Austin Radiological Association

Nuclear Medicine Procedure

THYROID IMAGING STUDY
(I-123 as Sodium Iodide)

Overview

- The Thyroid Imaging Study with radioiodine demonstrates the distribution of functioning thyroid tissue, including ectopic tissue, since thyroid tissue is the only tissue that concentrates large amounts of iodine.

Indications

- Evaluation of hyperthyroidism.
- Evaluation of enlarged glands or glands with nodules.
- Evaluation of patients who had irradiation of the head and neck in childhood with or without palpable nodules.
- Evaluation for ectopic thyroid tissue, e.g. struma ovarii (image over pelvis) and lingual thyroid (image upper neck and jaw).
- Evaluation of congenital hypothyroidism.

Examination Time

- Initially: 15 minutes for radiopharmaceutical administration.
- Imaging at 24 hours: 60 minutes.

Patient Preparation

- The patient must be off thyroid hormones:
  1. Thyroxine (T-4) for 4 - 6 weeks.
  2. Triiodothyronine (T-3) for at 2 weeks.
- The patient must not be taking antithyroid medications:
  1. Propylthiouracil (PTU) and Tapazole for 3 - 5 days.
- The patient must not have had intravenous or intrathecal iodinated contrast material (IVP, CT with contrast, myelogram, and angiogram) for at least 4 weeks.

- The technologist records a pertinent, standard history on the Thyroid Information Sheet (see below). The nuclear medicine physician records his/her palpation findings on the same form.
- TSH and T4 panel results.

Equipment & Energy Windows

- Gamma camera: Small or large field of view.
- Collimator: Pinhole with 5 mm insert.
- Energy windows: 20% window centered at 159 keV.

Radiopharmaceutical, Dose, & Technique of Administration

- Radiopharmaceutical: I-123 as sodium iodide.
- Dose: 190 – 270 uCi (7 - 10 MBq). Pedi by NACG chart.
- Technique of administration: Oral.

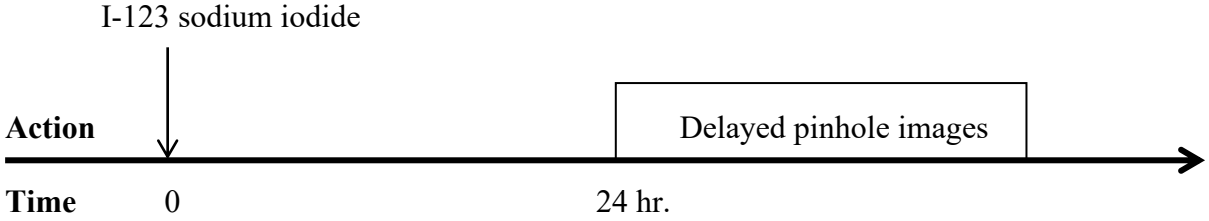
Patient Position & Imaging Field

- Patient position: Supine with the chin tilted up.
- Imaging field: Neck.

Acquisition Protocol

- Begin imaging 24 hours after ingestion of the radiopharmaceutical.
- Acquire 10 minute Anterior, RAO, and LAO images of the thyroid with the collimator 3 inches from the patient's neck.
- Have Radiologist review images for any history of nodules or mass

Protocol Summary Diagram



Data Processing

- None.

Optional Maneuvers

- Evaluation of midline activity: If the images show midline radioactivity which may be due to radioactive saliva, have the patient swallow water and repeat the image.

Method for timely correction of Data Analysis and reporting errors and notification of referring parties

- Data Analysis and reporting errors are reported to the interpreting physician and appropriate clinic manager for timely correction and notification of the referring physician via report addendum or STAT call if error is significant.

Principle Radiation Emission Data - I-123

- Physical half-life = 13.2 hours.

Radiation	Mean % per disintegration	Mean energy (keV)
Gamma-2	83.3	159.0
ce-K, gamma-2	13.6	127.2

Dosimetry - I-123 as Sodium Iodine

Organ	rads/500 µCi	mGy/18.5 MBq
Thyroid	3.75	37.5
Stomach wall	0.12	1.2
Ovaries	0.02	0.2
Red marrow	0.02	0.2
Liver	0.01	0.1
Whole body	0.01	0.1
Testes	0.01	0.1

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NUCLEAR MEDICINE THYROID DATA SHEET

Patient MRN_____ Date_____

Patient _____

Referring Physician _____

Test Ordered _____

_____ Thyroid Medication _____
_____ Other Medications _____
_____ RAI DX/RX (When & Where) _____
_____ Thyroidectomy _____
_____ Imaging in the last 30 days? Type of Exam(s) _____
Date of Exam(s) _____
_____ Myelogram, CT with IV contrast, IVP, Arteriogram, Cardiac Cath?
_____ Family history of Goiter or other thyroid problems? _____
_____ Pregnant? _____Nursing? _____LMP? _____
_____ Recent female hormones? _____
_____ Lump or Goiter? (how long have you noticed?) _____
_____ Recent change? _____
_____ Weight change? (how much, what time period?) _____
_____ Exopthalmus or pressure? (how much, how long?) _____
_____ Pain in lower neck, sore throat, dysphagia? _____
_____ Other remarks: _____

Date: _____
Radioisotope: I-123
Patient Dose: _____uCi @ _____(Time)
2 minute counts – aperture out:
Pill_____ - Background _____ = _____@_____(Time)
Decayed to administration _____ cts @ _____(Time)
Decayed to 24 hours _____cts (x .284)
Decayed to 4 hours _____cts (x .811)

Uptake formula: $\frac{\text{Neck counts – Leg counts}}{\text{Decayed Pill counts}}$ (X100) = Uptake %
4 or 24 Hr.

_____ - _____ (x100) = _____%

24 Hr. normal: 15 - 35%
4 Hr. normal: 5 - 20%