

PARATHYROID LOCALIZATION

<u>CPT CODES (ONLY USE ONE):</u>	
PLANAR ONLY	78070
SPECT ONLY	78071
SPECT/CT	78072
DIAGNOSTIC INJECTION	90784

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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 indeterminant, the patient should have the Dual Isotope study scheduled.

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.

Scheduling:

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

For the Dual Isotope study, allow 1 hour.

For Diagnostic Injection: 1 hour (+/- 15 minutes) before the surgery time

Radiopharmaceutical

& Dose:

Type of scan/radiopharmaceutical to be determined by NM physician.

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

Dual Isotope: 2 mCi +/- 20% Tl-201 (1.6-2.4 mCi), adjusted for weight per nomogram or NMIS
10 mCi +/- 20% of Tc-99m Pertechnetate (8-12 mCi), adjusted for weight per nomogram or NMIS

Diagnostic Injection (prior to surgery): 10 mCi +/- 20% Sestamibi (8-12 mCi), do not adjust for weight.

Imaging Device:

Washout Scan:

- GE INFINIA or Optima 640 cameras for SPECT/CT, SPECT ONLY or static (bail out).
- GE Millennium MPS for static only (bail out or scheduled)

Dual Isotope Scan: Gamma camera with HR collimation (MPS) for 45 min, for 20 min each.

Use Tl-201 windows set at 30% for the 72 and 20% for the 167 peaks.

The Tc-99m window is at 20%

Imaging Procedure:

Diagnostic Injection:

- Pre-surgery injection: no imaging required.
- Send scanned request with dose information to PACS.
- NOTE: Per General Surgery staff: Absolutely no pregnant patients are to be injected with Tc99m Sestamibi for a diagnostic injection.

WASHOUT SCAN

SPECT/CT or SPECT ONLY or Static Imaging only?

- Due to payors check your order for SPECT/CT or SPECT only and scan per order.
- Bail out of SPECT or SPECT/CT to Planar (not subtraction)
 - Shoulder girth or other body habitus too large for Infinia
 - If available, try the Optima
 - If not available or too large to Optima switch to Static Imaging
 - Unknown claustrophobia
 - Check with faculty for Static or to reschedule with the recommendation to the ordering provider that the patient needs oral meds or general anesthesia.

SPECT/CT:

- Inject patient with Tc-99m Sestamibi
- Early: 15 minutes post injection
 - Use predefined parathyroid protocol
 - 10-min Anterior static
 - SPECT with CT.
 - Image from top of heart (include a few slices of the heart) to the salivary glands
 - CT at full field of view
- Delay: 2 hours post injection
 - Repeat as above but SPECT only
- Specific camera parameters of the predefined protocol are below.

SPECT ONLY:

- Same as above but turn the CT selection off.

STATIC IMAGING:

- Same as above for timing but acquire ANT, 30° LAO and 30° RAO for 10 minutes at 256x256 matrix.

SPECT/CT Acquisition Parameters:

	INFINIA 1	INFINIA 2 & 3	OPTIMA640
<u>Tomo Key Parameters</u>			
Mode	H	H	H
Start Angle	0	0	0
Patient Location	Head First Supine	Head First Supine	Head First Supine
Use Body Contour	Check	Check	Check
Acquire CT/AC	Check	Check	Check
Select	Table In	Table In	Table In
Select	Emission First	Emission First	Emission First
CT/AC range	Full	Full	Full
Select On	Emission	Emission	Emission
Zoom	1.5	1.5	1.5
Matrix	128 x 128	128 x 128	128 x 128
Pan Y	0	0	0
Select	Step & Shoot	Step & Shoot	Step & Shoot
Seconds	20	20	20
<u>Scan on extender Optima640</u>			No
<u>Tomo Corrections</u>			
Energy session	Tc99m	Tc99m	Tc99m
Collimator	LEHR	LEHR	LEHR
COR Correction	Check	Check	Check
<u>Tomo CT/AC Parameters</u>			
Select	Slice Step 10 mm	Helical	Helical
Pitch		1.9	1.25
Voltage	140.0	140.0	120.0
Current	2.5	2.5	Absolute
Velocity	2.6	2.6	2.5
Matrix	256 x 256	512 x 512	512 X 512
Filter	Hann	Soft	N/A
Extended FOV		Check	N/A
<u>CT/AC Reconstruction</u>			
<u>Tomo Location Parameters</u>			
Slice Thickness (cm)			2.5
Slice Spacing (mm)			2.5
Kernel			Standard
Matrix			512x512
<u>Tomo Location Parameters</u>			
Mode	H	H	H
Start Angle	0	0	0
Patient Location	Head First Supine	Head First Supine	Head First Supine
Use Body Contour	Check	Check	Check
Detectors 1 and 2	Check	Check	Check
Absolute (table height)	73	73	90
Total Angular Range	360	360	360
View Angle	6	6	6
Direction	CW	CW	CW
Number of FOVs	1	1	1
FOV time multiplier	1.0	1.0	1.0
Rough Overlap	4	4	4
Direction	Table In	Table In	Table In
Select	Default	Default	Default
Motorized Pallet Support	Check	Check	Check
<u>Tomo Admin Parameters</u>			
Auto Apply	No	No	No
Release at end of scan		Check	Check
NM	None	None	None
CT/AC		None	None
FOV		None	None
Body Part	Chest	Head	Head
Acquisition Context	Unknown	Unknown	Unknown
Body Side	Other	Other	Other

Dual Isotope (Planar w/Subtraction):

- 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 and Image Display:**Washout Scan:**

For SPECT/CT or SPECT ONLY: See PARATHYROID SPECT PROCESSING Protocol
For Planar: Display early over late, 2 on 1 display

Dual Isotope Scan:

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

PACS:

Washout: See PARATHYROID SPECT PROCESSING protocol

Dual Isotope Scan: Check with NM physician as to what should be sent to PACS.

Diagnostic Injection: Send scanned request with dose information to PACS.

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