

PARKLAND HEALTH & HOSPITAL SYSTEM
Nursing Services

Section: Neuro-Related
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Procedure #: NSG 32-05
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Distribution: Nursing Procedure Manual

VENTRICULAR CATHETER INSERTION
(performed only in ICU, OR, and ER)

PRACTICE

STATEMENT: Qualified licensed nursing personnel shall assist the provider with ventricular catheter insertion in Critical Care Areas.

PURPOSE: To drain cerebrospinal fluid (CSF), monitor and/or decrease intracranial pressure (ICP) via a polyethylene catheter implanted through a burr hole.

EQUIPMENT: Cranial Drill Procedure Kit
External ventriculostomy drainage system
Ventricular catheter
Bedside Monitor

SUPPLIES:

For Provider:

- Antimicrobial solution (Betadine)
- 10 ml syringe
- 18 gauge needle (for drawing Lidocaine)
- 23 gauge needle (for lidocaine injection)
- 4 x 4 sterile gauze (10 pkg.) X 2
- Non-sterile gloves (1 pair)
- Sterile surgical gown, towels, and sheet
- Surgical cap & mask
- Sterile gloves (2 pair)
- Sterile tegaderm
- Ventricular catheter
- Cranial access kit:
2.0 & 3.0 silk
Lidocaine 1% w/ Epinephrine
Drill
- Benzoin swab
- Shave prep kit

For Nurse:

- 50 ml IV sterile **Normal Saline without bacteriostatic preservatives (Preservatives may cause seizures or an infectious process)**
- Pressure monitoring kit with disposable transducer (keep female yellow cap)
- 60 ml syringe
- 18 gauge needle
- Sterile towels (2 packs)
- Sterile gloves (1 pair)
- 1 micro clave port (blue luerlock port)
- Ventricular drainage device
- Betadine swab

PRE-PROCEDURE

1. Wash Hands.
2. Gather and assemble equipment.
3. Prepare pressure monitoring set-up/drainage system (sterile technique).
 - a. Don surgical cap, mask, and clean gloves. Prepare sterile towels on bedside table and use as sterile field to place supplies on.
 - b. Open pressure monitoring kit, external drainage system, 18 gauge needle, micro clave, and 60ml luer lock syringe and place on sterile field.
 - c. Wash hands and don sterile gloves.
 - d. Disconnect transducer from pressure system and attach the transducer to the system stopcock. (see diagram in manual supplied in package). Save all yellow caps. May discard the rest of tubing.
 - e. Place micro clave on drip chamber stopcock and turn stopcock off to drip chamber.
 - f. Have assistant swab port on NS bag with Betadine swab (bag is not sterile in package).
 - g. Place 18 gauge on 60 ml syringe. Have assistant hold NS bag while you aspirate 50ml of NS from bag.
 - h. Attach syringe to luerlock on distal end (the end closest to the patient) of ventricular drainage system and flush through patient line stopcock and through the end of catheter. Remove all air bubbles from line and clamp distal end of catheter.
 - i. Place female yellow occlusive cap on patient line stopcock and turn stopcock towards yellow cap.
 - j. Turn system stopcock off to drip chamber. Using syringe, continue to flush through transducer and place yellow occlusive cap. Turn system stopcock off to transducer.
 - k. Flush with remaining NS through to the drip chamber and turn system stopcock off to drip chamber.
 - l. Check for air bubbles. Remove NS from drip chamber by turning drip chamber stopcock off towards the micro clave port and drain NS into collection bag. Then turn stopcock off to drip chamber.

- m. Cover with sterile towels until ready for use. *Discard setup if not used within 2 hours of opening sterile system.*

B. PROCEDURE (Provider & Nurse):

1. Ensure consent has been obtained and initiate the “Time Out “ procedure , Admin 6-30 <http://Intranet.pmh.org/home/PP-Index/Admin/admin6-30.pdf>.
2. Identify patient by using two patient identifiers. Explain the procedure and precautions to patient and/or family, document education.
3. Obtain routine pre-operative or most recent laboratory results including coagulation profile. *Notify MD if coagulation profile or platelet count is not within normal limits.*
4. Position the patient supine with head slightly elevated (30 - 45 degrees).
5. Provide analgesic and/or sedation for the patient as ordered by the provider. If sedation is required, follow documentation guidelines for moderate sedation monitoring. (Refer to NSG 20-22, Moderate Sedation/Analgesia).
6. The provider and nurse will don surgical cap, mask and sterile gloves.
All personnel in the operative field must wear surgical cap and mask.
7. Provider will shave scalp using shave prep kit.
8. Assist the provider with 10-minute anti-septic prep of the insertion site. Allow to dry.
9. The provider places on surgical gown with assistance then dons new sterile gloves.
10. Nurse will assist with surgical drape placement and local anesthetic administration.
11. Nurse opens cranial access kit using sterile technique.
12. Maintain patient's head position as the provider locates area for ventricular catheter placement (Frontal lobe non-dominant hemisphere).
13. The nurse will assess the patient as needed throughout the procedure and advise the provider of any changes in condition.

C. POST PROCEDURE:

1. Provider will connect ventricular catheter with external drainage system – using sterile technique.
2. Assist the provider with applying a sterile transparent dressing to provide an occlusive dressing.
3. Level transducer air-fluid interface to temporal notch.
4. Zero the monitor while the CSF drip chamber of the drainage device is leveled at 0 cm of water. *The ventriculostomy is a **closed system**, the **atmospheric vent is located at the top of the drip chamber**. The drip chamber **MUST** be at 0 cm of water to calibrate to atmospheric pressure.*
5. **NOTE: NEVER REMOVE THE OCCLUSIVE CAP TO ZERO THIS CLOSED SYSTEM.**
6. Note CSF flow and ICP waveform to verify correct placement. *Manufacturer recommends that ICP monitoring and drainage be noted independently to provide accuracy of readings.*
7. Review provider orders. Ventriculostomy may be open to drain CSF or clamped to monitor ICPs.
8. If orders are to monitor ICPs, leave the drip chamber at 0 cm of water and keep the stopcock off to the drip chamber.
9. If orders are to drain CSF, place the CSF drip chamber of the drainage device at the prescribed level above the temporal notch (usually 0 to 20 cm of water). Turn the stopcock off to the pressure transducer and open to the drainage system.
 - CSF will drain continuously when the ICP is greater than the prescribed height of the drip chamber. *ICP must be greater than level of drip chamber on ICP drainage pole to drain CSF.*
 - Turn the stopcock off to the drainage device and open to the pressure transducer to obtain ICP readings.
10. Dispose of cranial access kit equipment per unit protocol for soiled equipment..
11. Set parameters for alarms (i.e. <0 and > 15) or as designated by the provider.

12. Document the following on the flowsheet and/or nurses note.
 - Procedure performed by name, year, and surgery service of resident and chief or staff who is assisting.
 - Neurological examination Pre and Post procedure.
 - Insertion site/occlusiveness of dressing.
 - Patient response to sedation and procedure. Reassess patient's level of pain after procedure.
 - Print and interpret the ICP waveform (i.e., crisp, dampened).
 - Head of bed elevation.
 - Document ventriculostomy insertion date on Kardex along with cm H₂O level for drainage.
 - Initial ICP and Cerebral perfusion pressure (CPP).
 - Level of drip chamber.
 - Amount, color, and character of drainage.

Links to Mosby's Nursing Skills

[Intraventricular Catheter Insertion: Assisting, Monitoring, Care, Troubleshooting, and Removal](#)