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CADTH Reference List

DaTscan for Diagnosing Movement Disorders

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Summary of Abstracts

CADTH

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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Key Messages

- No evidence was identified regarding the cost-effectiveness of DaTscan for the diagnosis of movement disorders.
- Two evidence-based guidelines were identified regarding the use of DaTscan for the diagnosis of movement disorders.

Research Questions

1. What is the cost-effectiveness of DaTscan for the diagnosis of movement disorders?
2. What are the evidence-based guidelines regarding the use of DaTscan for the diagnosis of movement disorders?

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concept was DaTscan. No filters were applied to limit the retrieval by study type. When possible, retrieval was limited to the human population. The search was also limited to English-language documents published between January 1, 2016, and August 10, 2021. Internet links were provided, if available.

Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open-access full-text versions of evidence-based guidelines were reviewed when abstracts were not available, and relevant recommendations were summarized.

Results

Two evidence-based guidelines regarding the use of DaTscan for the diagnosis of movement disorders were identified.[1,2] No relevant health technology assessments, systematic reviews, or economic evaluations were identified.

Table 1: Selection Criteria

Criteria	Description
Population	Patients with a suspected movement disorder (i.e., disorders associated with dopaminergic neurodegeneration, such as Parkinson disease, multiple system atrophy, or progressive supranuclear palsy)
Intervention	DaTscan (dopamine transporter scan)
Comparator	Q1: Standard clinical assessment (e.g., MRI or CT and clinical assessment) Q2: Not applicable
Outcomes	Q1: Cost-effectiveness (e.g., quality-adjusted life-years/cost, incremental cost-effectiveness ratios) Q2: Recommendations regarding the use of DaTscan for diagnosis of movement disorders
Study designs	Health technology assessments, systematic reviews, economic evaluations, evidence-based guidelines

DaTscan = dopamine transporter scan.

Additional references of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

Overall Summary of Findings

Two evidence-based guidelines regarding the use of DaTscan for the diagnosis of movement disorders were identified.[1,2] The Canadian guideline for Parkinson disease recommends that 123-ioflupane (DaTscan) be used with single-photon emission computed tomography (SPECT) scanning (^{123}I-FP-CIT SPECT) to aid clinical diagnosis in patients when there is uncertainty between Parkinson disease and nondegenerative parkinsonism or tremor disorders.[1] The National Institute for Clinical Excellence (NICE) guideline recommends that ^{123}I-FP-CIT SPECT be used for people with tremor if essential tremor cannot be clinically differentiated from parkinsonism.[2] NICE also recommends that ^{123}I-FP-CIT SPECT should be available for specialists with expertise in its use and interpretation.[2]

No relevant literature was found regarding the cost-effectiveness of DaTscan for the diagnosis of movement disorders; therefore, no summary can be provided.

References

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-Analyses

No literature identified.

Economic Evaluations

No literature identified.

Guidelines and Recommendations

1. Grimes D, Fitzpatrick M, Gordon J, et al. Canadian guideline for Parkinson disease. *CMAJ*. 2019 09;191(36): E989-E1004. https://www.cmaj.ca/content/191/36/E989 Accessed 2021 Aug 12.
   See: Table 2: Summary of recommendations for diagnosis and progression – Recommendation number C17.
2. National Institute for Health and Care Excellence. Parkinson's disease in adults. *(NICE guideline NG71)* 2017; https://www.nice.org.uk/guidance/ng71 Accessed 2021 Aug 12.
   See: 1.2 Diagnosing Parkinson's disease – Single photon emission computed tomography (p.7)

Appendix 1: References of Potential Interest

Economic Evaluations

Budget Impact: Impact of Reimbursement Cuts

3. Covington MF, McMillan NA, Kuo PH. Impact of Reimbursement Cuts on the Sustainability and Accessibility of Dopamine transporter Imaging. *J Am Coll Radiol*. 2016 09;13(9):1039-1043. PubMed

Clinical Practice Guidelines and Recommendations

Unclear Methodology

4. Morbelli S, Esposito G, Arbizu J, et al. EANM practice guideline/SNMMI procedure standard for dopaminergic imaging in Parkinsonian syndromes 1.0. *Eur J Nucl Med Mol Imaging*. 2020 07;47(8):1885-1912. PubMed
5. ACR Committee on Appropriateness Criteria. Movement Disorders and Neurodegenerative Diseases. Reston (VA): American College of Radiology; 2019. https://acsearch.acr.org/docs/3111293/Narrative/ Accessed 2021 Aug 12.
   See: Variant 3: Parkinsonian Syndromes. Initial Imaging – Ioflupane SPECT/CT Brain (p. 2)
6. Grabher BJ. Datscan Imaging. *J Nucl Med Technol*. 2019 03;47(1):27-28. PubMed
7. Subramaniam RM, Frey KA, Hunt CH, et al. ACR-ACNM Practice Parameter for the Performance of Dopamine transporter (DaT) Single Photon Emission Computed Tomography (SPECT) Imaging for Movement Disorders. *Clin Nucl Med*. 2017 11;42(11):847-852. PubMed

Review Articles

8. Akdemir UO, Bora Tokcaer A, Atay LO. Dopamine transporter SPECT imaging in Parkinson's disease and parkinsonian disorders. *Turk J Med Sci*. 2021 04;51(2):400-410. PubMed
9. Thobois S, Prange S, Scheiber C, Broussolle E. What a neurologist should know about PET and SPECT functional imaging for parkinsonism: A practical perspective. *Parkinsonism Relat Disord*. 2019 02;59:93-100. PubMed
10. LaFaver K, Espay AJ. Diagnosis and Treatment of Functional (Psychogenic) Parkinsonism. *Semin Neurol*. 2017 04;37(2):228-232. PubMed
11. Rodriguez-Porcel F, Jamali S, Duker AP, Espay AJ. Dopamine transporter scanning in the evaluation of patients with suspected Parkinsonism: a case-based user's guide. *Expert Rev Neurother*. 2016;16(1):23-29. PubMed

Additional References

12. Galbraith K. Is DaTSCAN cost-effective as a diagnostic tool in uncertain Parkinson's? *Critically Appraised Topics*. London (UK): UK Parkinson's Excellence Network; 2016. https://www.parkinsons.org.uk/sites/default/files/2017-07/RD2734%20DaTCAT%20cost%20effectiveness.pdf Accessed 2021 Aug 12.
    See: Clinical Bottom Line (p. 1)
13. Gomez-Rio M, Caballero MM, Gorriz Saez JM, Minguez-Castellanos A. Diagnosis of Neurodegenerative Diseases: The Clinical Approach. *Curr Alzheimer Res*. 2016;13(5):469-474. PubMed
14. Parkinson's UK. Clinical Summary: Use of DaTSCAN. *Diagnosis of Parkinson's disease: use of presynaptic dopaminergic imaging.* N.d. https://www.parkinsons.org.uk/professionals/clinical-summary-use-datscan Accessed 2021 Aug 12.