About Your Central Venous Catheter for Pediatric Patients

This information will teach you about the placement and care of your central venous catheter (CVC). For the rest of this resource, the words “you” and “your” refer to you or your child.

A CVC is a catheter (long, flexible tube) that’s placed in a large vein below your collarbone (see Figure 1). There are many different types of CVCs, and your doctor will decide which is best for you. All CVCs have 1 central catheter that enters your body. On the outside, the catheter may divide into 1, 2, or 3 lumens. Each lumen has a clamp and a needleless connector on the end.

Your CVC can be used to give:

- Fluids
- Chemotherapy and other medications
- Blood transfusions
- Intravenous (IV) nutrition

The advantages of having a CVC are:

- You won’t need as many needle sticks.
- It can stay in your body for as long as a few years and be removed when it’s no longer needed.

Your CVC will stay in place for your entire treatment.

Your nurse will teach you how to care for your CVC. You can have a caregiver, family member, or friend learn with you. You will learn how to use sterile technique to change your dressing (bandage). This will minimize your risk for infection. You will also learn how to change your needleless connectors and disinfection caps (SwabCaps®), as well as flush your CVC using a syringe with normal saline solution. You must flush your CVC to keep blood clots from forming inside of it. After you go home, use this resource to help you remember the steps to care for your CVC.
Before Your Procedure

**Ask about your medications**

Ask your doctor or nurse which medications you should take before your procedure, including the morning of your procedure.

You may need to stop taking some of your medications before your procedure. Talk with your doctor about which medications are safe for you. We have included some common examples below.

**Blood thinners**

If you take medication to thin your blood, ask your doctor what to do.

Some examples are:

- aspirin
- warfarin (Coumadin®)
- dalteparin (Fragmin®)
- heparin
- tinzaparin (Innohep®)
- enoxaparin (Lovenox®)
- clopidogrel (Plavix®)
- cilostazol (Pletal®)
- prasugrel (Effient®)
- ticlopidine (Ticlid®)

These medications can be used to treat blood clots or to prevent a heart attack or stroke.

**Diabetes medications**

If you take insulin or other medications for diabetes, you may need to change the dose before your procedure. Ask the doctor who prescribes your diabetes medication what you should do the morning of your procedure.

**Aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs)**

If you take aspirin or an NSAID such as ibuprofen (Advil®, Motrin®), ask your doctor if you need to stop taking it before your procedure. This will depend on the reason you're taking it. Read the resource *Common Medications Containing Aspirin and Other Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)* for examples of medications you shouldn’t take and what you can take instead.

**Vitamin E and other supplements**

If you take vitamin E, stop taking it 10 days before your procedure, or as directed by your doctor. If you take a multivitamin, any herbal remedies, or any other supplement, ask your doctor or nurse if you should continue.

**Tell us if you’re sick**

If you develop any illness (fever, cold, sore throat, or flu) before your procedure, call your doctor.

**2 days before your procedure**

A nurse or session assistant will call you 1 business day before your procedure. They will tell you where to go the day of your procedure and what time you should arrive. If your procedure is scheduled on a Monday, you will be called on the Friday before. If you don’t receive a call by 4:00 PM, please call 212-639-5948. Check the box next to the location of your procedure.

**Write in your admission time**

Date _________ Time __________
1 day before your procedure

Do not eat or drink anything after midnight the night before your procedure. This includes water, gum, and hard candy.

The Day of Your Procedure

Take your medications as instructed

If your doctor or nurse practitioner instructed you to take certain medications the morning of your procedure, take only those medications with a sip of water. Depending on what medications you take and the procedure you’re having, this may be all, some, or none of your usual morning medications.

Things to remember

• You can shower, but don’t put on any lotion, cream, powder, deodorant, makeup, or perfume.
• Don’t wear any metal objects. Remove all jewelry, including body piercings. The equipment used during your procedure can cause burns if it touches metal.
• Leave valuables, such as credit cards and jewelry, at home.
• Before you’re taken into the operating room, you may be asked to remove your hearing aids, dentures, prosthetic device(s), wig, and religious articles.
• If you wear contact lenses, wear your glasses instead.

What to bring with you

• A list of the medications you take at home, including patches and creams
• A case for your glasses or contacts
• Your Health Care Proxy form, if you have completed one
• Medications for breathing problems (such as inhalers), if you take any
• Medications for chest pain, if you take any
• Your breathing machine for sleep apnea (such as your CPAP or BiPAP machine), if you have one
• This resource
Where to park

MSK’s parking garage is located on East 66th Street between York and First Avenues. To reach the garage, turn onto East 66th Street from York Avenue. The garage is located about a quarter of a block in from York Avenue, on the right-hand (north) side of the street. There’s a pedestrian tunnel that you can walk through that connects the garage to the hospital. If you have questions about prices, call 212-639-2338.

There are also other garages located on East 69th Street between First and Second Avenues, East 67th Street between York and First Avenues, and East 65th Street between First and Second Avenues.

Once you’re in the hospital

You will be asked to state and spell your name and date of birth many times. This is for your safety. Patients with the same or similar name may be having a procedure on the same day.

Get dressed for your procedure

When it’s time to change for your procedure, you will be given a hospital gown, robe, and nonskid socks to wear.

Meet with your nurse

You will meet with your nurse before your procedure. Tell your nurse the dose of any medications (including patches and creams) you took after midnight and the time you took them.

Your nurse will place an intravenous (IV) line in one of your veins. The IV line may be used to give you fluids, medication to help you relax during your procedure, or both.

Prepare for your procedure

Once your nurse has seen you, 1 or 2 visitors can keep you company as you wait for your procedure to begin. When it’s time for your procedure, your visitor(s) will be shown to the waiting area.

You will either walk into the operating room or be taken in on a stretcher. A member of the operating room team will help you onto the operating bed.

During your procedure

First, your doctor will give you an injection (shot) of a local anesthetic near your collarbone. A local anesthetic is a medication that makes an area of your body numb. After the area is numb, your doctor will make 2 small incisions (surgical cuts):

- The insertion site: where the catheter enters your vein. It will be just below your collarbone.
- The exit site: where the catheter leaves your body. It will be a few inches below the insertion site.

Your doctor will place one end of the catheter through the insertion site and into your vein. They will thread the other end under your skin and out of the exit site. This will help keep your CVC from moving.
After the CVC is in place, your doctor will close your insertion site with Dermabond® (surgical glue) or Steri-Strips™ (surgical tape) and your exit site with sutures (stitches). Your CVC will be sutured to your skin at the exit site so that it will stay in place until it becomes anchored in the tunnel under your skin.

After Your Procedure

What to expect

When you wake up after your procedure, you will be in the Post Anesthesia Care Unit (PACU). Your nurse will continue to monitor your body temperature, pulse, blood pressure, and oxygen levels. Once you are fully awake, your nurse will give you a drink and a light snack. They will also remove your IV line.

Before you leave the hospital

If you have someone waiting with you, your nurse will teach both of you how to care for and change your dressing before you go home. They will also help you prepare an emergency kit to help you care for the dressing over your exit site. It’s important to keep the kit with you at all times. The emergency kit should have:

- 2 toothless clamps
- Dressing change kit
- Your doctor’s office and emergency telephone numbers

Caring for your exit site

You will have 2 dressings, 1 on your insertion site and 1 on your exit site. You may have some discomfort around your incisions. Ask your nurse for medication to relieve your pain.

You can shower after your procedure. Read the “Caring for Your CVC” section below for more information about showering. Don’t submerge your CVC in water (such as a bathtub or swimming pool).

It’s especially important to keep your dressings dry for the first 24 hours following your procedure. After 24 hours, you will need to change your dressings. Read the next section, “Changing Your Dressing, Needleless Connectors, and Disinfection Caps,” for instructions.

Two days after your procedure, you can remove the dressing covering your insertion site. After that, you can leave it open to the air. If you have Steri-Strips, leave them in place until they start to peel off. This should happen about 3 to 5 days after your procedure.

Your exit site will still need to be covered with a dressing.

Your doctors and nurses will give you instructions on what exercises and movements you can do while your incisions are healing. Check with your doctor or nurse before starting heavy exercises, such as running, jogging, or lifting weights.
Changing Your Dressing, Needleless Connectors, and Disinfection Caps

- **Do not do your CVC care in the bathroom after a shower.** The steam from a shower can keep the adhesive from sticking to your skin.

- You will see the folded *Map for Dressing Change: CVC* inside this resource. Open the map and spread it out where you can see it. It has step-by-step instructions for changing your dressing. The map shows the steps you’ll need to do using sterile technique. If you’ll also be using the *How to Put on Your Sterile Gloves* resource, be sure to open that as well. You won’t be able to touch any of these resources during those steps because that would break sterile technique.

- You will use a Tegaderm™ CHG dressing to cover your exit site. Change your dressing once a week. If the dressing gets wet, damaged, or dirty, change it sooner. Change it on the same day you change your needleless connectors and disinfection caps and flush your CVC.

- If the Tegaderm CHG gel pad becomes swollen, change your dressing. You can test the gel pad by gently pushing down on it with a finger. If you see an indent, the gel pad is swollen and your dressing should be changed. This can happen if there’s a lot of sweat under your dressing.

- If you have problems with your skin, such as irritability or sensitivity, your nurse may suggest a different type of dressing. In that case, you may need to change it more often than once a week. No matter which dressing you’re using, always change it right away if it starts to come off or gets wet. Don’t just put another dressing or tape over it.

**Equipment**

- 1 dressing change kit
- Nonsterile gloves
- Paper tape
- 1 disinfection cap for each lumen
- Alternative dressing or needleless connector, if your nurse gave you one
- A mirror that can stand up on a table, such as a makeup mirror
- Adhesive remover spray or wipes, as needed

**Sterile procedure for changing your dressing**

Remember: don’t change your dressing in the bathroom after a shower.

1. Prepare a clean work area. Gather your supplies.
2. Wash your hands thoroughly with warm water and antibacterial soap or use hand sanitizer. Dry them with a clean towel or a paper towel.
3. Get into a comfortable position. Unpin the CVC from your clothing, if necessary. Open or remove your clothing to expose the CVC.
4. Check to make sure that the CVC clamps are closed.
5. **Open the Map for Dressing Change for Pediatric Patients: CVC instructions enclosed in this resource and spread it out where you can see it.**

   Your dressing change kit also comes with a procedural checklist. This checklist is a brief summary of basic information and can be used alongside this resource. It has 2 sides. Use the side that your nurse tells you to.

6. Open and remove the outer packaging of the dressing change kit. Two surgical masks will be right on top (see Figure 2). Both you and the person helping you change your dressing need to wear a mask. **Do not touch anything else inside the kit.**

7. Put on the nonsterile gloves. Remove the old dressing by gently grasping an edge of the dressing and slowly peeling it off your skin toward the exit site. As you peel the dressing back, place your thumb or forefinger on the gel pad to hold the CVC in place and keep from pulling on it. To make it easier to remove, wipe the area underneath the gel pad with an adhesive remover pad or use an adhesive remover spray. Make sure the entire gel pad comes off with the dressing. Throw away the gloves and old dressing.

8. Without touching the area, inspect the exit site and the skin around it. It’s easier to do this by looking in the mirror. Call your doctor or nurse after you complete the dressing change if you notice any signs of infection or irritation, such as:
   - Red or raw skin
   - Swelling
   - Any drainage from the exit site
   - Leakage around your CVC

9. Open the wrapper of the kit. If your nurse gave you a different dressing or needleless connector to use, open its package so that the dressing or connector falls into the kit, onto the sterile field. **Follow steps 10-21 on the Map for Dressing Change for Pediatric Patients: CVC instructions to complete the dressing change.**

You’re done with the sterile part of your dressing change. Keep your gloves and mask on to change the needleless connectors and disinfection caps on your CVC. You will do this once a week.

### Changing your needleless connectors and disinfection caps

22. After you put on the new dressing, you will change the needleless connector and disinfection cap on each lumen of your CVC. Make sure you have 3 alcohol pads for each lumen.

23. Check to make sure that the clamps on your lumens are closed before you change your needleless connectors and disinfection caps.
24. Your gloves are no longer sterile, so don’t touch the inner part of the lumen tip or needleless connector. Using an alcohol pad, hold the lumen with your nondominant hand close to, but not touching, the needleless connector (see Figure 3).

25. Using your dominant hand, scrub the connection site for 15 seconds with another alcohol pad and allow it to dry for 15 seconds.

26. Twist off the old needleless connector. Throw away the old needleless connector and alcohol pad.

27. Scrub the end of the lumen with a new alcohol pad for 15 seconds and allow it to dry for 15 seconds.

28. Pick up the new needleless connector with your dominant hand. If it has a cover in place, remove the cover and then twist the new needleless connector onto the lumen (see Figure 4).

29. If you won’t be flushing your CVC immediately, apply the disinfection cap to the end of the needleless connector.

30. Repeat steps 22-29 for the second and third lumens.

31. Remove your mask and gloves. Throw them away.

32. Decide on the most comfortable way for you to leave your CVC. You can:
   • Tuck it inside of your bra, if you wear one.
   • Pin it to your clothing. To do this, prepare 1 piece of 3-inch paper tape. Fold down the edges of the tape (see Figure 5). Leave enough sticky tape so you can wrap the tape around all of your lumens. Gather the lumens with the paper tape, put a safety pin through the folded edges, and pin it to the inside of your clothing.

   **Leave the CVC hanging loose only if you’re sure it won’t be pulled.**

### Flushing Your CVC

You should flush your CVC with normal saline solution once a week on the same day that you change your dressing and needleless connectors. Flushing the lumens of your CVC will keep your lines from becoming clogged.

### Equipment

- Prefilled, 10 mL syringe(s) containing normal saline solution. You will need 1 syringe for each lumen
- Nonsterile gloves
- 2 alcohol pads for each lumen
- 1 disinfection cap for each lumen

**Steps to flushing your CVC**

1. Gather your equipment.

2. Wash your hands thoroughly with warm water and antibacterial soap. Dry them with a clean towel or a paper towel.

3. Put on a pair of nonsterile gloves.

4. To release the air bubbles in the syringe, hold the syringe pointing upward and gently tap the side of the syringe. The air bubbles should move to the top. Loosen but don’t remove the cap on the syringe. Press the plunger on the syringe until the air is pushed out. Retighten the cap.

5. Pick up 1 lumen. If you have a disinfection cap, remove it. If you don’t have a disinfection cap, scrub the end of the needleless connector with an alcohol pad for 15 seconds and allow it to dry for 15 seconds.

6. Remove the cap from the syringe. Throw away the cap. Make sure that nothing touches the clean end of the needleless connector while you’re doing this.

7. Carefully push the syringe into the needleless connector and twist it in a clockwise (to the right) direction until the connection feels secure. Unclamp the lumen. Before beginning to inject the saline, make sure there aren’t any twists or other blockages in the tubing.

8. Use the following push/pause method to flush your CVC:
   - Quickly inject ⅓ of the saline.
   - Pause.
   - Repeat.
   - Inject the last ⅓ of the saline. After the injection, clamp the lumen.

If you can’t inject the saline, stop and check to be sure that the lumen is unclamped and there are no twists or other blockages in the tubing. Try to inject the saline again. **If you still can’t inject the saline, do not use extra pressure to flush the line.** Remove the syringe, reclamp the lumen, and call your doctor or nurse.

9. Turn the syringe counterclockwise (to the left) to disconnect it from the lumen. Throw it away.

10. Attach a new disinfection cap to the end of the needleless connector.

11. Repeat steps 4-10 for each lumen.

12. Reclamp the lumens.

13. Throw away your mask and gloves and wash your hands thoroughly with warm water and antibacterial soap or use hand sanitizer.
Caring for Your CVC

- Don’t submerge your CVC in water (such as a bathtub or swimming pool).
- Clamp the lumens when your CVC isn’t in use.
- Keep your CVC secure at all times to avoid pulling it. You can tuck the lumens of your CVC into a bra if you wear one, or you can pin them to your clothing. Ask your nurse about the best way to secure your CVC. Avoid placing tape over the connection site.
- If your CVC is leaking at any time, clamp it above the leak. Use the white catheter clamp on the catheter, if possible. If the white clamp isn’t available, use the clamp found in the emergency kit. Wipe the area that’s leaking with an alcohol pad. Cover the site with tape. Call your doctor or nurse immediately. CVCs can often be repaired.

Guidelines for Showering

- Don’t shower for longer than 15 minutes. Use warm water, not hot water. This will help keep the AquaGuard® (waterproof covering you’ll put over your dressing) from coming off.
- Don’t submerge your CVC in water.
- If your dressing gets wet, change it.

Watch our video *Showering While You Have a Central Venous Catheter* for more information.

While your CVC is in place, it’s especially important to take good care of your skin to reduce your risk of infection. We recommend that you wash with Hibiclens® every day while your CVC is in place. It contains a fast-acting antiseptic called chlorhexidine gluconate that kills germs that live on your skin and will reduce your risk of infection. Hibiclens can work for up to 6 hours after using it. You will be sent home with a small bottle when you’re discharged from the hospital. You can buy more at your local pharmacy without a prescription.

Instructions for using Hibiclens

- If you’re washing your hair, shampoo and rinse thoroughly.
- Wash your face with regular soap.
- Rinse your body with warm water from the neck down.
- Apply Hibiclens to a washcloth or directly to the skin being cleansed. Wash gently. Don’t dilute the Hibiclens.
- Rinse thoroughly with warm water and pat yourself dry.

Important points to remember when using Hibiclens

- Don’t use Hibiclens on children who are younger than 2 months old.
- Don’t use Hibiclens if you are allergic to chlorhexidine.
- Don’t use Hibiclens on your face, ears, genital region, or on deep wounds.
- Don’t use regular soap, lotion, powder, or deodorant after washing with Hibiclens.
Instructions for using AquaGuard

You can shower with your catheter in place using AquaGuard, a one-time-use waterproof cover that goes over your dressing. Each time you shower, cover the Tegaderm CHG dressing completely with a new AquaGuard to protect it from getting wet.

1. The edges of the AquaGuard have peelable tape. Fold over a corner of each side of the tape (see Figure 6).
2. Hold the AquaGuard with the arrows pointing towards your head. Peel off the top strip and place the top edge above your dressing. Smooth it down.
3. Then, grab a folded corner and peel down one side, smoothing as you go.
4. Do the bottom and the remaining side the same way, making sure that the bottom edge of the AquaGuard is below your dressing. Make sure the lumens of your catheter are tucked into the AquaGuard and completely covered.

Don’t let the tape on the AquaGuard touch the Tegaderm CHG dressing. It can lift your dressing when you remove the AquaGuard after showering.

Dry the AquaGuard before removing it.

Call Your Doctor or Nurse Immediately if You:

- Have redness, swelling, or drainage around your exit site
- Are unable to flush your catheter
- Have a temperature of 100.4° F (38° C) or higher
- Have chills when you flush your catheter
- Have a break or leak in your catheter or if your needleless connector falls off
- Have an unexplained problem with your catheter

You can contact your healthcare providers directly Monday through Friday from 9:00 AM to 5:00 PM. After 5:00 PM, during the weekend, and on holidays, please call 212-639-2000 and ask for the pediatric doctor on call.
How to Put on Your Sterile Gloves

1. Open the package that contains the sterile gloves. Pull the edges of the package down to keep them flat.
2. Pick up 1 glove by the folded cuff.
3. Still holding just the cuff with 1 hand, slide your other hand into the glove, making sure the outside of the glove does not touch anything.
4. Slip the fingers on your gloved hand under the cuff of the other glove. Hold the glove up and do not let it touch anything.
5. Keep the thumb on your gloved hand pointing up so it is out of the way. Slide your other hand into the glove.
6. Pull the glove all the way up. Be careful not to touch anything, including your wrist.
15. With your nondominant hand, grasp your CVC using an alcohol pad (see Figure 2). Don’t touch the CVC itself. Touch only the alcohol pad. Hold the CVC away from your chest.

16. Beginning at the exit site, scrub up and down and side to side with the ChloraPrep to make a 2-inch box (see Figure 3). Do this for 30 seconds. Throw away the ChloraPrep.

17. Allow the site to dry for at least 30 seconds. Don’t fan or blow on the site to speed up the drying. Hold the catheter away while it dries.

18. Take another alcohol pad in your dominant hand. Place it around your CVC, just above where it separates into lumens. Hold the CVC with the alcohol wipe. Hold the CVC up and use another alcohol pad in your nondominant hand to clean the CVC. Start at the exit site and gently wipe down to the hub using a new alcohol pad for each lumen. (see Figure 4). Don’t pull on the CVC.

If the exit site is red, raw, swollen, or has drainage, tell your doctor after you finish the dressing change.

19. Apply the No Sting Barrier Film to your skin. Paint it on in the shape of an open rectangle about the size of the Tegaderm CHG dressing. Allow it to dry completely. The No Sting Barrier Film will help the dressing stick to your skin.

20. Peel the backing off of the Tegaderm CHG dressing (see Figure 5). Position it with the triangle shape over the CVC. Center the gel pad over the exit site and smooth down the dressing edge. Don’t stretch the dressing when applying.

21. Grasp the round plastic tab on the outside and peel the plastic off all the way around the dressing (see Figure 6). You may press on the outside of the dressing to make sure it is intact (see Figure 7).

Continue the instructions in the resource.