Austin Radiological Association
Nuclear Medicine Procedure

DaTscan
(I-123 Ioflupane)

Overview

- DaTscan is a radiopharmaceutical indicated for striatal dopamine transporter visualization using single photon emission computed tomography (SPECT) brain imaging to assist in the evaluation of adult patients with suspected Parkinsonian syndromes (PS). In these patients, DaTscan may be used to help differentiate essential tremor from tremor due to PS.

Indications

- Differentiate essential tremor from tremor due to presynaptic Parkinsonian syndromes, which include Parkinson's disease, multiple system atrophy, and progressive supranuclear palsy.

Contraindications

- Pregnancy
- Iodine allergy

Examination Time

- Initially: 15 minutes for administration of thyroid blocking agent. 130 mg potassium iodide tablet (IOSAT) or SSKI solution. Optional: 400 mg Potassium Perchlorate if true iodine allergy (if available).
- Minimum one (1) hour later: 15 minutes for 3-6 mCi DaTscan injection
- Delayed images at minimum 3 hours: for approximately 30-45 minutes.

Patient Preparation

- Arrive 90 minutes prior to injection for thyroid blockade

Off:

- Ephedrine, ketamine, isoflurane, codeine, phencyclidine 1 day
- Cocaine 1 - 2 days
- Phentermine 1 - 5 days
- Amphetamine, dexamphetamine, methamphetamine, methylphenidate, dexmethylphenidate 1 - 7 days
- Fentanyl 2 - 5 days
- Mazindol, modafinil, armodafinil 3 days
- Haloperidol 5 days
- Bupropion 5 – 8 days

Equipment & Energy Windows

- Gamma camera: Large field of view dual-head e.cam or Symbia
- Collimator:
  - Low energy high resolution, parallel hole.
- Energy window:
  - 20% window centered at 159 keV.

Radiopharmaceutical, Dose, & Technique of Administration

- Radiopharmaceutical:
  - I-123 DaTscan (Ioflupane)
- Dose:
  - 3 - 6 mCi (111 - 222 MBq).
- Technique of administration: Intravenous injection over 20 - 30 seconds into placed in-dwelling I.V. catheter

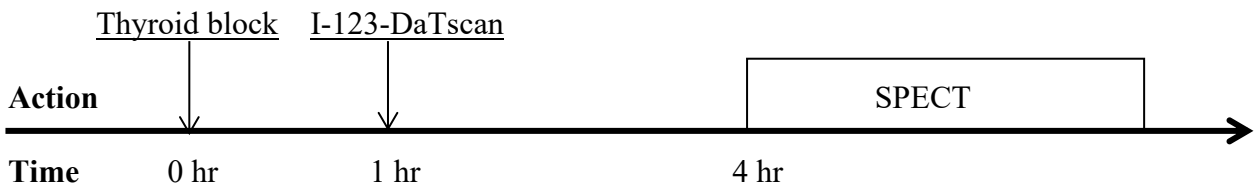
Patient Position & Imaging Field

- Patient position: Supine. Headrest MUST be used, with special attention to no tilt or rotation. Camera heads are placed as close as possible, with the nose typically being the limiting factor.
- Imaging field: Head.

Acquisition Protocol

- I-123: SPECT image are acquired at 3 hours post injection with dual-head camera:
  1. Degrees of rotation: 180°.
  2. Number of images: 60 per head
  3. Time per image: 30 seconds / azimuth 1.5M counts for optimal images
     Count rate 0.7 Kcts/sec – 1.1 Kcts/sec

Protocol Summary Diagram



Data Processing

- SPECT images in transaxial plane, note detector radius and 1st image counts
- DaTQUANT program for quantitative analysis

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 Ioflupane

Organ / Tissue	**Absorbed dose per unit administered activity (uGy/MBq)**
Adrenals	12.9
Brain	17.8
Striata	230.0
Breasts	7.8
Esophagus	10.0
Gallbladder Wall	26.4
Stomach Wall	11.2
Small Intestine Wall	21.2
Colon Wall	39.8
Kidneys	10.9
Liver	27.9
Lungs	41.2
Osteogenic Cells	28.2
Ovaries	16.8
Pancreas	13.0
Spleen	10.4
Testes	8.5
Thyroid	9.0
Urinary Bladder Wall	53.1
Uterus	16.1
Total Body	11.3
Effective Dose per unit - administered activity uSv/MBq	21.3

The Effective dose resulting from a DaTscan with an administered activity of 185 MBq (5mCi) is 3.94 mSv in an adult.