

# Thyroid I-131 Scan

Updated

9/8/2024

## • Indications

- To assess for the presence of and localization of any functioning residual, recurrent, or metastatic differentiated thyroid carcinoma after thyroidectomy or before/after I-131 ablation and for surveillance.

## • Radiopharmaceutical:

- Diagnostic Imaging - 1-4 mCi I-131 sodium iodine capsule administered by mouth
- Hyperthyroidism Ablation - 5-15 mCi I-131 sodium iodine capsule administered by mouth
- Thyroid Cancer Therapy - 30-150 mCi I-131 sodium iodine capsule administered by mouth

## • Patient Preparation:

- No specific preparation prior to radionuclide administration.

## • Conflicting Examinations/Medications:

- The following substances should be withheld for the indicated time frames as they can interfere with the uptake of radioiodine:
  - levothyroxine (Synthroid) - 4 wks
  - liothyronine (Cytomel) - 2 wks
  - methimazole (Thiamazole) - 3-7 days
  - carbimazole - 3-7 days
  - propylthiouracil (PTU) - 3-7 days
  - amiodarone - 3-6 mths
  - iodine-containing medication/preparation - 4 wks
  - Lugol's / SSKI solution - 4-6 wks
  - perchlorate - 1 wk
  - kelp - 4 wks
- Iodinated IV contrast must be avoided for 3-4 wks.
- A low-iodine diet should be followed for 1-2 weeks. Diet adequacy can be confirmed with an AM spot urine iodine level.
- TSH level should be  $\geq 30$  mIU/L accomplished by either thyroid hormone withdrawal or rhTSH (Thyrogen) stimulation.
- A patient may be maintained on T3 until 10-14 days prior to ablation to avoid severely symptomatic hypothyroidism.

## • Pregnancy/Lactation:

- A negative urine pregnancy test is required in potentially-pregnant patients prior to I-131 administration. See Pregnant, Potentially Pregnant and Lactating Patients policy for specifics.
- Pregnancy should be avoided for 6 mths following I-131 administration.
- Breast feeding mothers should discontinue breast feeding 6 wks (preferably 3-6 mths) prior to I-131 administration and should not resume breast feeding the current child. Breast feeding can resume with the next child.

## • Imaging Technique:

- Collimator - medium energy high resolution
- Photopeak - 364 keV 15% window for I-131
- Image Preset Counts
  - Whole Body Images - 8-10 cm/min
  - Static Images - 10-20 mins/image
- Matrix Size - 256 x 1024 (whole body), 256 x 256 (static)
- Zoom - 2.67
- Patient Positioning - supine

## • Imaging Views:

- Imaging is obtained at 24 hrs and 48-72 hrs after diagnostic imaging doses and usually at 2-7 days after ablative doses.
- Obtain anterior and posterior whole body images.
- Obtain anterior static images centered on the neck (from nasopharynx to upper chest) with chin and sternal markers present.

## • Notes:

- Thyroglobulin (Tg) is used as a tumor marker in differentiated thyroid cancer after total thyroidectomy and radioiodine ablation. Typically a Tg level  $< 1.0$  ng/mL indicates remission, while a level  $> 10$  ng/mL indicates persistent disease.
- Tg antibody is a class G immunoglobulin and can also be elevated in recurrent thyroid cancer.
- Metastatic thyroid cancer has lower density of and poorer functioning of Na-I symporters. TSH elevation over time is important to promote increased RAIU and retention in tumors. rhTSH-stimulated scans failed to detect remnant cancer localized to the

thyroid bed in 17% of patients and metastatic disease in 29% in whom it was detected after thyroid hormone withdrawal.

- Tg elevation after rhTSH stimulation is 3–5 times less than that obtained after thyroid hormone withdrawal, which may result in suboptimal evaluation of post operative / post ablation disease burden.
- Diagnostic RAI imaging may reveal unexpected iodine-avid metastatic disease in 22%–35% of cases and change management in approximately 30%–50% of cases.
- Diagnostic RAI imaging is useful in determining the I-131 dose for ablation. Larger doses are usually given for treatment if regional or distant metastases are detected on the pre ablation scan.
- Only 1% of total thyroidectomies are truly total.