UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

PARATHYROID TUMOR LOCALIZATION (Non-thyroid Endocrine) **CPT CODE: 78070**
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Indications:

- Hyperparathyroidism
- Pre-operative localization of abnormal parathyroid tissue. This study is performed using only the washout protocol below.
- If there is a history of previous parathyroid surgery, or if the Washout study is indefinite, the patient should have the Dual Isotope study scheduled.
- The Dual Isotope study is considered if the Washout scan is negative.

Patient Prep: No special patient preparation is necessary. The referring physicians must provide the serum calcium and serum parathyroid hormone measurements at the time of scheduling.

The patient must be able to lie flat and still for 30 minutes for Washout and 35 minutes for Dual Isotope.

Scheduling: For the Washout Scan, allow 45 minutes for the early and 45 minutes for the delayed images.

If the patient is scheduled for the Dual Isotope study, allow 1 hour.

Radiopharmaceutical & Dose: Type of scan/radiopharmaceutical to be determined by NM physician.

Washout Scan: 20 mCi of Tc-99m Sestamibi (+/- 20%)(16-24 mCi), adjusted for weight per nomogram/NMIS.

Dual Isotope: 2 mCi T1-201 weight ban per nomogram or NMIS
10 mCi of Tc-99m Pertechnetate

Diagnostic Injection:
Injecting prior to surgery: 10 mCi Sestamibi, do not adjust for weight.
Pre-surgery injection: no imaging required.

Imaging Device: **Washout Scan**: GE INFINIA cameras, scan at 15 min and 2 hours post injection, for 35 min each.

Dual Isotope Scan: Gamma camera with HR collimation (MPS) for 45 min, for 20 min each.
Use T1-201 windows set at 30% for the 72 peak and 20% for the 167 peak.
The Tc-99m window is at 20%

Imaging Procedure:

Washout Scan:

- Inject patient with Tc-99m Sestamibi
- Early: 15 minutes post injection
- INFINIA cameras
  - Use predefined parathyroid protocol
  - 10-min static
  - SPECT with CT

- Delay: 2 hours post injection
- INFINIA cameras
  - Use predefined parathyroid protocol
  - 10-min static
  - SPECT only, NO CT
- Planar imaging can be used if patient exceeds camera weight limit. Check with faculty.

Dual Isotope:

- Use UW parathyroid dual isotope protocol.
- Position the patient supine beneath camera with neck extended and head secured with masking tape.
- Set IV and have saline bag running.
- Inject the thallium. Position the patient with the thyroid at the top of the field of view so as to image the chest area. Take the 3-min image (preset: static, 128 x 128 matrix, 1 frame/3 min, zoom 1.33).
- Quickly reposition the patient for the rest of the study by centering thyroid in the field of view. Explain to the patient that the imaging process is about to begin and how imperative it is that no movement (including talking) occur until you indicate that the procedure is completed. Check that the neck is hyperextended.
- Begin Tl acquisition (preset: dynamic, 1 frame/min for 15 min, 128 x 128 matrix, zoom 2.67).
- At the completion of 15-min computer acquisition of the Tl study, inject the Tc-99m and begin the computer Tc-99m acquisition immediately (preset: dynamic, 1 frame/min for 15 min, 128 x 128 matrix, zoom 2.67).
- After completion of the Tc-99m acquisition, have the physician palpate the neck and mark the chin, suprasternal notch, and cricoid cartilage (using Co-57 wand source preset: static, 1 frame/1 min, 128 x 128 matrix, zoom 2.67).

Data Analysis:

Washout Scan:

- Display cine of rotating re-projected transaxial images, early and late (MPI).
- Display early and late SPECT images. Reconstruct using iterative reconstruction protocol. Use 3-slice display (8.84 mm) for both early and delay SPECTS and display each as a single screen and zoom images to 1.5. For the early SPECT/CT, use the volumetrix reconstruction with a .5 butterworth 3D filter. Triangulate any abnormality and save that screen to transfer to ALI. The raw data should also be transferred to the MD2 station for review by the physicians. Also transfer the raw CT file and the first transaxial file (under the saved General SPECT file) to ALI. The physicians use these files to merge the images using the Mirada software.
- Display early and late statics. Please use the parathyroid imaging display protocol and adjust images accordingly for intensity.

Dual Isotope Scan: Predefined study: Parathyroid Imaging.
Includes alignment, normalization, and subtraction of Tc (thyroid) from the Tl (parathyroid and thyroid) images.

NOTE: Check with NM physician as to what should be printed.

PACS: Send all raw SPECT and CT data to PACS. Also send all save sets and 30 min images to PACS.

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