# Diagnostic LP Guidelines

## Indications

To gain CSF for laboratory examination
To measure circulating pressure of CSF
To remove CSF- in the treatment of BIH, or to diagnose normal pressure hydrocephalus

Diagnostic LP is safe to perform without a preceding CT as long as none of the below are present. A normal CT does not rule out raised ICP so does not necessarily make it safe to do an LP.

- Signs and symptoms of raised intracranial pressure
- Seizure within 7 days
- Focal neurology
- GCS <14/15
- Papilloedema
- Impaired cellular immunity

## Contraindications

Thrombocytopenic, or other bleeding diathesis including anticoagulation (platelets <80, INR>1.4) Consider discussing with haematology, and using products to correct abnormality if LP absolutely necessary

Infection over site for LP

Meningicoccal rash

The is no increased risk in patients taking aspirin, however marginal increased risk in those taking clopidogrel

Suspected epidural abscess

## Complications

Post LP headache (10-30%)
Back pain (22%)
Radicular pain
Temporary Paraparesis (1.5%)
Infection- meningitis- more common after spinal anaesthesia
Bleeding (spinal haematoma)- (1-2%)
Cerebral herniation rare, but more common in patients with raised intracranial pressure
Failure

**Procedure**

Consider the need for performing the procedure, particularly out of hours

1. Gain verbal and written consent.

2. Collect together equipment required on a cleaned dressing trolley
   - Dressing pack
   - Sterile gloves
   - Surgical mask (CDC suggests if current LRTI)
   - Drapes/sterile field
   - Green/blue and orange sterile needles
   - Sterile 5ml syringe
   - Lignocaine (1 or 2%)
   - Cleaning agent- 0.5% chlorhexadine
     Iodine , and higher concentrations associated with irritative arachnioditis in children
   - Lumbar puncture needle- (pencil point, atraumatic 22-24 gauge)
   - Manometer
   - Universal sterile containers – 3 or 4, +/-glucose bottle depending on local laboratory
   - Sterile dressing

3. Position patient, left lateral allows accurate pressure reading, but can be performed on the sitting patient if pressure not needed or unable to do in lying position.

4. If performing in the left lateral position, the lumbosacral region should be as close as possible to the edge of the bed, with patient hugging knees to ensure maximum widening of the invertebral spaces. The spine should be parallel to the side of the bed.

5. Apply mask, and wash ands thoroughly. Apply sterile gloves.

6. Prepare lumbo-sacral region by swabbing in an outward spiral until an area of approx 20cm is covered

7. Identify appropriate space, up to L2/3 (???consider marking with nail) inject lignocaine initially subcutaneously using orange needle.

8. Allow the anaesthetic to take effect. Use this time to assemble the manometer, and check your equipment.

9. Change the needle to a bigger size and inject about 2ml of lignocaine into the lumbar interspace. Drawing back each time to check for blood or CSF

10. Introduce spinal needle in exact midline, between lumbar vertebrae and into subarachnoid space heading toward umbilicus. IF using a bevelled needle, have the bevel pointing to the flank to allow a parting of the dura. The needle should be perpendicular to the patients back at all times. Insertion should continue until a slight pop is felt.

11. Withdraw stylet to ensure it is in the subarachnoid space. Allow only one drop to escape or erroneous low pressure readings may result.

12. Attach the manometer to the hub of the needle, with the 3 way tap positioned appropriately. Record the pressure- normal pressure is between 11-16cm $H_2O$.

13. Obtain the appropriate specimens for examination. Take note of the colour of the CSF. Refer to your local laboratory for volumes of CSF needed for each test.

14. Closing pressures should be measured, and the stylet replaced before removal of the needle. Apply a sterile dressing after a short period of pressure on the site with gauze.

15. The patient can rest or mobilise after the procedure as they feel most comfortable. This does not alter the chance of developing a post LP headache.

16. Dispose of sharps and waste appropriately

17. Document the procedure, including the complexity, amount of local used, opening and closing pressure, colour of CSF, and samples sent to the laboratory including the tests requested.

18. Contact your laboratory to inform them the specimens are on the way. Do not use pneumatic tube systems to deliver specimens.

19. A paired serum glucose +/- oligoclonal bands should be sent at the same time as LP