

CSF LEAK
UPDATED: Dec 2011

CPT CODE: 78650

Indications: To determine presence of CSF leak. Patients present with past history of trauma or surgery, recurrent CNS infections, such as meningitis or nasal or otic discharge. In all instances, a physician will approve this test in advance and discuss the symptoms with the patient to determine if there is any position likely to induce the leak.

Patient Prep: The referring clinic (usually ENT) should be asked if the patient should be sent to ENT to be decongested before we inject tracer. The ENT Clinic will place the pledgets for nasal leak.

Scheduling:

- Lumbar puncture is required. This is performed by Neuroradiology. In-DTPA is preferred agent.
- No consent form is required. The test should be explained and documented by the person performing LP.
- If nasal leak, verify that an ENT physician is available for 10:30 AM placement at ENT Clinic.
- Times for scheduling are:
 - 8:30 Patient Injection
 - 10:30 Pledgets Placed
 - 12:00 Patient Scanned
 - 2:30 Patient Scanned
 - 3:00 Pledgets Pulled and Counted & Blood Sample Taken, Spun, and Counted
- Images may be required the next day.

NOTE: In-111 DTPA is a special order drug requiring a 24 hour notice to the Radiopharmacy

Radiopharmaceutical

& Dose: 0.4-0.6 mCi In-111-DTPA (standard CSF dose). Dose will be adjusted for patient weight if ≤ 45 kg or ≥ 90 kg (refer to NMIS nomogram).

Technique: **NOTE:** Before the injection of radioactive material, please check all connections to be sure there will not be a leak.
Patient is injected intrathecally by Nuclear Medicine resident or staff physician, usually in DVI. The dose will be followed by 15-20 ml of sterile saline (without bacteriostatic agent preparation), or the patient's own CSF. This material must be newly opened. If the suspected leak is nasal, then bilateral pledgets are to be used. They should be placed by a physician from ENT Service in the ENT department, at: the cribriform plate (B/L), the sphenoid recess under the middle turbinate (B/L), and one in the buccal mucosa for a control. Contact ENT Service, the nursing supervisor will arrange this at the ENT clinic 2 hours after injection of tracer. We will remove the pledgets at 5 hours, weigh, and then count them. (See attached form and letter to ENT Service. If an otic leak is suspected, Nuclear Medicine physician will place the otic and buccal pledgets.

Imaging Device: Gamma Camera with LEHRPH collimator for Tc-DTPA, ME collimator for In-DTPA.

Imaging Procedure: Patient should be positioned with head flexed forward and downward or in a position known to cause rhinorrhea or otorrhea. Anterior and both lateral views are taken at 3 hours and 6 hours (before pledget removal) and as necessary the next morning too. Images with lowered upper threshold lowered to demonstrate potential leak. If otorrhea is present, posterior views are to be included. If study appears normal, bring the patient back at 24 hours for the same views.

Pledgets should be removed at the end of the study (6 hours) and counted after weighing. In addition, 0.5 ml of serum will be weighed and counted. (A copy of the work sheet is attached to this protocol.) If the study is to be carried out to 24 hours, new pledgets will not routinely be placed. In some cases a view of the stomach is taken because the patient may swallow fluid from the leak. Calibrate the scale with the weight and note that it was done.

Interpretation:

These studies are notoriously difficult to interpret. To detect small leaks the upper threshold must be lowered to demonstrate a leak. The normal nasal secretions contain tracer and hence the use of opposite side (nose or ear), buccal mucosa and blood to determine what background is required. Since there is always considerable activity in the serum this measurement is important, and since saliva, etc. concentrates tracer, the leak can only be identified if there is significantly more activity present in the saliva than in the serum. Hence the use of weighed samples and comparison with controls that are normalized for fluid content. At least three times these background levels are required for a positive test, and the abnormality must be seen on the images to be called. The pledgets help localize the site of the leak.

Invasive Procedure:

This is a minimally invasive procedure, with very low risk (that of lumbar puncture). In the event of an outpatient, a complication will be readmission (usually for nosocomial infection). In the event of an inpatient, then attribution of an infection or other complication will be made by the QA monitoring staff (discharge analysts). No special monitoring is required by Nuclear Medicine.

Comments:

A Nuclear Medicine staff or resident physician should be consulted to determine if additional views are indicated.

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