

JoVE: Science Education

Changing the Dressing of a Central Venous Access Device using Sterile Procedure --Manuscript Draft--

Manuscript Number:	10311
Full Title:	Changing the Dressing of a Central Venous Access Device using Sterile Procedure
Article Type:	Manuscript
Section/Category:	Manuscript Submission
Corresponding Author:	Madeline Lassche UNITED STATES
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	
Corresponding Author's Secondary Institution:	
First Author:	Madeline Lassche
First Author Secondary Information:	
Order of Authors:	Madeline Lassche
Order of Authors Secondary Information:	

Author Name

Madeline Lassche, MSNEd RN; Katie Baraki, MS RN

Central Venous Access Device dressing change

Changing the dressing of a central venous access device using sterile procedure.

Overview

Central venous access devices (CVAD), commonly known as central lines or central catheters are large bore intravenous catheters that are introduced into central circulation. Typically, CVADs terminate in the superior vena cava, just outside of the right atrium of the heart, but they may also terminate in any one of the great veins (i.e. aorta, inferior vena cava, brachiocephalic vein, pulmonary artery, internal iliac vein, common femoral vein). Patients may need a CVAD for any number of reasons. CVADs allow for the rapid infusion of fluids to treat significant hypovolemia or shock. They are also beneficial when administering vasoactive medications, highly concentrated medications, total parenteral nutrition (TPN) or chemotherapy, because the increased blood volume in these areas allows for hemodilution of these potentially caustic or reactive agents. Patients who must receive multiple non-compatible intravenous medications, those that require long-term intravenous medications, or patients with limited vascular access may also require the placement of a central venous access device. These devices may be tunneled (inserted into a vein at one location and tunneled under the skin to emerge through the skin at another site) or non-tunneled (inserted through the skin and directly into a vein). Examples of CVADs include: multi-lumen central venous catheters, pulmonary artery catheters, dialysis catheters, port-a-cath, and peripherally inserted central catheters (PICC).

Because CVADs are introduced into central circulation, it is important that they are cared for using strict aseptic technique to prevent Central Line Associated Blood Infections (CLABSI). Nursing standards of care mandate using “sterile technique” when changing the dressing of CVADs. The Centers for Disease Control recommend changing CVAD dressings at least every 2 days for gauze dressings and at least every 7 days for transparent dressings for adult patients (CDC, 2011). For pediatric patients, the CDC recommends using clinical judgment to determine appropriate timing of CVAD dressing changes in children as the risk of line removal during the dressing change may outweigh the benefits (CDC, 2011).

This video presents the process of changing a central venous access device dressing using sterile technique.

Procedure and representative findings**Preparation**

1. Central venous access device (CVAD) dressing change considerations (review in the room, with the patient).

1.1. Upon first entering the patient's room, disinfect your hands by washing with soap and warm water, and vigorous friction for at least 20 seconds. Hand sanitizers may be used if the hands are not visibly soiled, but vigorous friction should also be used.

1.2. At the bedside computer, log into the patient's electronic health record and review the patient's medical history and documentation of previous CVAD dressing changes. Discuss with the patient any preferences or complications experienced during previous dressing changes.

1.3. Assess the CVAD insertion site and dressing. The considerations are similar to the assessment performed on a peripheral intravenous line. (Refer to video "Assessing and Flushing a Peripheral Intravenous Line.").

1.4. Leave the patient's room, wash hands as described above (1.1)

2.0. Gather needed supplies.

2.1. Supplies may be included in a CVAD dressing change kit. In addition, obtain an extra pair of sterile gloves (in case of contamination), clean exam gloves for dressing removal procedure, and extra face mask for patient use. (Figure 1)

2.2. If a kit is not available, needed supplies include: sterile gloves, clean gloves, 2 face masks, 2% chlorhexidine wand, presoaked antimicrobial disc, alcohol swab, 1 inch cloth tape, and a transparent dressing. If institutional policy requires central line anchoring device, retrieve this items if not included in the CVAD dressing change kit. (Figure 2)

2.3. Assess all packages for sterility. Packages that are damaged, wet, soiled, stained or past the expiration date should not be used.

Procedure

3. Upon first entering the patient's room, set supplies down on a clean, dry surface and wash hands as described in step 1.1.

4. Prepare the patient and equipment.

4.1. Assist the patient to a position that will allow for optimal access to the CVAD insertion site.

4.1.1. Typically, a semi-Fowler's position is optimal for tunneled central venous catheter access if it is tolerated by the patient. (Figure 3)

4.2. Assist the patient to don a face mask. Instruct the patient to keep head turned away from the CVAD insertion site during the dressing change to prevent site contamination.

4.3. Ensure that a bedside table and a trash receptacle are positioned near the head of the patient's bed and on the same side as the CVAD insertion site. Wash hands as described in step 1.1.

4.4. Don clean gloves and clean the bedside table using institutional approved cleansing wipes. Use a dry paper towel to dry the surface.

4.5. Transfer CVAD dressing change supplies to the clean bedside table. Ensure that the surface is dry before transferring supplies to avoid accidentally wetting the packages. If paper packages become wet or soiled, they are considered contaminated and new supplies must be obtained.

5.0. Remove old dressing

5.1. Wash hands as described in step 1.1 and don clean gloves.

5.2. Using your non-dominant hand, gently hold the CVAD in place while peeling back any tape that is anchoring the CVAD lines outside of the transparent dressing. Discard in trash receptacle.

5.3. Using your dominant hand, gently peel back a small portion of the corner of the old dressing, pulling towards the insertion site. With your non-dominant hand, hold the skin near the site that you are pulling to ease the removal of the dressing and decrease tissue damage and pain. Continue to peel the corner back until you are within about 2 cm from the insertion site.

5.4. Using the process described in step 5.3, continue to peel back the other three corners of the dressing.

5.5. With your non-dominant hand, hold the CVAD tubing to avoid accidental dislodgement during the removal of the dressing.

5.6. With your dominant hand, grasp a corner at the bottom of the dressing, and remove the dressing by pulling towards the insertion site and out and away. Using this approach will help to prevent accidentally dislodging the central catheter.

5.7. Drop the old dressing into the trash receptacle and remove and discard your gloves.

5.8. Wash hands as described in step 1.1.

5.9. Prepare the sterile field.

5.9.1. Open the outer packaging of the sterile gloves and gently remove the contents.

5.9.2. Place the packaging on the center of the bedside table and unfold the packaging once.

5.9.3. With both hands, grasp the edges of the center seams of the packaging and gently pull the packaging outward. Crease the packaging if necessary to ensure the packaging stays open. Avoid touching more than the very edges of the packaging. The outer 1 inch of the package edges should be considered non-sterile, as well as any portion of the package that hangs over the table edge.

5.10. Add supplies to the sterile field.

5.10.1. Using your dominant hand, hold the package and contents securely and with your non-dominant hand, gently peel back the wrapper.

5.10.2. With your dominant hand, hold the package a few inches above the sterile field and gently drop the item out of the package and onto the sterile field. Take care not to touch the sterile field with the supply package and to drop the item near the center of the field. If the item falls in the 1 inch border, a new item must be obtained. Do not allow your arms to cross over the sterile field. (Figure 4)

5.10.3. Repeat steps 5.10.1 and 5.10.2 until all items have been removed from packaging and are on the sterile field.

6.0. Don sterile gloves.

6.1. With your non-dominant hand, gently grasp the inner cuff of the glove for your dominant hand.

6.2. Insert the fingers of your non-dominant hand into the glove.

6.3. Gently pull the glove cuff with your dominant hand, until the glove is completely applied. Take care not to touch any external surfaces of the glove. (Figure 5)

6.4. With your sterile-gloved non-dominant hand, rearrange supplies if necessary on your sterile field to access the remaining glove.

6.5. With your sterile-gloved non-dominant hand, approach the remaining glove from the glove fingers and slip four fingers under the glove cuff. (Figure 6)

6.6. Insert the fingers of your dominant hand into the glove, taking care not to contaminate sterile surfaces.

6.7. Gently push the glove cuff with your non-dominant hand, until the glove is completely applied.

6.8. Rearrange the gloves as needed until they fit securely and snugly taking care to avoid touching any exposed skin.

7.0. Clean the insertion site.

7.1. With your dominant hand, grasp the chlorhexidine wand and gently squeeze the wings towards the wand to release the fluid.

7.2. Gently press the chlorhexidine wand at the CVAD insertion site to start the fluid flowing.

7.3. Grasp the CVAD tubing between the pinky and ring finger of your non-dominant hand. This will allow you to move the tubing as you clean the insertion site. These two fingers are now considered non-sterile and should not touch any sterile items henceforth.

7.4. Clean the insertion site for at least 30 seconds using a back and forth motion and friction.

7.5. Finish cleaning by gently moving up the catheter tubing.

7.6. All surfaces should be allowed to dry completely. For some products, this may take up to two minutes. Do not fan the site to promote drying.

7.6.1 A presoaked disk containing antimicrobial material is often placed at the catheter insertion site to decrease microbial action for up to 72 hours. If this is part of institutional policy, using your dominant hand, place disc under and around the catheter tubing using the pre-cut slit.

Variation

7.7. Institutional policy may require the use of a central line security device. Using your dominant hand retrieve the security device and remove backing with your non-dominant hand

while continuing to hold the catheter line.

7.7.1. Place the security device approximately 2 cm below the insertion site.

7.7.2. Release the catheter tubing from your non-dominant hand and gently push the catheter tubing into the security device channel. Secure the tubing using manufacturing directions depending on the brand and type of security device.

7.8. Using your dominant (remaining sterile hand) retrieve the 1 inch anchoring strip and remove the protective backing.

7.9. Place the anchoring tape approximately 1 inch below the insertion site at the line bifurcation. If an anchoring device is used, place the anchoring tape just below the anchoring device.

8.0. Apply the transparent dressing.

8.1. With your dominant hand, pick up the transparent dressing from the sterile field and transfer the dressing to your thumb and forefinger of your non-dominant hand.

8.2. Holding the dressing between your thumb and forefinger of your dominant hand, use the thumb and forefinger of your non-dominant hand to gently remove the paper backing of the dressing.

8.3. With the thumb and forefingers of both hands, grasp opposite edges of the dressing and hold the dressing taught just above the CVAD insertion site.

8.4. Center the transparent dressing above the CVAD insertion site and place the dressing on the site. Gently push down on the dressing to remove any air bubbles and secure the dressing to the site.

8.5. Using your non-dominant hand, remove the center window packaging from the front of the transparent dressing. This packaging often includes a sticker for labeling, do not discard the labeling sticker.

8.6. If a second anchoring strip with a small cutout is included in the CVAD kit, remove the backing, and place it under the CVAD lines and just over the transparent dressing. (Figure 7)

8.7. Using the sticker provided with the transparent dressing, write the date and time of the dressing change on the sticker. Place the sticker on an outer edge of the transparent dressing.

8.8. Remove and dispose sterile gloves and personal and patient face masks, and discard supply packaging.

8.9. Wash hands according to step 1.1.

10.0. Document CVAD dressing change procedure.

10.1. In the patient's EHR, record the date, time and location/site of the CVAD dressing change, and the findings of the CVAD assessment.

11. Leave the patient room. Upon exiting the room, wash hands as describe in step 1.1.

Summary

This video details the process of changing a dressing from a central venous access device (CVAD) using sterile technique. While it is important to maintain an aseptic approach, the most critical component of the process is to recognize when sterility has been compromised. This requires focus and awareness and ensuring that you do not turn your back on the sterile field. Common mistakes during CVAD dressing changes are failure to recognize when sterility has been compromised and when new supplies are needed or the process needs to be restarted. Another mistake is failing to secure the catheter, and the catheter is inadvertently dislodged from the insertion site. If the catheter becomes dislodged, sterility should be maintained and the catheter should be secured in place. The CVAD should not be used (stop all infusions) and the primary care provider should be notified immediately and an x-ray obtained to determine viability of the catheter. The catheter should never be pushed back into the site, as this can result in damage to the vessel or the introduction of pathogens into the site.

Figures

Figure 1: CVAD Dressing Change Kit

Common items found in a CVAD dressing change kit.

Figure 2: CVAD Anchor Device and Antimicrobial Disk

Illustration of a CVAD line anchoring device with antimicrobial disk placement

Figure 3: CVAD Insertion Sites

Common central catheter insertion sites with associated names

Figure 4: Dropping Items onto Sterile Field

Figure 5: Don Sterile Glove Non-Dominant Hand

Technique for donning the non-dominant hand sterile glove

Figure 6: Don Sterile Glove Dominant Hand

Technique for donning the dominant hand sterile glove

Figure 7: CVAD Adhesive Anchoring Strip

References

1. O'Grady, N. et al (2011). Guidelines for the prevention of intravascular catheter-related infections, 2011. Centers for disease control and prevention.
2. Potter, P.A., Perry, A.G., Stockert, P.A., & Hall A. (2015). Essentials for Nursing Practice, Eighth Edition. Elsevier Publishing Co., St. Louis, MO













