UNM HOSPITALS

Brain SPECT

Special Instructions	**Consult with attending radiologist about appropriateness of the examination and selection of radiopharmaceutical.** **Patients with seizures, dementia, or other neurologic deficits must be closely observed during the examination.** **For acetazolamide (Diamox) and balloon occlusion studies, the patient should also be authorized and scheduled for a baseline examination. The two examinations should be performed no closer than within 24 hours of each other.** **To be performed at UNMH only.**

Radiopharmaceutical: Tc-99m ECD (Neurolite), preferred, or HMPAO (Ceretec); Tl-201 chloride

Dose (Adult/Pediatric): Refer to Nuclear Medicine Dose Chart

Route of Administration: Intravenous

Patient Preparation: If sedation is required for the imaging, it should be administered no sooner than 5-10 minutes after injection of the radiopharmaceutical. If possible, the patient should be injected in a quiet, dimly lit room with minimal stimulation.

Equipment Setup:

Collimator: High Resolution (all radiopharmaceuticals)

SPECT/CT: Select Brain SPECT/CT protocol

ECD/HMPAO:

128 x 128 matrix

Choose non-circular orbit, 15 sec/image

Thallium: Select Brain SPECT/CT protocol

64 x 64 matrix

Choose non-circular orbit, 20 sec/image

Patient Positioning: Supine

The patient must be positioned so that he/she will be able to remain motionless for the SPECT acquisition. Arm boards, positioning wedges, and support straps must be effectively used to eliminate patient discomfort. The patient should be positioned as far as possible toward the narrow head-holder portion of the table. The patient's head rests in a cushioned plastic head holder and is positioned as symmetrically as possible.

Procedure: Ideally, the patient should be resting comfortably supine, in a quiet, dimly lit room for 15 minutes prior to the injection of the radiopharmaceutical and for 30 minutes after the injection.

Brain SPECT (continued)

For balloon occlusion studies: Both a baseline and a balloon-occlusion study should be performed, separated by ~24 hours or more.

The radiopharmaceutical should preferably be administered approximately 5 minutes before the anticipated balloon deflation; however, **times as short as 1 minute from IV administration to balloon deflation are acceptable** (~90% of the brain uptake of the tracer occurs within 1 minute). At all times, patient safety concerns take precedence (i.e., the neurosurgeon/neurointerventionalist performing the procedure can deflate the balloon whenever he/she deems medically necessary).

Record the following clock times:

1) Balloon inflation
2) Radiopharmaceutical administration (IV by the technologist)
3) Balloon deflation

The radiopharmaceutical administration will be performed by nuclear medicine staff who will properly dispose of the syringe and any other radioactive waste after completion of the injection. It is more difficult to control external stimuli at the time of radiopharmaceutical injection. When possible, the patient should be injected in a quiet, dimly lit room and resting comfortably.

For acetazolamide (Diamox) studies (if indicated by radiologist protocol): Administer the acetazolamide by slow intravenous push, wait 15-20 minutes, then administer the radiopharmaceutical. Typically, the acetazolamide study will be performed on Day 1. Then, at the discretion of the attending radiologist, a baseline study without acetazolamide will be performed the following day.

Time from injection to imaging:

For ECD: ≥45 minutes for best image quality; images at 20 minutes will be interpretable.

For HMPAO: ≥90 minutes for best image quality; images at 40 minutes will be interpretable.

For Thallim-201: ≥10 minutes for best image quality

Processing: Process CT in soft tissue (B30) and bone (B60) algorithm
Must have attenuation corrected and non attenuation corrected SPECT tomo files

Items Required For Complete Study:

- Processing and transfer of all images to PACS and Leonardo
  - SPECT-CT: Attenuation Corrected and Non Attenuation Corrected Tomo Reconstructions, CT (B30 and B60) to both; label with imaged region (e.g., Brain Tomo Recon – AC)
- Complete the examination in RIS