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Subject: Dopamine Transporter Imaging with Single-Photon Emission Computed Tomography

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Position Statement	Billing/Coding	Reimbursement	Program Exceptions	Definitions	Related Guidelines
Other	References	Updates			

DESCRIPTION:

Dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT), using radiopharmaceutical ioflupane (¹²³I) injection, is a neuro-imaging modality being evaluated to improve the differential diagnosis of parkinsonian syndromes.

Dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT) is based on the selective affinity of dopamine transporter ligands for dopamine synthesizing neurons, which allows visualization of deficits in the nigrostriatal dopaminergic pathway.

Dopamine transporter ligands include iodine 123 2β-carbomethoxy-3β-(4-iodophenyl) tropane (123I-β-CIT), which is a cocaine analogue with affinity for both dopamine transporter and serotonin transporters. Intravenous 123I-β-CIT requires a delay between injection and scan of about 24 hours. Iodine 123 N-(3-fluoropropyl)-2β-carbomethoxy-3β-(4-iodophenyl)nortropane (123I-FP-CIT) is a fluoropropyl derivate of β-CIT that is selective for brain striatal dopamine transporter, but can also bind to the serotonin transporter. Intravenous 123I-FP-CIT can be injected 3 to 6 hours before the scan (DaTscan). Other ligands with affinity for dopamine transporter include technetium 99m (2β((N,N-bis(2-mercaptoethyl) ethylene diamino)methyl) and 3β-(4-chlorophenyl) tropane (99mTc-TRODAT-1).

Binding of ligands with affinity and specificity for dopamine transporter ligands in the striatum is, in general, reduced in Parkinson disease (PD), genetic parkinsonism, dementia with Lewy bodies (DLB), corticobasal degeneration, progressive supranuclear palsy, and multiple system atrophy. In contrast, striatal DaT ligand binding is expected to be within the normal range in Alzheimer disease, essential tremor, dystonic tremor, orthostatic tremor, drug-induced parkinsonism, psychogenic parkinsonism, and vascular parkinsonism.

Visualization of striatal dopamine transporter binding, through DaT-SPECT, permits assessment of presynaptic dopaminergic deficit. It is proposed that an abnormal DaT-SPECT scan supports the diagnosis of PD, DLB, or other neurodegenerative parkinsonian syndrome, while a normal DaT-SPECT scan in a symptomatic patient supports the diagnosis of a disease not affecting the nigrostriatal dopaminergic pathway. There are, however, a significant percentage of patients with clinically diagnosed PD who do not show reduced DaT-SPECT binding. Patients with clinically diagnosed PD, who present with a normal DaT-SPECT scan, are referred to in the literature as “scans without evidence of dopaminergic deficit” (SWEDD). While many of these patients are ultimately diagnosed with non-PD syndromes, a portion of patients with normal DaT-SPECT imaging are confirmed to have PD by the reference standard. Additional research may shed light on these cases.

Analysis of DaT-SPECT images can be visual, semiquantitative, or quantitative. Because patients typically do not become symptomatic before a substantial number of striatal synapses have degenerated, visual interpretation of the scan is thought to be sufficient for clinical evaluation. A variety of methods are being tested to improve the validity and reliability of ratings, including commercially available software to define the region of interest for analysis and the development of an atlas for visual interpretation.

In 2011, the FDA approved [¹²³I]ioflupane ([¹²³I]-fluoropropyl βCIT), a dopamine transporter (DAT) radioligand, for SPECT. DaTscan (Ioflupane I 123 Injection) 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 (idiopathic Parkinson's disease, multiple system atrophy and progressive supranuclear palsy). DaTscan is an adjunct to other diagnostic evaluations.

POSITION STATEMENT:

Dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT) **meets the definition of medical necessity** when used for members with the following:

- Clinically uncertain Parkinson disease; **OR**
- Clinically uncertain dementia with Lewy bodies.

Dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT) for all other indications, including but not limited to monitoring of disease progression is considered **experimental or investigational**. The evidence is insufficient to determine the effects of dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT) on health outcomes.

BILLING/CODING INFORMATION:

CPT Coding:

There is no specific CPT code for dopamine transporter imaging.

HCPCS Coding:

A9584	Iodine I-123 ioflupane, diagnostic, per study dose, up to 5 millicuries
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ICD-10 Diagnosis Codes That Support Medical Necessity:

G20	Parkinson's disease
G21.0-G21.9	Secondary parkinsonism
G31.83	Dementia with Lewy bodies

REIMBURSEMENT INFORMATION:

Refer to section entitled [POSITION STATEMENT](#).

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products: No National Coverage Determination (NCD) and/or Local Coverage Determination (LCD) was found at the time of the last guideline reviewed date.

DEFINITIONS:

Parkinsonian syndromes: a group of movement disorders characterized by tremor, bradykinesia, and rigidity.

RELATED GUIDELINES:

[FDG-SPECT, 04-78000-15](#)

OTHER:

Other names used to report Dopamine transporter imaging with single-photon emission computed tomography (DaT-SPECT):

Note: The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

DaT neuroimaging

DaTscan

DAT-SPECT

DaT SPECT scan

Dopaminergic neuroimaging

Dopamine transporter imaging

Dopamine transporter (DaT) scan

Dopamine transporter scan (DaTSCAN)

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COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 12/7/23.

GUIDELINE UPDATEINFORMATION:

02/15/18	New Medical Coverage Guideline.
11/15/18	Review; no change to position statement, Updated references.
12/15/18	Revision; added position statement for clinically uncertain Parkinson disease and clinically uncertain dementia with Lewy bodies. Revised experimental investigational position statement. Added diagnoses codes (G20, G21.0-G21.9, G31.83). Updated references.

12/15/20	Review/revision; no change to position statement. Deleted code 78607. Updated references.
12/15/21	Review; no change to position statement. Updated references.
12/15/23	Review; no change to position statement. Updated references.