

Procedure	Level	Nonoperative/Preoperative	Intraoperative	Postoperative
Lumbar Puncture	1: Limited Participaton Demonstrates basic understanding of how the tools operate. Has very basic skills. Framework: What a learner directly out of medical school should know. The attending shows and tell during the procedure.	-demonstrates an understanding of the procedural indications but may not understand contraindications. -Able to identify anatomy relevant to a lumbar puncture (conus and nerve roots, spine anatomy, brain imaging, etc) -Obtains an H&P inclusive of basic focused exam -Aware of SIR guidelines for preprocedural labs and medication holds -Respectfully communicates basic facts of the procedure but inconsistently discusses potential complications or alternatives	-assists with preparation of sterile procedural field -maintains a sterile field -identifies relevant anatomy on intraprocedural imaging -follows intraprocedural directions but handles tools inefficiently	-Needs prompting to cover post-procedure expectations and potential complications/side effects with the patient/family -aware of the complications of LP but not familiar with their management -understands which CSF studies to send for and what the results indicate
	2: Direct Supervision Demonstrates an understanding of the steps of the procedure but requires direction to accomplish in a safe manner Framework: The learner can use the tools but may not know exactly how, what or where to do it. The attending actively helps throughout the case to maintain forward progression.	-identifies the appropriate spinal levels for LP, with minimal attending direction -demonstrates an understanding of the indications/contraindications and potential complications -communicates the elements of an informed consent discussion of LP and documents completely	-able to prepare a sterile field and position the patient appropriately only needing minimal direction from the attending -identifies a safe and appropriate spinal access site on intraprocedural imaging, needing only minimal attending direction -familiar with the tools and able to perform the beginning of the case but needs significant intraprocedural direction to complete the case	-in cases of "dry taps", able to counsel patient/primary service on hydration for repeat attempts, with attending direction -aware of how to manage complications after LP, with attending direction
	3: Indirect Supervision Can do a straightforward LP but may not be successful in a more advanced case with difficult anatomy Framework: The learner can perform straightforward LPs. The attending gives passive help for tougher cases. This passive help may be given with the attending scrubbed in for more difficult anatomy or during a check-in	-communicates the elements of an informed consent discussion of LP and counsels patients on next steps in the case of complications (ie: epidural blood patch for post LP headache)	-performs intraoperataive adjustments to accomodate anatomical variations to maintain smooth forward progression -performs all the steps of an LP efficiently without prompting on straightforward anatomy, may need passive help on difficult anatomy	-independently makes recommendations for "dry taps" -independently makes recommendations for management of post LP complications

	4: Practice Ready Can perform easy and challenging LPs and can manage post-LP headaches. Able to guide junior learners. Framework: The learner can perform all straightforward and difficult LPs and can manage post-LP complications independently. The attending is available as needed but is not routinely needed.	-independently conducts an informed consent discussion with the patient/family, documenting risks/benefits individualized to the patient -manages preoperative contraindications (ie: anticoagulation) -coordinates recommendations from different members of the health care team to optimize patient care	-independently performs LP on difficult anatomy efficiently -handles the tools and imaging equipment with coordination and dexterity to efficiently complete the procedure	-advises on steps to take to mitigate "dry taps", post LP headaches -appropriately and independently manages more complex complications of LP -advises junior learners on how to manage complications
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