

PARKLAND HEALTH & HOSPITAL SYSTEM
Nursing Services

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Distribution: Nursing Procedure Manual

CARE OF PATIENT WITH A VENTRICULAR CATHETER

PRACTICE

STATEMENT: Qualified licensed nursing personnel will monitor and troubleshoot the ventricular drainage system as needed.

PURPOSE: To provide the steps for system maintenance and general care of the patient with a ventricular drainage system.

PROCEDURE:

1. Assess the ICP waveform (in ICU's) as ordered and every shift and PRN for normal and abnormal patterns at rest, and with stimulation via the bedside monitor. Document ICP waveform character (i.e. crisp or dampened) with a strip along with a waveform interpretation in the Nurses Notes at the beginning of every shift and for any waveform changes. Notify provider if ICP waveform becomes dampened.
2. If the ventricular catheter is open to drain, assess patency of drainage at the beginning of every shift by visualizing the cerebrospinal fluid (CSF) drip rate into the drip chamber. If no drainage is present, do the following:
 - a. Lower the drip chamber below the temporal notch for five seconds then return to the temporal notch position.
 - b. Have the patient cough spontaneously or via suctioning. Monitor drip chamber for CSF drainage.
 - c. Notify provider if no CSF noted.
3. Level and zero the transducer air/fluid interface every four hours and prn with position changes.
 - a. Level the transducer to the patient's temporal notch. If this process requires moving the system up or down, turn the system stopcock off to the patient while moving the drainage system.
 - b. Set the drip chamber to 0 cm of water.
 - c. Turn the system stopcock off to the patient to create an air/fluid interface.
 - d. Press the zero button on the monitor to zero the system.
 - e. If the provider order is to drain CSF, return the drip chamber to the ordered height (usually 0 to 20 cm of water). Turn the system stopcock off to the transducer to allow CSF to drain. **Note:** It is acceptable to obtain ICP readings while drip chamber is at ordered height after leveling and zeroing system.

- f. If the provider order is to clamp ventriculostomy and monitor ICPs, leave the drip chamber at 0 cm of water and turn the system stopcock off to the drip chamber.
4. Maintain specified head of bed elevation for central venous pressure/pulmonary artery (CVP/PA) readings when ICP is elevated. Record the degrees of elevation in the Nurses Notes to assure consistent readings.
5. Record ICP and Cerebral perfusion pressure (CPP) on the flowsheet hourly or as ordered by the provider. Obtain the ICP reading with the stopcock off to the drip chamber. Notify the provider if ICP readings are not within written parameters or CPP is less than 60 mm Hg.

Formula for cerebral perfusion pressure – (CPP=MAP-ICP)
MAP=Mean Arterial Pressure

6. Record vented CSF drainage hourly on the output section of the flowsheet. Note the hourly amount over the cumulative total (i.e., [0700] 1/1; [0800] 4/5; [0900] 15/20) and empty the drip chamber every eight hours or when full. By keeping an hourly record of the CSF output, the effect of venting on ICPs can be noted and the patency of the ventriculostomy confirmed.
7. Notify the provider if no CSF drainage occurs with increased ICPs, if CSF drainage becomes increasingly bloody or cloudy, and/or if brain matter is noted in tubing.
8. Maintain an occlusive and dry ventriculostomy dressing. If dressing is dampened with CSF, notify the provider on call as this may signal a leak in the ventriculostomy.

REPLACE THE DRAINAGE BAG:

Note: Only change drainage bags when they are full.

Equipment:

- CSF drainage bag
- Sterile gloves (2) pair
- 4 X 4 (10 pkg)
- Anti-septic solution (betadine) Note: do not use chloroprep or alcohol.
- Surgical cap and mask

Procedure:

1. Identify patient using two patient identifiers and explain procedure to patient.
2. Turn the system stopcock off to the patient
3. Turn drip chamber stopcock off to the drainage bag.
4. Don surgical cap and mask.
5. Open sterile gloves and use wrapper as sterile field, place new CSF drainage bag onto sterile field.
6. Open package of 4X4's and pour small amount of anti-septic solution onto 4 X4's.

7. Don sterile gloves, prep the micro clave luer- lock connection port between drainage bag and drip chamber stopcock with anti-septic solution and allow to dry.
8. Clamp drainage bag using blue clamps located on both sides of the bag.
9. Disconnect the drainage bag from the chamber stopcock and detach the bag from the system panel. (Discard CSF in designated container for body fluids.)
10. Don new pair of sterile gloves and connect the sterile replacement drainage bag to chamber stopcock. Attach bag to system panel.
11. Turn drip chamber stopcock off to drip chamber to resume collection of CSF
12. Label drainage bag with date and time of change.

CHANGE VENTRICULOSTOMY DRESSING:

Equipment:

- Tegaderm
- Sterile gloves
- Benzoin swab
- Surgical hat and mask
- Clean gloves

Procedure:

1. Wash hands
2. Identify patient using two patient identifiers and explain procedure to patient.
3. Don hat, mask, and clean gloves
4. Open sterile gloves to create a sterile field.
5. Place tegaderm onto sterile field.
6. If hair around catheter site has re-grown. Leave old tegaderm in place and then shave scalp using shave prep kit.
7. Remove soiled or non-occlusive dressing from ventriculostomy.
8. Don Sterile gloves. Prep the insertion site and around the catheter with anti-septic and allow to dry. **Note: Never use chloroprep or alcohol based products.**
9. Apply benzoin to scalp if needed. **Do not get benzoin onto the ventricular catheter or site of insertion.** Allow to dry.
10. Place new transparent dressing on top of ventricular insertion site and verify occlusiveness.

REMOVAL OF VENTRICULAR CATHETER

NOTE: Ventricular catheters are only removed by the provider.

Equipment For Provider to Remove Ventriculostomy:

- Sterile 4X4s X 2
- 3.0 silk sutures (with straight needle)
- Sterile gloves
- Suture removal kit

- Antiseptic solution
- **Note: If CSF is noted leaking post ventriculostomy catheter removal, notify provider immediately.**

Traveling with a ventriculostomy:

- Never clamp ventricular catheters when transporting patients to ancillary services (i.e. CT Scan). Any clamping of drainage system (i.e. to transfer patient from the bed to a procedure table) shall be monitored closely and kept to a minimal length of time.
- While transporting a patient with a ventriculostomy, the drainage system must be on an IV pole, leveled and zeroed to the patient, and resume provider orders regarding ventriculostomy management.

DRAINING CSF FROM A VENTRICULOSTOMY FOR INCREASED ICP'S

EQUIPMENT:

- Ventricular drainage system
- Bedside Monitor

PROCEDURE:

1. Verify that the ventricular drainage system is leveled and zeroed at the patient's temporal notch to obtain an accurate ICP.
2. Review provider orders to confirm parameters for which the provider will be notified. If no parameters are set, call the provider for ICPs great than 15 cm water.
3. Obtain an order from the provider to drain CSF. (This order should include a height level for the drip chamber– usually 0 to 20 cm of water above the temporal notch.)
4. Document patient's ICP prior to opening the system to drain.
5. Turn the stopcock off to the transducer to allow CSF to flow from the patient into the drip chamber.
6. Recheck the patient's ICP in 5 minutes or as ordered. Observe for CSF drainage. If drainage is not present, notify the provider. (**Note: Only providers can irrigate the ventriculostomy catheter or drainage system**).
7. Notify the provider of the ICP reading after draining CSF. Obtain new orders or resume previous orders per provider.
8. Document the following on the ICU flowsheet or in the Nurses Notes:

- ICP prior to draining CSF
- ICP after draining CSF
- Color and amount of CSF
- Orders obtained from provider

COLLECTING CEREBROSPINAL FLUID SPECIMEN FROM VENTRICULAR DRAIN SYSTEM

EQUIPMENT:

- Antimicrobial agent (betadine) **Note: NEVER use chloroprep or alcohol based products.**
- Surgical cap, mask, and Sterile Gloves
- 10 ml luer lock syringe
- Sterile specimen cup- (*order CSF Cell Count w/Diff, Glucose CSF, Protein CSF, and CSF Culture w/Smear*)

PROCEDURE:

1. Identify patient using two patient identifiers and explain procedure to patient.
2. Empty the drip chamber into the drainage bag to obtain a new sample of CSF.
3. Record the total CSF volume on the intake and output form and circle this amount to indicate it is a total amount removed from the ventricular drainage system.
4. Wait until at least 10 ml of CSF drainage has re-accumulated into the drip chamber.
5. Don cap, mask and clean gloves.
6. Clean the microclave (blue luer lock port) located at the drip chamber stopcock with antimicrobial agent for 30 seconds and allow drying as indicated by solution used (i.e. betadine 2 minutes).
7. Turn system stopcock off to the patient.
8. Turn the drip chamber stopcock off to the drainage bag.
9. Open sterile gloves to create a sterile field for supplies. Don sterile gloves.
10. Attach the 10 ml syringe to the microclave port and aspirate 10 ml of CSF.

11. Turn the drip chamber stopcock off to the drip chamber (the stopcock should be pointed up). Turn the system stopcock off to the transducer (if orders are to leave open to drain) or off to the drip chamber (if orders are to monitor ICPs).
12. Maintaining sterile technique, transfer the CSF into the sterile specimen cup and seal the container.
13. Send the specimen to the lab per policy (Refer to policy NSG 26-00).
14. Notify the provider of the inability to obtain a specimen and/or any CSF abnormality.

Links to Mosby's Nursing Skills

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

[Neurologic Drainage and Pressure Monitoring System](#)