Title: Central Venous Access Device Maintenance: CLABSI Prevention Bundle	**Document #:** 62 **Version:** 7
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SUMMARY OF POLICY:

To provide caregivers with a comprehensive central line bundle that focuses on care and maintenance of central venous access devices (CVADs) in the prevention of central line associated blood stream infections (CLABSI).

SCOPE: This is a system-wide policy intended for use with CVADs. This policy is intended for all adult and pediatric patients with a CVAD that is 3 French or larger. For all patients with a CVAD less than 3 French please refer to the NICU policy.

DEFINITIONS: *(Definitions of acronyms or specialized terminology)*

Acute care: hospitalized adult and pediatric inpatients with CVAD 3 French or larger.

Blue Male Universal Cap: Luer-locking end cap to keep IV tubing sterile when not in use.

Central line dressing change checklist: A tool used by an observing clinician to ensure a standardized CVAD dressing change procedure utilizing proper technique, including the maintenance of aseptic technique.

CHG: Chlorhexidine Gluconate

ChloraPrep: ChloraPrep One-Step applicator containing 2% chlorhexidine gluconate and 70% isopropyl alcohol.

CLABSI: Central line associated bloodstream infection

CVAD: Central venous access device is an intravascular catheter that terminates at or close to the heart or in one of the central venous vessels, used for infusions, withdrawal of blood, hemodynamic monitoring, and/or dialysis and apheresis. These catheters include single-lumen, multi-lumen non-tunneled and tunneled catheters, and implantable ports.

CLABSI: Central line associated blood stream infection. A primary laboratory confirmed blood stream infection in a patient with a central line at the time of (or within 48 hours prior to) the onset of symptoms and the infection is not related to an infection from another site.

CLABSI prevention bundle: A group of evidence based interventions that when used together reduces the risk of CLABSI significantly.

Clean Work Surface: Clean work surface area with germicidal disposable wipes. Keep surface wet for 2 minutes and allow to air dry completely (four minutes (4) when using bleach wipes).

Disinfection Caps: Alcohol impregnated caps for ports/needleless connectors. Use of disinfection caps has been shown to reduce intraluminal microbial contamination and reduce rates of CLABSI.

DVT: Deep vein thrombosis

EHR: Electronic health record

Hub: The terminal (distal) end of a CVAD without a needleless connector

Infiltration: Inadvertent administration of non-vesicant solution or medication into Surrounding tissue; rated by a standard tool.

IV: Intravenous

IVF: Intravenous fluids

LCBI: Laboratory confirmed bloodstream infection

Needleless End Cap: Device that allows needleless access to a CVAD catheter.

PRN: Pro re nata (as needed)

NaCl: Sodium Chloride, normal saline

VAT: Vascular access team

TYPES of CVADs:

Non-tunneled Catheters: Percutaneously inserted catheters (by a qualified provider) that are sutured in place. Short term utilization (5-7 days) to hemodynamically monitor patients, and to infuse medications requiring central access. Catheter placement is confirmed with a chest x-ray prior to use. The tip of the catheter is located in the superior vena cava. An RN can remove a non-tunneled catheter with a provider order following policy and procedure.

Tunneled Catheters: This form of CVAD is inserted and removed by a provider. A segment of the CVAD catheter is tunneled through the subcutaneous tissue to a great vein with the entrance site being distal from where the catheter enters the vascular

system. The catheter includes a cuff at the entrance to the subcutaneous tissue into which the tissue grows to offer security for the catheter. This provides the body a chance to protect the catheter from bacteria by having a greater distance between the access site and the actual insertion site. The catheters are for long term use for patients who require chemotherapy, and long term access. **Note: it is not uncommon for patients with tunneled catheters to be admitted without a dressing covering the insertion site. All patients with tunneled catheters should have a dressing in place while hospitalized.**

Implanted Ports: Inserted and removed by a provider or interventional radiologist. Catheter device is implanted completely under the skin, requiring piercing through the skin each time the device is accessed. Accessing this device requires a Huber needle. These devices are for long term use similar to the tunneled catheter. The RN may access this device with a provider order and proper training and competency.

Peripherally Inserted Central Catheters (PICC): This device is inserted by a PICC certified RN or provider. The insertion site is typically in the veins of the upper arm. The catheter is threaded along the vein with the tip residing in the superior vena cava. A chest x-ray is required before use.

Valved Catheter: Any CVAD with an internal valve that prevents backflow; the valve only opens during infusion and aspiration.

Non-Valved Catheter: Any CVAD with an open-tip and without a built in valve. Non-valved catheters usually have a clamp built into the catheter design which requires closing during access at hub to restrict air embolism risk and backflow of blood.

INDEX (CLABSI Prevention Bundle)

I. GENERAL CVAD MAINTENANCE CONSIDERATIONS

A. VAT RNs are responsible for all CVAD dressing changes when they are available 7 days a week (7:00am-6:30pm).
B. If a CVAD dressing becomes compromised when VAT RNs are not available (after 6:30pm) 2 RN caregivers may change the dressing with one RN caregiver observing based on the dressing change checklist and stopping the line for corrective action.
C. For CVAD flushing, always use a syringe with a diameter ≥ to 10ml, regardless of flush volume to avoid delivering a high PSI to the catheter.
D. Scrub needleless end cap every time the catheter is accessed for a minimum of 15 seconds with alcohol prep and allow the alcohol to dry before accessing the system.
E. When a new central vascular access device is placed the entire intravenous infusion set must be changed.
F. When removing a needleless cap to access a CVAD at the hub ensure that the clamp (if a clamp is present) is closed until needless cap is reattached to hub.
G. **All central lines will be reviewed prior to transferring out of ICU with the goal to discontinue unless clinically indicated per national best practice standards.**

II. DAILY SITE ASSESSMENT

A. Daily Site Assessment
    1. Assess central line site at least once a shift (more frequently per nursing judgement) for signs and symptoms of complications; swelling/edema, discomfort, redness, drainage, changes in temperature, and condition of skin and dressing.
        a) If fever, redness or tenderness at insertion site, purulent drainage, or skin breakdown is present enter a consult to VAT in EHR (Bend & Redmond) or notify provider.
    2. Assess that the dressing is clean, dry, intact, and the insertion site and catheter are completely covered by the dressing. A dressing change is required if the dressing is not intact or soiling goes beyond the chlorhexidine gel square.
    3. Assess CVAD function at least once a shift by aspirating for blood return and flushing with 20ml of sodium chloride post blood return.
        a) If catheter occluded, leaking, or unable to obtain blood return enter a consult to VAT in EHR (Bend & Redmond) or notify provider.
    4. Ensure that **all** CVAD catheters as well as **all** infusion line ports (continuous and intermittent) have disinfection caps attached.
    5. Compare external catheter length documented at time of insertion to current external catheter length.
        a) If a discrepancy is noted between the lengths enter a consult to VAT in EHR (Bend & Redmond) or notify provider.
    6. Document assessment in the EHR.
    7. For concerns about edema and possible DVT in CVADs:
        a) Measure upper arm circumference 10 cm above antecubital fossa (or midway between the antecubital fossa and the axilla in smaller patients).
        b) Document measurement in the EHR.

c) Compare to baseline measurement; a ≥3cm increase in arm circumference and edema is associated with upper arm DVT (or any edema in smaller patients).
   1) Notify provider and VAT with concerns for DVT.
   2) Do not initiate therapy until provider and/or VAT evaluate and establish plan for use or discontinuation.

III. LINE NECESSITY DISCUSSION and Determination

A. Line Necessity Discussion
   1. Daily discussion of clinical line necessity will occur between the provider and the RN caregiver and be documented in EHR.
   2. CVADs should be discontinued upon unresolved complications, discontinuation of infusion therapy, or when no longer deemed necessary for the plan of care.

IV. DAILY HYGIENE FOR PATIENTS WITH CVAD

A. CHG 2% bath wipes will be used once every 24hrs on patients with a CVAD per CHG bathing policy
B. Linen changes daily and PRN
C. Document in EHR

Note: Do not perform CHG bathing if the patient has a severe skin disease, burns, or an allergy to CHG, or is under 2 yrs. of age.

V. CHANGING NEEDLELESS END CAPS

A. Needleless end caps should be changed at least every 7 days **OR**
   1. During routine CVAD dressing changes every 7 days
   2. When intravenous tubing is changed
   3. When blood or debris is present
   4. When blood cultures are drawn
   5. Every 24 hours for infusions of intralipids and lipid-based medications
   6. Every 12 hours for propofol infusion

Obtain:

- 10 mL prefilled NaCl syringe or appropriate flush solution per Flush Protocol (see below)
- Gloves
- Alcohol preps
- Needleless end cap
- Disinfection cap

Procedure:

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient and parents or guardian.
3. Prepare clean work environment.
4. Perform hand hygiene.
5. Don gloves.
6. Prime new needleless connector with 10ml NaCl flush syringe and leave syringe attached.
7. Clamp the CVAD catheter (if clamp present).
8. Remove old needleless end cap and disinfection cap.
9. Scrub catheter hub for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry before attaching new needleless end cap.
10. Aseptically attach new needleless end cap with 10ml NaCl flush syringe still attached.
11. Unclamp the catheter (if present).
12. Flush CVAD catheter with 10ml NaCl flush syringe and additional flush solution if necessary per flush protocol.
13. Attach disinfection cap.
14. Remove gloves.
15. Perform hand hygiene.
16. Document in EHR.

VI. DISINFECTION CAPS

A. All CVAD catheters as well as **all** infusion line ports (continuous and intermittent) must be protected with a disinfection cap (alcohol impregnated cap).
B. Disinfection caps that are removed from a needleless connector or from an infusion line must be discarded and are never reattached.
C. Once a disinfection cap is removed it is always replaced with a new disinfection cap.

VII. CVAD FLUSHING (not involving medication administration, see protocol on next page)

Obtain:

- 10 mL prefilled NaCl syringe and/or appropriate flush solution per Flush Protocol (see below)
- Disinfection cap
- Gloves
- Alcohol preps

Procedure:

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient & parents or guardian.
3. Perform hand hygiene.
4. Don clean gloves.
5. Remove disinfection cap.

6. Scrub needleless connector for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry before accessing the system.
7. Connect prefilled 10ml NaCl syringe into needleless end cap and flush using pulsatile positive pressure.
8. Flush with heparin if required per flush protocol.
9. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry
10. Place new disinfection cap on the needless connector.
11. Document flush volume, as well as NaCl flush and if necessary heparin flush in EHR.

INPATIENT FLUSH PROTOCOL **≥10ml syringes used for all central line flushes			
Catheter	Flush & Lock Amount		Flush Frequency
	Adult	Pediatric	
PIV/Midline	NaCl 10ml pulsatile flush with positive displacement clamping if clamp present	NaCl 3-5 ml pulsatile flush with positive displacement clamping if clamp present.	Every 12 hrs. or before and after each use
PICC valved	NaCl 10ml pulsatile flush	NaCl 3-5 ml pulsatile flush	Every 12 hrs. or before and after each use
PICC non-valved	NaCl 10 mL pulsatile flush followed by positive displacement clamping.	NaCl 3-5 mL pulsatile flush followed by Heparin 10 unit/mL 1-3 mL pulsatile flush with positive displacement clamping.	Every 12 hrs. or before and after each use
Non-valved, non-tunneled catheters	NaCl 10mL pulsatile flush with Positive displacement clamping	NaCl 5-10 mL pulsatile flush with positive displacement clamping	Every 12 hrs. or before and after each use
Non-valved, tunneled catheters	NaCl 10mL pulsatile flush with Positive displacement clamping	NaCl 5-10 mL pulsatile flush with positive displacement clamping followed by Heparin 10 units/mL 1-3 mL pulsatile flush with positive displacement clamping.	Every 12 hrs. or before and after each use
Valved, tunneled	NaCl 10 mL pulsatile flush	NaCl 3-5 mL pulsatile flush	Every 12 hrs. or before and after each use
Implantable Venous Port: non-valved	NaCl 10mL pulsatile flush followed by positive displacement clamping. **NOTE**: for de-accessing port: Confirm blood return then NACl 20mL pulsatile flush followed by Heparin 100 unit/ml 5 mL pulsatile flush with positive displacement clamping.	NaCl 5-10mL pulsatile flush followed by Heparin 10 units/mL 3-5 mL pulsatile flush with positive displacement clamping. **NOTE**: for deaccessing port: confirm blood return then NaCl 10-20 mL pulsatile flush followed by Heparin 100 unit/ml 1-3 mL pulsatile flush with positive displacement clamping.	When accessed every 12 hrs. or before and after each use. Deaccess/ reaccess every 7 days. When not in use port must be accessed and flushed every 30 days.

VIII. CVAD DRESSING CHANGES

A. All CVAD dressing changes will be completed by VAT 7 days a week (7:00am-6:30pm).
B. If a CVAD dressing becomes compromised (insertion site exposed to environment, soiled, wet, or chlorhexidine gel pad is 100% saturated) and the VAT is not available (6:30pm-7:00am) the dressing can be changed as a two RN procedure.

1. One RN will conduct the sterile steps of the dressing change per this policy (referred to as sterile RN in procedure below).
2. The second RN will perform the non-sterile steps of the dressing change and will observe RN performing sterile steps confirming that the dressing was changed per this policy and stop the line for corrective action if deviations are observed (referred to as non-sterile RN in procedure below).
    a) The dressing change and checklist will be documented in the LDA portion of the EHR.

NOTE: Do not use chlorhexidine-containing products on patients who have exhibited any sensitivity to it.

For contraindications to chlorhexidine solution, tincture of iodine or 70% alcohol may also be used. Allow any antiseptic to fully dry prior to dressing placement; chlorhexidine for at least 30 seconds and for iodine at least 1.5 to 2 minutes.

Use chlorhexidine with care in infants under 2 months of age due to risks of skin irritation and chemical burns. For pediatric patients with compromised skin integrity, remove dried iodine with sterile 0.9% sodium chloride or sterile water.

Obtain:

- Non-sterile gloves
- Sterile gloves
- CVAD dressing kit OR
    - the following individual supplies if kit not available ; mask, antiseptic applicator, antimicrobial dressing or biopatch, sterile forceps, sterile semipermeable transparent dressing, sterile drape, sterile gauze sponges, sterile water or NaCl, skin prep solution, skin tackifier solution.
- Povidone-iodine (if CHG is contraindicated)
- StatLock® securing device, required for CVADs that are not sutured.
- Alcohol pad or adhesive remover to loosen existing Statlock®

Procedure:

1. Identify the patient per hospital policy. (sterile RN)
2. Explain procedure to patient and parents or guardian. (sterile RN)

3. To help prevent dislodgement of catheter consider lowering the head of the bed so the patient is in a supine position. (sterile RN)
4. Prepare a clean work environment. (sterile RN)
5. Perform hand hygiene. (both nurses)
6. Open dressing change kit (or individual supplies) and remove mask from package fold and don. (sterile RN)
7. Prepare a sterile field by dropping supplies onto field or sterile drape as needed (including Statlock® and povidone-iodine swabs if needed). (sterile RN)
8. Don sterile gloves. (sterile RN)
9. Don non-sterile gloves. (non-sterile RN)
10. Stabilize the catheter and loosen the old dressing from the edge toward the insertion site, avoiding tension on the catheter. (non-sterile RN)
    a) Make sure weight of catheter will not dislodge catheter from insertion site.
11. Remove Statlock® securement device (non-sterile RN)
    a) Disengage catheter wings from Statlock® retainer.
    b) Dissolve Statlock® adhesive with alcohol swab or adhesive remover while gently lifting Statlock® pad.

NOTE: If using an acetone based product (i.e. adhesive remover), avoid direct contact with the catheter as it may damage the catheter.

12. Observe site for redness, tenderness, swelling, induration, drainage, catheter migration or cuff exposure, and mechanical problems. Check the entire system. If catheter dislodgement is suspected, measure the external catheter length. Note the measurement length and proceed with the dressing change. (sterile RN)
    a) If any variances are identified enter VAT Consult in EHR (Bend & Redmond) or notify provider.
13. Prepare site with appropriate solution. (sterile RN)
    b) CHG applicator should be used in a back and forth friction scrub for 30 seconds covering an area the size of the sterile dressing.
    c) Gently lift catheter so that skin underneath can be scrubbed ensuring that catheter is stabilized. (non-sterile RN)
    d) Ensure the section of catheter touched by non-sterile nurse is scrubbed with CHG applicator to ensure sterility.
    e) Alcohol and povidone-iodine (for allergies/sensitivities to CHG) should be applied in a circular fashion starting at insertion site and moving outwards.
15. Allow site to fully dry.
16. Apply Statlock® (sterile RN)
    a) Always connect Statlock® to catheter wings before adhering pad to patient's skin. Press the wings closed by pinching between thumb and index finger.
    b) Position Statlock® over targeted skin area. Use skin prep prior to placement.

1) Ensure that the Statlock® is placed and secured so that the dressing will completely cover it.
2) If absolutely necessary the Statlock® may be used outside the dressing.

17. Apply dressing so the entire catheter and Statlock® is secured under the dressing and the insertion site is in the center of the dressing and CHG gel patch. (sterile RN)
18. Mold the slit on the dressing around the catheter or hub in a manner that creates occlusive securement to protect insertion site and catheter from outside air and moisture. Use additional woven tape as needed to accomplish occlusive environment. (sterile RN)
19. Label dressing with date it was changed. (sterile RN)
20. Document CVAD site assessment and dressing activity in the EHR. (sterile RN)
21. Document dressing change checklist in EMR. (non-sterile RN)

IX. INTRAVENOUS ADMINISTRATION SET CHANGE

A. Continuous Infusions

NOTE: In addition to routine changes, the administration set (bag and tubing) is always changed when a new CVAD is placed.

NOTE: When needleless end caps are used within a continuous infusion system, the needleless end cap is changed when the primary administration set is changed.

NOTE: When an administration set is disconnected from the CVAD it becomes an intermittent set and requires changing at 24 hours, exception would be propofol which is required to be changed at 12 hours. **Avoid disconnecting primary continuous administration sets from CVADs due to increased risk of CLABSI.**

Obtain:

- 10 mL prefilled NaCl syringe
- Infusion bag
- Needleless connector
- Obtain proper intravenous tubing
- Gloves
- Alcohol preps

Procedure:

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient and parents or guardian.
3. Prepare clean work environment.
4. Perform hand hygiene.
5. Don gloves.

6. Spike infusion bag with intravenous tubing, and prime just prior to administration set change.
7. Prime new needleless end cap with NaCl syringe, leave syringe attached and set aside.
8. Close catheter clamp (if present) and remove existing administration set and needless end cap.
9. Scrub catheter hub for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry before access the system.
10. Connect formerly primed needleless end cap with attached syringe to CVAD hub and pulsatile flush the remaining NaCl.
11. Remove NaCl flush syringe.
12. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry before accessing the system.
13. Attached primed intravenous tubing.
14. Resume infusion.
15. Remove gloves.
16. Perform hand hygiene.
17. Label intravenous infusion tubing with date it was hung.
18. Document administration set and needleless connector change on LDA flow sheet in EHR.
19. Document CVAD patency assessment and flush in LDA flow sheet in EHR.

B. Intermittent Infusions

Obtain:

- 10 mL prefilled NaCl syringe or appropriate flush solution per Flush Protocol (see below)
- Gloves
- Alcohol preps
- Alcohol impregnated cap
- Intravenous infusion set
- Appropriate intermittent fluid/medication

Procedure:

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient and parents or guardian.
3. Prepare clean work environment.
4. Perform hand hygiene.
5. Don gloves.
6. Initiate intermittent infusion by spiking appropriate fluid/medication bag, prime, and program pump.
7. Remove alcohol impregnated cap from needleless end cap.
8. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry.

9. Flush CVAD with 10ml prefilled NaCl solution.
10. Connect intermittent intravenous administration set to needleless end cap.
11. Initiate infusion.
12. When intermittent infusion complete, disconnect intermittent intravenous administration set from needleless end cap.
13. Place a blue male universal cap on the end of the intermittent intravenous administration set to protect it.
14. Hang intermittent intravenous administration tubing in a manner that prevents it from touching the ground.
15. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry.
16. Flush CVAD with 10ml prefilled NaCl solution.
17. If necessary flush CVAD with appropriate flush solution per Flush Protocol (see above).
18. Close clamp (if present).
19. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing alcohol to dry.
20. Attach disinfection cap.
21. Label intermittent lines with hang date and change entire set (including needless end cap every 24 hours per intravenous administration set change protocol (below).

Intravenous Administration Set Change Protocol	
Administration Set Type	**Replacement Frequency**
Primary and Secondary Continuous Infusion	96 hours
Primary and Secondary Intermittent Infusion	24 hours
Total Parental Nutrition (TPN)	24 hours
Lipid Infusions	12 hours with container change
Hemodynamic and Arterial Pressure Monitoring sets	96 hours
Blood Components set and filter	4 hours
Propofol Infusions	12 hours

X. CVAD BLOOD SAMPLING

A. The preferred method for obtaining blood samples is through a peripheral site stick. Blood should not be drawn from a CVAD unless obtaining blood through

venipuncture is not possible, OR the provider orders it to be drawn from a CVAD for a specific reason.

B. If every effort to draw blood sample from peripheral site has been unsuccessful then the CVAD may be used for blood sample with a provider order.

Obtain:

- Appropriate specimen containers/laboratory tubes
- Sampling syringe(s) as needed
- 10 mL prefilled NaCl flush syringe
- Appropriate flush solution per flushing protocol if needed
- Gloves
- Disinfection cap
- Alcohol preps
- Blue male universal cap
- Female transfer device if desired
- Biohazard bag
- EPIC-generated labels

Procedure:

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient and parents or guardian.
3. Prepare clean work environment.
4. Perform hand hygiene.
5. Don clean gloves.
6. If intravenous fluids are infusing, pause the infusion to all lumens if multi-lumens are present.
7. Disconnect IV tubing from needleless end cap and place the male blue universal cap on tubing to maintain sterility.
8. Remove disinfection cap if present and lumen not infusing.
9. Scrub needleless end cap for a minimum of 15 seconds with alcohol prep, allowing to dry.

Note: You can draw a lab specimen directly through the needleless injection cap, except for blood cultures.

10. Flush with 10ml prefilled NaCl syringe. Flush with 20ml if TPN was running.
11. Aspirate 3-5mls of blood into empty syringe and discard syringe as waste.
12. Attach appropriate transfer device or syringe and collect blood.
13. Transfer blood to appropriate specimen containers
14. Dispose of transfer device(s) & syringes
15. Pulsatile flush with 20 ml of NaCl then
    1) heparin flush if appropriate per flush protocol OR
    2) reconnect to continuous infusion
16. Connect disinfection cap if no continuous infusion.

17. Immediately label specimen containers at the bedside or at site of collection in the presence of patient.
18. Place all samples in the biohazard transport bag for delivery to the laboratory.
19. Remove gloves.
20. Perform hand hygiene.
21. Document in EHR.

XI. CVAD BLOOD CULTURES

A. The preferred method for obtaining blood cultures is through two peripheral site sticks. Blood cultures should not be drawn from a CVAD unless obtaining blood through venipuncture is not possible, OR unless the provider orders it to be drawn from a CVAD for a specific reason.
B. If every effort to draw blood cultures from peripheral sites has been unsuccessful then the CVAD may be used for blood sample with a provider order.

Obtain

- ChloraPrep
- Sampling syringe(s) as needed
- 10 mL prefilled NaCl flush syringe
- Appropriate flush solution per flushing protocol if no infusion
- Gloves
- Needleless end cap
- Disinfection cap
- Alcohol preps
- Blood culture bottle set
- Blue male universal cap
- Female transfer device if desired
- Biohazard bag
- EPIC-generated labels

Procedure

1. Identify the patient per hospital policy.
2. Explain the procedure to the patient and parents or guardian.
3. Prepare clean work environment.
4. Perform hand hygiene.
5. Don clean gloves.
6. Remove culture bottle caps and cleanse tops with alcohol prep for 15 seconds, using a separate alcohol prep for each bottle; allow to air dry.
7. Prime new needleless end cap aseptically without removing protective cap and set aside with flush syringe still attached.
8. If infusing, pause infusion.
9. Clamp CVAD catheter (if clamp present).
10. If infusing disconnect IV tubing and needleless end cap and place the male blue universal cap on tubing to maintain sterility.

11. Remove existing needleless end cap and disinfection cap (if present).
12. Disinfect catheter hub with ChloraPrep. Allow to fully dry.
13. Attach collection syringe and unclamp catheter (if present).
14. Draw appropriate sample volume for culture into syringe (no waste).
15. Inoculate blood culture bottles. Inoculate aerobic bottle first, then anaerobic bottle. Must have 5ml minimum for each bottle. Inoculate bottles first before filling any specimen tubes.
16. Clamp catheter (if clamp present)
17. Disconnect syringe and set aside.
18. Scrub catheter hub for a minimum of 15 seconds with alcohol prep, allowing to dry.
19. Attach new needleless end cap with flush syringe still attached (previously prepared)
20. Unclamp catheter and flush per flush protocol.
21. Disconnect flush syringe.
22. Disinfect hub using 15 seconds of friction with an alcohol prep and allow to dry.
23. Reconnect infusion tubing and resume infusion or connect disinfection cap.
24. Immediately label specimen containers at the bedside or at site of collection in the presence of patient.
25. Blood culture bottles must be labeled very clearly with
    a) Lumen, you may label with color or proximal, medial, or distal.
    b) Anatomical location, i.e. right or left neck, chest, arm
    c) Date and time of draw
26. Remove gloves.
27. Perform hand hygiene.
28. Document in EHR.

XII. DISCONTINUING CVADs

A. Pertains to all CVADs **except** tunneled catheters and implanted ports (only providers remove these CVADs).

Obtain:

- Non-sterile gloves
- ChloraPrep
- Suture removal kit, OR, Sterile scissors
- Alcohol pad/swab
- Sterile gauze
- Antibiotic ointment
- Occlusive sterile gauze-type dressing

Procedure

1. Verify order.
2. Identify the patient per hospital policy.

3. Explain the procedure to the patient and parents or guardian.
4. Wash hands, and apply clean gloves
5. Place HOB flat.
6. Remove dressing.
7. If soiling present, cleanse site with ChloraPrep.
8. Remove sutures, if present, with sterile scissors. If secured w/ StatLock®, unlock catheter wings from StatLock®. Remove Statlock® w/ alcohol.
9. Instruct patient to hold breath and perform Valsalva's maneuver.
10. Grasp hub of catheter and remove by gently pulling staying parallel to the vein until catheter is completely removed.
11. Immediately apply pressure with sterile gauze until bleeding has stopped.
12. Sit patient upright and instruct patient to resume normal breathing.
13. Immediately apply antibiotic ointment over insertion site and cover with occlusive sterile gauze-type dressing for 24 hours.
14. If tip culture ordered refer to CVAD Tip Culture section below.
15. Document procedure in EHR.

XIII. CVAD TIP CULTURE

A. Routine tip cultures are not recommended.
B. **Catheter tip cultures cannot be used in place of blood specimens for meeting LCBI criteria**.
C. Requires a second nurse to maintain sterility.
D. Do not perform this step until you have completed the appropriate blood cultures.

Obtain:

- Sterile specimen cup
- Sterile Scissors

Procedure:

1. Label specimen container with date, time, initials, collection site, catheter type
2. Follow the procedure for discontinuing a CVAD (above).
3. Once catheter is removed hold catheter over specimen cup and cut 5cm of the tip with sterile scissors allowing the tip to drop into the cup.
4. Second RN caregiver immediately places pressure to insertion site.
5. The specimen needs to be delivered to the laboratory within 15 minutes.
6. Apply antibiotic ointment at old insertion site and apply sterile occlusive gauze dressing for 24 hours or until site has epithelialized.
7. Dispose of waste and supplies in appropriate receptacles.
8. Remove gloves
9. Perform hand hygiene

XIV. PATIENTS ADMITTED WITH A CVAD

A. Patients admitted with a CVAD must be assessed by a VAT RN or provider.
   1. Enter order for "central line care & maintenance" as well as VAT consult in EHR. VAT RN or provider consult must be complete prior to initiation of intravenous therapy.
   2. Notify provider and request a chest radiograph prior to starting intravenous therapy.
   3. Request provider write an order that the CVAD can be used once chest radiograph completed.
   4. Begin intravenous therapy (if ordered) once VAT RN or provider assessment complete and provider has written "ok to use" order.

B. **EDUCATION FOR PATIENT'S DISCHARGED WITH A CVAD**

Note: Patients should only be discharged with a valved catheter.
   1. If patient is discharged/transferred with a CVAD line in place, instruct the patient/family/responsible party regarding the necessity for continual assessment and intervention as needed.
   2. If patient is to be discharged with the PICC, ask the patient's physician or practitioner for an Outpatient Referral for patient and/or plan for follow-up care (dressing changes, routine flushing etc.).
   3. Send PICC insertion book with insertion detail sticker/information on front home with the patient.
   4. Document education in EHR.

XV. ANTIBIOTIC LOCK THERAPY

A. Patient must have a confirmed central venous catheter related bacteremia
B. Lock therapy may be used for the following types of catheters: Hickman, Broviac, Groshong, Implanted ports, and PICCs
C. Lock therapy should always be used in conjunction with systemic antibiotics
D. All lumens of a multi-lumen catheter should be instilled with the lock solution
E. Once order is obtained follow pharmacy instructions for administration of lock therapy.
F. Refer to policy # 7180, "Antibiotic Lock Therapy"

References

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Addendum A

COMMON COMPLICATIONS:

A. Monitor and notify provider of any complications. The following is partial list of the most common complications:
   1) **Catheter Occlusion**: Either total or withdrawal occlusion – refer to work instruction, Declotting Central Venous Catheters for procedure.
   2) **Infection**: Observe for redness, tenderness, drainage, induration, increased temperature of unknown origin, chills or rigor, elevated WBC
   3) **Suspected Infection**: Cultures are obtained per physician order. Cultures should be obtained through 2 peripheral sticks. If peripheral sticks are not possible blood cultures can be drawn from CVAD with provider order. Consider antibiotic lock therapy for catheter salvage.
   4) **Catheter malposition/tip dislocation**: Suspected when external measure either increases or decreases from that of original insertion date.
   5) **Infiltration into the neck or chest**: Suspected when neck or chest becomes asymmetric in appearance, painful and blood return is no longer present.
   6) **Venous thrombosis**: Suspected when there is swelling to involved arm, or there are S/S of thrombophlebitis proximal to insertion site of catheter.

7) **Catheter breakage**: External portion of catheter has evidence of leaking, cracking or severed. Additionally, internal breakage may occur as w/ severe pinch-off syndrome.
8) **Catheter breakage**: Immediately provide bleed-back and air embolism protection by:
    - Folding catheter between break and insertion site. Tape folded catheter tightly in place and cover with sterile dressing. Repair may be possible. Contact VAT and provider.