PROCEDURE FOR: External Ventricular Drainage (EVD) or Lumbar Drainage or Externalized Ventriculoperitoneal Shunt\(^1,2\)

Cerebral spinal fluid is colorless, clear fluid produced in the 3\(^{rd}\) and 4\(^{th}\) ventricles of the brain that functions to cushion the brain and spinal cord. Drainage may be indicated to control increased intracranial pressure or hydrocephalus. Refer to UC San Diego Neurological Guidelines of Care for questions.

INDICATIONS:
- Obstructive hydrocephalus or acute hydrocephalus
- Cerebral edema
- Surgical mass lesions
- VP Shunt malfunctions
- Cerebral spinal fluid leak
- AAA surgery

EQUIPMENT:
- Integra LimiTorr Volume Limiting CSF Drainage System
- Evolution pole mount secured to IV pole
- Integra lumbar catheter tray with lidocaine
- Duraprep x two (2)
- One large tegaderm dressing
- Sterile gown, gloves, towels & ½ drape, surgical masks & caps if inserting lumbar drain at bedside
- Sterile preservative free normal saline (0.9%) 30-40 mL
- \textit{Do not use alcohol (Curos) caps on EVD drainage system}
- \textit{Do not use CHG or CHG impregnated (Biopatch) sponges at insertion site}

NURSING RESPONSIBILITIES:
- Maintain sterile technique at all times when handling stopcocks, priming, bag changes or dressing at insertion site or anytime infection is at risk
- Assess and document every 2-4 hours as ordered in PCU/IMU and every 1-2 hours in ICU
  - Changes in neuro status from baseline including decreases LOC, pupillary changes, headache, focal changes or sensitivity to light, elevated temperature.
  - If any of the above are identified, notify PA or MD immediately
  - Instruct family to notify RN if neuro status changes
- Amount, clarify and color of CSF drainage
  - If amount of drainage has decreased or color changes especially blood tinge, notify PA or MD immediately
- Integrity of dressing
  - Notify PA or MD if dressing is wet or soiled or any leakage in the system occurs
- If assisting with insertion at the bedside:
  - Maintain strict sterile technique will be maintained.
  - Patient drape is large enough to prevent cross-contamination but with facial landmarks remaining visible.
  - Doors to the room must stay closed during insertion.
  - All people in the room will wear hats and masks.
  - Physician performing procedure will be in full sterile garb including sterile gown, sterile gloves, mask, and cap.

\(^1\) American Association of Neuroscience Nurses AANN (2011). Care of the patient undergoing intracranial pressure monitoring/external ventricular drainage or lumbar drainage
\(^2\) UCSD Medical Center Best Practice Guidelines: Neurological

Adapted from LimiTorr Instructions for Use in alignment with UC San Diego Nursing Neurological Guidelines of Care – 2015

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Set-up

1. Insert the post of bracket through hole on the graduated burette cap

2. Connect drainage bag fitting over the square post on pole mount ensuring the bracket is placed squarely until it rests entirely on the post.
   a. Tighten knob

3. Insert pressure transducer manifold into pole mount as shown even if you are not monitoring pressure

4. Level lumbar drain by aligning the yellow indicator with ‘0’ cmH₂O on the pole mount at the level of the anatomical landmark.
   a. The yellow indicator is moved to align with the ordered height.

Priming

- Prime with 30-40mL preservative free normal saline (pre-packaged syringes) into the drainage bag

Zero and Set Pressure Level

- Zero to external auditory canal. Lumbar or EVD may be zeroed to anatomical landmark as ordered by MD.
- Raise graduated burette to set pressure level as ordered by MD in alignment with pressure level numbers on pole

Draining CSF

- Burette is positioned upright at all times
- Drain volume according to MD orders by lowering the graduated burette
- The amount of drainage is controlled by the height of the pressure level line on the graduated burette and can affect intracranial pressure.
- Draining CSF too quickly may cause headache.
- Position stopcock in the ‘off’ position to drain into the burette and prevent draining straight into the drainage bag

Replace Drainage Bag

- Replace drainage bag when it is ¾ full.
- Maintain sterility of the system and don sterile gloves and mask
- Extra drainage bags are stocked according to your unit practice

ONLY ICU RN’s are permitted to perform CSF sampling

<table>
<thead>
<tr>
<th>Patient Care</th>
<th>Transport</th>
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<tbody>
<tr>
<td>1. Maintain strict hand hygiene at all times and maintain sterility when accessing or handling drainage device.</td>
<td>• Prior to transport, empty contents of burette into drainage bag, then empty drainage bag.</td>
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<tr>
<td>2. Dressing changes and site care done by MD or with MD order only. Notify MD if dressing is compromised.</td>
<td>• Temporarily close patient line stopcock to prevent retrograde flow of CSF from drainage line into the burette.</td>
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<td>3. Collection system should be maintained in an upright position</td>
<td>• Drainage system should be kept in the upright position and correctly aligned if possible</td>
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<td>4. Change the drainage bag when ¼ full using sterile technique</td>
<td>• IF CSF migrates into the yellow vent during transport, open the stopcock between the burette and drainage bag to drain vent. Failure to drain vent could result in under or over drainage of CSF.</td>
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<td>5. Ensure connections are tight and that stopcocks and clamps are in the correct position to allow drainage regulation</td>
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