

Lumbar Drain (Subarachnoid catheter) Pointers

Below are some guidelines regarding lumbar drains (subarachnoid catheters). The points below and the attachments address some commonly asked questions and concerns.

1. It is preferable to use the closed tip subarachnoid catheters for CSF drainage over the epidural arrow catheters:
 - The subarachnoid catheters are larger in diameter with multiple holes at the end which makes them less likely to clot and therefore more likely to ensure CSF drainage. The closed tip and flexibility of these catheters theoretically makes it less likely to produce nerve root irritation when compared to the stiff epidural catheters
2. The subarachnoid catheter should be flushed before inserting the stylet wire to facilitate wire insertion and minimize the bunching of the catheter on wire removal.
3. The subarachnoid catheters are closed tip so the wire will not go beyond the tip.
4. The subarachnoid catheters, unlike the epidural catheters, are not numbered from the tip. Instead the " zero mark" corresponds to 9 cm from the tip which is the length of the Touhy needle. The catheter should be between the 5 and the 7.5 mark at the skin entrance depending on the needle depth where CSF flow is obtained.
5. Regardless of the type of catheter, do not pull the catheter without pulling the Touhy needle simultaneously if the catheter does not thread easily.
6. Once the catheter is in the subarachnoid space, hold the catheter at the skin entry site gently before you pull the wire. If you hold the catheter too tight, it might lead to catheter bunching on the wire or damage to the wire itself. If you pull the wire and it is not totally intact and believe that part of it is still inside the catheter, just remember the catheter is a closed tip, so pull it out.
7. Once the catheter is positioned and secured in place, make sure that it is draining before inducing anesthesia.
8. A CHANGE to our current practice: please try to transduce and measure the CSF pressures. To do so you will need to connect the catheter with the Limitor drainage system and maintain the transducer at the level of the tip of the catheter, which will be at the same level of the patient's back in a supine patient in the hybrid OR. We can still drain 8-10cc/hr but use CSF pressures as a guide. Most of the literature recommends CSF pressures between 8-12cmH₂O, below that we should communicate with the surgeons and discuss possibly holding off on drainage as there may be a risk of overdrainage with its known complications. PLEASE NOTE that our monitors are defaulted to mmHg and not cmH₂O, so keep this in mind. 10 cmH₂O = 7.35mmHg.
9. DIFFICULTIES with insertion:
 - Please consent the patient for the lumbar drain with a detailed discussion of risks and benefits. The benefits are spinal cord protection as per recommendations and guidelines. The risks should include all the usual risks as well as the risk of "intracranial and lumbar" bleeding and PDPH.

- If there is a bloody tap with insertion, please discuss with the surgeon and the patient regarding risks and benefits of proceeding the same day particularly if it is an elective procedure, or postponing to another day and inserting it with CT or fluoro guidance
- Discuss with the surgeon the need for fluoroscopic guided insertion if multiple attempts fail. These cases are done in the hybrid rooms. Neuroradiology has helped us in the past with a few very difficult cases.
- If the patient is having difficulty sitting for the procedure, try lateral position. Also if you do it after induction, the patient will need to be in the lateral position.
- Consider using ultrasound in patients that might be difficult. It may be helpful in decreasing the number of attempts.

10. After hour troubleshooting, insertion, or replacements:

- The first call will be to the anesthesia E1pm. He/she will evaluate the patient and decide based on clinical data and comfort with the equipment which catheter (lumbar or epidural) will be placed. He/she may also delegate this to another anesthesiologist who is available.
- If difficulty is encountered, next steps will need to be consult with the ICU attending of the unit where the patient is admitted
- The ICU attending will try to troubleshoot the catheter problem or further consult with the ICC attending if he/she feels uncomfortable with the procedure.
- The surgical team should be notified immediately should there be any problems with the subarachnoid catheter (unable to drain CSF or dislodgement) in order to discuss the next steps