

Brain DaTscan® (I-123 Ioflupane) SPECT

Special Instructions	<p>Before scheduling this patient for the examination, confirm the necessity and indication with the attending radiologist.</p> <p><u>Contact the ordering provider at the time of scheduling to determine:</u></p> <ol style="list-style-type: none">1) Whether the patient is taking any of the interfering medications (see addendum below for medication list), and, if so, whether these can be stopped.2) Whether the patient can/should be prescribed a short-acting benzodiazepine such as diazepam (Valium®) to help him/her hold still for the entire 30-45 minute imaging. The camera will move very close to the patient's face, and thus any patients with possible claustrophobia or difficulties holding still should be prescribed a benzodiazepine by the ordering provider for the imaging unless medically contraindicated.3) Whether the patient has moderate or severe hepatic or renal dysfunction. <p><u>Before ordering the dose, contact the patient to confirm:</u></p> <ol style="list-style-type: none">1) Appointment date/time.2) That they have stopped or will stop interfering medications per their provider's instructions. See list of interfering medications and duration of cessation in the addendum below. The patient should bring their medication list to the imaging test.3) That they will bring benzodiazepines (anti-anxiety medication) to take at the time of the procedure, if prescribed by their provider. **If benzodiazepines have been prescribed, confirm that another person will come with the patient to drive them home after the imaging.** <p>To be performed at UNMH only.</p>
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Radiopharmaceutical: I-123 ioflupane (DaTscan®) (I-123 FP-CIT)

Dose (Adult/Pediatric): Refer to Nuclear Medicine Dose Chart

Route of Administration: Intravenous for I-123 ioflupane
Oral for SSKI

Contraindications: See Addendum.

Patient Preparation: The technologist should review the pre-procedure checklist with the patient/caregiver, to be scanned in as an attachment on PACS. This includes interfering medications and duration of time stopped; medical history/medication list; and possible side effects of DaTScan®. See separate checklist.

Pre-treat with 1 drop of SSKI orally at least one hour prior to radiopharmaceutical administration. Avoid the use of any of these products in patients with known sensitivities. Even in the absence of a blocking agent, the radiation dose to the thyroid would be low.

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Equipment Setup: Collimator: Low-energy, High Resolution
SPECT-CT/Evo: **Select “Brain Datscan” protocol**
Radius of rotation: 13.0 cm (14-cm CT headrest)
Energy window: 159 keV, 15%
Projection angles: 120 over 360°
Image matrix: 128×128, zoom 1.23 (~3.89 mm)
Time per projection: 30 sec
FBP, 2-D Butterworth prefilter, power factor 8, cutoff 0.6
<http://us.datscan.com/imagers/imaging-protocols/camera-specific-parameters/> (Siemens Symbia Dual Head)

Patient Positioning: Head first, supine

The patient must be positioned so that he/she will be able to remain motionless for the SPECT acquisition. Arm boards, positioning wedges, and support straps must be effectively used to eliminate patient discomfort. The patient should be positioned as far as possible toward the narrow head-holder portion of the table. The patient’s head rests in a cushioned plastic head holder and is positioned as symmetrically as possible.

Every effort should be made to achieve the 13 cm patient-to-detector distance for the SPECT acquisition. To accomplish this, the patient should be positioned as far as possible toward the narrow head-holder end of the table. The detectors should be positioned so the lower portion of the brain is just barely included in the field of view. Rotate the detectors around the patient’s head to verify that the scanner orbit does not cause the detectors to collide with the shoulders (note that, during acquisition, the camera will automatically step out about 1 cm from the marked positions; thus it is appropriate to move the detectors quite close to the patient for marking of the orbit.)

Procedure:

1. When patient arrives, explain the procedure to the patient. Follow the pre-procedure checklist to review medications that should have been stopped, obtain relevant medical history and medication list, and discuss possible side effects of the test.
2. Administer SSKI (1 drop) orally and instruct the patient to return one hour later for the I-123 ioflupane (DatScan®) injection. Avoid the use of any of these products in patients with known sensitivities. Even in the absence of a blocking agent, the radiation dose to the thyroid would be low.
3. One hour post SSKI: Initiate IV access and confirm patency with at least 10 mL of saline. Slowly administer the I-123 ioflupane intravenously over 20-30 seconds and follow with a normal saline flush.
4. The patient should remain in the nuclear medicine waiting room for 30

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minutes post injection for any signs of immediate adverse reactions.

To report suspected adverse reactions, inform the attending radiologist, who can contact GE Healthcare at 800-654-0118 or the FDA at 800-332-1088.

5. After 30 minutes, remove the IV. The patient can leave but must return **3 hours post-injection** for images. (Note: Imaging window is 3 to 6 hours. Imaging at 3 hours will allow patient to be re-imaged if original imaging has any positioning problems, motion, etc.)

6. If sedation is required, have the patient take it after the tracer injection, prior to SPECT imaging.

Sedation instructions as follows: If a patient is not able to remain still, and if the referring physician and patient or patient's legal representative agree, the patient's provider may prescribe sedation with short-acting benzodiazepines to be used during the scan (will not affect scan quality). If sedation is used and the patient traveled to the hospital by car, there should be an accompanying person to drive the patient home.

7. Patients should be encouraged to void before scanning to avoid disturbance during image acquisition.

8. After positioning the patient appropriately (per positioning instructions above), acquired the SPECT (and low-dose CT images if on the SPECT-CT). If there is any question of patient motion during the scan, check the images with the radiologist before releasing the patient.

Processing:

Process CT in soft tissue (B30) and bone (B60) algorithm

Must have attenuation corrected and non attenuation corrected SPECT tomo files

Items Required For Complete Study:

- Processing and transfer of all images to PACS and Leonardo
 - SPECT-CT: Attenuation Corrected and Non Attenuation Corrected Tomo Reconstructions, CT (B30 and B60) to both; label with imaged region (e.g., Brain Tomo Recon – AC)
- Complete the examination in RIS

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Addendum: Indications, Contraindications, and Patient Screening

Clinical Indications: *(adapted from SNMMI guidelines 2012)*

1. Differentiation of essential tremor from tremor due to presynaptic Parkinsonian syndromes, which include Parkinson's disease, multiple system atrophy, and progressive supranuclear palsy.
2. Differentiation of presynaptic Parkinsonian syndromes from parkinsonism without presynaptic dopaminergic loss, such as drug-induced parkinsonism or psychogenic parkinsonism.
3. Differentiation of dementia with Lewy bodies from Alzheimer's disease.

Contraindications: *(adapted from SNMMI guidelines 2012)*

1. Pregnancy.
2. Inability to cooperate with SPECT or SPECT/CT brain imaging.
3. A known hypersensitivity to the active substance or to any of its excipients. An iodine allergy is, however, not a contraindication to receiving this tracer.
4. Breastfeeding is a relative contraindication; it is not known if 123I-ioflupane is excreted into human milk. For caution, if the test remains indicated, nursing women may consider pumping and discarding breast milk for at least 1 d and perhaps up to 6 d after tracer administration.
5. This test is also not approved for pediatric patients.

Relative Contraindications: *(adapted from DaTscan® prescribing information, 9/2015):*

The effect of renal or hepatic impairment upon DaTscan imaging has not been established. DaTscan is excreted by the kidney and patients with severe renal impairment may have increased radiation exposure and altered DaTscan images.

Screening for Medication Interactions: *(adapted from SNMMI guidelines 2012)*

- A. The following medications should NOT be discontinued:
- Selective serotonin reuptake inhibitors may increase binding to DaT somewhat but should not interfere with visual interpretation.
 - Cholinesterase inhibitors and neuroleptics probably do not interfere significantly with 123I-ioflupane binding to DaT.
 - Anti-Parkinsonian drugs (e.g., L-dihydroxyphenylalanine, dopamine agonists, monoamine oxidase B inhibitors, N-methyl-D-aspartate receptor blockers, amantadine, and catechol-O-methyltransferase inhibitors in standard dosages) do not interfere with 123I-ioflupane binding to DaT to any significant degree.
- B. The following medications should be discontinued:
- Cocaine, amphetamines, and methylphenidate severely decrease 123I-ioflupane binding to DaT.
 - The central nervous system stimulants ephedrine and phentermine, particularly when used as tablets, may decrease 123I-ioflupane binding.
 - Bupropion, fentanyl, and some anesthetics (ketamine, phencyclidine, and isoflurane) may decrease 123I-ioflupane binding to DaT.

Drugs	Days to be stopped before test
Amphetamine	7

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Amphebutamone	8
Benzatropine	5
Bupropion	8
Cocaine	2
Dexamphetamine	7
Ephedrine and Pseudoephedrine	1
Mazindol	3
Methlyamphetamine	3
Methylphenidate	2
Modafinil	3
Phentermine	14
<i>Adapted from Kagi et al., The Role of DAT-SPECT in movement disorders. J Neurol Neurosurg Psychiatry. 2010;81:5-12.)</i>	

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