

BRAIN SPECT SCAN
UPDATED: APRIL 2010

CPT CODE: 78607

Indications: Single Photon Emission Computed Tomography (SPECT) is used to evaluate regional cerebral blood flow. These examinations are very useful in evaluating the brain blood flow in a variety of pathological states, including epilepsy, stroke, and tumors.

Patient Prep: **Inter-ictal:** None.
Ictal: Patient to be admitted to IP floor. Start large bore (18-20g) IV. Seizure meds are withheld until seizure.

Scheduling:

- Requires 2-1/2 hour presence (60 minute camera time).
- Patient needs to arrive at least 30 minutes prior to injection.
- A quiet room needs to be available for patient at least one hour prior to imaging.

NOTE: For inter-ictal imaging, a minimum of 12 hrs post seizure is standard. To image < 12 hrs post seizure requires faculty approval.

**Radiopharmaceutical
& Dose:**

Inter-Ictal Exam or Exam for Other Causes (ie Demencia): 20 mCi \pm 20% (16-24 mCi) Tc-99m-HMPAO (Exametazime) or Tc-99m-ECD (Bicisate). Nuclear Medicine physician to decide Rx. Dose will be adjusted for patient weight per NMIS or nomogram.

The TcO₄ needed to reconstitute the HMPAO kit must be eluted within the previous two hours. The generator that the above eluant came from must have been eluted within the previous 24 hours. The kit needs a greater than 85% tag by solvent extraction (ethylacetate/water). (The package insert says 80% minimum, literature suggests 85% minimum.) The expiration time of the kit is 4 hours.

The TcO₄ needed for the ECD kit should be less than 6 hours old. Quality control is done via ITLC, with SG paper as the paper, and ethyl acetate as the solvent. Results should be above 90%.

Ictal: The nuclear medicine technologist or physician will administer the dose during the seizure. Alternatively, one dose shall be kept on the inpatient floor in a secured lock box to be administered by the trained nursing staff, should the patient have an "ictal" event.

The dose is the same as Inter-Ictal and will be adjusted for patient weight. However, the dose range will be \pm 30% and calibrated for the second hour of the 4-hour shelf life (post prep). Dose range will be 14-26 mCi. We will send a new dose to the floor after the 4-hour window expiration, if needed.

Imaging Procedure: **Inter-Ictal Exam or Resting Exam for Other Indications:** Patient should arrive 30 minutes before injection. Put patient in quiet, dimly lit room. Start an IV drip in patient. Inform radiopharmacy when the IV has been placed. Inject agent into patient using IV. Wait 60 minutes before beginning imaging.

*Patient must be "seizure free" for > 12 hours, or the NM physician should be contacted.

Ictal: Injection is made as soon as seizure begins as identified by EEG. Rapid bolus injection followed by 10cc saline. Patient is stabilized by attending nursing staff. Imaging begins ideally at one hour, but up to 3.5 hours is allowed. Patient is transported to NM as soon as patient is stable and camera is available.

Imaging Device: Infinia Hawkeye.

Data Acquisition:

- * Make sure patient is within Hawkeye range as noted on table.
- * Secure head to table with patient positioned head-first with head holder.

Collimators: LEHR

Protocol: Factory - Brain - Brain Tc99m Hawkeye

Camera Information: 128 x 128 matrix

Mode : H

Scan Information:

Patient Location: Head first-Supine

Rotation Type: Step_Shoot

CT/AC range: Partial

Check "usebody contour"

Select on: Emission

Start Angle (deg): 0

Click on Emission First

of Views per Scan: 60(30/head)

Acquire CT/AC: Table In

Angle Step Size (deg): 36

Time per Acquisition (sec): 40

Zoom: 1.5 x

Backprojection Information:

Pan Y: -20

Recon Matrix X Size: 128

Recon Matrix Y Size: 128

Data Analysis: Use iterative Reconstruction and Volumetrix for Hawkeye to process.

PACS: Screen capture the sagittal, transverse, and coronal images. Send screen captures to PACS including ALL raw data, transverse, coronal, sagittal, and CT data.

Interpretation: Abnormal brain areas in the inter-ictal state demonstrate decreased radiotracer uptake, such as those recently suffering a stroke or epileptic foci. During an ictus the focal cause will be "hot". Demencia imaging-abnormal areas appear as hypoperfused regions in the brain.

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

Bibliography: SNM Procedure Guideline for Brain Perfusion SPECT using Tc99m Radiopharmaceuticals 3.0

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