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Lumbar Puncture – Clinical Checklist

Confirm Indication	**Diagnostic:** **Urgent** 1. Suspected CNS infection or meningitis 2. Suspected subarachnoid hemorrhage with negative imaging **Non-Urgent** 3. Non-obstructive malignancy 4. Normal pressure hydrocephalus 5. Autoimmune (e.g., CNS Vasculitis, Multiple Sclerosis, Guillain-Barré syndrome, Paraneoplastic syndromes) **Therapeutic** 6. Intrathecal medication or contrast injection 7. Pseudotumor cerebri (also for diagnostic)
Contra-Indications	**Absolute** 1. Overlying skin infection or suspected epidural abscess **Relative** 1. Space occupying lesions, Arnold-Chiari malformation (Consider CT characterization and/or neurosx consultation) 2. Platelets <50K 3. INR ≥1.5 4. Therapeutic anticoagulation (Heparin drip held for <4hr, LMWH <12hr, DOAC <2.5 half-life, or local guidelines) 5. Prior lumbar surgery
Obtain Consent	Explain & confirm patient's understanding: 1. Procedural procedure 2. Risks & techniques to mitigate them (see back) 3. Potential benefits 4. Risks of not performing & alternatives
Positioning	Optimize for patient comfort and accessibility of intervertebral space by maximizing spinal curvature **Upright:** Patient sits at the edge of the bed leaning over a side table, lumbar is vertical and thoracic spine arched, feet resting on stool/chair (cannot obtain OP in upright position) **Lateral Decubitus:** 1. Patient in left lateral decubitus if provider is right-handed, right lateral decubitus if provider is left-handed 2. Ankles, knees and shoulders should all be stacked to avoid R/L spinal rotation. Consider pillow between knees 3. Place a pillow under the head; dependent arm should be outstretched near the pillow 4. Chin should be tucked and knees as high as possible towards abdomen
Identification of Insertion Site by Anatomical Landmarks and Ultrasound	Assess and mark insertion site by anatomical landmarks. **Anatomical landmarks** 1. Palpate the iliac crest and identify corresponding vertebral level, L4 2. Palpate the spinous process from thoracic to lumbar spine to identify curvature of the spine 3. Mark the L3-L4 and L4-L5 or L2-L3 interspinous spaces **Ultrasound (recommended)** Using low-frequency transducer, start at the sacrum and slide transducer cephalad to map the lumbar spine 1. In the transverse view, identify the midline of the spine & mark with a craniocaudal line across 3 spinal processes 2. In the longitudinal view, identify the interspinous spaces & mark perpendicular to the spine
Supplies	See reverse side for details
Timeout	Confirm name, DOB, procedure, location, allergies
Sterile Prep	1. Apply iodine povidone swabs x3 and let dry (preferred to chlorhexidine given risk of meningeal irritation) 2. Place the white, non-fenestrated sterile sheet on the bed adjacent to the patient 3. Apply the fenestrated drape in landscape orientation
Draw-up Lidocaine	1. If lidocaine cap was previously removed, clean with EtOH swab 2. Aspirate 5-10cc of lidocaine using filtered needle
Anesthetize Tract	**Anesthetize the tract using a 22-25g needle, beginning with a superficial dermal 'wheal'**. Use only 0.5cc lidocaine for the dermal wheal to avoid masking insertion markings.
Spinal Needle Insertion and Accessing the Subarachnoid Space	1. Insert spinal needle with stylet in place, at the midline, aiming towards patient's umbilicus, in the anesthetized tract. 2. Advance the spinal needle slowly, completely removing the stylet frequently to check for return of CSF. 3. If you strike bone, withdraw to the subcutaneous tissue and redirect. Each attempt should allow you to advance the needle deeper than previously if you are staying in the midline.

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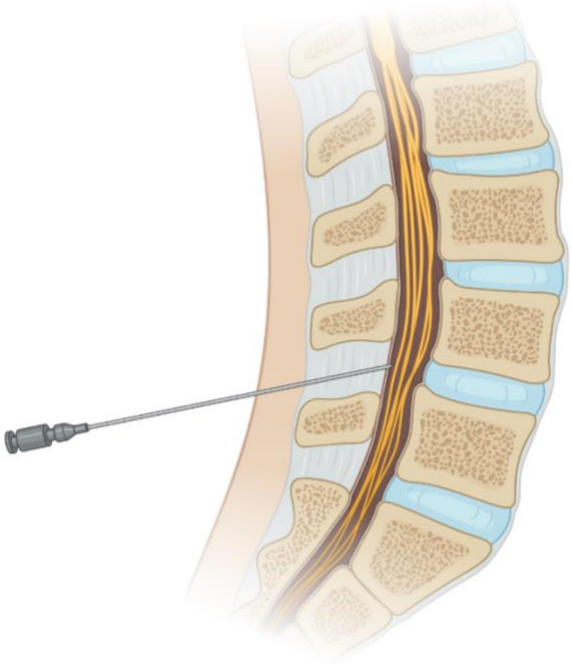
Opening Pressure Evaluation	Only possible in the lateral decubitus position. 1. Prepare column and extension tubing prior to procedure 2. Once you have CSF return, attach column to spinal needle with tubing. Ensure that tubing stays horizontal and open stopcock towards the column. Once column of fluid is stable, take measurement. - OP is normal between 10-25cm H20 3. If OP is elevated, straighten the patient's legs as this can drop OP by 5cm H20
Fluid removal and sample collection	1. If OP was obtained, close stopcock to the patient and collect CSF 2. If OP was not obtained, remove stylet, attach extension tubing and collect the minimum necessary amount of CSF into tubes 1-4. If slow fluid flow, try rotating the needle in 30-degree increments 3. Replace stylet into needle, and remove needle keeping stylet in place 4. Ensure hemostasis and apply dressing
Post-Procedure	1. Dispose of sharps safely 2. Reassess patient vital signs, clinical status. 3. Ensure each sample tube is labeled and send to lab 4. Update nursing staff on patient status. 5. Document procedure note



Supplies	
Not sterile	**Sterile**
Ultrasound Ultrasound gel Lidocaine 1% without epinephrine (10cc) Mask with eye shield Marker	Sterile gloves Lumbar Puncture Kit

References

1. Dodd KC, Emsley HCA, Desborough MJR, Chhetri SK. Periprocedural antithrombotic management for lumbar puncture: Association of British Neurologists clinical guideline. *Pract Neurol*. 2018;18(6):436-446. doi:10.1136/practneurol-2017-001820
2. Soni NJ, Franco-Sadud R, Kobaidze K, et al. Recommendations on the Use of Ultrasound Guidance for Adult Lumbar Puncture: A Position Statement of the Society of Hospital Medicine. *J Hosp Med*. 2019;14(10):591-601. doi:10.12788/jhm.3197
3. https://proceduralist.org/lumbar-puncture/technique/
4. Rochwerg B, Almenawer SA, Siemieniuk RAC, et al. Atraumatic (pencil-point) versus conventional needles for lumbar puncture: a clinical practice guideline. *BMJ*. 2018;361:k1920. Published 2018 May 22. doi:10.1136/bmj.k1920