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Central Venous Access Device Dressing Change

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Overview

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Central venous access devices (CVAD), commonly known as central lines or central catheters, are large-bore intravenous (IV) catheters that are introduced into the 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, or 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 the hemodilution of these potentially caustic or reactive agents. Patients who must receive multiple non-compatible IV medications, those that require long-term IV medications, or those with limited vascular access may also require the placement of a CVAD. These devices may be tunneled (*i.e.,* inserted into a vein at one location and tunneled under the skin to emerge through the skin at another site) or non-tunneled (*i.e.,* 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 the 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 CVAD dressings. The Centers for Disease Control recommends changing CVAD dressings at least every 2 days for gauze dressings and at least every 7 days for transparent dressings on adult patients. For pediatric patients, the CDC recommends using clinical judgment to determine the appropriate timing of CVAD dressing changes, as the risk of line removal during the dressing change may outweigh the benefits.

This video presents the process of changing CVAD dressings using sterile techniques.

Procedure

Preparation

1. CVAD dressing change considerations (review in the room, with the patient).

1. Upon first entering the patient's room, disinfect your hands by washing with soap and warm water, applying vigorous friction for at least 20 s. Hand sanitizers may be used if the hands are not visibly soiled, but vigorous friction should also be applied.
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.
3. Assess the CVAD insertion site and dressing. The considerations are similar to those performed on a peripheral IV line. Refer to "Assessing and Flushing a Peripheral Intravenous Line" video.
4. Leave the patient's room and wash hands as described above (step 1.1)

2. Gather the necessary supplies.

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 the dressing removal procedure, and an extra face mask for patient use.
2. If a kit is not available, the necessary supplies include sterile gloves, clean gloves, 2 face masks, a 2% chlorohexidine wand, a presoaked antimicrobial disc, an alcohol swab, 1 inch of cloth tape, and a transparent dressing. If institutional policy requires a central line anchoring device, retrieve this item if it is not included in the CVAD dressing change kit.
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 the supplies down on a clean, dry surface and wash hands as described in step 1.1.

4. Prepare the patient and equipment.

1. Assist the patient into a position that will allow for optimal access to the CVAD insertion site.
    1. Typically, a semi-Fowler's position is optimal for tunneled central venous catheter access, if it is tolerated by the patient.
2. Assist the patient in donning a face mask. Instruct the patient to keep his/her head turned away from the CVAD insertion site during the dressing change to prevent site contamination.

3. Ensure that a bedside table and a trash receptacle are positioned near the head of the patient's bed, on the same side as the CVAD insertion site. Wash hands as described in step 1.1.
4. Don clean gloves and clean the bedside table using institutionally approved cleansing wipes. Use a dry paper towel to dry the surface.
5. Transfer the CVAD dressing change supplies to the clean bedside table. Ensure that the surface is dry before transferring the supplies to avoid accidentally wetting the packages. If the paper packages become wet or soiled, they are considered contaminated, and new supplies must be obtained.

5. Remove the old dressing.

1. Wash hands as described in step 1.1 and don clean gloves.
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 them in a trash receptacle.
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 from to ease the removal of the dressing and to decrease tissue damage and pain. Continue to peel the corner back until you are within about 2 cm of the insertion site.
4. Using the process described in step 5.3, continue to peel back the other three corners of the dressing.
5. With your non-dominant hand, hold the CVAD tubing to avoid accidental dislodgement during the removal of the dressing.
6. With your dominant hand, grasp a corner at the bottom of the dressing and remove it by pulling towards the insertion site, out and away. Using this approach will help to prevent accidentally dislodging the central catheter.
7. Drop the old dressing into the trash receptacle and remove and discard your gloves.
8. Wash your hands as described in step 1.1.
9. Prepare the sterile field.
    1. Open the outer packaging of the sterile gloves and gently remove the contents.
    2. Place the packaging on the center of the bedside table and unfold the packaging once.
    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 that 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.
10. Add supplies to the sterile field.
    1. Using your dominant hand, hold the package and contents securely and, with your non-dominant hand, gently peel back the wrapper.
    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.
    3. Repeat steps 5.10.1 and 5.10.2 until all items have been removed from their packaging and are on the sterile field.

6. Don sterile gloves.

1. With your non-dominant hand, gently grasp the inner cuff of the glove on your dominant hand.
2. Insert the fingers of your non-dominant hand into the glove.
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.
4. With your sterile-gloved non-dominant hand, rearrange supplies if necessary on your sterile field to access the remaining glove.
5. With your sterile-gloved non-dominant hand, approach the remaining glove from the glove fingers and slip four fingers under the glove cuff.
6. Insert the fingers of your dominant hand into the glove, taking care not to contaminate sterile surfaces.
7. Gently push the glove cuff with your non-dominant hand until the glove is completely applied.
8. Rearrange the gloves as needed until they fit securely and snuggly, taking care to avoid touching any exposed skin.

7. Clean the insertion site.

1. With your dominant hand, grasp the chlorohexidine wand and gently squeeze the wings towards the wand to release the fluid.
2. Gently press the chlorohexidine wand at the CVAD insertion site to start the fluid flow.
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 henceforth not touch any sterile items.
4. Clean the insertion site for at least 30 s, using a back and forth motion and friction.
5. Finish cleaning by gently moving up the catheter tubing.
6. All surfaces should be allowed to dry completely. For some products, this may take up to 2 min. Do not fan the site to promote drying.
    1. A presoaked disk containing antimicrobial material is often placed at the catheter insertion site to decrease microbial action for up to 72 h. If this is part of institutional policy, use your dominant hand to place the disc under and around the catheter tubing using the pre-cut slit.
    Variation
7. Institutional policy may require the use of a central line security device. Using your dominant hand, retrieve the security device and remove the backing with your non-dominant hand while continuing to hold the catheter line.
    1. Place the security device approximately 2 cm below the insertion site.
    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 manufacturer directions, depending upon the brand and type of security device.

8. Using your dominant (remaining sterile hand) retrieve the 1-inch anchoring strip and remove the protective backing.
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. Apply the transparent dressing.

1. With your dominant hand, pick up the transparent dressing from the sterile field and transfer the dressing to the thumb and forefinger of your non-dominant hand.
2. Holding the dressing between the 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.
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.
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.
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.
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, just over the transparent dressing.
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. Remove and dispose of the sterile gloves and personal and patient face masks, and discard the supply packaging.
9. Wash your hands according to step 1.1.

9. Document the CVAD dressing change procedure.

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

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

Applications and Summary

This video details the process of changing a dressing from a 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, as well as being sure not to turn your back on the sterile field. Common mistakes during CVAD dressing changes are failure to recognize when sterility has been compromised, when new supplies are needed, or when the process needs to be restarted. Another mistake is failing to secure the catheter, causing the catheter to inadvertently dislodge 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 (*i.e.,* stop all infusions), the primary care provider should be notified immediately, and an x-ray should be obtained to determine the 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.

References

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

