

Cerebral Perfusion (Brain Death) Scan

Updated

9/8/2024

- **Indication**

- To assess brain blood flow in patients suspected of brain death particularly when clinical assessment and EEG are less reliable because of conditions such as severe hypothermia, coma caused by barbiturates, electrolyte or acid-base imbalances, endocrine disturbances, drug intoxication, poisoning and neuromuscular blockade.

- **Radiopharmaceutical:**

- 20-30 mCi Tc-99m DTPA administered IV

- **Patient Preparation:**

- The patient should have stable blood pressure and all correctable major systemic biochemical abnormalities addressed.
- Tourniquet placed around the scalp encircling the head just above the eyebrows, ears and posterior prominence of the skull.

- **Conflicting Examinations/Medications:**

- No Nuclear Medicine exams within the previous 24 hrs (if the FOV will be affected by the prior exam).

- **Pregnancy/Lactation:**

- Pregnancy testing is only needed in potentially pregnant patients who state they could be pregnant. See Pregnant, Potentially Pregnant and Lactating Patients policy for specifics.

- **Imaging Technique:**

- Collimator - LEHR or LEAP
- Photopeak - 140 keV 20% window for Tc-99m
- Image Preset Counts
 - Flow - 2 secs/image for 2.5 mins (75 images)
 - Static - 5 mins/image or 500k to 1 million counts/image
- Matrix Size - 128 x 128 (dynamic), 256 x 256 (static)
- Zoom - 1.23 (E-Cam), 1.28 (Discovery NM630)
- Patient Positioning - supine with patient's head straight (or camera angles adjusted to match the angulation of head)

- **Imaging Views:**

- Flow Images
 - Begin imaging immediately after radionuclide administration.
 - Obtain anterior and posterior images for 2.5 mins.
- Static Images
 - Obtain anterior and posterior images at 5 mins and 10 mins.
 - Obtain right lateral and left lateral images.
 - Check with Radiologist before ending exam to see if any additional planes or more delayed imaging is needed.

- **Notes:**

- The absence of demonstrable radionuclide activity within the brain is consistent with the diagnosis of brain death.
- Delayed images using agents that are not brain specific (such as DTPA) may show superior sagittal sinus activity even in the presence of brain death in as many as 50% of patients. Lack of superior sagittal sinus activity, however helps confirm the lack of cerebral perfusion.
- Cerebral scintigraphy and EEG are confirmatory but not diagnostic of brain death.
- Clinical exam and a properly performed 4-vessel cerebral angiography can be used to diagnose brain death.