UHN Princess Margaret Cancer Centre

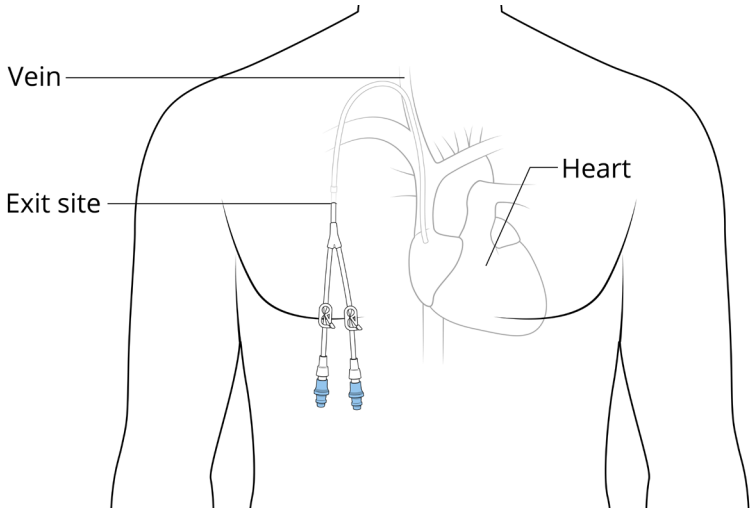
How to Flush and Lock your Central Venous Catheter (CVC)

Read this resource to learn:

- What a CVC is
- Parts of a CVC
- Why you need to flush and lock your CVC lumens
- When to flush and lock your CVC lumens
- How to flush and lock your CVC lumens

What is a Central Venous Catheter (CVC)?

A central venous catheter, or CVC, is a soft, flexible tube that is used to give medicines, fluids, nutrients, or blood products over a long period of time. One end of the catheter is placed into a large vein above your heart. The other end of the catheter is outside, or just underneath, the skin. The place where the catheter comes out of the skin is called the exit site.



A CVC can be used for:

- Giving chemotherapy treatment
- Giving antibiotics (medicine to fight infections) and other medicines
- Taking blood samples
- Giving IV fluids
- Giving nutrients (food) through IV, which is called parenteral nutrition
- Hemodialysis treatment (for patients with kidney disease)

There are three types of CVCs:

- Tunneled CVCs, which enter the skin through the chest
- Peripherally inserted CVCs (PICC), which enter the skin through the arm
- Subcutaneous ports, which has a small, round portal that is placed completely under the skin on the chest or arm

This brochure will teach you how to flush and lock tunneled CVCs and PICCs only. If you have a subcutaneous port, a nurse will usually flush and lock it for you.

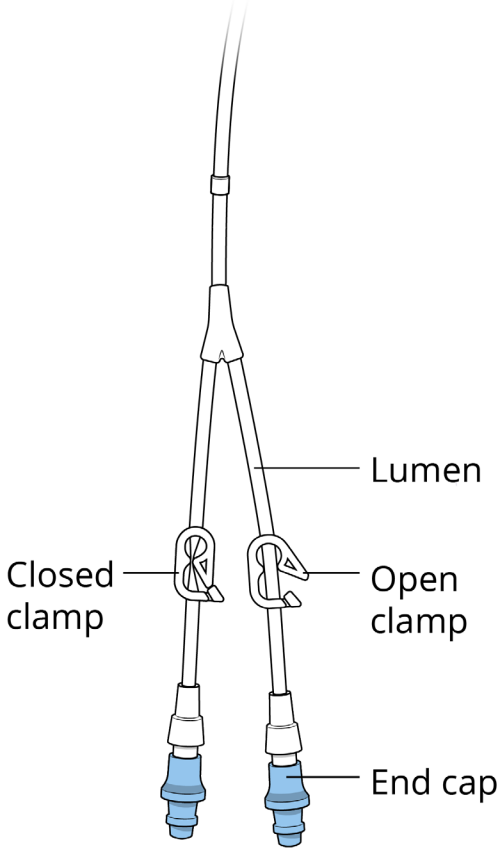
Parts of a CVC

These are the parts of a tunnelled CVC or PICC:

- **Lumens:** Your tunnelled CVC may have 2 or 3 tubes that come out of your skin. These tubes are called lumens. Each lumen is a separate tube. Lumens are the part of the catheter used to give IV treatments or take blood. Having more than 1 lumen means your nurse can give 2 or 3 different IV treatments at the same time.

On each lumen, you will find a:

- **Clamp:** The clamp is used to prevent blood from coming out of the catheter. Keep the clamp closed at all times when the catheter is not in use. Some tunnelled CVCs do not have a clamp. Instead they have a special valve inside the catheter that works like a clamp. Your nurse will let you know if you have this type of catheter.
- **End Cap** (also called a lumen cap): An end cap is added at the end of each lumen opening. This cap is used to:
  - Stop blood from coming out of the lumen if the catheter is not clamped
  - Prevent germs from entering the catheter
  - Allow IV tubing and syringes to attach to the lumens safely



Why you need to clean your CVC lumens

Your Central Venous Catheter (CVC) needs to be kept clean to prevent infections and to keep your CVC working well. To keep your CVC clean, leftover blood or medicine needs to be cleared from the lumens. Cleaning your CVC lumens is called flushing and locking.

Flushing a CVC means putting a small amount of saltwater solution called “Normal Saline” into the lumen to clear it out. Locking a CVC means putting a medicine called Heparin into your CVC lumen to stop blood clots from building up inside the lumen. This process is called a “Heparin Lock.” If

you are allergic to heparin or have been told you have Heparin Induced Thrombocytopenia (or HIT), tell your doctor or nurse. Your nurse will flush your catheter with a different medicine.

Some CVCs only need to be flushed with saline and do not need a heparin lock. Your nurse will tell you if your catheter does not need a heparin lock.

If your CVC lumen gets clogged or blocked, your nurse will try to unblock your CVC lumen with a different medicine. If your CVC lumen cannot be unblocked, it will need to be removed and replaced.

When to flush and lock your CVC lumens

Your CVC lumens should be flushed with saline and locked with heparin:

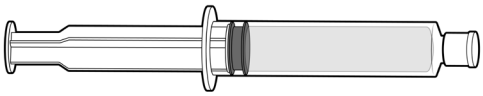
- After IV therapy. Usually a nurse will do this process.
- If your CVC has not been used for 7 days

You must also change the end cap of your CVC lumen every 7 days. This must be done while you flush your lumens. Change your end caps and flush your line sooner if they become dirty, loose or comes off. This brochure will tell you how to change your end caps and flush your line at the same time.

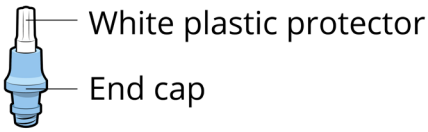
How to flush and lock your CVC lumens

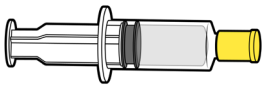
To flush your CVC lumens you will need:

- **One saline syringe for each lumen.** These are syringes that contain a sterile mix of water and salt, called a saline solution. You will flush your CVC with the saline solution first. You will need one saline syringe for each lumen that you have. Each syringe contains 10 mL of saline.
- **One heparin syringe for each lumen.** These are syringes that contain heparin. You will lock your CVC with heparin after the saline solution. You will need one heparin syringe for each lumen that you have. Each syringe contains 3 mL of heparin (300 units)
- **One end cap for each lumen**
- **Alcohol wipes**
- **Gloves**
- **Mask**

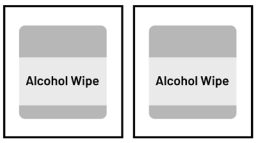


Saline syringe





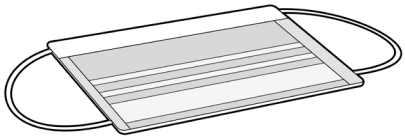
Heparin syringe



Alcohol wipes



Gloves



Mask

Ask your healthcare team to find out where to get these supplies. You will need a prescription for the heparin syringes.

Before you start, check the expiry date of the saline and heparin syringes. An expiry date is the date when a product is unsafe to use. Do not use a syringe that past its “expiry” date. The expiry date lists the year, month, and day. You can find this information on the plastic wrap packaging.

Find a clean dry area. Do not do flush and lock the lumens in a damp area, like the bathroom.

There are 3 main steps you must take to flush and each CVC lumen:

- Prepare all your supplies
- Flush your lumen with Saline
- Lock your lumen with Heparin

Prepare your supplies

Before you flush and lock your lumens, prepare all the syringes and end caps you will need for every lumen. For example, if you have two lumens, prepare two saline syringes with two end caps, and two heparin syringes.

Step 1: Clean your hands and surface area

Clean your work surface with a disinfectant wipe or with soap and warm water.

Remove all jewelry from your fingers and wrists. Wash your hands with soap and warm water for 30 seconds. Dry your hands with a clean paper towel.

Put on a pair of gloves and a mask, then put your supplies on the clean surface.

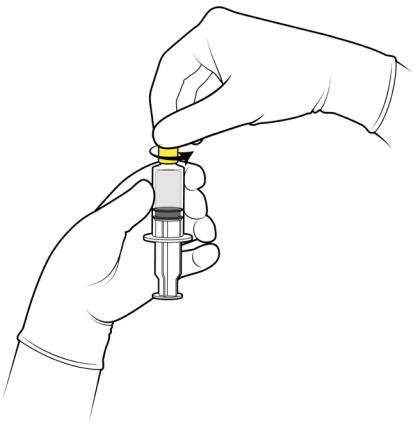
Step 2: Prepare the heparin syringes

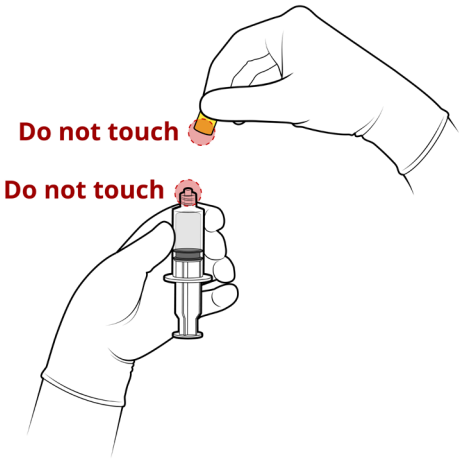
You must prepare the saline and heparin syringes to remove air. This makes the syringes ready to use.

Take all the saline and heparin syringes out of their packages. Hold the heparin syringe with the yellow protected cap pointing up.

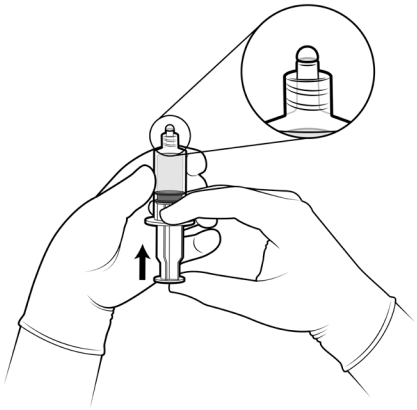
Unscrew the yellow syringe cap. Place the yellow cap down, with the opening end facing up.

Do not touch the end of the syringe and the opening side of the yellow cap. If anything touches the end of the syringe, use another one.





To remove the air bubbles in the syringe, gently squeeze the plunger until a drop of the heparin starts coming out of the tip of the syringe.

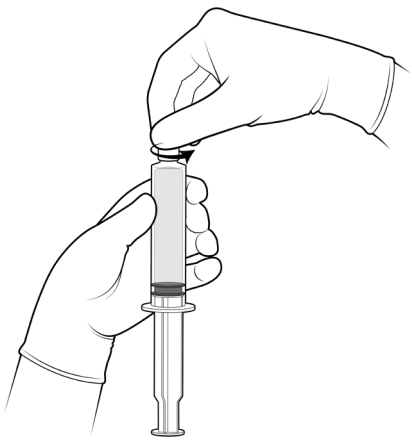


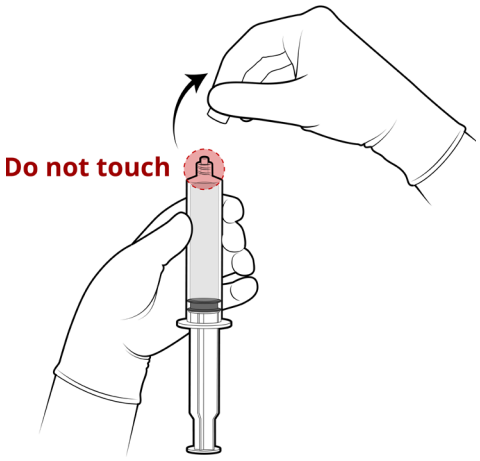
Screw the cap back onto the syringe, but do not over-tighten it. Place the syringe back on the disinfected surface. Repeat the same steps for the other heparin syringes.

Step 3: Prepare the saline syringes

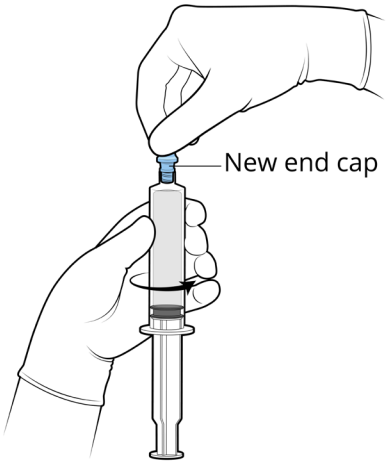
Open the packaging of a new end cap, but do not take the end cap out.

Hold the saline syringe with the syringe cap pointing up. With your other hand, unscrew the white syringe cap and put it in the garbage. Do not touch the end of the syringe as this can cause an infection. If anything touches the end of the syringe, use another one.

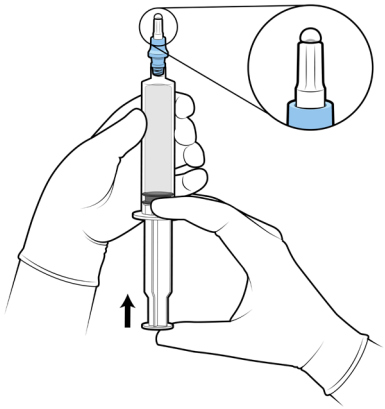




Pick up the new end cap with your other hand. Do not remove the white plastic protector. Push the saline syringe into the blue flat surface of the end cap. Screw the saline syringe clockwise and make sure it is secured.



Push the saline plunger until you see a drip of saline at the white protected end of the cap.



Keep the new end cap and syringe connected and place it on your disinfected surface. Repeat these steps for the other saline syringes. Your syringes are now ready to use.

Flush your CVC lumen

Flush and lock each lumen together before starting on the next one.

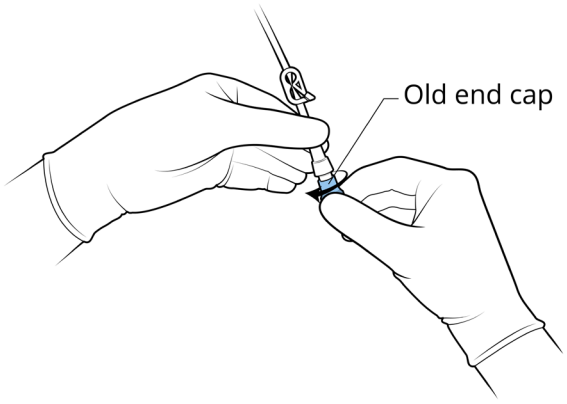
To flush a lumen:

Step 1: Remove the old end cap from the lumen

Before you remove the old end cap, make sure the clamp is closed.

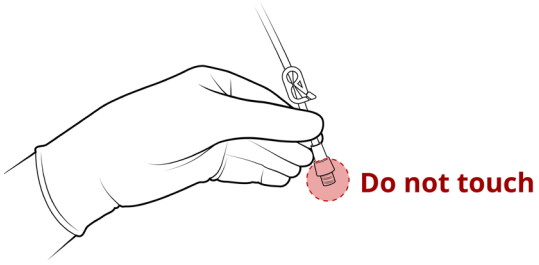
Open the alcohol pad packaging, but to not take the alcohol pad out until you are ready to use it.

Hold the lumen with one hand and twist the old end cap with your other hand to remove the cap from the lumen.

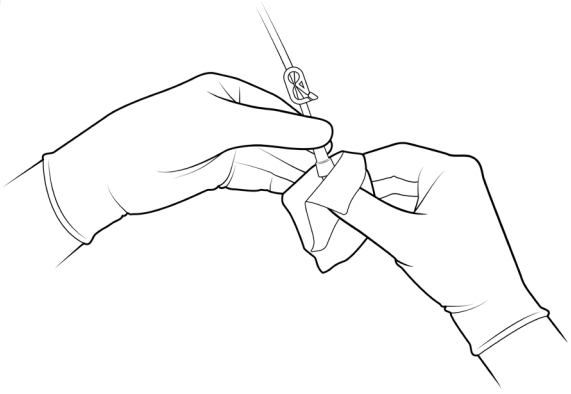


Step 2: Clean the outside of the lumen

Hold the lumen. Do NOT touch the open part.



With your other hand, take an alcohol pad and rub the opening of the lumen back and forth for 15 seconds in a twisting motion

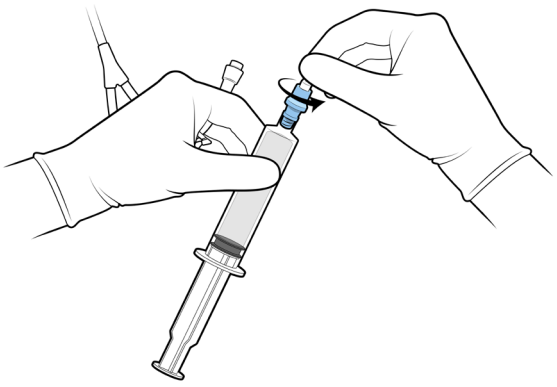


Stop rubbing and hold the lumen to let it dry for 5 seconds. Continue to hold the lumen and do not touch any part that has been clean. If you do, clean it again for 15 seconds with another alcohol wipe.

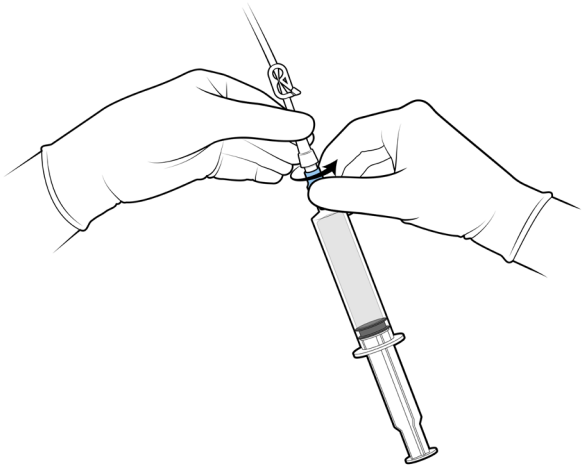
Step 3: Attach the end-cap and saline syringe to the lumen

Hold the lumen with your non-dominant hand (the hand you do not write with) in between your index finger and middle finger.

With the same (non-dominant) hand, hold the saline syringe that is connected to the end cap. Using your dominant hand (the hand that you do write with), remove the white plastic protector from the end cap.

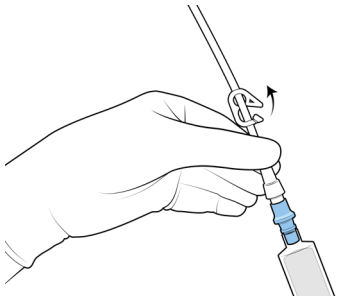


Push the opening end of the cap into the lumen. Turn the end cap clockwise to lock it onto the lumen.



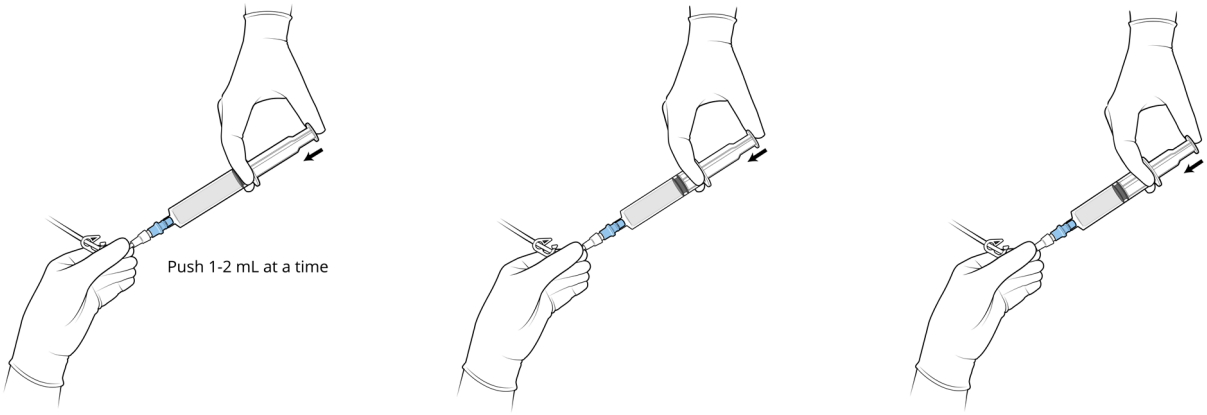
Step 4: Unclamp the lumen

Release the clamp on the lumen of your CVC.

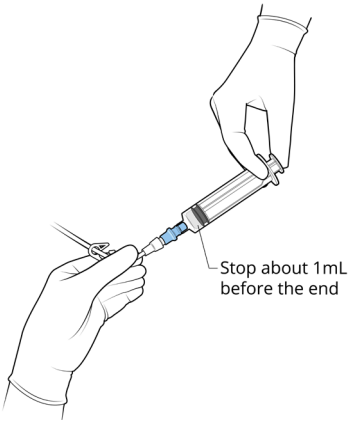


Step 5: Flush with saline

Slowly start to flush the lumen by pushing the plunger in a pulsing motion. Hold the syringe so that the plunger faces up. Push about 1 to 2 mL of saline at a time, then pause, then push again. It is important you use this method to keep your line clear and open.

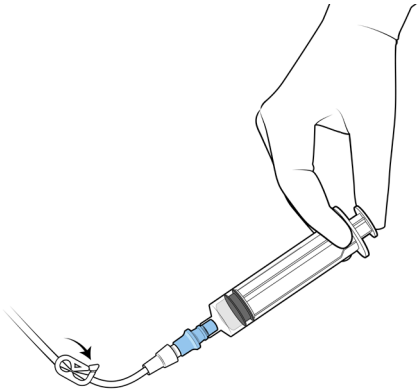


Stop about 1 mL before the end. This stops air bubbles from going into the lumen.



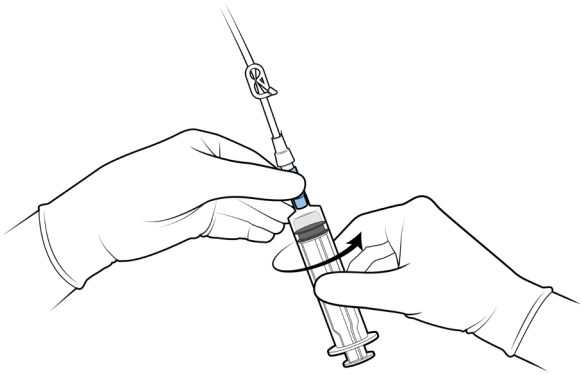
Step 6: Clamp the CVC lumen

While still keeping your thumb on the plunger end of the syringe, clamp the lumen back.



Step 7: Remove the syringe

Hold the end cap of the CVC, not the lumen. Unscrew the saline syringe in a counter-clockwise motion. You can throw away the syringe. The new end cap will stay attached the lumen.



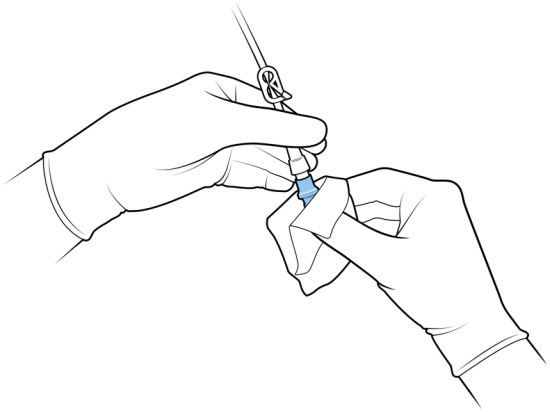
The flushing step is now complete. Next, you will lock the lumen with heparin. Lock the lumen that has just been flushed before you start working on another lumen.

Lock your CVC

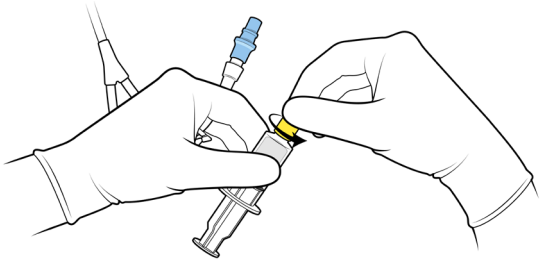
Locking your CVC lumen is similar to flushing your lumen, only you will use heparin instead of saline. You do not need to change the end caps again when you lock your lumen.

To lock your CVC lumen:

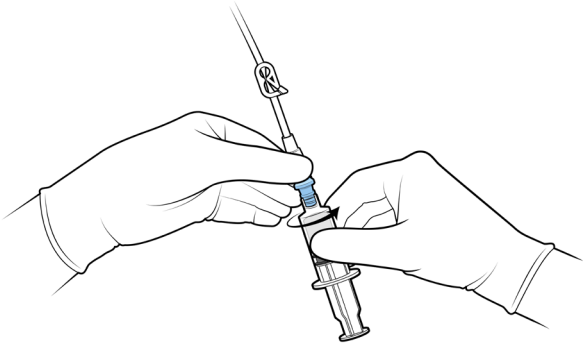
Clean the end cap of the lumen with an alcohol wipe.



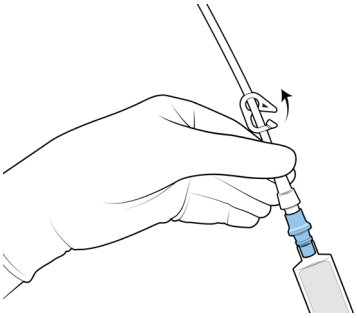
Remove the yellow cap on the heparin syringe and throw it in the garbage.



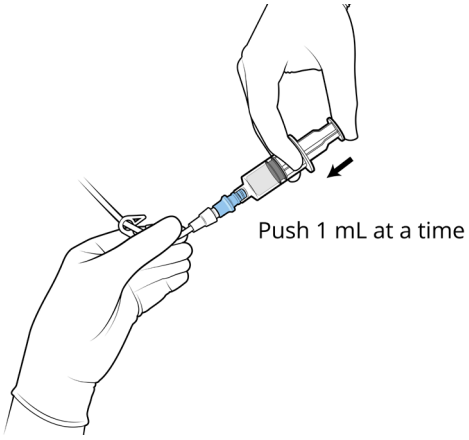
Attach the heparin syringe to the end cap by screwing it in clockwise.



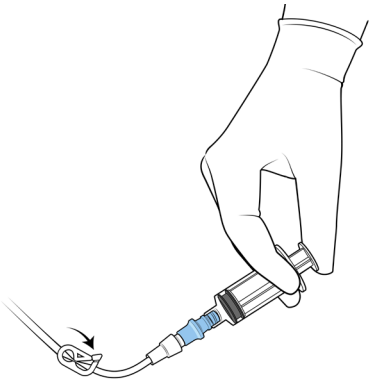
Unclamp the lumen.



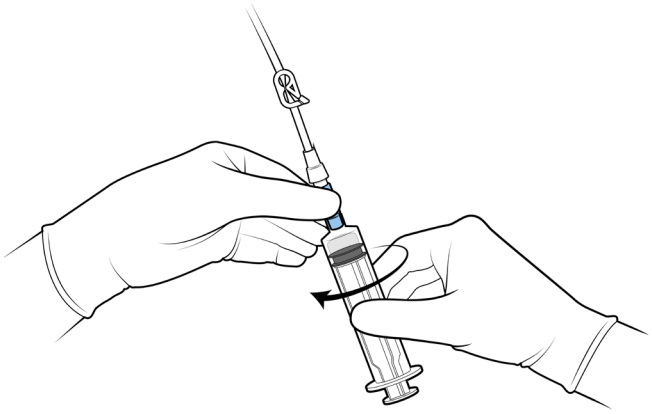
Push heparin into the lumen. Push 1mL of heparin at a time in a pulsing motion, until all 3 mL of heparin is given.



Clamp the lumen while keeping your thumb on the plunger.



Unscrew and remove heparin syringe from end cap.



Repeat the flushing and locking steps with the saline and heparin syringes on your other lumens if you have them.

If you have a PICC line, secure the PICC lumens with a stocking net or a handmade pouch. Put all used syringes and supplies in a regular garbage can. Remove gloves and wash your hands.

Contact your health care team if you have any questions.

How to deal with problems

What if I forget to flush the catheter or change the dressing on time?
If you forget, flush your catheter or change the dressing as soon as you remember.

What if the cap falls off or there is leakage around the cap?
If there is any leaking along the catheter, clamp the catheter right away above the leak. If there is any leaking around the cap, make sure the cap is tightly screwed. Wrap a gauze or tissue around the cap. Call your doctor or nurse for further instruction.

What if any part of the catheter is cut or breaks off?
Clamp the catheter right away between the exit site and where the cut or break is. If the catheter has no clamp, bend the catheter lumen that has the cut or break to make a U shape. Wrap a rubber band tightly around the lumen. Go to the nearest hospital emergency department.

What if the clamp breaks?
Make sure the cap is still attached to the lumen (do not over tighten the cap). Blood will not come out from the lumen as long as the cap is on. Call your doctor or nurse right away. If there is no cap at the end of the catheter, bend the catheter lumen and wrap a rubber band tightly over the catheter. Go to the nearest hospital emergency.

What if my catheter moves or falls out?
If the catheter moves out of its regular place, tape the catheter firmly onto the skin. Call your

doctor or nurse to find out what you should do. Do not push the catheter back into the skin as this can cause an infection. If the catheter falls out, cover the site with clean gauze or a clean towel right away. Then apply firm pressure until the bleeding stops. Go to the nearest hospital emergency room right away.



Go to the nearest emergency room if you have:

- A fever (38 °C or 100.4 °F), with or without chills
- Shortness of breath
- Dizziness
- Chest pain
- Excess pain, drainage (fluid) around the entrance or exit site
- Swelling on your neck, face, or arm on the side where the catheter was inserted
- The catheter was pulled out
- Any fresh (bright red) blood coming through your dressing
- Any fresh (bright red) blood after you remove the dressing

These may be signs of an infection or other problems.