

**DIGNITY HEALTH  
CLINICAL POLICY AND PROCEDURE**

<b>TITLE:</b>	Central Venous Catheter (CVC) Insertion and Maintenance (Adult)		
<b>POLICY NUMBER:</b>	100.8.030	<b>EFFECTIVE DATE:</b>	October 24, 2018
<b>APPLIES TO:</b>	<input type="checkbox"/> System Offices	<b>ORIGINAL EFFECTIVE DATE:</b>	October 24, 2018
	<input checked="" type="checkbox"/> Acute Care Entities		
	<input type="checkbox"/> Non-Acute Care Entities		

**POLICY:**

A. It is the policy of Dignity Health to define the process for the insertion, maintenance and removal of central venous catheters (CVCs) by clinical staff who have demonstrated competency and whose scope of practice includes insertion, maintenance and/or removal of CVCs. This policy provides guidelines for the insertion, maintenance and removal of CVCs.

1. A Licensed Independent Practitioner (LIP) order is required for insertion and discontinuation of a CVC.
2. CVCs will be used for treatment, to monitor, and/or to administer fluids, blood products, medications, nutritional components and contrast material to patients.
3. Vascular access device (VAD) selection will be guided by the *Vascular Access Device Selection Policy*; taking into consideration infusate characteristics, type of therapy, duration of therapy, and the vascular integrity of the patient.
4. A needleless system will be used with all CVCs, except when using a Huber needle.

**B. Insertion:**

1. CVCs must be inserted by a LIP with the following exception:
  - a. Clinical staff whose scope of practice includes insertion of CVCs may insert CVCs.
    - i. CVC placement is an advanced skill which requires additional training and competency assessment.
2. Prior to PICC placement the inserter will assess for appropriateness and contraindications, review relevant labs, review medication list for anticoagulants, consider venous thromboembolism (VTE) risk factors, and complete a physical assessment. (Attachment A).
3. CVC placement will be confirmed by radiograph or fluoroscopy
  - a. Food and Drug Administration (FDA) tip confirmation system may be used for placement at facilities with an established protocol.
  - b. CVC placement confirmation via radiograph or other methodology is not required for CVCs inserted via the femoral vein unless CVC malposition is suspected.
  - c. CVCs placed intraoperatively will have confirmation of placement performed immediately post-operatively, based on patient condition.
4. A LIP order is required for approval to use a CVC.
5. A sutureless securement device will be used to anchor CVCs that are not sutured to prevent movement.

**C. Assessment:**

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1. CVCs will be assessed every shift, with each use, and PRN for signs and symptoms of phlebitis, infection, infiltration, and malposition.
  - a. Assessment includes verification of line patency with positive blood return
    - i. Exception: Dialysis catheter limbs are assessed for patency when initiating hemodialysis; an infusion port limb of a dialysis catheter is assessed for patency as indicated above.
    - ii. Obtain an order to declot CVC with Alteplase when assessment indicates line may have a thrombolytic occlusion as indicated by sluggish or no blood return.
  - b. CVC placement will be confirmed with radiograph when CVC malposition is suspected.
  - c. Notify the LIP and collaborate with pharmacy if signs of extravasation are present.
2. CVCs will be assessed as outlined above when patients present with a pre-existing CVC.
  - a. Pre-existing CVCs may be used when the assessment is within normal limits (WNL) and the catheter is patent with a positive blood return.
    - i. **Notify LIP if assessment is not WNL, a blood return is not obtained, and/or CVC malposition suspected.**
3. CVC tip location (placement confirmation) will be addressed on all radiographic images taken that include the CVC.
4. Justification of the need for a CVC will be documented daily by the LIP in the patient's record.

#### D. Blood Draws:

1. CVCs will be used for routine blood draws while in place.
  - a. Blood draws from a CVC are limited to LIPs and to registered nurses who have demonstrated competency.
2. Blood cultures will not be drawn from a CVC unless there is a LIP order.
  - a. Exception: blood cultures may be drawn from a CVC upon insertion.

#### E. Dressings:

1. CVC dressings will be changed every seven (7) days and PRN for soiled, loosened and/or contaminated equipment.
  - a. Securement devices and chlorhexidine-impregnated sponge will be changed with each dressing.
  - b. Transparent dressings will be used.
  - c. Gauze dressings can be used if the patient is diaphoretic.
    - i. Gauze dressings are changed every two (2) days.
2. Dressings will be labeled with time, date and clinical staff's initials to identify when the dressing was placed.

#### F. Disinfection caps:

1. CVCs must have a new disinfection cap placed on all needleless connectors at the following times:
  - a. Upon completion of IV device insertion.
  - b. After each use of a needleless connector.
3. Each disinfection cap is for **one (1) time use only** and must be removed from the needleless connector.
4. Upon removal of the disinfection cap which has been in place for greater than one (1) minute, the needleless connector may be accessed immediately without further disinfection.

5. Any time the needleless connector becomes or has potentially become contaminated during use, the access valve must be disinfected with 70% isopropyl alcohol by scrubbing for a minimum of fifteen (15) seconds and allowed to air dry prior to use.

#### **G. IV Tubing and Needleless Connectors:**

1. Primary continuous tubing, secondary continuous tubing and needleless connectors will be changed every 96 hours.
  - a. Needleless connectors will be changed with the primary continuous tubing.
  - b. Needleless connectors will be changed before blood cultures are drawn from CVC.
2. Primary intermittent tubing will be changed every 24 hours.
3. All IV tubing will be changed when a new central line is inserted.
4. All IV tubing, will be labeled with time, date and clinical staff's initials to identify when the tubing was hung.
5. Tubing for albumin, lipid emulsions, lipid-based medications, immune globulin products, and total parenteral nutrition (TPN) and peripheral parenteral nutrition (PPN) are changed every 24 hours unless otherwise specified more frequently by the manufacturer's instructions for use.
6. Blood tubing and filter will be changed after completion of each unit OR every four (4) hours.
  - a. If more than one (1) unit can be infused in four (4) hours, the transfusion set can be used for a four (4) hour period.
7. Chemotherapy tubing is for one time use.
8. All IV medications requiring their own pump for infusion will have IV tubing labeled with the name of the medication at the infusion port closest to the patient.
9. All medications delivered using a route of administration other than intravenous will have the tubing labeled with the route of administration (e.g., intrathecal, intra-arterial, subcutaneous) and name of the medication.


#### **H. Removal:**

1. A LIP order is required to discontinue a CVC.
2. Tunneled CVCs and implanted infusion ports are to be removed by a LIP.
3. Discontinuation of all other CVCs can be completed by clinical staff who have demonstrated competency.
4. Occlusive dressing must be applied when line is discontinued and stay in place for 24 hours.

**AFFECTED DEPARTMENTS:** Clinical departments

#### **PROCEDURE:**

- A. Follow the procedures outlined in Elsevier's Clinical Skills:
  1. *Central Venous Catheter: Blood Sampling*
  2. *Central Venous Catheter: Maintenance and Dressing Change*
  3. *Central Venous Catheter: Removal*
  4. *Central Venous Catheter: Declotting with Alteplase*
  5. *Implanted Venous Port: Access, Deaccess, and Care*
  6. *Intravenous Therapy: Administration Set Change*
  7. *Peripherally Inserted Central Catheter Insertion*
  8. *Intravenous Therapy: Ultrasound-Guided Initiation - CE*

To access the Skill, hover mouse on the “**Content Linkage**” icon at the upper right hand portion of the screen,  then select the appropriate Skill, which will open in a new browser window.

## **DEFINITIONS:**

Central venous catheters (CVC) - a catheter placed in the central vascular system.

Peripherally inserted central catheter (PICC) - A central venous catheter inserted through the veins of the upper extremity; the catheter tip is located in the superior or inferior vena cava, preferably at its junction with the right atrium.

Non-tunneled CVC - percutaneously placed central venous catheter.

Tunneled CVC – surgically placed central venous catheter which is tunneled through subcutaneous tissue.

Implanted infusion ports – devices surgically placed in subcutaneous tissue with a tunneled catheter which goes into the central vascular system, i.e. port-a-cath.

CVC Malposition - CVC tip located in an aberrant position; the CVC is NOT in the preferred vena cava or cavoatrial junction location.

Extravascular Malposition - CVC tip located outside of the vein in nearby anatomical structures such as mediastinum, pleura, pericardium, or peritoneum.

Intravascular Malposition. CVC tip located in a suboptimal or aberrant position inside a vein; occurs as primary or secondary malposition.

Primary CVC Malposition. CVC tip positioned in a suboptimal or unacceptable location occurring during the insertion procedure.

Secondary CVC Malposition. CVC tip found to be in a suboptimal or unacceptable location at any time during the catheter dwell time; commonly referred to as tip migration.

Disinfection cap – a disposable cap containing seventy percent (70%) isopropyl alcohol (IPA) that twists onto IV access points for disinfection and protection.

Extravasation – inadvertent administration of vesicant medication or fluid by IV route into the surrounding tissue instead of into the intended vascular pathway.

FDA tip confirmation system – FDA approved system that serves as an alternative method for PICC tip placement confirmation in adult patients. This is an advanced skill that requires additional training and demonstrated competency.

Hemodialysis catheter – percutaneous centrally placed vascular access device used to perform acute or continuous hemodialysis. The hemodialysis catheter may include an additional catheter limb(s) which may be used for central venous access, as required.

Infiltration – the inadvertent administration of non-vesicant medication or fluid by IV into the surrounding tissue instead of into the intended vascular pathway.

Licensed Independent Practitioner (LIP) – an individual permitted by law and regulation to provide care and services without direction or supervision within the scope of their license, and consistent with the privileges granted by the organization.

Needleless connector – a disposable valve installed on IV catheter limbs and/or IV tubing which allows administration or withdrawal of fluid without the use of a needle.

Primary continuous tubing – intravenous tubing set with y-site connectors and injection ports used for the administration of maintenance fluids at a continuous rate.

Primary intermittent tubing – intravenous tubing set used for the intermittent administration of fluids, medications, or nutritional components.

Secondary continuous tubing – intravenous tubing set free of access ports continuously connected to the primary continuous tubing used for the intermittent administration of fluids, medication, or nutritional components.

Securement device – device used to stabilize and secure a VAD.

Ultrasound (US) – non-invasive equipment used to visualize the peripheral vascular system.

Vesicant – highly reactive medications or fluids that can cause tissue necrosis and damage.

#### **REFERENCES:**

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**STATUTORY/REGULATORY AUTHORITIES:** *None Cited*

## ATTACHMENT A: Considerations

**Purpose:** To assist in deciding PICC appropriateness, and minimize risks associated with PICCs to assure best outcomes.

### Potential contraindications to PICC placement

1. Conditions requiring venous preservation for future AVF, arteriovenous fistula formation
  - CKD IIIB or greater, GFR <45, (check baseline if acute kidney injury present)
  - Hx Kidney Transplant (at risk for rejection and may need fistula formation)
  - Polycystic Kidney Disease (high risk for kidney failure and need for dialysis)
  - Peritoneal dialysis (high risk for need to convert to hemodialysis)
2. SVC syndrome s/s: chest collaterals, head, neck, and upper extremity swelling. (consider referral to IR)
3. Axillary node dissection: Complication from PICC may cause greater difficulty for resolution.

### Review relevant labs (WBC, Platelets, Coags, GFR, pending blood cultures)

*Considerations regarding abnormal lab findings:*

- Patient's deemed hypocoagulable are not contraindicated for PICC placement.
- GFR less than 45 ml/min may indicate acute or chronic kidney failure.
  - Acute Kidney Injury (AKI) may be transient and may not be an indication of imminent dialysis
  - Collaboration with Nephrologist is recommended.
- Elevated temperature, positive or pending blood cultures may deem PICC placement inappropriate for concerns of catheter colonization.
  - Review and/or request LIP/infectious disease specialist consult regarding risk vs. benefits.
  - Consider antimicrobial catheter.

### Consider VTE Risk factors\*

#### Hypercoagulability

- Active cancer especially brain, adenocarcinomas, ovarian, lymphoma, leukemia.
- Pregnancy and recently delivered.
- Hormone replacement therapy or birth control.
- Inflammatory bowel diseases, Crohn's, Ulcerative Colitis, Irritable Bowel Syndrome, active C.Difficile.
- Lupus and other systemic autoimmune diseases.
- Factor V Leiden
- Antiphospholipid Syndrome
- Severe dehydration (correct before placement, if possible)
- Heavy smokers
- History of VTE

#### Immobility or impaired venous return

- CVA with hemiparesis
- Prolonged sedation
- Planned surgery >1 hour due to paralytic state
- Quadriplegia
- Gross edema

\*Weigh risks vs. benefits, consider other site and or antithrombogenic catheter.

### **Physical Assessment Guidelines**

- Assess chest for vein collaterals, mastectomies, rhythm devices, previous port sites, and/or evidence of surgery that may affect the vasculature.
- Visually assess for preexisting complications, phlebitis, thrombophlebitis, edema or immobility.
- Assess veins with ultrasound from forearm to axilla observing for tortuosity, echogenicity and compressibility.
- Assess for physical conditions limiting the ability to secure the device or to access the device or vein such as severe contractures.
- Consider physical or mental conditions that affect insertion and care and maintenance.
- If patient will be performing self-administration of IV therapies, the free arm/hand must be usable to perform the IV administration.
- Choose contralateral basilic/ brachial over cephalic vein insertion.
- Consider patient preference.
- Select catheter that will occupy less than 45% of the vessel.