STANDARDIZED PROCEDURE
WITHDRAWING CEREBROSPINAL FLUID FROM A VENTRICULAR SHUNT OR RESERVOIR (Adult, Neonatal, Peds)

These procedures are intended to describe procedures performed by Nurse Practitioners and/or Certified Nurse Midwives (depending on the clinical privileges granted to the individual practitioner) at UC San Diego Health.

I. Definition:
The purpose of this procedure is to allow the Advanced Health Practitioner (AHP) to drain cerebrospinal fluid (CSF) in patients with clinical symptoms of increased intracranial pressure, or in patients with ultrasonographic or CT evidence of progressive ventriculomegaly. This procedure also guides the AHP when obtaining fluid from shunt or Ommaya reservoir for laboratory analysis of CSF to rule out infection or other disease process.

II. Background Information
Ventriculoperitoneal shunts are placed in order to alleviate increased intracranial pressure due to hydrocephalus. A reservoir may be inserted prior to permanent ventricular catheter drainage in obstructive hydrocephalus when intermittent lumbar punctures fail to drain ventricles effectively, or when the patient’s condition precludes insertion of a ventriculoperitoneal shunt.

Adults may have ventriculoperitoneal shunts placed for obstructive hydrocephalus due to such diseases as tumor, or vascular malformation. Communicating hydrocephalus is produced by problems such as meningitis or subarachnoid hemorrhage.

Ommaya reservoirs may be placed into the ventricles or into cystic cavities in the brain in order to withdraw fluid when necessary or instill chemotherapeutic agents into the Central Nervous System.

A. Setting:
The setting (inpatient vs outpatient) and population (adults vs pediatrics) for the 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 Services 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 protocol will be determined by the AHP 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 AHP.

Direct supervision will not be necessary once competency is determined, as provided for in the protocol. The AHP 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
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2. Bleeding that is not resolved
3. Outcome of the procedure other than expected

C. Indications
1. Patients requiring withdrawal of CSF to decrease intracranial pressure.
2. Patients requiring withdrawal of CSF or cyst fluid for laboratory examination and testing, i.e., to rule out meningitis or evaluate for cytology.

D. Precautions / Contraindications
Cellulitis or abrasion over the reservoir site.

III. Materials
1. Sterile gloves
2. Chlorhexadine
3. 25 gauge needle or butterfly
4. Sterile 4 x 4’s
5. 5 or 10 ml sterile syringes
6. Sterile culture tubes

IV. Procedure
1. Take a time-out to check two patient identifiers and review patient allergies
2. Wash hands. Don sterile gloves.
3. Scrub site with Chlorhexadine.
4. Insert needle through skin just into reservoir bladder. Angle needle at 30 – 45 degrees from the skin and avoid puncturing the bottom of the reservoir.
5. Aspirate fluid into syringe slowly (1-3 ml per minute).
6. Limit the total volume aspirated at each tapping to no more than 30 ml. The initial puncture should not exceed 10 ml in volume and can be increased on sequential taps at a rate of not more than 5 ml/day.
7. Send sample for culture, cell count, glucose, and protein as requested by MD.
8. Remove needle and hold firm pressure for 2 minutes or until CSF leakage from skin stops. Clean Chlorhexadine from the skin after the procedure.

V. Follow-up
A. Observe for the following complications:
   1. Local skin breakdown.
   2. Intravascular fluid depletion.
   3. Hyoproteinemina.
   4. Hyponatremia.
   5. Wound or reservoir infections.

B. CSF leak from puncture site.
   1. Obstruction of ventricular catheter.
   2. Ventriculitis.
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VI. 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, amount of CSF removed, 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. All abnormal or unexpected findings are reviewed with supervising physician.

VI. Competency Assessment

A. Initial Competence
   1. The AHP will be instructed on the efficacy and the indications of this therapy and demonstrate understanding of such.
   2. The AHP will demonstrate knowledge of the following:
      a. Medical indication and contraindications of withdrawing CSF from ventricular shunt or reservoir
      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. AHP will observe the supervising physician perform each procedure three times and perform the procedure three times under direct supervision.
   4. Supervising physician will document AHP’s competency prior to performing procedure without direct supervision.
   5. The AHP 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 AHP will demonstrate competence by successful completion of the initial competency.
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2. Each candidate will be initially proctored and signed off by an attending physician. AHP 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 AHP. The AHP 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
Please contact the Advanced Practice Council if you need help. The administrative assistant for the Chief Nursing Officer can direct you. Call; 619-543-3438.

VIII. HISTORY OF POLICY
Revised by the Committee of Interdisciplinary Practices: 2/26/2014, 9/28/2016
Reviewed by the Medical Staff Credentials Committee: 3/5/2014, 10/6/2016
Approved by the Medical Staff Executive Committee: 3/20/2014, 10/7/2016