## **CEREBROSPINAL FLUID (CSF) CHECKLIST**



Remember, never delay or withhold treatment if your patient is in a critical condition.

Before performing a lumbar puncture (LP), a head computed tomogram (CT) should be performed to determine contra-indications such as central nervous system (CNS) lesion or spinal mass leading to increased intracranial pressure.

The patient should be assessed for additional contraindications such as: infection near or at the site of LP, low platelet count (< 20,000 mm<sup>3</sup>), extensive or rapidly spreading purpura, focal neurological deficit and reduced consciousness or abnormal pupillary reactions.

In cases of suspected meningitis or encephalitis, LP should be performed at the earliest opportunity provided it is safe to do so (no contraindications to LP).

A LP, also referred to as "spinal tap," is a commonly performed procedure that involves obtaining and sampling CSF from the spinal cord.

## Procedure

Introduce yourself to the patient and explain the risks and benefits then obtain informed consent (or otherwise documented if unable to obtain due to patient lack of capacity, with suitable discussion with next of kin).

1.	LP kits: spinal needle with a stylet (20 gauge or 22-gauge needle), three CSF collection vials, sterile drape, manometer with three-way valve, local anesthetic, syringes with needles (typically 18-gauge to draw up anaesthetic and 25-gauge to inject into the skin), disinfecting solution (0.5% chlorhexidine/70% alcohol or 10% povidone-iodine), sterile gloves, mask with face shield and surgical cap.	
2.	LP is an aseptic procedure, wear sterile gloves, a facemask, surgical cap and a gown and observe sterile precautions throughout the procedure. The equipment should be ready to use and in the sterile field.	
3.	Position the patient in either a lateral recumbent position or sitting position (patient should be instructed to assume the fetal position, which involves the flexion of the spine).	
4.	In order to keep the needle at the midline during insertion, the lumbar spine should be perpendicular to the table in the sitting position and parallel to the table if in the recumbent position.	
5.	The ideal insertion point of the spinal needle should be either in the interspinous area between L4 and L5.	
6.	Palpate the landmarks before cleaning the skin with a disinfecting agent. The disinfectant should be applied to the skin in a widening concentric circular fashion, starting at the point of needle insertion and circling outward. Allow the cleaned area to dry. Drape the area with sterile drapes.	
7.	Apply a local anaesthetic to the area of needle insertion.	
8.	Insert the needle smoothly in a singular direction in the midline at the superior aspect of the inferior spinous process. There may be some minor resistance when passing through the ligamentum flavum, which may result in a "popping" sensation.	
9.	CSF fluid will flow once the subarachnoid space has been reached by the needle. If obtaining an opening pressure, ensure the patient is in the lateral decubitus position to ensure the readings will be accurate.	
10.	Allow the CSF to drain passively from the needle hub into the collection vials, collect approximately one mL per collection vial. Do not aspirate the CSF fluid.	
11.	Label 3 sterile, CE marked leaked proof, screw-capped tubes as 1, 2 and 3. Add a minimum of 1ml CSF in each tube in numerical order (1-3). No.1 (back-up for microscopy and/or PCR, where feasible); No.2 (biochemistry); No.3 (Gram stain, culture and sensitivity). For Mycobacterium species, at least 10mL in total is required if possible.	
12.	After the collection of CSF fluid samples, replace the stylet into the spinal needle, and remove the needle. Apply gentle pressure with sterile gauze over the area where the needle was inserted. Cover the area with a small bandage.	
13.	Label the sample correctly with patient's details, date and time sample was taken and immediately deliver the samples in sealed plastic bags.	
14.	Dispose infectious waste and sharps as per local standard operating procedures (SOPs).	

## Please Note

- Time between collection to microscopy and culture should occur within a maximum of 2 hours.
- Delay in examining CSF reduces the chances of isolating a pathogen and cell disintegration resulting in a cell count that does not reflect the clinical situation of the patient.

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Do not refrigerate specimen before transfer to the laboratory.





## References

- 1: UK Standards for Microbiology Investigations: Investigation of Cerebrospinal Fluid
- 2: District Laboratory Practice in Tropical Countries, Part 2; Monica Cheesebrough
- 3: NIH-National Library of Medicine; Lumbar puncture; Lois A. Jane, Anton A. Wray
- 4: Diagnostic lumbar puncture; Carolynne M. Doharty, Raeburn B. Forbes
- 5: Recommendations | Meningitis (bacterial) and meningococcal disease: recognition, diagnosis and management | Guidance | NICE

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