

What is a Hickman Catheter?

A Hickman Catheter, also called a central venous catheter or central venous line, is a long hollow tube (lumen) made of soft silicone. The catheter is surgically inserted into a large vein leading directly into your child's heart.

A portion of the catheter, which is tunneled under the skin, has a small cuff. This cuff serves two purposes: it secures the catheter in place as the skin heals around it, and it acts as a physical barrier to prevent bacteria from entering the body through the skin.

The external end of the catheter may have either a single or double lumen which can be attached to intravenous tubing, a syringe or a protective cap. **If your child has a double lumen catheter, each tube must be treated separately.**

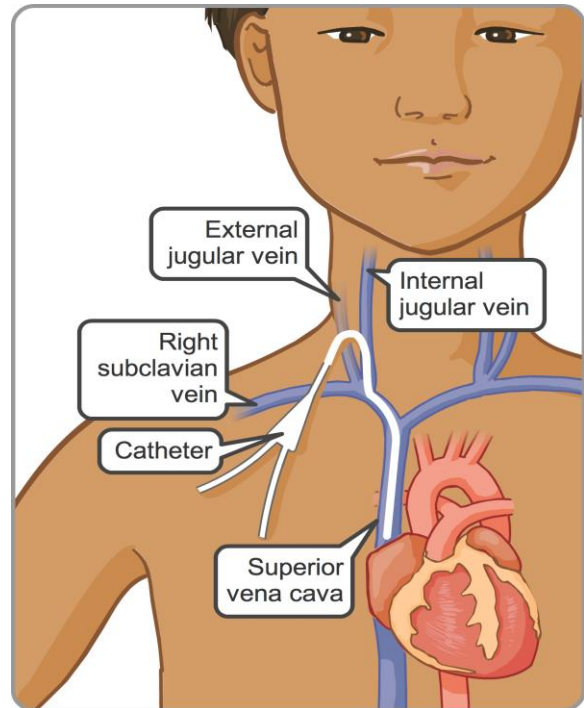
Why is a Central Venous Catheter Used?

A Central Venous Catheter is used in children who need intravenous (IV) therapy for a long time. It can be used to:

- provide intravenous fluid
- provide intravenous medications
- provide intravenous transfusions
- allow for blood sampling (Note: There may still be times when blood will have to be drawn from veins in the arm or by finger poke)

How is the Central Venous Catheter Inserted?

The catheter is inserted in the operating room by a Surgeon or Interventional Radiologist. Your child will be given special "sleep medicine" called a general anesthetic before the procedure to ensure your child does not feel any pain. During the procedure, a small incision will be made near the collarbone or shoulder. This incision is known as the "insertion site". A second incision, called the "exit site," will be made between the nipple and mid-chest.



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The catheter will be tunneled under the skin between these two incisions and threaded into a large vein leading into the heart.

What to Expect After the Procedure

After the procedure, your child may experience soreness or discomfort at the incision sites, which usually lasts one to two days. If this happens, inform your doctor or nurse. They may be able to give your child pain medication to make your child feel comfortable. Often, children feel like they have a stiff neck due to the neck bandage. It is safe for your child to move his/her neck as usual.

Aseptic Technique

Aseptic technique is a procedure used to prevent the contamination of harmful microorganisms (germs) (ie., bacteria, viruses) in the environment.

One of the major risks associated with central line care is infection. **Aseptic technique is extremely important** and must be **STRICTLY** followed when caring for a central venous line

to prevent exposure to microorganisms that cause infection.

This can be accomplished by **good** handwashing, keeping your work surface clean, and the use of aseptic technique when handling supplies and “sterile” parts of the catheter.

Handwashing

Proper hand washing is the most effective way to prevent and control the transmission of infection.

Handwashing Using Soap and Water

1. Remove jewelry and push sleeves above the elbows.
2. Be sure your fingernails are short and trimmed neatly. Avoid long or artificial nails.
3. Turn on water and regulate temperature so that water is warm.
4. Wet hands and wrists. Keep hands and forearms lower than the elbows during washing.
5. Apply soap, lathering thoroughly.
6. Wash hands vigorously for at least 15 seconds. Interlace fingers and rub palms and back of hands with circular motion at least five times each.
Hint: Hum the “Happy Birthday” song from beginning to end twice while scrubbing.
7. Rinse hands and wrists thoroughly, keeping hands down and elbows up.
8. Dry hands with a clean towel from fingers to wrist.
9. Turn taps off with the towel – do not touch the taps with your cleaned hands.



Emergency Care for Central Venous Catheter

A break in the line is a **MEDICAL EMERGENCY**.

Before you leave the hospital, you will be given a Central Venous Catheter Emergency Kit. This kit contains supplies you will need if your child's catheter breaks. A nurse will give you the kit and review it with you before you leave. You should always make sure that the kit is with you in case the lumen breaks.

If the catheter breaks **CLAMP** the line, **COVER** the break in the line, & **CALL** a health care provider.

CLAMP

Use the slider clamp and bulldog clamp to **CLAMP** the line between the break and your child.



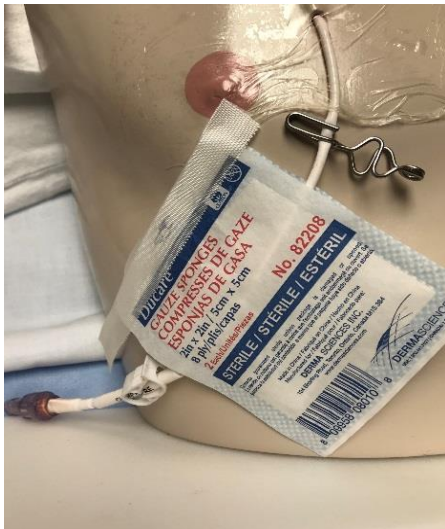
CALL

If you are in hospital notify your nurse or doctor. If you are at home **CALL** the emergency department at your local hospital.



COVER

Use a sterile dressing to **COVER** the break in the line



Principles to Keep in Mind When Caring for Your Child's Central Venous Catheter

- **A sterile object becomes contaminated when it comes in contact with an unsterile object. If you are in doubt** about the sterility of anything, it should **not** be used.
- **Never turn your back or walk away from the sterile field.** This will prevent possible contamination when the field is out of your view.
- **Hold sterile objects above the level of the waist.** This will ensure the object is in sight; therefore avoiding possible contamination.
- **Avoid talking, coughing, sneezing, or reaching over a sterile field or object.** This will help prevent contamination of droplets from your nose or mouth, or particles from your body.
- **If you have a cough or cold cover your nose and mouth with a mask when caring for a central line.** This will prevent the spread of infection.

Supplies Needed for Care of Hickman Catheter



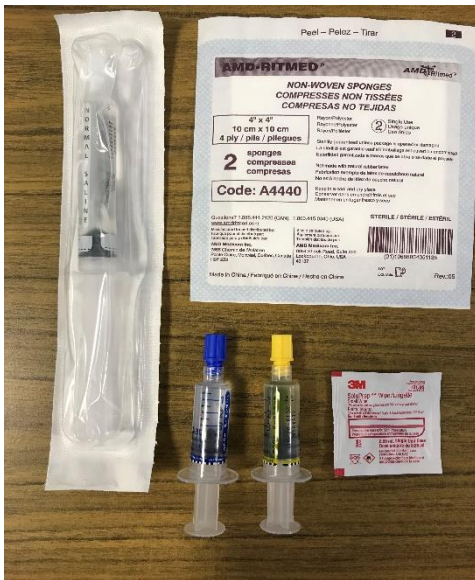
- Sterile Dressing Tray
- 10 ml prefilled normal saline syringes (one for each lumen)
- Surgical Masks
- Semipermeable transparent dressing Membrane Dressing (i.e., Tegaderm IV Advanced)
- IV Connector Cap (one for each lumen)
- Heparin solution
 - For children greater than 10 kg (22 lbs) use heparin 100 units/ml
 - For children less than 10 kg (22 lbs) use heparin 10 units/ml
- StatLock
- Antiseptic wipe (2% chlorhexidine with 70% alcohol wipe or 2% aqueous chlorhexidine swab for children less than 2 months of age).
- Sterile Gloves
- Clean Gloves
- Alcohol Handrub
- Sterile normal saline (infants less than 2 months of age)

Heparinizing (Locking) the Catheter

The purpose of locking the catheter is to help keep the line working properly. Lock each lumen every **Monday, Wednesday, and Friday**.

Step 1: Wash hands.

Step 2: Gather the following supplies on a clean work surface:



- 10 ml prefilled normal saline syringe (one for each lumen)
- Antiseptic wipes (2% chlorohexidine with 70% alcohol wipe)
- Heparin lock solution appropriate for your child's weight
 - For children greater than 10 kg (22 lbs) use heparin 100 units/ml
 - For children less than 10 kg (22 lbs) use heparin 10 units/ml
- Sterile gauze

Step 3: Hold the catheter lumen off the chest with your non-dominant hand. With your other hand, cleanse the IV connector cap with the antiseptic swab/pad for 15-30 seconds with a vigorous scrubbing technique. Place cleaned catheter lumen in opened gauze package and

allow for the connector cap to completely air dry.



Step 4: Prepare the 10 mL normal saline prefilled syringe by pushing the solution to the tip of the syringe. Make sure all air bubbles are removed. You can do this by taking the cap off the syringe and tapping the syringe with your knuckles to shift the bubbles to the top of the syringe. Gently pull back on the plunger of the syringe then carefully push on the plunger to move the air up and out of the syringe.

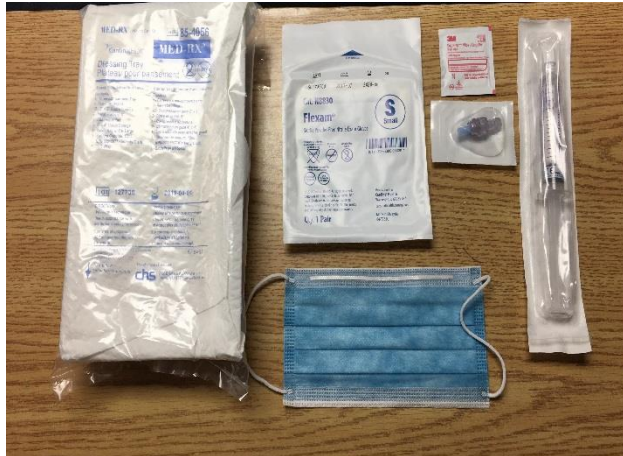


Replacing the IV Connector Cap (i.e., One Link®)

You will need to change the IV connector cap once a week. Plan to change it on a Monday, Wednesday, OR Friday, when you are locking the catheter lumen(s). This is a sterile procedure and requires sterile gloves and surgical mask.

Step 1: Wash hands and apply mask.

Step 2: Gather the following supplies on a clean work surface:



- Sterile dressing tray
- Sterile gloves
- Surgical mask(s)
- 2 antiseptic wipes (2% chlorohexidine with 70% alcohol wipe). If your child has a double lumen catheter you will need to use 4 antiseptic wipes
- 10 ml prefilled normal saline syringes (one for each lumen)
- IV Connector Cap (i.e., One Link®)
- Clean gloves

Step 3: Assemble sterile dressing tray and add supplies.



Step 4: Position your child's head so it is turned away from the insertion site. Consider placing a mask on your child if he or she has difficulty with this position.

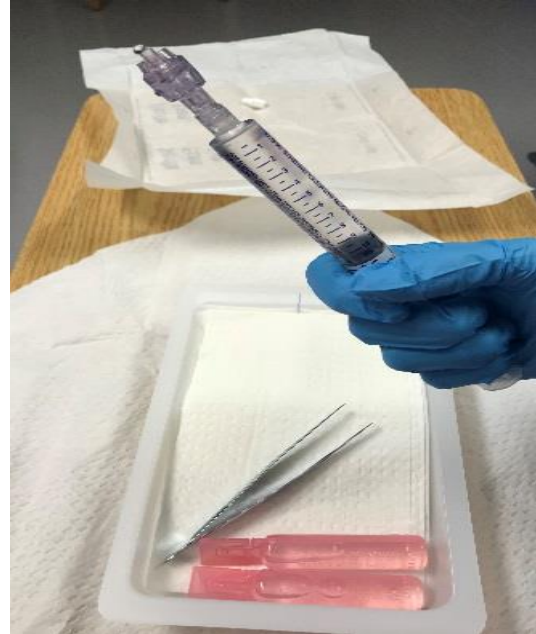
Step 5: Hold the catheter lumen off the chest with your non-dominant hand. With your other hand, cleanse the IV connector cap on the end of the catheter and up the catheter towards the exit site with the disinfecting swab/pad for 15-30 seconds using a vigorous scrubbing technique.



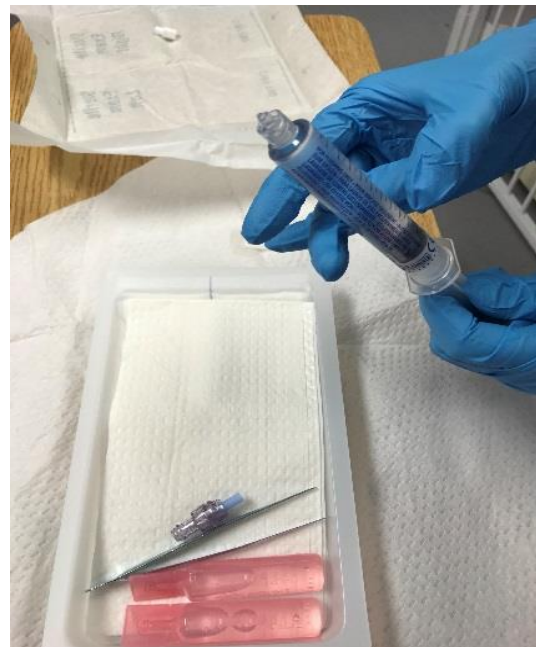
Step 6: After cleansing, place the sterile drape on your child's chest then lay the catheter on the drape and allow to dry.



Step 8: Attach a new IV connector to a prefilled 10 mL normal saline syringe. Flush the solution through the new cap, and ensure there are no air bubbles present.



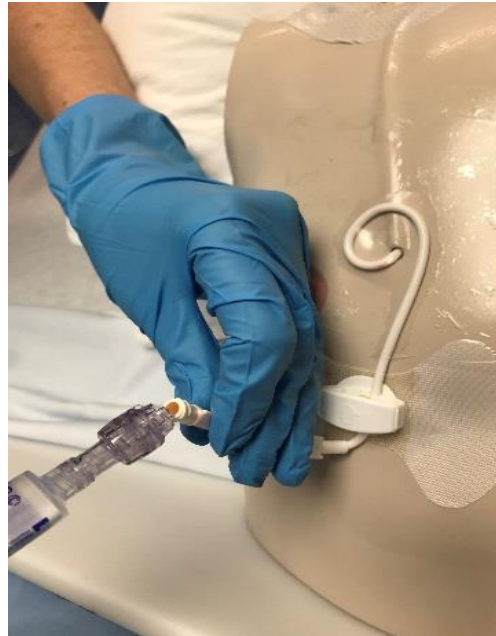
Step 7: Wash hands and apply sterile gloves.



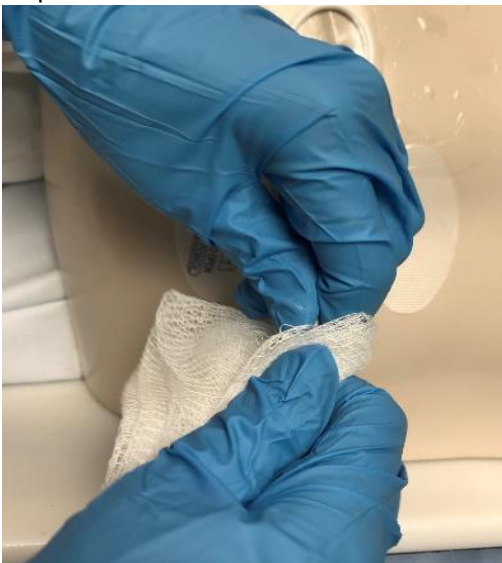
Step 9: Make sure the clamp on the catheter lumen is closed.



Step 11: Using the prefilled normal saline syringe with IV connector cap attached, fill the hub of the catheter lumen with normal saline.



Step 10: Using a piece of sterile gauze, remove the old IV connector cap from the catheter lumen by turning it counter-clockwise. Discard old cap.



Step 12: Attach the new one link IV connector cap to the catheter lumen using a clockwise motion to tighten it.



Step 13: Continue with the procedure for “Locking the Catheter” following steps 7-9.

Dressing Change

Your child's dressing should be changed once a week, or more frequently if the dressing is wet, soiled or no longer occlusive. If gauze is placed over the exit site the dressing must be changed every 48 hours (2 days).

Step 1: Wash hands and apply a mask.

Step 2: Gather the following supplies on a clean work surface:



- Dressing tray
- Transparent semipermeable membrane dressing (i.e., Tegaderm IV Advanced)
- Sterile gloves
- Clean gloves
- 2 antiseptic swabs (2% chlorhexidine with 70% alcohol wipe, 2% aqueous chlorhexidine swab for infants less than 2 months of age)
- Stat Lock
- Alcohol wipe
- Mask(s)

Step 3: Assemble sterile dressing tray. Open supplies and carefully add items to tray. Do not touch the inside of the packages or dressing tray with your bare hands.

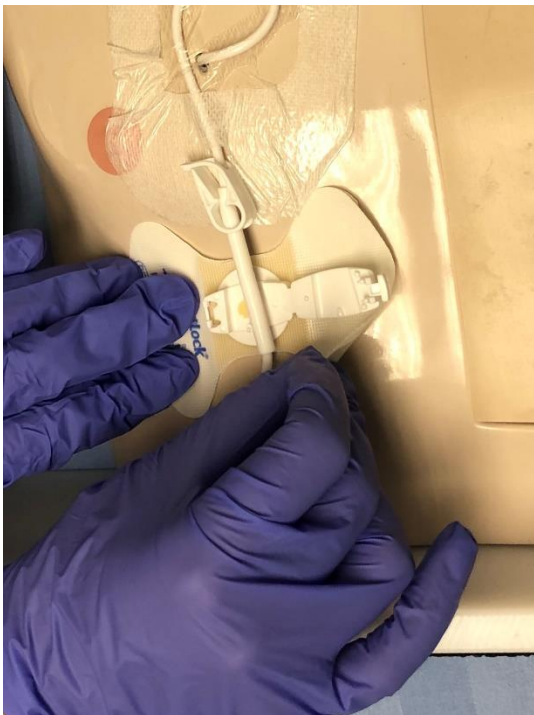
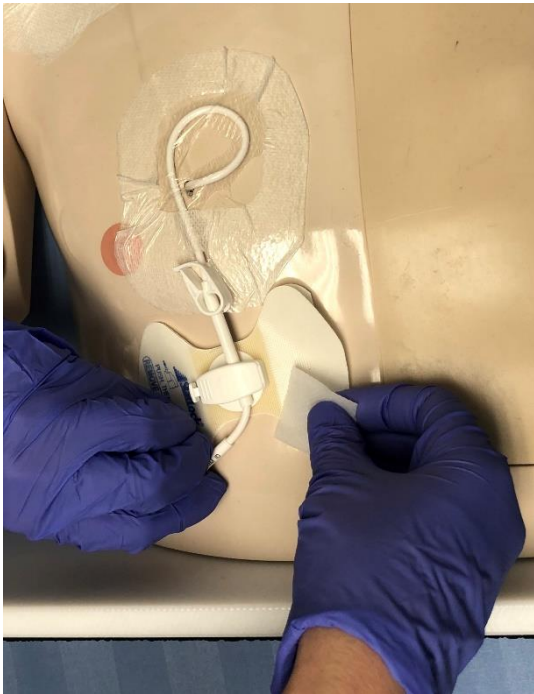


Step 4: Wash hands and put on clean gloves.

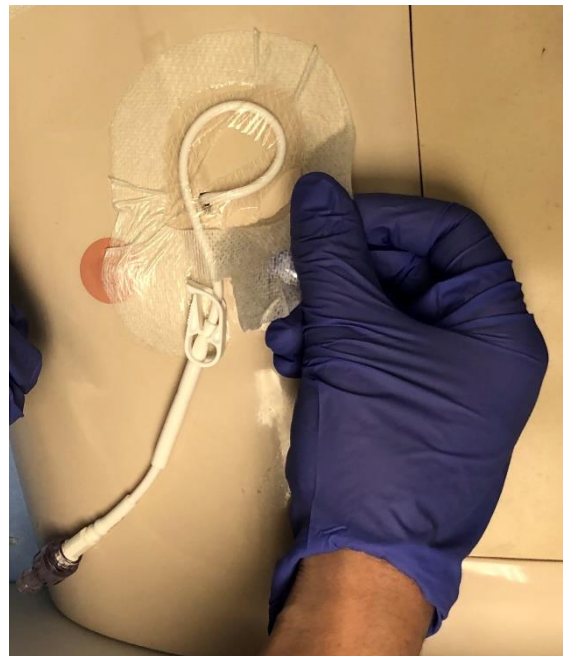
Step 5: Position your child's head so it is turned away from the insertion site. Consider placing a mask on your child if he or she has difficulty with this position.

Step 6: If the transparent dressing is covering the stat lock peel it back so that the entire stat lock is exposed. Remove stat lock using alcohol wipe.





Step 7: Remove the old dressing by gently pulling it parallel to the skin away from the exit site. **BE CAREFUL NOT TO TUG ON THE CATHETER WHILE REMOVING DRESSING.** Do not touch exit site with hands.



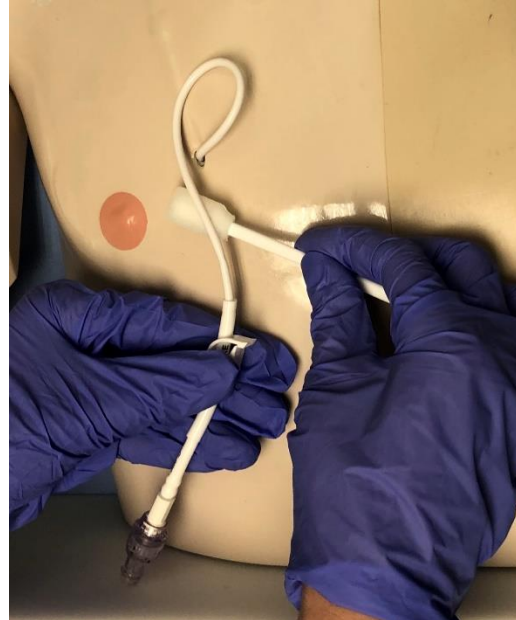
Step 8: Examine exit site for skin irritation, redness, tenderness, drainage, and/or swelling. Also, examine old dressing for any drainage. If you see any of these signs, finish the dressing and then notify your doctor or nurse.



Step 9: Hold the catheter lumen off the chest with your non-dominant hand. With your other hand, cleanse the site with the disinfecting swab/pad using a back and forth motion for a minimum of 30 seconds. Use gentle pressure. Allow to air dry completely. Do not blow on it or wave your hands above the site. (If child is less than 2 months of age use aqueous chlorohexidine swab, allow the site to completely dry, cleanse with normal saline and allow the site to dry again).



Step 10: Once the exit site is cleansed, cleanse 5 cm along the length of the catheter towards the IV connector cap with a new antiseptic swab/pad. Do not move back over an area already cleansed. Discard swab/pad.



Step 11: If the exit site is oozing place the non-woven 2x2 gauze above the exit site.

Step 12: Wash hands again and put on sterile gloves.

Problem	Possible Cause	What to do
-Fever (38.3 °C by mouth or 37.8°C under the arm) -Chills -Perspiring (sweating) -Weakness -Fatigue (Tiredness) -Redness or drainage around Hickman catheter exit site or surrounding skin -Tenderness around the Hickman catheter site -Shortness of breath -Pains in chest or arm	Infection -It is necessary to use aseptic technique when caring for the Hickman catheter. Contamination of the catheter connection can allow entry and growth of microorganisms in the body and cause infection.	Notify your Physician or Public Health Nurse immediately OR immediately go to closest Emergency department.
-Trouble flushing the catheter -Unable to give medicine or fluid into the Hickman catheter	-Catheter may be clamped -Catheter or tubing may be kinked	-Unclamp Hickman catheter -Remove the kink -If the catheter is not kinked or clamped do not force the solution into the catheter. Notify Physician or Public Health Nurse immediately OR immediately go to closest Emergency department
Fluid leaking from the Hickman catheter	-Injection cap is not screwed on securely -A hole in the catheter	-Tighten the injection cap. -If you see a leak in the catheter, clamp it (or fold it over and pinch it) between the damaged area and the skin. Notify the Physician or Public Health Nurse immediately, OR immediately go to closest Emergency department
Missing IV Connection Cap	Injection cap became loose and fell off	Scrub the catheter hub with an antiseptic swab/pad and replace the IV connector cap using sterile technique
Skin redness where the tape or dressing is located	Sensitivity to tape or dressing	You may need to change the type of dressing or tape used
Hickman catheter accidentally comes out		-Apply firm, direct pressure over the site with sterile gauze until the bleeding stops -Apply thick dressing using gauze with tape and -Notify the Physician or Public Health Nurse immediately, OR immediately go to closest Emergency department

If you have any questions/concerns, please call:

Physician: _____

Public Health Nurse: _____

Local Emergency: _____

Other: _____

HealthLine: 811

Supporting Documents

Central Venous Tunneled Catheter: Flushing (Pediatrics). (2018). In *Mosby's clinical skills*. Retrieved from https://lms.elsevierperformancemanager.com/ContentArea/NursingSkills/GetNursingSkillsDetails?skillid=CCP_143B&skillkeyid=871&searchTerm=central%20venous&searchContext=home

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