STANDARDIZED PROCEDURE
LUMBAR PUNCTURE/INTRATHECAL CHEMOTHERAPY (Adult, Peds)

I. Definition

The lumbar puncture (LP) may assist in diagnosis of central nervous system (CNS) infections, malignancies and subarachnoid hemorrhage after imaging studies. The LP also facilitates the administration of chemotherapy into CSF in previously diagnosed lymphoma and leukemia with CNS involvement OR high risk for CNS involvement. Intrathecal (IT) chemoprophylaxis/ chemotherapy is administered via lumbar puncture (or ommaya reservoir) to treat, (see Standardized Procedure for accessing Ommaya Reservoir) leukemic/ lymphomatous involvement of the CNS. The LP can be performed in the inpatient or outpatient settings by an individual who has been adequately trained and supervised in this procedure.

II. Background Information

A. Setting: The setting (inpatient vs outpatient) and population (adults vs pediatrics) for the Advanced Health Practitioner (AHP) is determined by the approval of the privileges requested on the AHP Privilege Request Form. If the procedure is being done on a Pediatric patient, make sure Child Life is involved and use age appropriate language and age appropriate developmental needs with care of children, as appropriate to the situation.

B. Supervision: The necessity of this procedure will be determined by the Advanced Health Practitioner in collaboration with the supervising physician or his/her designee. Designee is defined as another attending physician who works directly with the supervising physician and is authorized to supervise the Advanced Health Practitioner.

Direct supervision will not be necessary once competency is determined, as provided for in the procedure. The Advanced Health Practitioner will notify the physician immediately upon being involved in any emergency or resuscitative events or under the following circumstances:

1. Patient decompensation or intolerance to the procedure
2. Bleeding that is not resolved
3. Outcome of the procedure other than expected

C. Indications:

1. Patients with recent diagnosis of CNS malignancy, history of CNS malignancy, therapy related complications of the CNS, or signs and symptoms of infections of the CNS, acute leukemia or lymphoma (as staging or CNS prophylaxis).
2. Patient with meningeal signs or symptoms, such as nuchal rigidity and headache without evidence of increased intracranial pressure.

3. Patients with fever, change in mental status, headaches or other signs and symptoms of meningitis or encephalitis once other etiologies have been ruled out.

D. Precautions/Contraindications:

1. Thrombocytopenia (if platelet count is less than 50,000 consult physician).
2. Evidence of increased intracranial pressure: Increased blood pressure with widened pulse pressure, papilledema, or significant decrease in the level of consciousness until imaging studies have ruled out mass effect.
3. New focal neurological findings and/or lesions, or imaging studies revealing significant mass effect.
4. Patients with coagulation defects or those receiving anticoagulant therapy.
5. Cutaneous infection at the site of procedure.
6. Use caution with patients with a history of low back pain, lower extremity neuralgia or sciatica. Patients with prior back surgery will be evaluated by the attending physician prior to the procedure.

III. Materials

1. Standard LP kit
2. Sterile gloves, sterile gown, mask and hat.
3. Chlorhexadine
4. Prepared chemotherapy syringe, if indicated.
5. Chemotherapy agents to include (prepared with preservative-free normal saline) preservative-free methotrexate 12 mg., preservative-free Ara-C 50 mg., and preservative-free hydrocortisone 50 mg. are obtained from pharmacy (inpatient or clinic pharmacy).

IV. Lumbar Puncture and Intrathecal Chemotherapy Procedure

A. Pre-treatment evaluation

1. Subjective
   a. History of pancytopenia, anticoagulation or aspirin use, renal insufficiency, disseminated intravascular coagulation, liver dysfunction, seizures, cerebral bleeding, head trauma or back surgery should be elicited.
   b. Review of systems; Headache, confusion, altered mental status, nuchal rigidity fever, bleeding, lower extremity weakness, back pain, difficulty with elimination or ambulation
2. Patient Evaluation

a. General appearance, vital signs, fever.

b. Complete a focused neurological and mental status examination. Assess for focal neurologic findings. Evaluate for evidence of increased intracranial pressure: high blood pressure, widening pulse pressure, papilledema, decreased level of consciousness. Evaluate for evidence of local infection or metabolic abnormalities.

3. Diagnostic

   a. Previous LP (MRI, CT results, if applicable)

   b. As indicated, current CBC with differential, PT/PTT, platelets, electrolytes, creatinine, and /or other chemistries as needed.

B. Patient Preparation:

1. After providing the purpose, risks and benefits, and steps of the procedure, obtain informed consent from the patient or appropriate legal designee. Perform a time out, with all appropriate steps.
2. Check platelet count and/or presence of coagulopathy if indicated. Consult with attending physician if platelet count is <50,000, or there is a known coagulopathy as to whether platelet transfusion or other intervention is needed prior to the procedure.
3. The most important step is positioning the patient. The lateral decubitus position may be used; firm bed, head on pillow, head flexed with chin on the chest, legs maximally flexed toward the head. Alternatively, the patient may be sitting, flexed forward and supported by stable table or assistant).
4. Identify interspaces and mark the puncture site at the L4-5 interspace in a perpendicular line from the iliac crest. The L3-4 interspace above this level may also be used.
5. Don sterile gloves, sterile gown, mask and hat. Set up prepared LP tray
6. Using the sponge applicator provided in the LP tray, prepare the back with chlorhexadine solution beginning at the site marked for the needle puncture, working outward; repeat two more times for a total of three times.
7. Drape the patient.
8. Recheck the landmarks.
9. Infiltrate the skin and subcutaneous tissue with preservative free 1% lidocaine with a 22-25 gauge needle.
10. Insert the spinal needle into the midline of the interspace with bevel up. Direct the needle on a 10 degree angle toward the umbilicus (horizontal axis).
11. Advance the needle slowly, removing the stylet every 2-3 mm to check for CSF flow. If the patient complains of nerve root pain, do not advance the needle. Remove stylet and check for CSF. If none, then replace stylet and

remove. Remove the needle to subcutaneous tissue, change angle and continue. If repeated bony resistance is noted, discard the needle and replace it. If blood is returned, watch for clearing of fluid; if no clearing, replace the stylet, remove the needle and notify the attending MD.

12. Once CSF flow is established, rotate the needle 90 degrees counter-clock wise (bevel in transverse plane) for patients in the lateral decubitus position. If the patient is in the sitting forward position no adjustment is needed.
13. Remove 1-2 ml of CSF in each of four tubes.
14. Send samples to the lab for glucose, protein, cell count, culture and gram staining, and/or other tests as indicated.
15. Attach chemotherapy syringe (pre-filled with preservative free methotrexate 12 mg. and/or Ara-C 50 mg. and hydrocortisone 50 mg prepared for intrathecal administration in total volume 6 ml preservative-free normal saline) with extension tubing attached to the spinal needle aspirate small amount of CSF to reconfirm needle position, and slowly the inject chemotherapy over 1-2 minutes.
16. For patients in the lateral decubitus position, replace stylet turn needle 90 degrees clockwise (sagittal plane) and remove needle.

C. Post Procedure

1. Cleanse procedure area of povidone iodine solution and place dry sterile dressing.
2. Advise patient to lie prone for 1/2 - 1 hour in the clinic prior to discharge and to increase oral fluids over next 12 -24 hours.
3. Assess patient for any adverse reaction to procedure/chemotherapy.
4. Label CSF specimen tubes and send to lab.
5. Instruct patient to observe LP site for any signs of bleeding or infection, and to call clinic for any problems.
6. Document procedure results, patient response, characteristics of CSF, and patient follow-up instructions.

D. Follow-up treatment

The Advanced Health Practitioner will review all abnormal lab and cytology findings with the supervising physician.

V. Documentation

A. Documentation is in the electronic medical record

1. Documentation of the pretreatment evaluation and any abnormal physical findings.
2. Record the time out, indication for the procedure, procedure, type and size of needle used, EBL, the outcome, how the patient tolerated the procedure, medications (drug, dose, route, & time) given, complications, and the plan in the note, as well as any teaching and discharge instructions.

B. Document that all abnormal findings are reviewed with supervising physician.

VI. Competency Assessment

A. Initial Competence

1. The Advanced Health Practitioner will be instructed on the efficacy and the indications of this therapy and demonstrate understanding of such.
2. The Advanced Health Practitioner will demonstrate knowledge of the following:
   a. Medical indication and contraindications of lumbar puncture-intrathecal chemotherapy
   b. Risks and benefits of the procedure
   c. Related anatomy and physiology
   d. Consent process (if applicable)
   e. Steps in performing the procedure
   f. Documentation of the procedure
   g. Ability to interpret results and implications in management.
3. Advanced Health Practitioner will observe the supervising physician perform each procedure three times and perform the procedure **three** times under supervision.
4. Supervising physician will document Advanced Health Practitioner's competency prior to performing procedure without supervision.
5. The Advanced Health Practitioner will ensure the completion of competency sign off documents and provide a copy for filing in their personnel file and a copy to the medical staff office for their credentialing file.

B. Continued proficiency

1. The Advanced Health Practitioner will demonstrate competence by successful completion of the initial competency.
2. Each candidate will be initially proctored and signed off by an attending physician. Advanced Health Practitioner must perform this procedure at least

three times per year. In cases where this minimum is not met, the attending must again sign off the procedure for the Advanced Health Practitioner. The Advanced Health Practitioner will be signed off after demonstrating 100% accuracy in completing the procedure.

3. Demonstration of continued proficiency shall be monitored through the annual evaluation.
4. A clinical practice outcomes log is to be submitted with each renewal of credentials. It will include the number of procedures performed per year and any adverse outcomes. If an adverse outcome occurred, a copy of the procedure note will be submitted.

VII. RESPONSIBILITY

Questions about this procedure should be directed to the Chief Nursing and Patient Care Services Officer at 353-4380.

VIII. HISTORY OF POLICY

Revised June 2012 by Subcommittee of the Committee for Interdisciplinary Practice
Reviewed June 2012 by the Committee on Interdisciplinary Practice
Prior revision October 2008
Approved June 2012 by the Executive Medical Board and the Governance Advisory Council.