UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

CEREBRAL FLOW – DEATH **CPT CODE: 78615**
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Indications: To determine presence/absence of intracerebral blood flow.

Rationale: The test is to determine if there is intracerebral perfusion.

Scheduling/Prep: This study is done emergently. No special prep.

Radiopharmaceutical & Dose: 16-24 mCi (+/- 20%), adjusted for weight per nomogram or NMIS of a Technetium agent. The ideal agent is Tc-99m-DTPA since the tracer is most rapidly excreted, allowing repeat tests sooner. If the study is performed after hours, then TcO_4 can be used if the DTPA is not available (ALARA).

Imaging Device: Camera with LEHR collimator/GE MPS (Room B) preferred.

Imaging Procedure: Ensure that the patient's head is as straight as possible and the entire head is in the field of view. The anterior projection requires a caudal tilt such the detector face is in line with the forehead and tip of the nose. If the patient's head is not straight, adjust the camera laterally, as needed. With patient positioned and detector head placed, inject the dose as a bolus into the largest vein available, preferably a central line. The imaging protocol is commenced (the computer started) and six seconds later (the tech starts counting aloud 1 through 6 when acquisition starts) the tracer is injected (provides means of obtaining background activity which can be subtracted out if radiotracer is present from a previous procedure) - ensures adequacy of test by documenting carotid and extracerebral blood flow.

Data Acquisition: Use the predefined protocol User → UW Cerebral → Brain Death that includes:

1. 1-second images for 120 seconds.
2. Two 1-minute static images obtained sequentially.
3. 128 x 128 matrix
4. Zoom x 1

Display: To display, select User Applications → Brain Death Display.
It automatically displays the flow at 3 seconds/frame and two 1-minute statics on the bottom.
Make a screen capture of this page.

PACS: Send all dynamic images and save captures to PACS.

Interpretation: This test does not identify cerebral death, it identifies absence of intracerebral perfusion. This test does not examine brain stem flow. The absence of activity over the skull vault region (external carotid territory) implies poor injection. The common carotids and the skull vault should be seen well.

If there is the "trident" sign seen (territories of both middle and anterior cerebral arteries) then intracerebral perfusion is present. If no activity is present in the territory of the anterior or middle carotid arteries, and no superior sagittal sinus activity is seen in the 1- and 2-minute delayed images, then the finding is consistent with the absence of cerebral perfusion. The absence of the "trident" sign (non visualization of the anterior and middle cerebral artery

territories) with some superior sagittal sinus activity only present on the delayed images probably means some drainage of the skull vault activity into the superior sagittal sinus rather than intracerebral perfusion per se. This does not completely exclude some minimal intracerebral perfusion, but no patient has made significant recovery from their comatose state with this scan finding.

Comments: A Nuclear Medicine staff member must be notified to interpret the study.

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