UC Riverside, School of Medicine Policies and Procedures
Policy Title: Lumbar Puncture Policy
Policy Number: 950-03-030

Responsible Officer:	Chair, Neurosciences
Responsible Office:	Neurosciences
Origination Date:	06/2019
Date of Revision:	
Scope:	UCR Health Practice Sites

I. **Policy Summary** The purpose of this policy is to provide a standard evidence-based procedural guideline in preventing complications from a lumbar puncture.

II. **Definitions** For the purposes of this policy directive, these terms shall have the following meanings:

1. **ATN** – Atraumatic pencil-point spinal needle or atraumatic small bore needle
2. **CJD** - Creutzfeldt-Jakob disease
3. **CSF** – Cerebrospinal Fluid
4. **EBP** – Epidural blood patch
5. **IA** - Immunoassay
6. **LDP** – Lateral Decubitus Position
7. **LP**- Lumbar Puncture
8. **MS** – Multiple Sclerosis
9. **NPDPSC-** National Prion Disease Pathology Surveillance Center
10. **PLPH** – Post-lumbar puncture headache

III. Responsibilities
UCR Physicians

IV. Procedures

A. Scheduling

1. Office shall schedule appointment for an hour slot only at the following times
    i. 8:00am – 9:00am
    ii. 9:00am – 10:00am
    iii. 10:00am – 11:00am
    iv. 11:00am – 12:00pm
    v. 13:00pm – 14:00pm
2. Office may schedule in neurology attending clinic
3. Office may schedule in neurology residency continuity clinic

B. Clinic Staff Checklist

1. Confirm insurance authorization
2. Obtain informed consent (provider)
3. Obtain vital signs
4. Supplies:
    i. LP kit
    ii. Chlorhexidine
    iii. Sterile gloves
    iv. Patient labels for sample tubes

C. Provider Checklist

1. Review if patient has any bleeding tendency
2. Provider to review if patient is on blood thinning medication
3. Provider to decide if labs of platelet, PT and PTT are needed

STOP! Do not Perform LP If:

1. Intracranial mass or lesion causing shift or mass effect is present
2. If existent labs show INR > 1.4
3. If existent labs show platelets > 50,000
4. Uncorrected bleeding tendency. May perform after correction of bleeding tendency
5. If there is an epidural infection or overlying cellulitis

V. Obtaining Informed Consent

A. Provider will explain benefits and reasons for procedure, prior to procedure

B. Provider to explain risks:

i. Post-LP headache in 1 of 4 patients (cutting needle), 1 of 8 (atraumatic needle)
ii. Pain at insertion site
iii. Allergy to anesthesia
iv. Bleeding
v. Infection
vi. Nerve injury (very rare) to cauda equine

C. Provider to explain Post-LP headache:

i. Usually self-limited
ii. 40% resolve in 3-4 days
iii. 75% resolve in 1 week with increased fluids and bed rest
iv. Other may need IV caffeine or epidural blood patch (up to 2-3 times)
v. Extremely rare to have persistent CSF leak requiring surgery to repair it. It is not related

VI. Technique

A. Preparation

i. Patient removes shirt/top.
ii. Pants or bottoms and underwear can be kept on as long as the waist band can be lowered
iii. Patient to wear a gown, gowns to be opened in the back
iv. Offer a blanket

B. Positioning

i. If you need opening pressure then position patient in Left Lateral Decubitus Position
ii. Patient lays on left side, chin tucked to chest, knees/legs tucked into chest into a fetal position
iii. You may need someone to help you hold the patient into the this position if patient can't follow commands or have physical limitations
iv. Shoulders must be vertically aligned/directly stacked on top of each other
v. Hips must be vertically aligned/directly stacked on top of each other
vi. If you do not need an opening pressure then you may do LP in sitting Up position
vii. Sitting Up Position: Patient sits at the side of bed, elbows on steady table in front of them, head down, hunched over into curled ball position. Make sure patient is not leaning to either side

C. Palpation:

i. Palpate prior to beginning the procedure
ii. Palpate for the anterior iliac crest and find the corresponding spinous process which will be level L4
iii. If iliac crest is difficult to palpate as in obese patients, you may ask the patient to place their hands on their "hip bone" so that you then palpate it
iv. Palpate the vertebral processes and find a vertebral space above and below the L4 level
v. Use two fingers to palpate on either side of the vertebral column to make sure you are centered over the vertebral column and not just following the skin groove
vi. Mark you location for needle insertion with a s kin marking pen or make indentation in the skin using gentle pressure
vii. **NOTE:** If neurology resident is preforming the procedure, the neurology attending should be supervising the procedure at all times and should be ready to take over at any time during the procedure when needed

VII. Prep/Anesthesia

I. Clean with chlorhexidine
II. Drape the patient using sterile technique
III. Allow skin to dry
IV. Set up the manometer and your CSF collection tubes before you begin the procedure
V. Palpate again to find the vertebral space where you will be inserting the LP needle noting that the injected lidocaine may distort the landmark
VI. Draw up lidocaine
VII. Use the shorter, smaller needed to numb skin and subcutaneous tissue. Pull back to make sure no venous return prior to injecting
VIII. Numb in different angles around the chosen site. Hub this shorter needle while numbing. Use between 2-3 cc of lidocaine for this
IX. Then switch to the longer, larger gauge needle to numb the deeper subcutaneous tissues. Pull back the syringe to make sure no venous return before injecting and after each advancement of the needle. Hub this needle. Use about 2-3 cc of lidocaine for this

I. Needle Insertion

i. Insert the 22 gauge 2 ½ inch spinal needle with the bevel up, angling toward the umbilicus initially
ii. Advance the needle slowly
iii. If you hit bone, you may be able to draw back the needle and try different angles of the needle. Upon penetrating the dura you may feel a "pop," or a give way of resistance
iv. Remove the stylet of the needle often to check for CSF flashback
v. Generally you want to collect more CSF than you think you need – typically 8-15mL
vi. If you are sending special studies, more CSF may be required
vii. If CSF flow slows/stops, you may consider rotating needle
viii. When completed, replace the stylet and withdraw the needle
ix. Properly dispose all sharps

II. Post Lumbar Puncture Instructions

i. The patient may rest and lay down for a short while after the procedure for comfort, however the studies show no evidence to support that this reduces post lumbar puncture headache
ii. Educate patient to drink plenty of fluids and may drink caffeinated beverages to help prevent post lumbar puncture headache
iii. Provider to make sure that patient has no sever back pain and no weakness or numbness or radiating pain to the legs after the procedure
iv. Patient may be allowed to leave shortly after procedure

v. If lab for MS panel is ordered (Multiple Sclerosis), please arrange for patient to head to the lab after the procedure for blood draw for MS panel. The blood sample should be collected within 4 hours from the CSF collection

III. Manometry and CSF collection

i. Once you obtain flashback of CSF, quickly attach the manometer or replace the stylet until you can attach the manometer. Try not to lose too much CSF during the process so as to not affect the opening pressure
ii. During the measurement of opening pressure you must instruct the patient to slightly straighten their legs and head or have the person helping you do this
iii. Opening pressure will be falsely elevate if you measure if while the patient is in the fetal position
iv. Once the meniscus has leveled out in the manometer (Normal CSF pressure as measured with manometer is considered to be less than 250 mm H20), take note of the opening pressure
v. Drain the manometer into CSF collection tube and collect additional CSF in the sequential tubes
vi. Securely tighten the lid to avoid any leakage

IV. Tube Handling and Transport

1. Routine labs and culture
   i. Make sure sample tubes are dated, labeled and initialed before sending to the lab
   ii. Transport the CSF to a microbiology laboratory within 1 hour or culture and analysis
   iii. Specimens for culture should not be refrigerated or exposed to extreme cold, excessive heat, or sunlight. They should be transported at temperatures between 20°C and 35°C. For proper culture results, CSF specimens must be plated within 1 hour
2. CSF for Prion disease/CJD instructions
   i. Do not use the first 2 mL that flows from CSF
   ii. Collect next 5 mL CSF, avoiding bloody tap
   iii. Specimen Processing: Freeze within 20 minutes of collection
   iv. Store and transport frozen
   v. Ship using a Styrofoam container with sufficient dry ice (5 lbs./24 hours)
   vi. The NPDPSC requests a urine sample for research purposes with all CSF samples if available. Ship Monday through Wednesday
   vii. Required patient information: Please complete and send the National Prion Requisition "Test Request Form", available on the

website at National Prion Disease Pathology Surveillance Center with sample

viii. In addition to our Test Request Form, all senders of CSF will be required to also complete and submit our CSF Billing Requisition Form only if the NPDPSC is to bill patient directly

ix. Patient is also asked to submit frozen urine sample (100-200 mL) for validation of a recently published diagnostic test on Creutzfeldt-Jakob disease; no report will be issued. Please inform patient and/or family that urine is used for research on a diagnostic test and obtain oral consent

3. Urine for CJD (research):
   i. Ship double boxed using a Styrofoam container with sufficient dry ice (5 lbs./24 hours)
   ii. Transport Temperature is Frozen
   iii. Specimen stability room temperature: 24 hours
   iv. Refrigerated: 14 days
   v. Frozen: indefinitely
   vi. Methodology
   vii. Immunoassay (IA)

- These tests were developed and their performance characteristics determined by the NPDPSC and they have not been cleared or approved by the FDA. These assays should be used in conjunction with other clinical, pathological and laboratory findings.

- Performing Laboratory:

National Prion Disease Pathology Surveillance Center
Case Western Reserve University
2085 Adelbert Road, Room 419
Cleveland, OH 44106
Setup Schedule
Set up: Tues, Thurs; Report available: 7-10 days

VIII. Forms/Instructions

Attachment A- General Consent to Treat

IX. Related Information

X. Revision History

Approval(s):

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DATE June 24, 2019

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