TITLE
CLIN_082 ADULT CENTRAL LINE CATHETER INSERTION AND MANAGEMENT (Including: nontunneled, tunneled, peripherally inserted central catheters, and implanted vascular access devices)

POLICY STATEMENT(S)
To provide standardized evidence based practices for insertion and maintenance of central lines.

APPLICABILITY
EDWARD HOSPITAL

DEFINITION(S)
Antimicrobial Disc: A foam disc impregnated with an antimicrobial agent such as chlorhexidine gluconate used at the central line insertion site as part of the sterile dressing (i.e. Biopatch)
Central Venous Catheter (CVC)/Central Vascular Access Device: A catheter whose tip terminates in a great vessel is considered a central line. Great vessels include the aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins and common femoral veins. CVCs may be tunneled or non-tunneled.
Chlorhexidine Gluconate: CHG
Disinfection Cap: A cap that contains 70% Isopropyl Alcohol (IPA) disinfectant solution and covers the needleless connector to continuously disinfect and protect the connector from touch and airborne contamination.
Implanted Vascular Access Device (Port): Plastic or titanium port with a self-sealing silicone septum placed in the subcutaneous tissue for long-term central venous access. Can be single or double lumen. Example: port-a-cath.
Non-Tunneled Central Venous Catheters: A catheter that is percutaneously inserted into central veins (subclavian, internal jugular, or femoral) and terminates in the superior or inferior vena cava. These catheters are intended for short-term use. Example: multi-lumen catheters.
Peripherally Inserted Central Venous Catheters (PICC): A catheter that is inserted into the basilica, cephalic, or brachial veins and enter the superior vena cava. These catheters are intended for short-term use up to one year.
Tunneled Central Venous Catheters: A catheter that is implanted into the subclavian, internal jugular or femoral veins and terminates in the superior vena cava. These catheters are intended for long-term use. Examples: Groshong and Hickman catheters.

PROCEDURE
A. General Principles
1. Flush and administer medication using no smaller than a 10ml syringe.
2. Place all infusions on an IV pump, except IV push medications.
3. Use Chlorhexidine gluconate (CHG) wipes for bathing inpatients with central lines (including PICC)
4. Explain each procedure to patient/family.
B. Central Vascular Catheter (CVC) Insertion
1. Nursing care prior to and during insertion
   a. Educate the patient and/or family about central line infection prevention prior to insertion and document this in the Medical Record (see Exhibit C: FAQs about Catheter-Associated Bloodstream Infections).
b. Obtain consent.
c. Act as the assistant for bedside insertions with the exceptions of nurse-inserted PICCs.
d. Notify the healthcare professional inserting the CVC of any deviations from the central line bundle and stop the procedure if necessary.

2. Healthcare professional inserting the CVC (inserter)
a. Implement the central line bundle which includes:
   1) Perform hand hygiene before and after palpating the catheter insertion site and prior to insertion.
   2) Utilize maximal barrier precautions.
      a) Inserter and assistant wear a cap, mask, sterile gown and sterile gloves.
      b) Cover the patient with a fenestrated head to toe sterile drape.
      c) Additional staff present wear a mask.
   3) Scrub the insertion site with chlorhexidine for 30 seconds using friction, allow to dry completely before puncturing the skin. If chlorhexidine is contra-indicated, use 70% alcohol.
   4) The subclavian vein is the preferred site for non-tunneled catheters. Avoid the femoral vein unless other sites are not available.

3. Nursing care post insertion
a. Confirm proper placement of any central line prior to use.
   1) Implanted vascular access devices may be used immediately post-op following x-ray verification of placement and physician order.
   2) Peripherally inserted central catheter (PICC) position may be confirmed using radiology or FDA approved confirmation system.

b. Secure the device
   1) Nontunneled central lines, except PICC lines, are sutured securely in place. PICC lines can be secured with securement devices.

c. Dressing
   1) Apply a Chlorhexidine antimicrobial disc and dress the site as defined in Section C.3.
   2) Change the dressing on a port-a-cath within 24 hours post insertion.

C. Central Line Maintenance

1. Hand Hygiene: Perform hand hygiene before and after accessing, repairing, or dressing a Central Venous Catheter (CVC)/Central Vascular Access Device including before donning and after removing gloves.

2. Site Assessment:
a. The insertion site is inspected once a shift by the RN, for signs of infection or other complications including:
   1) Pain, tenderness or numbness
   2) Discoloration (i.e., blanching, erythema)
   3) Localized swelling or induration
   4) Edema
   5) Temperature changes (skin and body temperature)
   6) Exudate (drainage)
   7) Catheter migration
   8) Device rotation or extrusion
   9) Wound hematoma
   10) Accumulation of serous fluid

b. Site dressed with transparent dressings may be visualized through the dressing. If signs of complication are present, remove the dressing for thorough examination of the site. Note: For sites dressed with gauze remove the dressing for site inspection every
48 hours unless symptoms or dressing integrity warrant earlier removal.
c. Notify the physician of any signs of infection or other complications.
   1) Obtain an order for discontinuation and cultures of catheter tip on non-tunneled catheters if infection is suspected (see C.10.).
   2) Obtain an order for physician consultation on tunneled and implanted vascular access devices if infection is suspected.

3. **Dressing Changes**
   a. Change dressings at established intervals or when the dressing is damp, loosened, soiled or contamination is suspected. Established intervals are as follows:
      1) Change dressing upon admission for all inpatients admitted with a CVC/Vascular Access Device if:
         a) Chlorhexidine antimicrobial disc is not in place. Apply chlorhexidine antimicrobial disc and sterile dressing.
         b) Gauze is present. Remove gauze if site is greater than 48 hours post insertion and apply chlorhexidine antimicrobial disc and sterile dressing.
      2) Change transparent dressings every 7 days.
      3) Change transparent dressings with gauze under the dressing at 48 hours.
         a) Exception: If gauze is used to stabilize the needle in an implanted vascular access device, the transparent dressing with gauze under the dressing is changed every 7 days.
         b) Dressing change procedure (see Exhibit D for non-tunneled and tunneled catheters; see Exhibit E for implanted vascular access device)
      4) Remove hemostatic agent when evidence of bleeding has stopped and replace with chlorhexidine antimicrobial disc.

4. **Tubing**
   a. Change administration sets, including add on devices and tubing, at established intervals depending on solution, when contamination is suspected, when integrity is compromised, or with new central line access. (Refer to Exhibit A, Table 3 for specific details)
   b. Cover the open end of IV tubing or piggyback tubing with a new/unused sterile cap (needleless connector, blunt cannula or sterile cap) when the tubing is disconnected and will be used again.

5. **Changing and Maintenance of Add On Devices**
   a. Change add on devices (such as extension sets, filters, stopcocks, injection caps and needleless connectors) with the changing of administration sets or when contamination is suspected or product integrity is compromised.
   b. Needleless connectors are changed if there is blood visible within the connector and/or prior to a blood culture draw.
   c. For multi-lumen ports, which are not being used, the needleless luer device is changed every 7 days with the dressing change.
   d. Prior to each access, disinfect needleless connectors and injection ports with application of a disinfection cap for minimum of five minutes or by using an antiseptic wipe using friction and scrubbing motion. Allow the disinfectant to dry prior to access.
   e. Discard disinfection cap after single use and apply sterile disinfection cap to needleless connector or injection port if a continuous infusion is not connected.

6. **Patency**
   a. Aspirate for a positive blood return from all central line types to confirm patency prior to medication administration and/or flushing procedure.

7. **Flushing/Heparinizing** (Refer to Exhibit A, Table 1 and Table 2 for specific flushing information)

8. **Infusions**
a. To keep open (TKO)/Keep vein open (KVO) order is interpreted as 10-20 ml/hr in Adults.
b. Affix label to include start date/time and discard date/time with RN’s initials.
c. Based on Product/Solution a maximum hang time is recommended as indicated in Exhibit A Table 3

9. Blood Draws (excluding blood cultures – see #12 for blood culture collection)
   a. PTTs are not recommended to be drawn on heparinized lumens of central catheters. PTTs are drawn on non-heparinized lumens or by peripheral venipuncture however if this is not possible see Exhibit A, Table 1 for blood discard and flushing volumes.
   b. **Equipment**
      - Non-sterile gloves
      - 2 – 10 ml prefilled saline syringes
      - Needleless blood transfer device.
      - **Note:** syringes and transfer needles will only be used for difficult aspirations. Large red top tube or syringe for waste and other appropriate vacutainer tube(s) as needed and patient label.
      - Alcohol swabs
c. **Procedure**
   1) Perform hand hygiene
   2) Maintain sterility when opening packages
   3) Don gloves
   4) Stop infusion by detaching IV while maintaining sterility of tubing.
   5) Scrub end of needleless connectors with alcohol for 15-30 seconds and allow to dry
   6) Attach 10ml syringe with normal saline, unclamp, aspirate for blood return, flush and clamp. Wait one minute.
   7) Aspirate 4-5ml of blood. Discard blood. (Please refer to Exhibit A for PTT draws).
   8) Attach needleless blood transfer device and insert blood collection tubes to obtain specimen as ordered
   9) Disinfect needleless connectors and attach syringe with normal saline
   10) Flush with normal saline
   11) Detach syringe
   12) Reinstitute IV infusion.
      **NOTE:** If IV infusion not being reinstituted on implantable vascular access devices, attach syringe with physician ordered Heparin, unclamp, flush, clamp.

10. Blood Culture Collection
   a. Obtain a physician order.
   b. Blood cultures will only be obtained from a CVC/Vascular Access Device if no other venous access is available or if specifically ordered.
   c. Blood cultures will not be drawn from pre-existing peripheral IV cannula.
   d. The blood cultures are drawn before any other lab specimens.
   e. **Blood Culture Specimen Collection Procedure**
      1) **Equipment**
         - Gloves
         - Chlorhexidine gluconate
         - Needleless connector
         - 20ml syringe or 2-10 ml syringes
         - Needleless blood transfer device
         - 10ml syringe with 10mls normal saline
         - 1 aerobic and 1 anaerobic blood culture bottle
2) **Procedure**
   a) Use aseptic technique
   b) Prep culture tube tops with chlorhexidine gluconate and allow to air dry (minimum 30 seconds).
   c) Attach syringe to needleless connector.
   d) Withdraw appropriate amount of blood: 20ml for adult tubes (10ml in each bottle – 1 aerobic, 1 anaerobic).
   e) Remove syringe, attach it to a needleless blood transfer device and transfer blood to culture bottles filling aerobic bottle first.
   f) Attach syringe with normal saline to the central line and flush.
   g) Detach syringe.
   h) Re-attach IV infusion.

   **NOTE:** Blood cultures can be drawn through arterial lines or through stopcocks, as long as the appropriate preparation steps listed above are followed.

11. **Managing CVC Issues**
   a. In case of catheter damage such as fractured, leaking catheter, or cracked hub:
      1) Stop infusions into catheter.
      2) Clamp catheter with clamp between leak and insertion site and anchor catheter to prevent movement.
      3) Mark catheter “do not use.”
      4) Notify the responsible physician or PICC nurse for nurse-inserted PICCs.
      5) Initiate a peripheral IV if fluids or medications are critical to the patient’s well-being.
      6) Closely monitor the patient and assess for signs of air embolism such as sudden onset of pallor, cyanosis, dyspnea, coughing, chest pain and tachycardia.
   b. If signs of air embolism are identified:
      1) Place patient in left lateral decubitus position
      2) Initiate basic life support as needed
      3) Locate and resolve source of air entry
      4) Notify physician
      5) Initiate pulse oximetry and telemetry
      6) Call Rapid Response Team if necessary
   c. CVC will not flush or it will flush but cannot draw blood
      1) Change patient’s position (lie on side, place arms over head etc.)
      2) Ask the patient to cough or take a deep breath and hold while trying to aspirate.
      3) Flush with 10ml of saline then try to withdraw blood.
      4) If problem continues, change needleless connector.
      5) If problem is still unresolved, consider use of thrombolytic agent.
   d. Clotted line – consider thrombolytic agent use – See policy #CLIN_039 – Adult Declotting Central Lines with Thrombolytic Agents
   e. If signs of extravasation are present – Immediately stop infusion and notify the physician. Refer to CLIN_251, Extravasation Management of Antineoplastics and Non-Antineoplastic Medications.
   f. If signs of pneumothorax such as shortness of breath, uneven chest movement or breath sounds, tachycardia, and chest pain are present:
      1) Immediately clamp the line close to the insertion site
      2) Notify the physician immediately
      3) Discourage coughing as much as possible
   g. If signs of catheter embolism are identified:
      1) Keep patient on bed rest
      2) Notify the physician
3) Monitor for signs and symptoms of distress
4) Carry out interventions and treatments as ordered

12. Catheter Replacement
When adherence to aseptic technique cannot be ensured (i.e. when catheters are inserted in an emergency situation), replace catheters as soon as possible but no longer than 48 hours post insertion.

13. Review of Line Necessity
a. Line necessity is assessed daily.
b. When a line no longer meets the criteria for continued use, listed in the guidelines for line necessity (see Exhibit B), a nurse to physician discussion will be initiated regarding timely removal of the central line.

14. CVC Discontinuation
a. Removal of catheter will be done following a physician’s order. Tunneled and/or cuffed catheters (Hickman, Broviac, Groshong) are discontinued by physicians only.
b. Removal of nontunneled CVC
   1) Equipment
      • Sterile disposable suture removal set
      • Sterile gloves
      • Sterile 4x4 gauze
      • Gloves - non-sterile
      • Tape
      • Antiseptic ointment
      • Transparent semipermeable dressing
   2) Procedure
      a) Explain procedure to patient and/or family.
      b) Place patient supine in slight Trendelenburg position with head of bed flat. For PICC removal, have patient lie flat but Trendelenburg position not necessary.
      c) Educate patient in Valsalva maneuver
      d) Perform hand hygiene and put on non-sterile gloves.
      e) Open equipment.
      f) Remove old dressing and discard appropriately.
      g) Inspect and disinfect catheter skin juncture
         NOTE: If purulent drainage is noticed, culture site.
      h) Perform hand hygiene and put on sterile gloves.
      i) Clip and remove sutures (if applicable) or stabilization device.
      j) Ask patient to take deep breath and hold it (for the patient on a ventilator withdraw during inspiratory phase). Remove catheter with one slow continuous movement of one hand while holding gauze over the site and quickly applying pressure once the catheter is removed with the other hand.
      k) Apply pressure to site with sterile 4x4 for approximately five minutes or until bleeding stops.
      l) Observe site for bleeding, hematoma, drainage.
      m) Apply gauze with application of antiseptic ointment to exit site, secure gauze to site, cover with occlusive adhesive material, change dressing every 24 hours until site is healed
      n) Check catheter integrity (for PICCs measure length) to be sure complete catheter has been removed.
      o) Patient will remain supine for 30 minutes post central line removal
      p) Dispose of equipment in proper container.

15. Culturing the Central CVC/Vascular Access Device Catheter
a. When a catheter is discontinued, due to suspected infection, the catheter tip may be cultured.
   1) Obtain an order for culture. Cut 2 inches of the tip, using sterile scissors, and place in a sterile cup.
   2) Send catheter tip to Lab for culture and sensitivity following physician’s order.

D. Implanted Vascular Access Device (Port)
1. Accessing Implanted Vascular Access Devices
a. Equipment
   - Central line dressing change kit
   - Transparent dressing, if not included in kit
   - Surgical adhesive skin closure
   - Sterile 2x2 gauze
   - Antimicrobial disc (for inpatient use only)
   - 20g non-coring needle for adult. Length of needle is selected to accommodate depth of port.
   - Needleless luer device
   - Alcohol wipes
   - Sterile 10 ml pre-filled saline syringe
   - 1” tape
   - Non-Sterile gloves
   - Mask (for adult inpatient)
   - Optional: Topical anesthetic, ice pack, IV pump, IV tubing, 10 ml syringe with physician ordered heparin dose

b. Procedure
   1) Perform hand hygiene.
   2) Don non-sterile gloves.
   3) Visually inspect site for erythema, inflammation, exudate, supraclavicular swelling or venous distention. If present, do not access. Notify physician for further orders.
   4) Palpate site to locate port.
   5) Place topical anesthetic, if ordered, for recommended time then remove or place an ice pack for several minutes over site if appropriate.
   6) Perform hand hygiene, wear mask as appropriate (adult inpatient).
   7) Open central line dressing change kit, maintaining sterility. Drop additional supplies onto the sterile field aseptically.
   8) Don sterile gloves.
   9) Scrub site with CHG for 30 seconds. Allow area to dry completely.
   10) Attach needleless access device to the needle tubing, then attach a sterile normal saline syringe, prime line and clamp, prior to accessing port.
   11) Immobilize the port by holding upper and lower edges firmly with thumb and index finger of non-dominant hand while inserting needle perpendicular into the center of port septum using dominant hand. Insert needle firmly through skin and septum until it touches the back of the port chamber.
   12) Open clamp and confirm correct position of needle by aspiration of blood. If no blood return is present notify the physician for approval to use the port. Blood return may be brown with fibrin clots if the port has not been accessed in a while. Continue to aspirate until blood return is bright red then attach new normal saline filled syringe.
   13) Flush and clamp.
   14) Apply antimicrobial disc for inpatients.
   15) Apply 2x2 gauze under wings of the non-coring needle if stabilization is needed.
Then place surgical adhesive skin closure with adhesive side up under the wings of the needle, crisscross it over the needle and secure it to the skin.

16) Apply transparent dressing and press gently around the edges.
17) Initial, date and time dressing.
18) Attach IV fluids on an IV pump OR flush with physician ordered heparin and clamp.
19) Anchor extension tubing to skin to prevent tension on the line.
20) Document procedure.

2. **Discontinuing IV Fluids used with Implantable Vascular Access Device**
   a. **Equipment**
      - Non-sterile gloves
      - 10 ml syringe with normal saline
      - 10 ml syringe with physician ordered heparin dose
      - Needleless luer device
      - Alcohol wipes
   b. **Procedure**
      1) Perform hand hygiene.
      2) Turn off IV pump and clamp non-coring needle extension tubing.
      3) Don non-sterile gloves.
      4) Detach IV tubing from needleless luer on non-coring needle extension tubing.
      5) Scrub needleless luer with alcohol for 15-30 seconds and allow to air dry.
      6) Attach syringe with normal saline to needleless luer, unclamp, aspirate to confirm blood return, flush, clamp.
      7) Attach syringe with physician ordered heparin, unclamp, flush and clamp.
      8) Document procedure.

3. **Decannulation of Implanted Vascular Access Device**
   a. **Equipment**
      - Non-sterile gloves
      - Gauze pad
      - Alcohol wipes
      - 10 ml syringe with normal saline
      - 10 ml syringe with physician ordered heparin dose
      - Appropriate bandage
      - Optional: Port access equipment if needed
   b. **Procedure**
      1) Perform hand hygiene.
      2) Don non-sterile gloves.
      3) Stop IV fluid infusion and detach tubing. If port is being decannulated because of non-coring needle change place sterile cap on end of IV tubing.
      4) Scrub needleless luer with alcohol for 15-30 seconds and allow to air dry.
      5) Attach syringe with normal saline, unclamp, aspirate for blood return, flush and clamp.
      6) Attach syringe with physician ordered heparin, unclamp, flush and clamp (if not recannulating).
      7) Remove transparent dressing, gauze, antimicrobial disc and surgical adhesive strips if present.
      8) Remove needle by pressing down on port with two fingers on non-dominant hand while simultaneously withdrawing needle using dominant hand.
      9) Wipe away any drainage from injection site with gauze and apply appropriate bandage.
      10) Document procedure.
4. **Computed Tomography Scan Studies (CT scan) and Implantable Vascular Access Device**
   a. Verify type of port device prior to CT scan using the appropriate identifiers:
      1) Patient identification card and operative report OR
      2) Chest x-ray
   b. If a CT with infusion is ordered, the following should occur:
      1) For patients with a power injectable port, a power injectable Huber needle and tubing is used
      2) For patients with a non-power injectable port, obtain peripheral IV access or notify CT that the port is non-power injectable
   c. Confirm catheter tip placement prior to injection of contrast.
   d. Power injectable infusion sets cannot be used with non-power injectable ports due to the risk of possible patient injury.
   e. Flush device following the completion of the exam with 10 ml of normal saline. Continue IV fluids or RN to heparinize port.

5. **Documentation**
   a. Document appropriate actions in the medical record/IV record.

**CROSS REFERENCE(S)**

**CLIN_039, Adult Declotting Central Lines with Thrombolytic Agents**

**AACN Policy Manual**

**CLIN_100, Adult Peripheral Intravenous Line Insertion, Maintenance and Removal**

**CLIN_251, Extravasation Management of Antineoplastics and Non-Antineoplastic Medications.**

**Policy No:** CLIN_082

**Previous Policy No.:** CLNI002; CLNI003; CLNI005; CLNI006; CLN:1009, CLIN_162, CLIN_034; CLIN_016

**Effective Date:** 03/01/2009

**Policy Creation Date:** 06/1985

**Most Recent Review/Revision Date:** 06/09/2016

**Approved by:** Edward Quality Committee; 1/12/2010
Table 1 ADULT CV CATHETER MAINTENANCE PRACTICES

Note: Prior to flush procedure aspirate for a positive blood return to confirm patency.

<table>
<thead>
<tr>
<th>Catheter Type</th>
<th>Saline Flush After TPN/Meds</th>
<th>Heparin Flush</th>
<th>Flushing Frequency for Unused Lumens</th>
<th>Blood Sampling For All Catheter Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunneled Catheters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROSHONG</td>
<td>10ml</td>
<td>None</td>
<td>q 7 days</td>
<td>Routine labs or blood cultures:</td>
</tr>
<tr>
<td>HICKMAN</td>
<td>10ml</td>
<td>None</td>
<td>q 12 hours</td>
<td>Lumen prep: Alcohol</td>
</tr>
<tr>
<td>Non-Tunneled Catheters</td>
<td></td>
<td></td>
<td></td>
<td>Blood discard: 4-5 ml (not necessary when drawing blood cultures)</td>
</tr>
<tr>
<td>MULTI-LUMEN</td>
<td>10ml</td>
<td>None</td>
<td>q 12 hours</td>
<td></td>
</tr>
<tr>
<td>Peripherally Inserted Central Catheter (PICC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bard PICCs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single and multi lumen</td>
<td>10ml</td>
<td>None</td>
<td>q 7 days</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 ADULT IMPLANTED VASCULAR ACCESS DEVICE MAINTENANCE PRACTICES

Recommended flushing volumes, must have physician order

<table>
<thead>
<tr>
<th>Situation</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>When port not in use</td>
<td>5 ml of 100units/ml heparin every 4 weeks</td>
</tr>
<tr>
<td></td>
<td>GROSHONG: 5mL of normal saline every 4 weeks</td>
</tr>
<tr>
<td>After each infusion of medication, TPN and/or accessed more than once per day</td>
<td>TKO infusion preferred for intermittent meds (inpatient) OR 10 ml normal saline then 5 ml of 100units/ml heparin GROSHONG: 10 mL of normal saline</td>
</tr>
<tr>
<td>Locking after blood withdrawal</td>
<td>20 ml normal saline then 5 ml of 100units/ml heparin GROSHONG: 20 mL normal saline</td>
</tr>
<tr>
<td>Locking after power injection of contrast media</td>
<td>10 ml normal saline then 5 ml of 100units/ml heparin GROSHONG: 10 mL of normal saline</td>
</tr>
</tbody>
</table>
Table 3: ADULT MAXIMUM HANG TIME AND TUBING FREQUENCY CHANGE

<table>
<thead>
<tr>
<th>Product/Solution</th>
<th>Maximum Hang Time</th>
<th>Tubing Frequency Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Products</td>
<td>4 Hours</td>
<td>Every 4 hours or after the 2nd unit (Whichever comes first)</td>
</tr>
<tr>
<td>Parenteral Nutrition (TPN) with lipids</td>
<td>24 Hours</td>
<td>Every 24 Hours</td>
</tr>
<tr>
<td>Parenteral Nutrition (TPN) without lipids</td>
<td>24 Hours</td>
<td>Every 96 Hours</td>
</tr>
<tr>
<td>IV Fluids mixed in pharmacy or on nursing units</td>
<td>24 Hours</td>
<td>Continuous connection: Every 96 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermittent connection: Every 24 Hours</td>
</tr>
<tr>
<td>Commercially prepared IV solutions</td>
<td>72 Hours if continuously infusing</td>
<td>Continuous connection: Every 96 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermittent connection: Every 24 Hours</td>
</tr>
<tr>
<td>Propofol</td>
<td>12 Hours</td>
<td>Every 12 Hours</td>
</tr>
<tr>
<td>Lipids - Intravenous Fat Emulsion</td>
<td>12 Hours</td>
<td>Continuous: Every 24 Hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intermittent: after each unit</td>
</tr>
<tr>
<td>Ativan</td>
<td>24 Hours</td>
<td>Filter and Tubing every 24 hours</td>
</tr>
<tr>
<td>Arterial and pulmonary artery flush solutions</td>
<td>72 Hours</td>
<td>96 Hours</td>
</tr>
</tbody>
</table>

Table 4: ADDITIONAL MAINTENANCE PRACTICES

DRESSING CHANGES: Refer to #C.4. in policy for further details
- Transparent every 7 days
- Transparent with gauze every 24 hours

MULTI-LUMEN CATHETERS
- Blood specimens are obtained from the port most distal to the catheter hub

PATENCY
- Aspirate for a positive blood return from the central line to confirm patency prior to medication administration.
- For implantable vascular access device continuous infusion, do not exceed 25 PSI with controller device (IV pump).
Guidelines for Daily Review of Central Line Necessity

When the following indications for central line necessity are no longer being met for a 24-hour period of time, daily discussions will begin regarding line necessity and planning for discontinuation of the central line.

<table>
<thead>
<tr>
<th>Indication</th>
<th>CVC Tunneled</th>
<th>CVC Nontunneled</th>
<th>PICC</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>No or poor peripheral intravenous access or inadequate for site rotation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Consider midline catheter (see CLIN_100)</td>
</tr>
<tr>
<td>Extended IV access required - longer than 6 days</td>
<td>X 4 wks to 1 yr.</td>
<td>X 1-4 wks</td>
<td>X 4 wks to 1 yr.</td>
<td>Consider midline catheter (see CLIN_100)</td>
</tr>
<tr>
<td>Frequent blood draws</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fluid resuscitation/volume loading</td>
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<td>Temporary trans-venous pacemaker</td>
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<tr>
<td>Infusion of caustic/toxic/irritating solutions:</td>
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<tr>
<td>TPN therapy (glucose &gt;10)</td>
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<td>Hypertonic/hyperosmotic (osmolarity &gt; 600)</td>
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<td>Vesicant</td>
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<tr>
<td>pH extremes (&lt;5 or &gt;9)</td>
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<tr>
<td>Infusion of:</td>
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<tr>
<td>Vasoactive agents</td>
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<td>Inotropic agents</td>
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<td>Blood products – large amounts or multiple blood products</td>
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<td>Long term antibiotic therapy</td>
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<td>X</td>
<td>Consider midline catheter (see CLIN_100)</td>
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<td>Code blue – for drug and fluid administration</td>
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<tr>
<td>Procedure</td>
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<tr>
<td>Insertion of Swan Ganz catheter</td>
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<td>Central venous pressure measurement</td>
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<td>Hemodialysis/plasmapheresis</td>
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<td>Cardiac catheterization</td>
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<td>Pulmonary angiography</td>
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<td>Pulmonary artery catheterization</td>
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<td>Radiological procedures</td>
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<tr>
<td>Pre-operative - posterior craniotomy or cervical laminectomy in a sitting position</td>
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<tr>
<td>Administration of incompatible medications</td>
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<td>X-Triple lumen</td>
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</table>

**EXHIBIT C**
**CLICK HERE FOR**
*FAQs about Catheter-Associated Bloodstream Infections*

**EXHIBIT D**
**Dressing Change Procedure: Non-tunneled and tunneled catheters**

**Equipment**
- Central venous dressing change kit
- Chlorhexidine antimicrobial disc
- Site appropriate dressing and stabilization device (if necessary)
- Non-sterile gloves
- Surgical mask for patient

**Procedure**
1. Perform hand hygiene
2. Apply mask to self and patient (except for patients on ventilators)
3. Use aseptic technique.
4. Position patient with head turned away from catheter site
5. Remove old dressing and discard (use non-sterile gloves for dressing removal). Take care not to pull on unsutured PICCs.
6. Perform hand hygiene.
7. Open dressing change kit, maintaining sterility
8. Inspect site and catheter
9. Don sterile gloves
10. Cleanse site with chlorhexidine gluconate for 30 seconds. Allow area to air dry completely.
11. Apply Chlorhexidine antimicrobial disc, stabilization device (if necessary) and cover site with occlusive transparent dressing.
   Note: Chlorhexidine antimicrobial disc will not be applied for outpatient PICC insertions.
12. Anchor the remaining portion of the catheter to the skin to prevent tension on the line.
EXHIBIT E
Dressing Change Procedure: Implanted Vascular Access Devices (Port)

Equipment
- Central line dressing change kit
- Transparent dressing, if not included in the kit
- Surgical adhesive skin closure
- Sterile 2x2 gauze
- Antimicrobial disc for inpatients
- 1” tape
- Non-sterile gloves
- Mask for everyone present (adult inpatient)

Procedure
1. Perform hand hygiene.
2. Wear mask as appropriate (adult inpatient). Patients on ventilators do not need to wear a mask.
3. Position patient with head turned away from catheter site.
4. Don non-sterile gloves and remove old dressing using aseptic technique. Refer to
decannulation and access procedures if appropriate.
5. Inspect site and placement of non-coring needle.
6. Perform hand hygiene.
7. Open central line dressing change kit, maintaining sterility. Drop additional supplies into the
sterile field aseptically.
8. Don sterile gloves.
9. Scrub site with CHG for 30 seconds. Allow area to air dry completely.
10. Apply antimicrobial disc for inpatients.
11. Apply 2x2 gauze under wings of the non-coring needle if stabilization is needed. Place surgical
adhesive skin closure with adhesive side up under the wings of the needle, crisscross it over
the needle and secure it to the skin.
12. Apply transparent dressing and press gently around the edges.
13. Initial, date and time dressing.
14. Anchor extension tubing to skin to prevent tension on the line.