STANDARDIZED PROCEDURE
CENTRAL LINE PLACEMENT and TEMPORARY NONTUNNELLED CENTRAL VENOUS DIALYSIS CATHETER INSERTION (Adult, Peds)

I. Definition:

This protocol covers the task of central (venous) catheter placement and temporary nontunnelled central venous dialysis catheters by the Advanced Health Practitioner. The purpose of this standardized procedure is to allow the Advanced Health Practitioner to safely place the central catheter when needed. The primary indication for a central catheter is for resuscitation where administration of IV fluids and/or medications by central access is preferable (e.g. hypotension, use of medications requiring central access) or for patients who require an IV for treatment but no peripheral access is available. The primary indication for a temporary nontunnelled central venous dialysis catheter is for pheresis, hemodialysis or renal replacement therapies in critical care patients.

II. Background Information

A. Setting: The setting (inpatient vs outpatient) and population (adults vs pediatrics) for the Advanced Health Practitioner (AHP) is determined by the approval of the privileges requested on the AHP Privilege Request Form. If the procedure is being done on a Pediatric patient, make sure Child Life is involved and use age appropriate language and age appropriate developmental needs with care of children, as appropriate to the situation.

B. Supervision: The necessity of this protocol will be determined by the Advanced Health Practitioner in collaboration with the supervising physician or his/her designee. Designee is defined as another attending physician who works directly with the supervising physician and is authorized to supervise the Advanced Health Practitioner.

Direct supervision will not be necessary once competency is determined, as provided for in the protocol. The Advanced Health Practitioner will notify the physician immediately upon being involved in any emergency or resuscitative events or under the following circumstances:

1. Patient decompensation or intolerance to the procedure
2. Unexpected resistance is met during catheter placement
3. Bleeding that is not resolved
4. Outcome of the procedure other than expected

C. Indications:

Central Venous Catheter

1. As preferred access in critical patients requiring IV fluids, vasopressors or other medications requiring central access.
2. As the only available access for other patients who require IV therapy and medications and peripheral access is not obtainable.

Temporary Nontunnelled Central Venous Dialysis Catheters

1. As access in critical care patients requiring pheresis, hemodialysis or renal replacement therapies.

D. Type of Central Line

Femoral access is the preferred route for emergent venous line access in most cases. The Advanced Health Practitioner may establish competency in femoral line and Internal Jugular placement and then perform these procedures without direct attending supervision. All Internal jugular lines placed by Advanced Health Practitioners will be performed under sonographic guidance. Anyone placing a CVC must complete CVC module.

E. Precautions / Contraindications:

Extra should be exercised in patients with coagulopaties or thrombocytopenia and correction with blood products prior to line placement should be determined in consultation with supervising physician and primary service. There is a risk of hemorrhage, hematoma formation, and pneumothorax during central line placement. A chest x-ray will be performed immediately following thoracic central line placement to assure line placement and rule out pneumothorax. Additional caution should be exercised in patients requiring femoral vein catheterization who have had prior arterial surgery. In such patients, consultation with both the primary service and the ICU attending or fellow should be obtained.

III. Materials

The following materials may be used during central catheter placement:

1. Chlorhexadine swab
2. Gauze
3. Central line kit (1, 2, 3, 4 lumen central line or introducer) or temporary nontunnelled dialysis catheter kits
4. Opsite or Tegaderm cover dressing
5. Local anesthetic (1% or 2% lidocaine, EMLA cream)
6. Suture material for securing line
7. Scissors and/or scalpel
8. Sterile drape, gown, gloves. Mask, eye protection
9. Sterile flush solution
10. If CVP is to be performed:
    a. Monitor cable for transducing central venous waveform
    b. Pressure I.V. tubing with transducer set up
    c. Pressure bag

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IV. Procedure

A. Pre-treatment evaluation:

Assess clinical necessity for central or dialysis catheter, coagulation status, and ability of patient to cooperate with procedure. Working collaboratively, the necessity of the procedure will be determined along with the expected outcomes of the procedure, and the treatment plan.

B. Set up: Gather and set up all necessary materials.

C. Patient preparation

Discuss need for the central or dialysis catheter with the patient and alternatives to the procedure. Consent should be obtained if applicable and documented in the patient's chart.

If the patient is unable to give consent attempt to obtain permission from DPOA or others and document in chart from whom consent was obtained.

1. Perform a time out with all appropriate steps.
2. Position the patient in a comfortable position that gives adequate access to the placement site (IJ or femoral). For femoral line, patient should be flat. For IJ, in trendelenberg (if patient can tolerate Trendelenberg).
3. If applicable, assure that pressure tubing with transducer is connected to bedside monitor (for CVP).

D. Perform the procedure

1. Wash hands
2. Don sterile gown, mask, gloves, eye protection, mask, and hat. Perform a time out prior to start of the procedure.
3. Cleanse the chosen area with Chlorhexidine solution and allow drying. When applying Chlorhexadine solution, work in a circular motion from proposed insertion site outward.
4. Drape patient appropriately
5. Administer local anesthetic (lidocaine 1%-2%).
6. Prepare central line by flushing all ports with sterile normal saline.

For Femoral Lines

a. **When feasible**, locate the vein using ultrasound. Vein will be entered medial to the artery. (Remember: NAVEL / **N**erve-**A**rtery-**V**ein-Empty-**L**ymphatic)

b. (Seldinger technique) Enter the skin with small bore #21 finder needle (provided in central line kit) attached to a syringe. Probe for the desired vein. (Use finder needle first whether or not ultrasound is used.)

c. When the vein is entered and venous blood is readily aspirated, remove needle and syringe and re-enter vein with larger, hollow bore needle.

d. When vein is entered with larger needle and blood is readily aspirated, detach syringe from the needle.

e. Insert guide wire ("J" wire) into hub of the needle and thread it through the needle into the vein **as far as possible**, keeping the distal end of the wire visible and accessible at the hub.

f. Remove the needle over the guide wire, holding the guide wire in place.

g. Make a small nick in the skin of sufficient depth to penetrate the dermis with the scalpel blade where the wire enters.

h. Pass the dilator over the guide wire, using a twisting motion to pass through resistance at the skin. **Pass the dilator 2-3" only. (It is not necessary to advance to the hub; you are only trying to dilate the skin and subcutaneous tissue.)**

i. Remove the dilator over the wire, keeping the wire in place.

j. Pass the IV catheter over the wire and advance it up to the hub, allowing distal end of guide wire to pass through one of the ports of the catheter.

k. Remove the guide wire.

l. Confirm placement by aspirating blood from all ports.

1. Flush ports with sterile normal saline and clamp.
2. Secure central line with a non-absorbable suture
3. Clean site and apply sterile transparent dressing (Op-site, Tegaderm)
4. Dispose of sharps and used materials appropriately.
5. A chest x-ray will be performed immediately following thoracic central catheter placeent to assure catheter placement and to rule out pneumothorax.

Address post-procedural analgesics as needed.

V. Documentation

A. Written record reflects the indications for central or dialysis catheter insertion, consent, medications administered, events of procedure, the time out, how the procedure was tolerated, EBL, confirmation of placement by the radiologist and chest-X-ray results

B. Documentation is in the electronic medical record

1. Documentation of the pretreatment evaluation
2. Record the time out, procedure, EBL, the outcome, patient tolerance, medications given, and the plan in the note, as well as any teaching and discharge instructions.

C. All abnormal or unexpected findings are reviewed with the supervising physician.

VI. Competency Assessment

A. Initial Competence

1. The Advanced Health Practitioner will be instructed on the efficacy and the indications of this therapy and demonstrate understanding of such.
2. The Advanced Health Practitioner will demonstrate knowledge of the following:
   a. Medical indication and contraindications of central or dialysis catheter placement
   b. Risks and benefits of the procedure
   c. Related anatomy and physiology
   d. Consent process (if applicable)
   e. Steps in performing the procedure
   f. Documentation of the procedure
   g. Ability to interpret results and implications in management.
3. Advanced Health Practitioner will observe the supervising physician perform each procedure three times and perform **ten** CVC / dialysis catheter insertions under direct supervision.

4. Critical care nurse practitioners (NPs) may be proctored in cenrtral line placement by experienced critical care NPs under the following circumstances:

   a. The proctoring NP has been credentialed to place central lines independently for at least one year.

b. The proctoring NP has been approved to proctor the NP who is not yet credentialed by a supervising phycisian.

c. The supervising MD must be given feedback directly or in the form of email after the procedure is completed.

5. Supervising physician will document Advanced Health Practitioner's competency prior to performing procedure without direct supervision. Indirect supervision must be available at all times during this procedure.

6. The Advanced Health Practitioner will ensure the completion of competency sign off documents and provide a copy for filing in their personnel file and a copy to the medical staff office for their credentialing file.

B. Continued proficiency

1. The Advanced Health Practitioner will demonstrate competence by successful completion of the initial competency.

2. Each candidate will be initially proctored and signed off by an attending physician. Advanced Health Practitioner must perform **five** CVC / dialysis catheter insertions annually to maintain competency. In cases where this minimum is not met, the attending, must again sign off the procedure for the Advanced Health Practitioner. The Advanced Health Practitioner will be signed off after demonstrating 100% accuracy in completing the procedure.

3. Demonstration of continued proficiency shall be monitored through the annual evaluation.

4. A clinical practice outcomes log is to be submitted with each renewal of credentials. It will include the number of procedures performed per year and any adverse outcomes. If an adverse outcome occurred, a copy of the procedure note will be submitted.

C. Use of Mannequin Simulation

1. New graduates may use the simulation mannequin with AHP or attending proctoring for no more than five (5) of the ten (10) central line procedures they need for initial competency. Prior to performing procedure on a patient, at least two (2) simulation attempts must be satisfactorily completed.

2. New hires with documented line experience (from a prior employer within the past two (2) years) may use the simulation mannequin to count

towards no more than seven (7) of the ten (10) required procedures for initial competency. Thereafter, the experienced new hire AHP must perform the three (3) remaining initial procedures on a patient with NP or attending proctoring.

VII. RESPONSIBILITY

Questions about this procedure should be directed to the Chief Nursing and Patient Care Services Officer at 353-4380.

VIII. HISTORY OF PROCEDURE

Revised February 2012 by Subcommittee of the Committee for Interdisciplinary Practice
Reviewed February 2012 by the Committee on Interdisciplinary Practice
Prior revision April 2008
Approved February 2012 by the Executive Medical Board and the Governance Advisory Council.
Revised October 2014 by Subcommittee of the Committee of Interdisciplinary Practice
Reviewed October 2014 by the Committee on Interdisciplinary Practice
Approved October 2014 by the Executive Medical Board and the Governance Advisory Council.
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March 2016 Approved by the EMB and GAC