I. SCOPE:

This policy applies to [insert Hospital] (“Hospital”), its employees, Medical Staff, and contractors, regardless of service location, who provide treatment for patients who require a central venous catheter.

II. PURPOSE:

Many patients require the placement of central line catheters. These patients are at risk for development of central venous catheter associated blood stream infection (CVCBSI) and complications which increase morbidity, mortality and healthcare costs. The purpose of this policy is to outline the evidence-based clinical practice guidelines that Hospital shall follow to reduce the incidence of CVCBSI.

III. DEFINITIONS:

A central line is an intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. Great vessels include: aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, common femoral veins, and in neonates, the umbilical artery/vein. Permanent tunneled catheters and certain dialysis catheters terminating close to the heart are considered central line catheters. NOTE: An introducer is not considered a central line. Pacemaker wires and other nonlumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed, nor withdrawn through such devices.

IV. POLICY:

The Hospital will implement all components of the “CVCBSI prevention bundle” for all patients who have a central line.

V. PROCEDURE:

A. Before Insertion

1. Explain the procedure to the patient and provide educational materials as appropriate. After the patient has been given an opportunity to ask questions
to the individual performing the procedure, ensure informed consent is provided by the physician. The attestation of informed consent is documented according to Hospital policy.

2. Conduct a time out according to hospital requirements and document in the medical record. (See Clinical Operations policy CO-2.011 Universal Protocol for Preventing Wrong Site, Wrong Procedure, Wrong Person Surgery.)

B. At Insertion

1. Use a catheter checklist to ensure adherence to infection prevention practices at time of CVC insertion (see Attachment A).
   a. Use a checklist to ensure compliance with all processes related to central line placement.
      (1) CVC insertion should be observed by a nurse, physician, or other healthcare personnel who has received appropriate education (see above), to ensure that aseptic technique is maintained.
      (2) Checklist use is required in all areas including sterile areas. For sterile technique areas, the checklist may be posted.
      (3) Healthcare personnel should be empowered to stop a procedure if breaches in aseptic technique are observed.

2. Perform hand hygiene before catheter insertion or manipulation
   a. Use an alcohol-based waterless product or antiseptic soap and water.
      (1) Use of gloves does not eliminate the need for hand hygiene.
      (2) Wash hands prior and after patient contact.
(3) Don gloves after hand hygiene for any task that involves touching the central line catheter apparatus, before and after inserting, replacing, accessing repairing or dressing an intravascular device.

(4) Refer to Clinical Operations policy CO-2.017 Hand Hygiene for specific actions and rationale for hand hygiene.

3. Optimal Catheter Site Selection
   a. Avoid using the femoral vein for central venous access in adult patients.
      • Use of the femoral access site is associated with greater risk of infection and deep venous thrombosis in adults.
   b. Whenever possible, and not contraindicated, the subclavian line site should be preferred over the jugular and femoral sites for non-tunneled catheters in adult patients.
      • Avoid subclavian site in hemodialysis patients and patients with advanced kidney disease.

4. Use an all-inclusive catheter cart or kit

A catheter cart or kit that contains all necessary components for aseptic catheter insertion is to be available and easily accessible in all units where CVCs are inserted.

5. Use maximal sterile barrier precautions during CVC insertion
   a. Use maximal sterile barrier precautions.
      (1) A mask, cap, sterile gown, and sterile gloves are to be worn by all healthcare personnel involved in the catheter insertion procedure.
(a) All hair should be under cap

(b) Mask should cover mouth and nose tightly

(2) The patient is to be covered with a full body (head to toe) sterile drape during catheter insertion. If a full-size drape is not available, two smaller sterile drapes can be applied to cover patient.

b. These measures must also be followed when exchanging a catheter over a guidewire.

6. Use a chlorhexidine-based antiseptic for skin preparation in patients older than 2 months of age

a. Before catheter insertion, apply an alcoholic chlorhexidine solution containing a concentration of chlorhexidine gluconate greater than 0.5% to the insertion site.

b. The antiseptic solution must be applied to skin with friction (30 seconds) and allowed to dry completely (2 minutes) (or according to manufacturer’s recommendations) before making the skin puncture.

(1) Chlorhexidine products are not approved by the US Food and Drug Administration for children younger than 2 months of age; povidone-iodine can be used for children in this age group. NOTE: Avoid tincture of iodine because of potential effect on the neonatal thyroid. Other iodine-containing products can be used (povidone iodine).

(2) If there is a contraindication to chlorhexidine preparation, the alternatives include: 70% alcohol, tincture of iodine, or an iodophor and allowed to dry according to manufacturer’s recommendations.
1. Document the site, time and date of placement.

2. Disinfect catheter hubs, needleless connectors, and injection ports before accessing the catheter.
   a. Before accessing catheter hubs or injection ports, clean them with an appropriate antiseptic (chlorhexidine, 70% alcohol, povidone iodine or an iodophor) to reduce contamination.
   b. Access the needleless access device port only with sterile devices.
   c. Replace needleless components at least as frequently as the administration set. Do not change needleless connectors more frequently than every 72 hours.

3. Daily Review of Line for Necessity / Remove nonessential catheters
   a. Assess the need for continued intravascular access on a daily basis during multidisciplinary rounds. Remove catheters not required for patient care. When adherence to aseptic technique cannot be ensured (i.e., catheters inserted during a medical emergency), replace the catheter within 48 hours.

[Facilities in California insert:]

[(1) Physicians are required to document daily the continued need for a central line.]

b. The CDC guidelines discourage catheter replacement and scheduled time intervals for routine placement or for temporary catheters over a guidewire.
   (1) Replacement of temporary catheters over a guidewire in the presence of bacteremia is not an acceptable replacement strategy, because the source of infection is usually colonization of the skin tract from the insertion site to the vein.
(2) An umbilical venous catheter can be used up to 14 days if managed aseptically, but should be removed when no longer necessary.

4. Change transparent dressings and perform site care with a chlorhexidine-based antiseptic at least every 7 days or more frequently if the dressing is soiled, loose, or damp. (See Attachment B)

5. Replacement of Administration Sets
   
a. Replace primary and secondary administration sets and add on devices at least every 7 days, but no more frequently than 96 hours for patients not receiving blood, blood products or fat emulsions.

b. Replace tubing used to administer blood, blood products, or fat emulsions (those combined with amino acids and glucose in 3-in-1 admixture or infused separately) within 24 hours of initiating the infusion.

c. Replace tubing used to administer propofol infusions every 6 or 12 hours, when the vial is changed, per the manufacturer’s recommendation.

6. Perform surveillance for CVCBSI
   
a. Measure unit-specific incidence of CVCBSI (CVCBSIs per 1,000 catheter-days) and report the data on a regular basis to the units, physician and nursing leadership, and hospital administrators overseeing the units.

b. Compare CVCBSI incidence with historical data for individual units and with national rates (i.e., data from the National Healthcare Safety Network).

E. Responsible Person
The Infection Preventionist/ [insert title] is responsible for assuring that all Hospital staff adhere to the requirements of this policy, that these procedures are implemented and followed at the Hospital, and that instances of noncompliance with this policy are reported to the [insert title of senior Hospital leader with operational responsibility for this area].

F. Enforcement

All Hospital employees and Medical Staff Members whose responsibilities are affected by this policy are expected to be familiar with the basic procedures and responsibilities created by this policy. Failure to comply with this policy will be subject to appropriate performance management pursuant to all applicable policies and procedures, including the Medical Staff Bylaws, Rules and Regulations.

VI. REFERENCES:


- Institute for Healthcare Improvement Topics, Implement the Central Line Bundle

VII. ATTACHMENTS:

- Attachment A: Central Line Insertion Care Team Checklist

- Attachment B: Central Venous Catheter Dressing Change Procedure
Central Line Insertion Checklist

[Insert Hospital Central Line Insertion Checklist Here]

[This sample is available for download from eTenet at the Clinical Operations Infection Control SharePoint site:]

<table>
<thead>
<tr>
<th>Critical steps</th>
<th>Yes</th>
<th>Yes with reminder</th>
<th>Procedure Deviation (complete incident report)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the procedure, did the operator (person inserting line) maintain a sterile field?</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Explain the procedure to the patient and provide educational materials as appropriate. After the patient has been given an opportunity to ask questions to the individual performing the procedure, ensure informed consent is provided by the physician.</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain consent for the procedure (signed and witnessed)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Perform a head and neck examination before line placement</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Gown, hand washing, and sterile gloves immediately prior</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Operation(s): select site, mask, sterile gown/scrub, eye protection</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Assistant: wear cap, mask, sterile gown and gloves, eye protection (If a risk for injuring sterile field, use sterile gown and gloves)</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Properly position patient to prevent air emboli: For Chordal, Transplant (HORV less than 60 degrees) For Femoral or subclavian lines when transposition is contraindicated:</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Prep procedure site (chlorohexidine) for 30 seconds. allow air to dry an additional 30 seconds. (gown prep, scrubs for 2 minutes and allow to dry for 1 minute)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Allow site to dry</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use sterile technique to change from level to be</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Utilize local anesthetic and/or sedation</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During the procedure: did the operator maintain a sterile field?</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Monitor the patient’s vital signs</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collect any patient not used during insertion (to avoid an emboli: angio-photodilatation)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Obtain qualified second operator after 3 unsuccessful sites (exclude if emergency)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Apply tourniquet to each arm (to avoid an emboli and ensure intragastric placement)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Transfuse O2 estimate O2P by fluid column (to rule out arterial placement)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>After the procedure: did the operator</td>
<td>✔</td>
<td></td>
<td></td>
<td>STOP</td>
</tr>
<tr>
<td>Obtain blood from site using anticoagulant agent (heparin); apply sterile dressing and apply sterile tape on all sites</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Verify placement by x-ray (pre- and post-op in CVTMA position) (but if placed under fluoroscopy in the femoral vein)</td>
<td>✔</td>
<td></td>
<td>STOP</td>
<td></td>
</tr>
</tbody>
</table>

Operator: ___________________________ Assistant: ___________________________
Central Venous Catheter Dressing Change Procedure

1. Gather the following supplies:
   a. Select the appropriate dressing change tray. Trays are available for adults CVCs, pediatrics CVCs, PICC lines, and dialysis catheters. Dressing Change Tray (items needed for bundle compliance):
      Order (top down):
      □ mask on top
      □ non-sterile gloves
      □ alcohol prep pad
      □ sterile gloves
      □ drape
      □ alcohol prep swab stick
      □ chlorhexidine prep
      □ antimicrobial hub disc (Use when indicated)
      □ skin protector wipe
      □ clear dressing
      □ label
      □ tape
   b. If additional equipment (e.g., securement device) or size of gloves is needed, gather prior to beginning procedure.

2. Assess patient’s chart for any signs, symptoms of complications related to his/her vascular access device.

3. Question patient about any concerns over his/her catheter or experience with catheter.

4. Explain dressing change procedure to patient.

5. Perform hand hygiene.

6. Don surgical mask.

7. Place surgical mask on patient (as needed to prevent contamination).

8. Don non-sterile gloves.

9. Remove the old dressing and securement device, if applicable, and discard in accordance with blood and body fluids and standard precautions off of the sterile field.
   a. As needed, secure “loose” tubing (outside of dressing) with non-sterile tape (not found in kit) to help hold line placement.
   b. Use a non-sterile towel (not found in kit) to protect the patient’s gown and linens.
   c. Remove transparent dressing by pulling up a small section on each side and pull laterally, being careful not to dislodge the catheter. Avoid tugging on the catheter, or use of scissors, or other sharp objects near the catheter. May need alcohol prep pad to help loosen the dressing if it has adhered to the skin.
   d. When removing a transparent dressing, peel film away from catheter and the antimicrobial disk will come away with the film.
   e. Be careful to prevent touch contamination of catheter insertion site.
   f. Discard dressing in accordance with blood and body fluids and standard precautions off of the sterile field.
10. Examine the catheter site for any of the following:
   a. Erythema and induration
   b. Drainage
   c. Redness
   d. Tenderness
   e. Dilated vessels (may indicate thrombosis)
   f. Swelling
   g. Condition of catheter
   h. Loose sutures (if sutured)
11. Notify the physician if any of the above symptoms exist.
12. Remove non-sterile gloves and perform hand hygiene.
13. Don sterile gloves.
14. Unfold sterile drape.
15. Arrange kit contents on sterile field for easy access during procedure.
16. Clean insertion site with chlorhexidine wand for 30 seconds using a back and forth motion. Allow to dry thoroughly. (If patient is allergic to chlorhexidine: thoroughly cleanse the site with 70% Isopropyl alcohol, followed by application of povidone-iodine solution. Allow to air dry for a minimum of two minutes.)
17. When indicated, place antimicrobial disc around the catheter (ensure correct side placement as indicated on disc). Align catheter with radial slit. Ensure edges of slit touch.
18. Apply skin protector. Allow skin protector to dry.
19. Apply securement device if access is not sutured.
20. Apply transparent/clear dressing securely over the site.
21. Anchor excess tubing or pigtail hubs to relieve direct tension on catheter.
22. Record/label the following information on the dressing:
   a. Date/time of dressing change
   b. Nurse initials.
23. Remove sterile gloves and perform hand hygiene.
24. Document the dressing change and insertion site appearance in the patient’s medical record per hospital policy.