### WHAT YOU CAN DO:

- ▶ Always clamp the tubing in the correct location and check the wear at the clamp site.
- ▶ Keep the tubing under clothing, which will prevent pulling on the CVAD. This is especially important with infants and toddlers, as it will also prevent them from chewing on the CVAD.
- ▶ If the tubing breaks, clamp the CVAD closest to the chest with the existing clamp or use your emergency clamp. Cover the end of the tubing with gauze. If 2 inches are extending out from the chest, the catheter can be repaired. **Call your health care team.**
- ▶ Keep your emergency clamp with you. If you need to, pinch the tubing to stop blood from coming out of the tubing until you can find your clamp.

## Air in the Line

No air should be in the CVAD tubing.

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### WHAT YOU CAN DO:

- ▶ Remove any air in the flush solution before your flush.
- ▶ Remove all air when you prime the tubing. Check to make sure there is no air before attaching it to the CVAD.
- ▶ If you notice air in the tubing and you are not short of breath, remove the air by doing the following steps:
  - Clamp the tubing.
  - Gather your supplies to flush the CVAD, including 2 prefilled syringes.
  - Wash your hands, put on clean gloves, and clean the needleless connector for 15 seconds.
  - Push out 5 of the 10 cc of sodium chloride from a syringe and attach it to the needleless connector.
  - Unclamp the tubing and pull back on the syringe until blood appears. Reclamp and discard the blood.
  - Attach a sodium chloride flush, then unclamp and flush the tubing. If needed, flush with heparin.
  - Clamp the line when finished.
- ▶ If you notice air in the tubing and you suddenly become short of breath or confused, do the following steps:
  - Clamp the tubing.
  - Lie down on your left side with your heart lower than your hip.

**Call 911 and inform them that you have air in your line.**



# Home Management and Other Resources

Your CVAD is designed to give you as much physical freedom as possible.

## Bathing (PICC and Tunneled Catheter)

Consider taking a shower instead of a bath. The entry site of the CVAD should not be immersed in water. During showering, the entry site should be covered with a plastic covering (such as AquaGuard®, plastic wrap, or shower sleeves) to prevent water from entering the site. Continue to use an antibacterial body wash.



## Activity and Exercise

Most patients report they can return to normal activities within several days. Talk to your doctor before you start a vigorous exercise program.

- ▶ **For a PICC line:** Measure the line to be sure the arm movement and activity do not cause it to slip out. There are often lifting restrictions of no more than 10 pounds or a gallon of milk. This is to prevent the muscle contracting around the CVAD.
- ▶ **For a tunneled catheter and implanted port:** There are no published complications related to moderate exercise, but contact sports should be avoided. Patients state that they feel pain for the first few days to weeks near the port placement and occasionally in their back.
- ▶ **Swimming (PICC and Tunneled):** There is not sufficient evidence to make a recommendation related to swimming. The small number of studies report an increase in infection rate overall during the summer. There is consensus in all guidelines that the site and all needleless connectors should be cleaned immediately after swimming and water quality should be checked.

## Returning to Work

You can return to work as soon as you are able. Some patients report returning the next day, while others need time off due to their illness and treatment (chemotherapy). If you have a job that requires repetitive arm use, heavy lifting, or is particularly dirty, you should work with your doctor and employer to make some adjustments.

## Traveling

- ▶ Check with your doctor to make sure you are able to travel.
- ▶ Travel with emergency supplies—emergency clamp, dressing change kit, and needleless connector.
- ▶ For driving, there are usually no restrictions once you are off narcotics for pain control. If you feel discomfort from the seat belt, seat belt pads, or port, donut covers may be helpful.
- ▶ Keep a CVAD information card with you listing your CVAD type, product, insertion date, and doctor contact (see ACS kit and patient education website: [surgicalpatienteducation.org](http://surgicalpatienteducation.org)).
- ▶ If you are traveling with PN, medications, flushes, or any medical supplies, you should contact your doctor and supplier to make sure that everything can be shipped ahead of time.
- ▶ For air travel, inform the transportation security officer before screening. The Transportation Security Administration website ([tsa.gov/traveler-information/internal-medical-devices](http://tsa.gov/traveler-information/internal-medical-devices)) provides guidelines for air travel and includes implanted ports, medications, and pumps.



## Dressing

For a PICC and tunneled catheter, covers are available to keep the tubing from getting in the way of your clothes and activities. Cut-off socks and tube tops are also used. For an implanted port, bra strap pads to cushion over the port site may be helpful.



## Antibiotics and Dental Procedures

The American Heart Association found no convincing evidence that the microorganisms associated with dental procedures cause an increase in infection with CVADs at any time after implantation. Check with your doctor before seeing your dentist.



# Your Discharge Plan

My doctor is \_\_\_\_\_ Phone number \_\_\_\_\_

My home health nurse is \_\_\_\_\_ Phone number \_\_\_\_\_

Other contacts \_\_\_\_\_

## Your Central Line Supplies

The type of line that I have inserted is:

- PICC    Tunneled    Implanted port    Power PICC  
 Single lumen    Double lumen    Triple lumen    Other

Date of insertion \_\_\_\_\_ Inserted by \_\_\_\_\_

The tip is located at \_\_\_\_\_ External length is at \_\_\_\_\_

This line can be used for intravenous fluids, blood sampling, central venous pressure monitoring, and pressure injection of contrast media.

Special instructions:

- Change dressing every \_\_\_\_ day(s) (or if loose, dirty, or wet)  
 Change needleless connector every \_\_\_\_ day(s)  
 (or after blood draws or if blood in connector)  
 Flush each lumen with \_\_\_\_ cc of sodium chloride (normal saline) every \_\_\_\_ day(s)  
 Flush each lumen with \_\_\_\_ cc of heparin (100 units/mL) every \_\_\_\_ day(s)

## Your Follow-Up Visit

My clinic/home care agency/long-term care provider is \_\_\_\_\_ and  
 the date of my first visit is \_\_\_\_\_

During my first visit, I will be ready to review the following steps:

- |   |  |
|---|--|
| <input type="checkbox"/> Demonstrate how to wash hands<br>and prepare a clean surface | <input type="checkbox"/> Demonstrate how to change<br>a dressing (simulator) |
| <input type="checkbox"/> Demonstrate how to give medication                           | <input type="checkbox"/> Demonstrate how to flush                            |
| <input type="checkbox"/> State what to watch for each day                             | <input type="checkbox"/> State what to do in an emergency                    |

Notes:

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# Central Line Resources

## FOUNDING ORGANIZATION

### American College of Surgeons

*surgicalpatienteducation.org*

800-621-4111

Surgical Patient Education Program

## COLLABORATIVE ORGANIZATIONS

### ACS Commission on Cancer (CoC)

*facs.org/coc*

800-621-4111

### American Pediatric Surgical Association (APSA)

*eapsa.org*

847-480-9576

### American Pediatric Surgical Nurses Association (APSNA)

*apsna.org*

855-984-1609

### American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.)

*nutritioncare.org*

800-727-4567

Guidelines for parenteral and enteral nutrition therapy and home nutrition support

### Association of periOperative Registered Nurses

*aorn.org*

800-755-2676

### Infusion Nurses Society (INS)

*ins1.org*

781-440-9408

### The Oley Foundation

*oley.org*

800-776-OLEY

Tools, support, and online resources for professionals and families

### Society of Vascular Surgery (SVS)

*vascular.org*

800-258-7188

### Visiting Nurses Association of America (VNA)

*vnaa.org*

888-866-8773

# Check Your Knowledge

Each question can have more than one correct answer.

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## QUESTION 1

**How can you prevent infection when using your central venous access device?**

- A. Wash your hands using the proper technique
- B. Vigorously wipe the needleless connector with alcohol for 15 seconds prior to using your CVAD
- C. Change the dressing daily
- D. Change the needleless connector every 2 days

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## QUESTION 2

**How often do you change your central venous access device dressing?**

- A. Once a day
- B. If the dressing is loose and no longer covers the entry site
- C. Every 7 days
- D. If the dressing becomes wet

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## QUESTION 3

**Which statements are true about flushing your central venous access device?**

- A. Flush any air through the tubing toward the heart as soon as you see it
- B. Wipe off the needleless connector with an alcohol wipe for 15 seconds before attaching the syringe
- C. Push any air out of the syringe before attaching it to the needleless connector
- D. The tubing does not need to be clamped after the line is flushed

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## QUESTION 4

**When should you notify your doctor?**

- A. If the line has moved or slipped out
- B. If you have redness, swelling, or soreness at the site of your CVAD
- C. Before your monthly dressing change
- D. If you cannot give fluids or medication through the tubing

**Answers:** Question 1 – A and B      Question 2 – B, C, and D  
Question 3 – B and C      Question 4 – A, B, and D

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# Glossary

**Analgesic:** A drug that relieves pain.

**Antimicrobial:** An agent that kills microorganisms or stops their growth.

**Catheter:** A small, flexible tube that is inserted through the skin into a large vein. In this case, it is a central venous catheter. Its purpose is to give medicines, fluids, nutrients, or blood products over a long period of time, usually several weeks or more.

**Clean gloves:** Gloves that are made of thin rubber (latex or nonlatex) that are used to help reduce the risk of microorganisms. They are made for single use and typically come in a box of 100.

**Flow rate:** The amount of fluid that flows in a given time. Intravenous fluid must be given at a specific rate, neither too fast nor too slow. The specific rate may be measured as mL/hour or drops/min. To control or adjust the flow rate, drops per minute are used.

**Flushing:** Rinsing. You need to rinse the inside of the catheter after each use. Flushing helps keep the catheter clean. It also prevents blood clots from blocking the catheter tip.

**Negative pressure:** Flowing in reverse.

**Occlusive dressing:** A protective dressing that seals a wound to prevent contact with air or moisture. It may consist of a sheet of thin plastic sealed on all sides.

**Parenteral nutrition:** A special liquid food mixture given into the blood through an IV catheter. The mixture contains proteins, carbohydrates (sugars), fats, vitamins, and minerals (such as calcium). This special mixture may be called parenteral nutrition (PN) or total parenteral nutrition (TPN).

**Peripheral veins:** The smaller veins in your arms, hands, legs, and feet.

**Prime:** The process of running the fluids through the tubing so that there is no air in the tubing.

**Spike:** Inserting a sharp, hard plastic “spike” into a bag containing fluid.

**Sterile gloves:** Gloves that are sterile and packaged as a single pair. The packaging keeps the gloves completely free of any microorganisms (germs).

**Topical cream:** A cream applied directly to the “top” of your skin.

# Watch the DVD

To help prepare you for the critical role you will play in recovery, the ACS has created a video program to accompany this booklet. This video will reinforce and demonstrate the skills you will need to manage your central line at home.

If you do not have a DVD player, you can find the DVD contents online at [facs.org/patienteducation](http://facs.org/patienteducation). On the left-hand navigation, click on **Skills Programs**. Then click on **Central Lines Program**. Scroll down to the bottom to watch the videos. The videos will play in order in the YouTube window.

# Central Lines

## HOME SKILLS KIT<sup>©</sup>

This program was created by the American College of Surgeons in collaboration with the following:

ACS Commission on Cancer (CoC)  
American Pediatric Surgical Association (APSA)  
American Pediatric Surgical Nurses Association (APSNA)  
American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.)  
Association of periOperative Registered Nurses (AORN)  
Infusion Nurses Society (INS)  
The Oley Foundation  
Society of Vascular Surgery (SVS)  
Visiting Nurses Association of America (VNAA)

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[surgicalpatienteducation.org](http://surgicalpatienteducation.org)

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