Austin Radiological Association

Nuclear Medicine Procedure

THYROID IMAGING STUDY
(Tc-99m as Sodium Pertechnetate)

Overview

- The Thyroid Imaging Study with Tc-99m-pertechnetate demonstrates the distribution of tissues that take up anions. Such tissues include the thyroid, salivary glands, and stomach.

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 of primary congenital hypothyroidism.

Examination Time

- 1 hour.

Patient Preparation

- The technologist records a pertinent, standard history on the Thyroid Information Sheet (see below).

Equipment & Energy Windows

- Gamma camera: Small or large field of view.
- Collimator: Pinhole with 5 mm aperture.
- Energy windows: 20% window centered at 140 keV.

Radiopharmaceutical, Dose, & Technique of Administration

- Radiopharmaceutical: Tc-99m as sodium pertechnetate.
- Dose: 10 mCi (370 MBq). Pedi dose by NACG chart.
- Technique of administration: Standard intravenous injection.

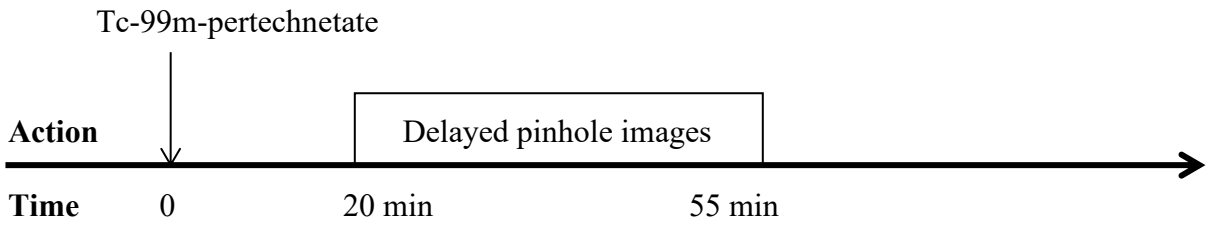
Patient Position & Imaging Field

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

Acquisition Protocol

- Begin imaging 20 minutes following injection 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

- Follow up I-123 study for functioning nodules: If 1 or 2 functioning nodules are identified, a repeat study with radioactive iodine should be performed since some thyroid cancers concentrate Tc-99m-pertechnetate, but not radioactive iodine.

- SPECT imaging: SPECT imaging of the thyroid may be performed.

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 - Tc-99m

- Physical half-life = 6.01 hours.

Radiation	Mean % per disintegration	Mean energy (keV)
Gamma-2	89.07	140.5

Dosimetry - Tc-99m-Pertechnetate as Sodium Pertechnetate

Organ	rads/5 mCi	mGy/185 MBq
Thyroid	0.65	6.5
Large intestine	0.60	6.0
Bladder wall	0.43	4.3
Stomach	0.26	2.6
Ovaries	0.15	1.5
Whole body	0.06	0.6
Testes	0.05	0.5
Red marrow	0.01	0.1

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: _____