Pediatric Central Line Care

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CALL FOR PROBLEMS
Pediatric Transplant Patients

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<tr>
<td>8am–10pm, Monday–Friday</td>
<td>(206) 288-7600</td>
</tr>
<tr>
<td>8am–6pm, Saturday, Sunday; 8am–5pm, Holidays</td>
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<tr>
<td>10pm–8am, Monday–Friday</td>
<td>(206) 987-2032</td>
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<tr>
<td>6pm–8am, Saturday, Sunday; 5pm–8am, Holidays</td>
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Knowledge is Power
SCCA Patient and Family Education

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What is a Central Venous Catheter?
A central venous catheter, or central line, is a small flexible tube inserted into a large vein in your child’s chest. It is used to give your child fluid, nutrients, medicine, and blood products. It is also used to get blood samples without having to draw blood from your child’s arm. Many types of central venous catheters are available; they may be called tunneled catheters, central venous lines, and Hickman lines.

Central Venous Catheter Placement: What to Expect
The insertion of the central line is a minor surgical procedure. It is done in an operating room under general anesthesia (full sleep) and takes about one hour. The catheter is threaded through a “tunnel” under the skin and then placed into a large vein in the chest near your child’s neck that returns blood to his or her heart. A small cuff on the catheter helps hold the catheter in place in the tunnel, underneath the skin. This cuff also acts as a barrier to help prevent bacteria on your child’s skin from traveling up the catheter tunnel and into the bloodstream. Your child will likely have a few sutures in place to help secure the line. Your child’s shoulder and chest area may be sore for a few days after insertion, for which a mild pain reliever will be prescribed. It is helpful for your child to move the shoulder and neck right after surgery to help keep the area from getting stiff.

Your child’s nurse will teach you how to care for the central line catheter by the day before it is inserted, and you will perform the first dressing change with the nurse’s help the day after the catheter is inserted.

How is the procedure done?
1. The doctor will make two small incisions—one in the upper chest near the neck, and the other on the lower chest.
2. Between these incisions, your child’s doctor will make a tunnel under the skin.
3. The catheter will be inserted in the lower incision on the chest and pulled through the tunnel.
4. The catheter is inserted into the large chest vein located near the neck (this vein returns blood to the heart).

Things to remember:
- Securing the line by dressing your child in a tight-fitting tank top or sports bra for at least one night after placement is recommended.
- Do not give your child aspirin, ibuprofen, or other over-the-counter pain medications without first checking with your child’s doctor or nurse.
- No heavy lifting for 72 hours.

Activity
Routine light exercise, sports, sleep, and travel are not limited by having a central line. The dressing is changed depending on dressing type or any time the dressing gets wet. Avoid swimming pools and hot tubs. Do not allow the blue caps of the catheter to float in bath water. Do not submerge any part of the catheter in bath water. The most important thing to remember about your child’s line during activity is to always attach his/her catheter to the skin, clothing or necklace to prevent accidental dislodgement. You may use a “bulldog” clamp to attach it to clothing or tape the catheter to the skin. Remember that the “bulldog” is an emergency clamp and should be kept with your child at all times.

Catheter Care at a Glance

<table>
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<th>Dressing Options</th>
<th>Dressing Change</th>
<th>Flushing</th>
<th>Tape Tabs</th>
<th>Alcohol Wipe</th>
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<tr>
<td>Occlusive Dressing with or without Biopatch®</td>
<td>every 7 days</td>
<td>daily or with each use</td>
<td>daily</td>
<td>daily</td>
<td>with bathing</td>
<td>with bathing</td>
</tr>
<tr>
<td>Gauze and Tape</td>
<td>daily</td>
<td>daily or with each use</td>
<td>daily</td>
<td>daily</td>
<td>with bathing</td>
<td>with bathing</td>
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Fast Facts on Central Line Care: How to Protect Your Child’s Catheter

**DO**

- Keep dressing supplies dry—away from the bathroom and kitchen.
- Secure your child’s catheter and prevent accidental removal of the line. There are many ways to do this:
  - Place plastic tape tabs between clamp and cap on the catheter and change daily. Use the plastic tape tabs and bulldog clamp to secure the catheter to clothing or a necklace.
  - Place catheter in a clean, cloth pouch and secure the pouch with a bulldog clamp to clothing or a necklace.
  - Coil the catheter over the exit site and tape it to the skin.
- Place catheter clamps on the thick, reinforced area of the line, not too close to the hard plastic portion of the line.
- Change the dressing if it is wet, if it starts to come off, or if there is moisture underneath the dressing.
- Clean your child’s line once a day with alcohol swabs and replace plastic tape tabs.
- When bathing or showering, you should always cover the exit site of your child's catheter with a plastic covering such as Aquaguard® or plastic wrap to prevent tap water from entering the catheter tunnel. The uncovered exit site should not come in contact with tap or bath water.
- Always securely wrap the Clave® end caps with Parafilm® to prevent water from entering the Clave® top or into the connection to the catheter.
- Change your child’s dressing if you notice moisture under the dressing when removing the plastic covering and Parafilm®. If you notice moisture under the Parafilm®, ask to have your child’s Clave® caps changed in the clinic.
- When changing your child’s dressing, if build-up is noted, you may first cleanse skin around the exit site with a sterile, saline-soaked gauze pad to remove ChloraPrep One Step® (chlorhexidine) and the no-sting barrier. Never use tap water to cleanse the exit site.
- Keep your child's bulldog clamp with you at all times. The bulldog clamp is a safety clamp. Clamp the catheter close to their chest and call the clinic immediately if the catheter leaks, gets cut, or breaks.

**DON’T**

- Do not take the Clave® cap connectors off of your child's catheter.
- Do not tape over the connection between Clave® caps and catheter.
- Do not let your child swim or use a hot tub.
- Do not allow Clave® caps, central catheter, or exit site to be submerged in bath water.
- Do not store catheter supplies in the bathroom or kitchen.
- Do not use scissors near your child's catheter.

**Daily Care: When to Flush and What Solution to Use**

- Flush each line of the catheter with normal saline followed by a heparin solution at least once each day and after each use.
- If your child is having a blood draw, both lines of the catheter will be flushed at that time unless the side not used for blood draw is connected to IV tubing.
- Flush the catheter at the beginning of an infusion with normal saline only.
- Flush the catheter at the end of an infusion with normal saline followed by a heparin solution.
- **If your child is receiving antibiotics:** Your doctor may recommend that they alternate infusing antibiotic doses between all lumens of the catheter. Please check with your child’s nurse if you have any questions.
Anti–Coagulation Therapy for Your Child’s Catheter

Heparin is used to flush your child’s catheter to prevent clot growth within the central line. You will flush each lumen of the catheter with normal saline and heparin lock flush solution at least once a day. The daily heparin catheter flush is still required even if your child is on any of the oral or injectable blood thinners listed below to prevent or treat a blood clot.

In addition to heparin flushes, your child may also be required to take other medications to prevent clotting such as:

- **Warfarin (Coumadin®)** is given orally to prevent or treat clotting within or around your child’s central line or to treat blood clots that have formed in other blood vessels. Your child will have their Protime (PT) and International Normalized Ratio (INR) blood levels drawn throughout their treatment to make sure that the clots are treated appropriately.

- **Low-molecular weight heparin**, such as enoxaparin (Lovenox®), tinzaparin (Innohep®), and dalteparin (Fragmin®), or fondaparinux (Arixtra®; which is not a heparin or low-molecular weight heparin): Your child will be prescribed only one of the low-molecular weight heparin medications or Arixtra® at any one time. Your child will receive a shot/injection under the skin 1-2 times each day. Your child will have blood levels drawn periodically to check for anti-coagulation activity to ensure that they are treated appropriately.

Heparin “allergy” or history of heparin-induced thrombocytopenia (HIT): If you have ever been told that your child has an allergy to heparin, they should not use heparin or low-molecular weight heparin to prevent clots. This includes using heparin to flush the catheter. If your child has a heparin allergy, please ask about other flushing options. Please discuss with your child’s doctor or nurse if you are unsure if your child has a heparin allergy.

How to Flush the Catheter

Flush each line of the catheter at least once each day and after each use, first with saline, then with heparin.

Supplies needed:
- Two -10 ml syringes with normal saline flush
- Two -5 ml syringes with heparin lock flush solution
- Alcohol wipes

1. Wash your hands.

2. Remove the syringe(s) from their package(s) by peeling the plastic downward.

3. Put on clean gloves. Vigorously scrub the top of the Clave® cap with an alcohol wipe for 15 seconds using twisting motion as if you were juicing an orange. Allow the Clave® to dry completely for at least 5 seconds.
4. Hold the syringe with the cap on, pointed towards the ceiling, and remove the cap from the syringe. Carefully remove the air bubble by gently pulling back on the syringe to release pressure and then pushing up on the plunger until all air is removed from the syringe.

5. Insert the syringe into the center of the Clave® cap by pushing in and turning toward the right. Be sure not to touch the end of the Clave® cap or end of the syringe with your hand. The syringe tip should only touch the cleansed end of the catheter cap. If in doubt, please throw it out.

6. Unclamp the catheter.

7. Flush first with 5ml of normal saline followed by 2.5ml of heparin. Push the plunger on the syringe with alternating pressure and release (starting and stopping to create turbulence) to inject the fluid into the catheter. This keeps the catheter clean. Do not flush all of the fluid into the catheter. Only flush 5 ml of normal saline and 2.5 ml of heparin.

9. To create positive pressure in the line, clamp the catheter while injecting the last of the fluid before removing the syringe.

10. Remove the syringe. Discard in regular garbage can.

11. Repeat steps 2-10 on the other line. Use separate syringe for flushing each side of the central line.

**Daily Care: Cleaning the Catheter**

It is important to clean your child’s catheter every day. This helps to prevent infection.

1. Remove plastic tape tabs near Clave® caps.
2. Using two alcohol wipes for each line (one to hold the line and one to wipe it), start where line exits the dressing and wipe towards the end of the line. Take special care to thoroughly scrub around the connection between the line and the Clave® caps.
3. Replace plastic tape tabs near Clave® caps.

If you are using a baby bootie or cloth bag to hold your line, please be sure to use a freshly laundered bag after you clean your line. Make sure to change it daily.

Remember to clean your child’s catheter every day.
When to Change Your Child’s Dressing

- If your child has a Biopatch® and Occlusive Dressing:
  - Change the dressing every 7 days.

- If your child has a Transparent Occlusive Dressing:
  - Change dressing every 7 days.

- If your child has a Gauze and Tape Dressing:
  - Dressing should be changed daily.

Additional Dressing Change Tips:
- Both dressing and exit site should be looked at each day.
- Talk to the nurse if your child’s skin is sensitive to the dressing.
- The dressing should also be changed if:
  - The exit site cannot be seen because of drainage or moisture.
  - The dressing starts to come off.

Dressing Change Supplies
Wash your hands with soap and water. Assemble your supplies on a clean workspace:

- If your child has a Biopatch® and Occlusive Dressing:
  - 1 package 2x2 gauze
  - Biopatch®
  - 1 ChloraPrep One-Step® application
  - 2 pairs of clean gloves
  - Sterile saline flush
  - 2 alcohol wipes
  - 2 Cavilon No-Sting Barrier Film® foam pads
  - Transparent dressing (IV3000, Sorbaview, Tegaderm™ HP)
  - Plastic tape

- If your child has a Transparent Occlusive Dressing:
  - 1 package 2x2 gauze
  - Transparent dressing (IV3000, Sorbaview, Tegaderm HP)
  - 1 ChloraPrep One-Step® application
  - *If allergic to Chlorhexidine, use 1 package isopropyl alcohol swab sticks and 1 package povidone-iodine swabs stick.
  - 2 pairs of clean gloves
  - Sterile saline flush
  - 2 alcohol wipes
  - 2 Cavilon No-Sting Barrier Film® foam pads
  - Plastic tape

- If your child has a Gauze and Tape Dressing:
  - 3 packages 2x2 gauze (or 1 package 2x2 split gauze and 2 packages 2x2 gauze)
  - 2 alcohol wipes
  - Sterile saline syringe
  - Skin prep
  - Paper tape
  - 1 ChloraPrep One-Step® application
  - *If allergic to Chlorhexidine, use 1 package isopropyl alcohol swab sticks and 1 package povidone-iodine swabs stick.
  - 2 pairs of clean gloves
  - Plastic tape (for tape tabs)

Dressing Change Steps
1. Wash your hands with soap and water again.

2. Put on a clean pair of gloves.
3. Remove old dressing and throw away.

☐ If your child has an occlusive dressing with Biopatch®:
  • Remove the transparent dressing by starting at a corner, pulling “low and slow.” When the Biopatch® is reached, continue to slowly pull back on the dressing to separate the Biopatch from the transparent dressing. Do not use scissors.

☐ If your child has an Occlusive Transparent Dressing:
  • Remove the transparent dressing by starting at a corner, pulling “low and slow.” Do not use scissors.

☐ If your child has a Gauze and Tape Dressing:
  • Remove the old gauze and tape dressing. Do not use scissors.

4. Remove plastic tape tabs near Clave® caps and throw away.

5. Open gauze pad and wet the pad with saline from the syringe. Do not set a wet gauze pad on any surface or it will become dirty.

6. Gently wipe skin in all directions around exit site with the saline-soaked gauze pad, allow to dry. This will remove any buildup of Chloraprep® and No-Sting Barrier® film and will also decrease skin irritation. Throw away gauze.

7. Report to your nurse if there is:
  • Bleeding or drainage at the catheter site.
  • Redness or swelling at the catheter site.
  • Pain or discomfort at the catheter site.

8. Take off gloves and throw them away.

9. Wash your hands again.


11. If crust is present, clean it from catheter exit site, using an alcohol wipe if necessary. If this is a scab, you do not need to remove it.

12. Clean around catheter exit site with ChloraPrep One-Step® swab using a back-and-forth motion across the exit site for 30 seconds. Allow to dry completely for 1-2 minutes. The Chlorhexidine used while cleaning the catheter exit site should be completely dry before applying the Cavilon No-Sting Barrier Film®.
   *Alternate cleaning for Chlorhexidine allergy: Clean exit site in circular motion starting at the catheter and circle outward away from the exit site using one of the povidone-iodine swabs. Use the other two povidone swabs for a total of 3 cleanings at the exit site. Allow to air dry. Follow with 3 applications of alcohol swab sticks in the same pattern. Allow to air dry.

13. Open two alcohol wipe packages.
  • Using one alcohol wipe, hold the catheter near the exit site (near chest).
  • Using the second alcohol wipe, start where the line exits the skin and wipe the entire catheter.

15. Apply skin prep:
   - **If your child has a Biopatch® and Occlusive Dressing:**
     - Apply skin prep (Cavilon No-Sting Barrier Film®) to the area that will be under the transparent dressing. Avoid the exit site and the area that will be under the Biopatch®, as it will not be able to penetrate the skin and work to prevent an infection. Allow to dry completely for 1-2 minutes.
   - **If your child has a Transparent Occlusive Dressing:**
     - Apply skin prep (Cavilon No-Sting Barrier Film) to the site where the dressing will be placed.
   - **If your child has a Gauze and Tape Dressing:**
     - Apply skin prep to area where paper tape will be applied—allow to dry completely.

16. Apply new dressing:
   - **If your child has a Biopatch® and Occlusive Dressing:**
     - Place Biopatch® around catheter with the white side towards the skin (white to the bone, blue to the sky). The edges of the slit should touch each other to work best.
     - Do not place Biopatch® on top of catheter. If edges do not meet because catheter is too big or stitches are in the way, place the Biopatch® around the catheter making sure the Biopatch® is in contact with the skin.
     - To ensure easy removal, place Biopatch® so that the catheter rests on or near the slit.
     - Place the transparent dressing over the catheter. **Optional:** make a loop with catheter to decrease the external length of the catheter.
     - Paint the border of the transparent dressing with the Cavilon No-Sting Barrier® to create a seal between the dressing and the skin.
     - Date the dressing with today’s date.
     - If the Biopatch® becomes swollen with fluid, water, or blood, or the dressing starts to come off, the dressing should be changed more frequently. Talk to your nurse if your child’s skin is sensitive to the transparent dressing or if your child’s dressing needs to be changed more often than once every 3 days.
   - **If your child has a Transparent Occlusive Dressing:**
     - Place transparent dressing over central line exit site. **Optional:** make a loop with catheter to decrease the external length of the catheter.
     - Paint the border of the transparent dressing with Cavilon-No Sting Barrier® to create a seal between the dressing and the skin.
     - Date the dressing with today’s date.
   - **If your child has a Gauze and Tape Dressing:**
     - If using folded gauze: touching only the corner, remove one of the 2x2 gauze pieces, fold in half and place under the catheter.
     - **If using split gauze:** Touching only the corners, place the 2 split gauze with the slits positioned horizontally (in opposite directions) around the central line as close as possible to where it exits the skin.
     - Place the second 2x2 over the line and gauze.
     - Secure gauze to skin with paper tape. Write the date and time on the dressing.
     - Talk to your child’s nurse if the skin is sensitive to paper tape; an alternative tape may be suggested.
17. Secure the catheter by:
- Coiling it over the exit site and taping it to the skin,
- Placing in a clean cloth pouch and secure with a bulldog clamp.
- Using a bulldog clamp to attach the tape tab to your clothing or necklace.

**Protecting Your Child's Central Line When Bathing Or Showering**

1. Wash your hands.

2. Place Parafilm® on Clave® caps and tubing connections.
   - First stretch the Parafilm®.
   - Then wrap it around the Clave® cap connection on each side of the catheter (stretching it makes it stick to itself).
   - Then flip it over the end of the catheter to cover the Clave® cap, using your fingers to twist and mold it around the catheter, with a spiraling-down technique.
   - Wrap only around the thicker part of the end of the catheter. The Parafilm® will fit closely around the connector and will stick to itself. Make a tab on the end so it will be easier to remove.

3. Cover the entire dressing with a square of AquaGuard® (approximately 9x9). You may place the entire catheter under the AquaGuard®. If you do, the catheter tips must still be covered with Parafilm®. **Alternatively, plastic wrap may also be used in place of AquaGuard® and tape with paper tape on all sides.**

4. If your child takes a bath, the catheter should be kept above the water level at all times. If your child showers, the dressing should be kept out of the direct stream of water.

5. After bathing, dry off the plastic wrap or AquaGuard® with a towel, then remove it and throw it out.

6. Remove Parafilm® from Clave® caps – **DO NOT USE SCISSORS.**

7. Replace the dressing if there is moisture underneath or it has become loose.
## Troubleshooting Problems for the Central Venous Catheter

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
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| **Line does not flush.**                                               | 1. Check to see if catheter is clamped or kinked.  
2. Contact the SCCA Clinic or After Hours Clinic for instruction.                                                                                         |
| **Fluid is leaking from the catheter. Do not use scissors near your child’s line. Catheter may be cut accidentally if dressing is removed with scissors.** | 1. Immediately place a bulldog clamp on the catheter as close to the chest as possible.  
2. Check the catheter to find the break. It can be as small as a pinhole.  
3. Clean the break with an alcohol wipe.  
4. Wrap a sterile 2x2 gauze or an alcohol wipe around the break in the catheter and tape it in place.  
5. Notify the SCCA Clinic or After Hours Clinic immediately to get instructions.                                                        |
| **Clave® cap comes off catheter.**                                     | 1. Immediately clamp catheter – **DO NOT REPLACE CAP.**  
2. Scrub catheter end with alcohol for 15 seconds and let dry 5 seconds.  
3. Place sterile saline syringe on end of catheter – **DO NOT FLUSH.**  
4. Notify the SCCA Clinic or the After Hours Clinic immediately to get further instructions.                                             |
| **Swelling around the exit site or fluid leaking from exit site.**     | 1. Stop any fluids running into the catheter.  
2. Place an ice pack on the swollen area, do not apply directly to bare skin.  
3. Notify the SCCA Clinic or the After Hours Clinic immediately to get instructions.                                                          |
| **Swelling of the neck and face.**                                     | 1. Stop any fluids running into the catheter.  
2. Notify the SCCA Clinic or the After Hours Clinic immediately to get instructions.                                                              |
| **Air in the catheter, the child is NOT short of breath.**            | 1. Check the clamp to make sure that it is closed and then wash hands.  
2. Open two pre-filled saline syringes and one pre-filled heparin lock flush syringe.  
3. Scrub the end of the catheter cap with alcohol for 15 seconds and let dry 5 seconds.  
4. Attach one of the pre-filled saline syringes.  
5. Unclamp the line.  
6. **Pull back** on the syringe until blood appears.  
7. Clamp the line and discard the syringe.  
8. Scrub the end of the catheter cap with alcohol for 15 seconds and let dry for 5 seconds.  
9. Flush the catheter as usual, making sure to close the clamp at the end of the flush. If the clave cap is not on the line, leave the syringe attached.  
10. If your child becomes short of breath, call 911. Call Clinic if Clave® Cap is off.                                               |
| **Air in the catheter, and your child SUDDENLY becomes SHORT OF BREATH, DIZZY, OR CONFUSED.** | 1. Have your child lie down on their left side so that their right hip is lifted above the level of the heart while checking the clamps on the catheter to be sure they are closed.  
2. Call 911 for emergency assistance.  
3. Tell the medics to take your child to Seattle Children’s.  
4. Call SCCA Clinic or After-Hours Clinic to tell them that your child is going to the ER via ambulance. |