

PROTOCOL

TITLE: CENTRAL VENOUS ACCESS DEVICE (CVAD) PROTOCOL

CONTENT: A) Assessment B) Dressing Change C) Catheter Usage D) Infection Control

PURPOSE: To outline the standard of care for a patient with a central venous catheter, including nursing responsibilities in assisting with insertion, care and assessment and the discontinuation of the catheter.

LEVEL: ___ Dependent ___ Independent Interdependent

SUPPORTIVE DATA:

1. Central Venous Catheter: a vascular access device that terminates at the junction of the CVS and right atrium. This protocol covers the care of the triple lumen (non-tunneled) catheters, site care for pulmonary artery catheters and arterial catheters.
2. Only physicians are allowed to insert these devices and patients must sign consent for the procedure. Time out needs to be completed at beginning of procedure.
3. Follow guidelines/procedure for assisting with insertion, in Perry and Potter, Clinical Nursing Skills and Techniques, p771-776
4. See additional policies for PICC lines, tunneled central venous catheters (Hickman) and Implanted subcutaneous ports (port-a-caths). See AACN Manual for Insertion assistance and care of the pulmonary artery and arterial catheters.
5. IHI and CDC guidelines include 5 elements for best practice for prevention of Blood stream infection (BSI) related to central line insertion/maintenance. These elements are offered referred to as Central Line Bundle. They are:
 - a) Hand Hygiene: Individuals caring for central venous catheter insertion sites either to assess, insert, replace, access or change the dressing should wash their hands prior using an alcohol-based waterless hand cleaner. Palpation of the insertion site should not be performed after the application of antiseptic.
 - b) Maximal Barrier Precautions on insertion: For the provider this includes: hand hygiene, head covering and mask, mask covering nose and mouth, sterile gown and gloves. For the patient this includes covering the patient's head and entire body with a large sterile drape. For observers this includes donning a mask.
 - c) Chlorhexidine (CHG) skin antiseptis: FDA approved 2% chlorhexidine antiseptis recommendation. For patients with an allergy to CHG or impaired skin integrity: povidone iodine and 70% alcohol can be used.
 - d) Optimal Catheter Site selection: Femoral catheters are strongly discouraged. The subclavian site is preferred over the jugular and femoral sites whenever possible and not contraindicated for non-tunneled catheters in the adult patient to reduce the risk of infection. Exception: Hemodialysis patients and patients with advanced kidney disease, the subclavian site is not recommended. (Avoid subclavian vein stenosis) CDC Category 1A
 - e) Review of central line necessity: Communication between nursing staff and physician will occur daily regarding the necessity of the central line.
6. Replacement of temporary catheters over a guidewire in the presence of bacteremia is not acceptable.
7. When adherence to aseptic technique cannot be ensured (catheters inserted during a medical emergency) or a catheter is placed femorally, replace the catheter as soon as possible, within 48 hours.
8. Prior to initial use of the catheter, a physician must confirm placement and place an order on the chart to use the catheter.
 - **Subclavian and Jugular placed catheters are confirmed by chest x-ray**
 - **In the event a femoral is placed, the catheter is confirmed by an arterial ultrasound of the lower extremity**
9. The use of ultrasound guidance to place CVC catheters to reduce the number of cannulation attempts is recommended.

A. Assessment

1. Assess during insertion of catheter for:
 - a. Compliance with Central Line Bundle and complete Insertion Checklist. Send to Infection Control.
 - b. Aseptic technique
 - c. Appropriate equipment is available
 - d. Patient is positioned appropriately
 - e. Physician must confirm placement prior to line use

POST INSERTION

2. Assess hydration status every 4 hours by monitoring fluid intake and output
3. Assess site condition every 4 hours
 - a. Assess/inspect condition of skin and integrity of dressing at insertion site.
 - b. Assess for signs of infection (erythema, warmth, tenderness, edema or drainage)
 - c. Palpate for crepitus/subcutaneous emphysema.
 - d. Assess circulation to limb if femoral line is placed
4. Assess for proper functioning and maintenance of CVAD every 8 hours
 - a. Integrity of the catheter
 - b. Ability to flush or infuse fluids
 - c. Ability to aspirate blood
 - d. Assess if any lumens require flushing or site needs dressing change
5. Assess need for discontinuation daily

B. Dressing Change

1. Change dressing weekly
2. Dressing can be changed more frequently if needed. Change if soiled, loose or the integrity of the dressing is compromised in any way.
3. Use CVP kit to do weekly dressing changes. Sterile gloves and a mask are in the kit. For observers, donning a mask is also required.
4. Scrub site with supplied chlorhexidine prep. Use repeated back and forth strokes for approximately 30 seconds. Allow the area to air dry for approximately 30 seconds.
5. Apply bio-patch over site before applying dressing.
6. Apply bio-occlusive dressings. Label site with insertion date, date it was changed and initials of the person changing the dressing.
7. Gauze dressing: Used if actual/expected oozing from site. If gauze dressing is applied, site care and dressing change is completed every 48 hours.

C. Catheter Usage

1. The largest port (16G) of the three lumen catheter is the **distal port** (brown). This port is used for CVP monitoring and high volume/viscous fluids, colloids or meds. It is the closest to the heart.
2. The **proximal port** (18 G) (white) is used for blood sampling, medication and/or blood administration. At this location the fluids infusing push other fluid infusing away from this port, which might affect lab results.
3. The **medial port** (blue) is usually reserved for TPN. If TPN is not used, it can be used for medication administration.
4. **Unused ports** will be flushed daily (q24h) with heparinized saline (heparin concentration is 10units/mL) using a 10 cc syringe or pre-filled heparinized saline syringe.
 - a. If there is no continuous infusion via a port and it is being accessed more than once a day for medication administration, consult with the physician regarding patient's tolerance for a continuous low infusion for

medication administration. (i.e. infusion to run at 10mL/hr and piggyback or push medications can be infused without multiple flushes and multiple entries into the port)

- b. Never use a syringe less than 10mL when flushing
 - c. Instruct the patient to perform the Valsalva Maneuver prior to opening the clamp.
 - d. When aspirating, flush the line with Normal Saline using the pulsatile, push-pause method. Clamp the line while infusing the last 0.5ml of solution.
 - e. Scrubbing the hub vigorously with alcohol and allow to dry prior to all accessing.
 - f. Follow guidelines in Perry and Potter, Clinical Skills and Techniques, p. 779
5. **Blood Draw**
- a. Check for physician order for lab work and Patient Identification prior to blood draw
 - b. Turn off all electrolyte and glucose containing solutions that are infusing into all the lumens for at least one minute. *If you can't stop the infusion draw blood from a peripheral vein.*
 - c. Scrub the hub /claves with antiseptic and allow it to dry prior to accessing port.
 - d. Lumen is flushed with 10mL of normal saline prior to specimen collection.
 - e. Attach syringe or vacutainer to lumen for blood draw.
 - f. Draw 10 mL of discard into syringe, or vacuum tube if using vacutainer.
 - g. Draw samples into lab tube using vacutainer or syringe. Clamp line when complete.
 - h. Flush the lumen after blood samples are drawn with 20mL of normal saline.
 - i. Flush the lumen with heparinized saline if it is an unused port or unclamp other ports and resume therapy.
 - j. Give blood tubes to lab technician who will assist in proper labeling of specimens at the bedside.
 - k. Follow guidelines in Perry and Potter, Clinical Skills and Techniques, p. 777

D. Infection Control

1. Observe for signs and symptoms of site infection
2. Transparent dressing may remain in place for 7 days without increasing the risk for infection (INS 2011)
3. Perform hand hygiene and apply mask and gloves when completing dressing change. (Unsterile gloves to remove dressing, sterile gloves for cleaning site and application of new dressing)
4. Discuss catheter necessity daily with LIP.
5. Change all injection caps (claves) with dressing change and after any blood sampling.
6. Cleanse all injection caps (claves) with antiseptic swab and allowed to dry prior to access port.
7. Monitor vital signs, noting changes symptomatic of infection.
8. Complete central line checklist for quality assurance, send to Infection Control Practitioner. This is not part of the medical record.

E. Line Removal

1. Line removal is completed by the LIP
2. Pressure is applied to site until bleeding is controlled. Assess site q15 minutes for 1 hour after removal to assure no further bleeding is noted. Reapply pressure if bleeding starts and notify physician.

3. When catheter is removed and bleeding is controlled, apply petroleum based ointment (Bacitracin) to exit site and apply a small occlusive dressing.

F. Patient Education

1. Confirm with patient if any of the following allergies exist: Iodine, Lidocaine, or latex prior to the insertion of the catheter.
2. Instruct patient on the purpose, care and maintenance of the catheter
3. Assess patient's understanding of need to inserting catheter, risk of infection and need for discontinuation as soon as catheter is no longer required.

G. Reportables

1. Catheter damage, breakage
2. Occlusion, inability to aspirate and/or flush catheter port
3. Signs and symptoms of infection
4. Dislodgement or catheter migration
5. Infiltration, extravasation
6. Pneumothorax/subcutaneous emphysema, chest pain, dyspnea, hypoxia, sudden confusion

H. Documentation

1. Record all vital sign data and intake and output measurements
2. Document all assessment findings
3. Record date/time of dressing change in medical record as well as on the dressing
4. Document all patient education discussion
5. Document initial insertion procedure using the pre-printed central line sticker
6. Document discontinuation of line, patient's toleration to procedure and assessment of site post removal.
7. Document reportables to the physician
8. Document all flushes on the eMar

REFERENCES:

Perry, Anne Griffin, RN, EdD, FAAN, Potter, Patricia A. RN, MSN, PhD, FAAN, Clinical Nursing Skills & Techniques, 7th edition, Mosby Elsevier, 2010. *Insertion and Care of Central Venous Access Devices*, pages 771-783.

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