



Parkinson's and Movement Disorders Center

2025

Spring Conference

For patients, families, and friends

Inova Conference Center, 2nd floor
8100 Innovation Park Drive
Fairfax, VA 22037

**Saturday,
March 29, 2025**





Speaker:

Abigail Lawler, MD

Movement Disorders Specialist
Autonomics Director

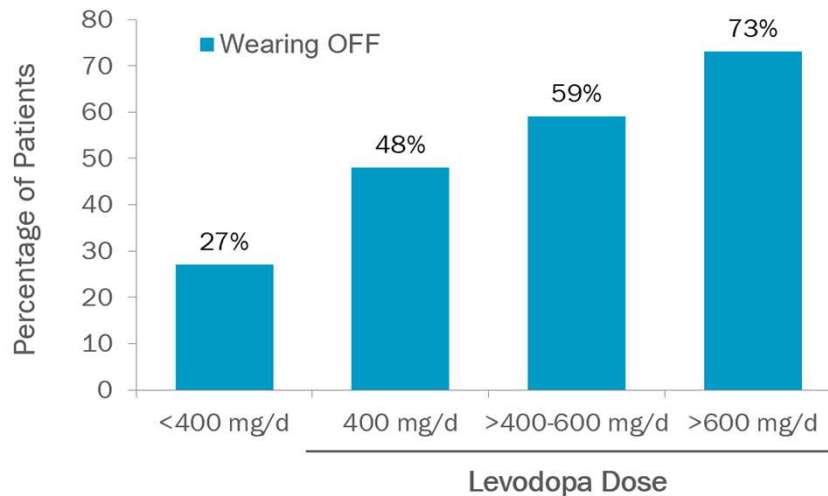
Inova Parkinson's and Movement
Disorders Center (IPMDC)

©2025 Inova. All rights reserved.

What's new in
medications
and targeted
technologies?

Off time is the enemy

- Prevalence of ~25–50% within a period of 2–6 years of initiating carbidopa/levodopa treatment^{1,2}
- In a single-visit pilot study of 151 patients with PD on stable doses of levodopa for ≥4 weeks, 64% reported experiencing motor fluctuations³



Online survey of 3,000+

70% reported 2+ Off episodes a day.

65% reported 2 or more hours a day

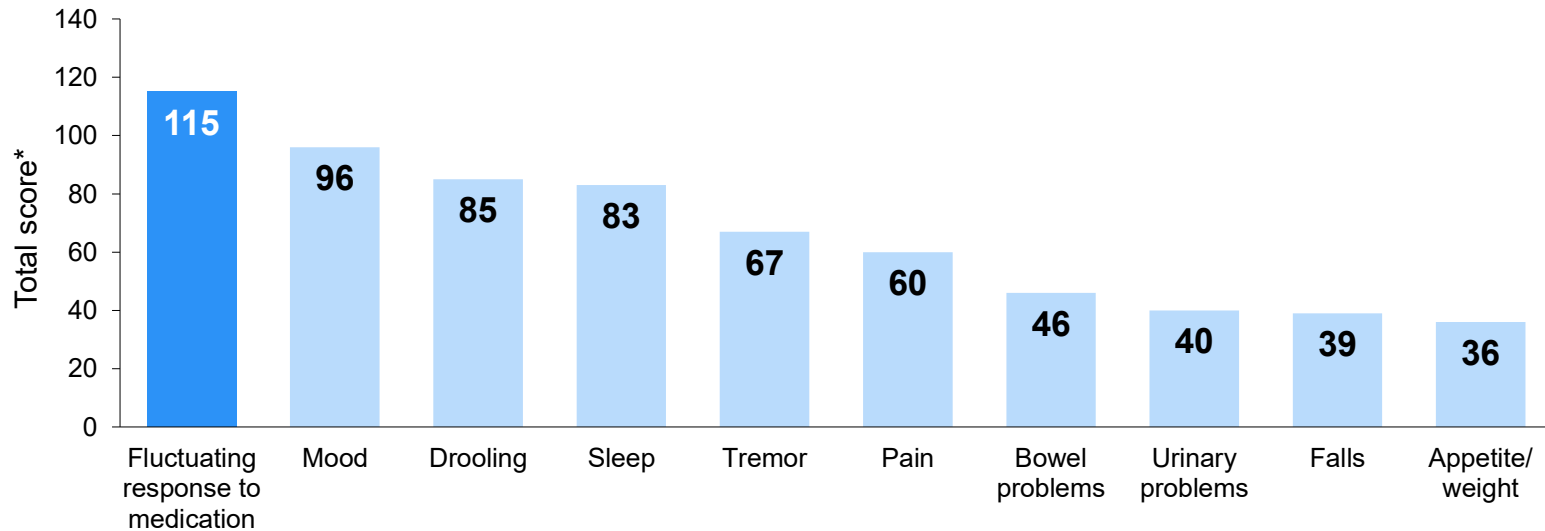
50% – moderate/severe, affected daily activities

1. Chou KL, et al. *Parkinsonism Relat Disord.* 2018;51:9-16. 2. Ahlskog JE, et al. *Mov Disord.* 2001;16:448-458. 3. Stocchi F, et al. *Eur J Neurol.* 2019;26:821-826.

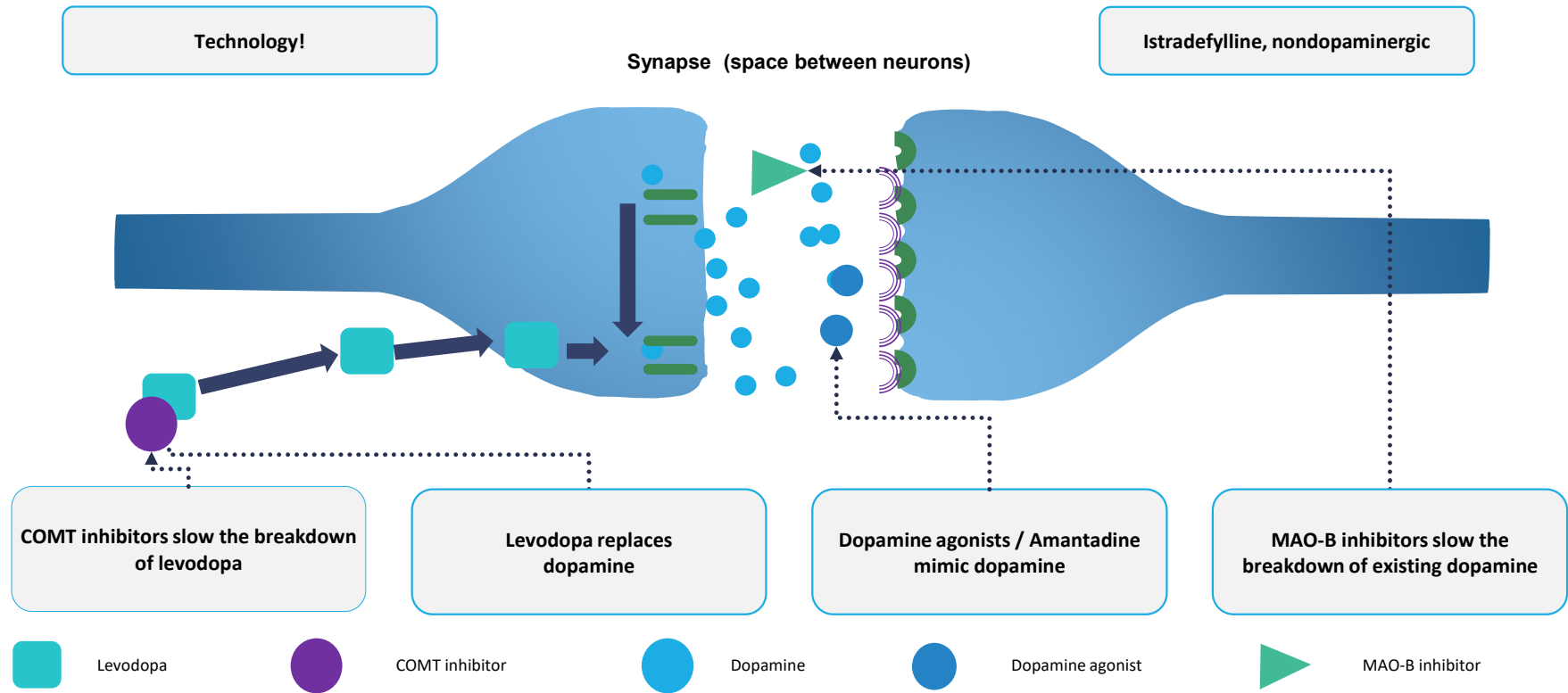
Mantri S, Lepore M, Edison B, Daeschler M, Kopil CM, Marras C, Chahine LM. The Experience of OFF Periods in Parkinson's Disease: Descriptions, Triggers, and Alleviating Factors. *J Patient Cent Res Rev.* 2021 Jul 19;8(3):232-238. doi: 10.17294/2330-0698.1836. PMID: 34322575; Stamford et al. Off-Park Survey Steering Group. *J Parkinsons Dis* 2015;5(3)533-539.

Not just off time, but fluctuations

Ranking of most bothersome PD-related symptoms experienced by patients with more than 6 years disease duration (N=173)



Different avenues of treatment



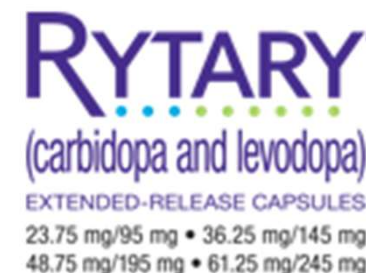
COMT = catechol-O-methyltransferase.
MAO-B = monoamine oxidase-B.

Kalia LV et al. *Lancet*. 2015;386:896–912

©2025 Inova. All rights reserved.

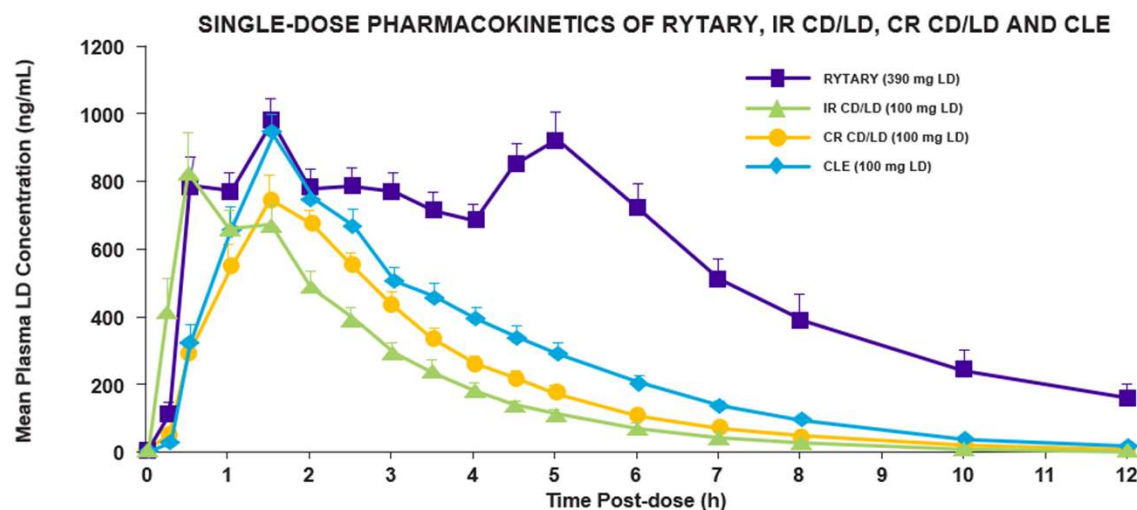
Longer lasting carbidopa/levodopa 2015

Rytary™ (carbidopa/levodopa) Amneal



History of evolution
of levodopa delivery ----->

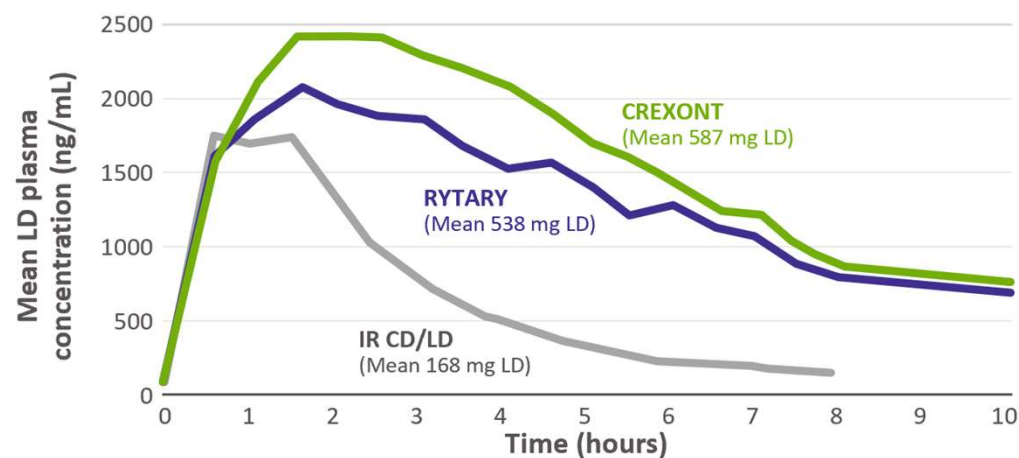
- Equivalent dose of Rytary on average 1.2 more hours of “on time” compared to IR.



Longer lasting carbidopa/levodopa 2024

Crexont™ (carbidopa/levodopa) Amneal

- Capsule/bead formula.
- Adhesive polymer.
- 4.8 hrs above 50% Cmax, 3x daily (avg)
- 1.6 hr longer on time per dose (avg)

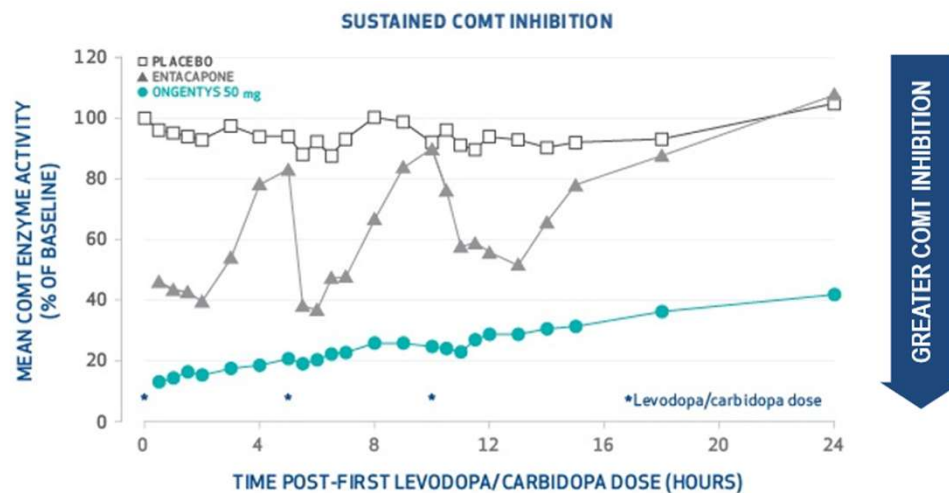


1. Hauser RA et al. *JAMA Neurol.* 2023;80(10):1062-1069.

Maximizing levodopa

Ongentys™ (opicapone) Amneal

- 1x daily peripheral COMT inhibitor
- Significant boost in levodopa availability.
- 1.95 improvement in off time, $\Delta 1.01$ hr

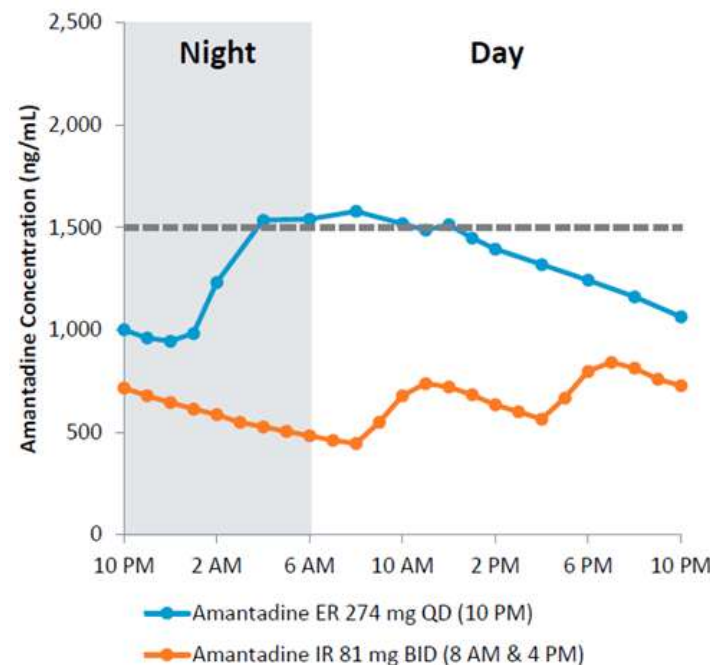


Amantadine, off time + dyskinesia control



Gocovri™ (amantadine ER) Supernus

- 1x daily delayed release, extended release.
- Dyskinesia AND Off Time
- 41% reduction in dyskinesia, 21% reduction in off time (avg) – 45% more good ON time daily.



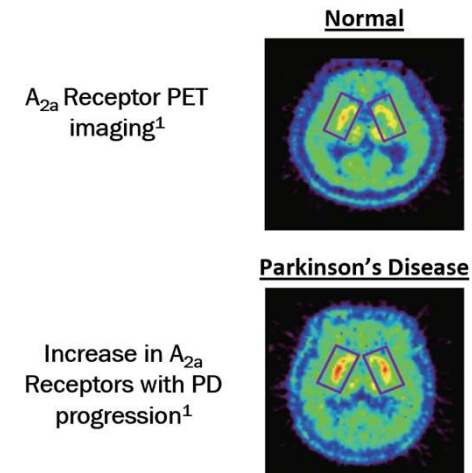
Non-dopaminergic approach

Nourianz™ (istradefylline)



Indicated as adjunctive treatment to levodopa in adult patients with Parkinson's disease (PD) experiencing wearing off phenomena.

- Indirect pathway – adenosine A_{2a} receptor antagonist
- Addition reduced levodopa dose escalation over 37 weeks¹ and 72 months²
- Effective in tremor dominant and postural instability and gait difficulty subtypes (*post hoc*)³.



1.Hatano T et al. Impact of Istradefylline on Levodopa Dose Escalation in Parkinson's Disease: ISTRA ADJUST PD Study, a Multicenter, Open-Label, Randomized, Parallel-Group Controlled Study. *Neurol Ther.* 2024 Apr;13(2):323-338.

2.Hattori N et al. Real-world evidence on levodopa dose escalation in patients with Parkinson's disease treated with istradefylline. *PLoS One.* 2023 Dec 22;18(12):e0269969

3.Torres-Yaghi et al. Istradefylline effects on tremor dominance (TD) and postural instability and gait difficulty (PIGD). *Clin Park Relat Disord.* 2023 Oct 14;9:100224.

Rescue option #1 - Apokyn

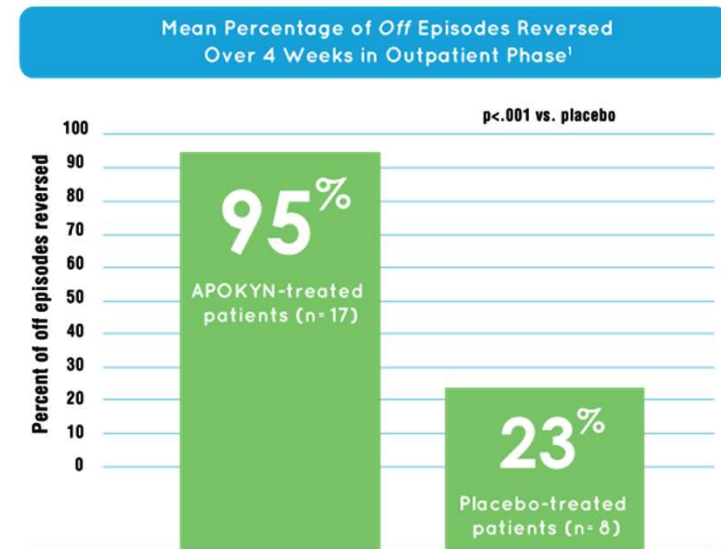
Apokyn™ (apomorphine injection) Supernus

Rapid onset Dopamine Agonist via injection

For different types of OFF episodes:

- Rapid off, wearing off
- Dose failure / unexpected off
- Delayed on
- First AM symptoms or exercise intolerance

Achieve ON within 10-20 minutes



Rescue option #2 - Inbrija

Inbrija™ (levodopa inhalation powder)

Merz



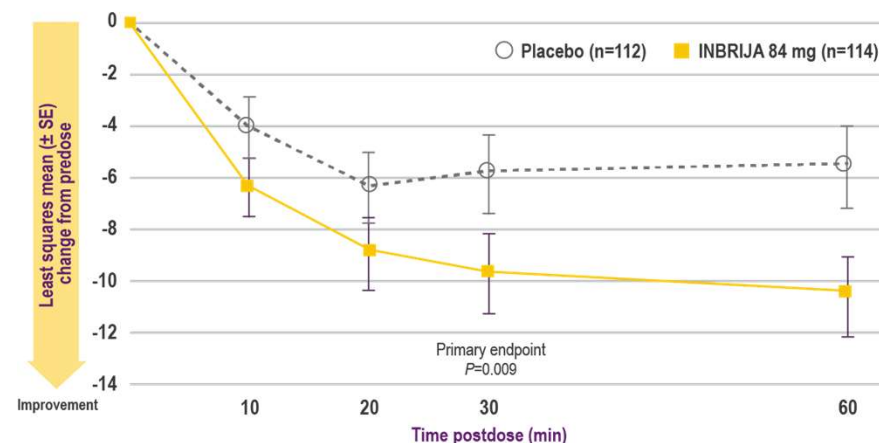
Rapid onset levodopa through inhaler

For different types of OFF episodes:

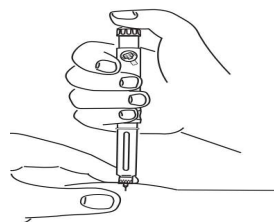
- Rapid off, wearing off
- Dose failure / unexpected off
- Delayed on
- First AM symptoms or exercise intolerance

Achieve ON within 10 minutes,
can take up to 5x daily

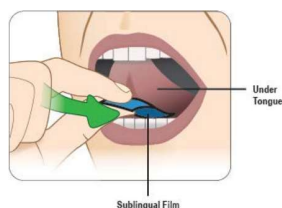
UPDRS Part III Score Change From 0-60 Minutes Postdose at Week 12



As needed / on demand



**20 minutes
post-dose:
-23.9 vs -0.1
($P < 0.001$)¹**



**30 minutes
post-dose:
-11.1 vs -3.5
($P = 0.0002$)²**

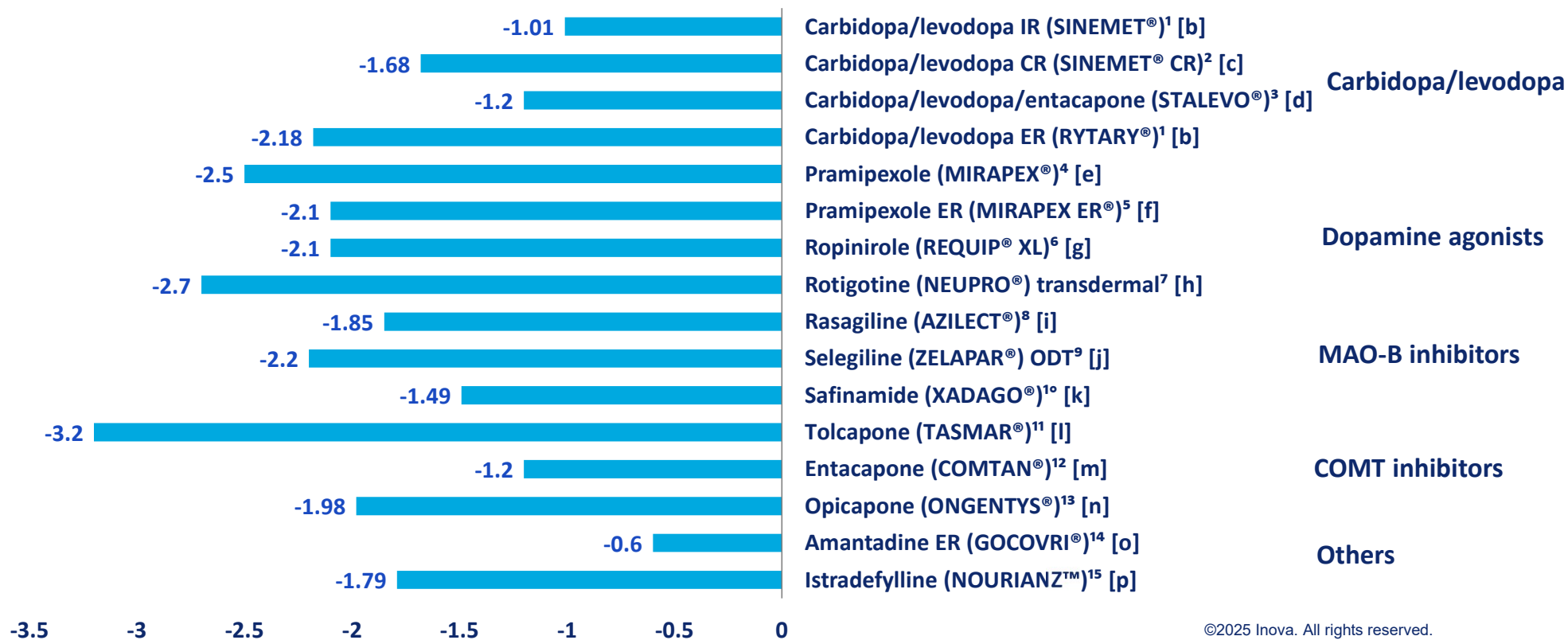


**30 minutes
post-dose:
-9.8 vs -5.9
($P = 0.0088$)³**

1. Dewey RB, Hutton JT, LeWitt PA, Factor SA. A randomized, double-blind, placebo-controlled trial of subcutaneously injected apomorphine for parkinsonian off-state events. Arch Neurol. 2001;58(9):1385-1392. 2. Olanow CW, et al. Lancet Neurol. 2020;19:135-144.

3. LeWitt PA et al; SPAN-PD Study Investigators. Safety and efficacy of CVT-301 (levodopa inhalation powder) on motor function during off periods in patients with Parkinson's disease: a randomized, double-blind, placebo-controlled phase 3 trial. Lancet Neurol. 2019 Feb;18(2):145-154. doi: 10.1016/S1474-4422(18)30405-8.

Summary of OFF time reduction



©2025 Inova. All rights reserved.

Technology – Foslevodopa Pump

Vyalev™ (foscarbidopa/foslevodopa)

Abbvie

- 24 hour subq foslevodopa pump
- 2.72 hr increased ON time
- 83% waking in the ON state, reduced sleep disturbance (36%)
- Replaces oral levodopa
- **Currently available non-Medicare – Medicare later this year.**



Pahwa R, Soileau MJ, Standaert DG, et al. Rapid onset of good ON-time and improvement in motor-state stability in aPD patients after treatment with continuous subcutaneous foslevodopa/foscarbidopa. Poster presented at: The International Congress of Parkinson's Disease and Movement Disorders (MDS); September 15-18, 2022; Madrid, Spain. ©2025 Inova. All rights reserved. 15

Hauser RA, Bergmans B, Malaty I, et al. Effects of continuous subcutaneous infusion of foslevodopa/foscarbidopa on sleep dysfunction in people with Parkinson's. Poster presented at: The American Academy of Neurology 76th Annual Meeting (AAN); April 13-18, 2024; Denver, CO

Technology – Apomorphine Pump

Onapgo™ (apomorphine infusion) Supernus

- Add on subq pump during waking hours
- 2.8+ hr increased ON time
- Added in addition to foundational oral therapies
- Coming April/May 2025

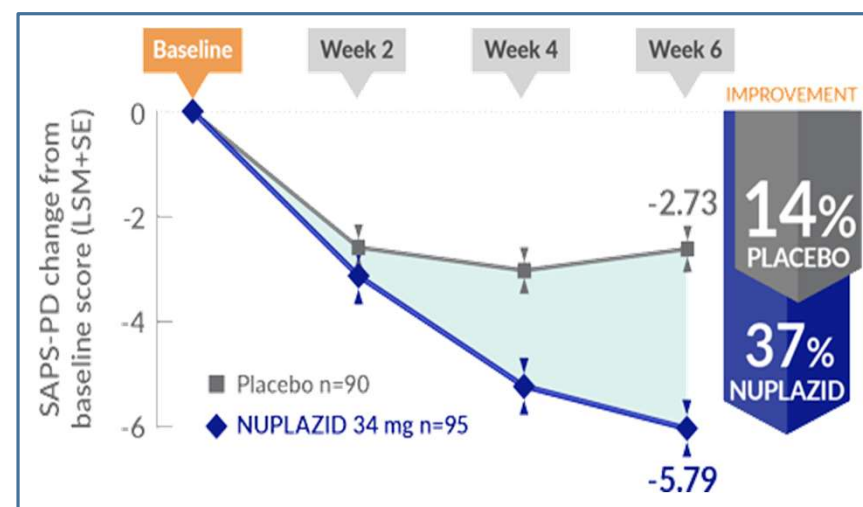


Hallucinations and Psychosis

Nuplazid™ (Pimavanserin) Acadia

- First antipsychotic medication specifically designed for hallucinations and 'psychosis' associated with Parkinson's Dementia and Lewy Body Dementia.
- Serotonin Agonist with no impact on dopamine receptors
- + SAPS-PD improvement with no change in UPDRS
- More effective when prescribed sooner, when hallucinations are beginning.

NUPLAZID™
(pimavanserin) tablets



Timing of Medications

- Very little flexibility in scheduling.
- 4 hours means 4 hours apart.
- Look for lower limit of the window (i.e., No closer than 4 hours apart)

- Timing of protein and meals with meds
- Space tube feedings away from meds



Contraindicated medications

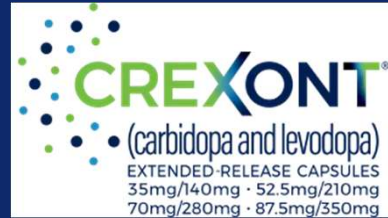
AVOID:

- **haloperidol (Haldol™)** and most neuroleptics
- prochlorperazine (Compazine), metoclopramide (Reglan), promethazine (Phenergan) droperidol (Inapsine)
- Selective MAO B inhibitors, such as rasagiline (Azilect), selegiline (l-deprenyl, Eldepryl), and selegiline HCL oral disintegrating (Zelapar) are contraindicated with commonly prescribed medications such as meperidine (Demerol) and tramadol (Rybix, Ryzolt, Ultram)

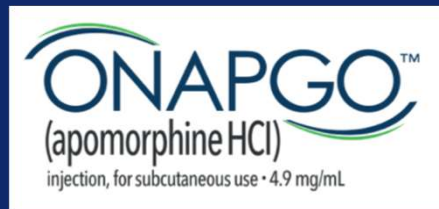
Additional information at: www.ipmdc.org/hospital

CONSIDERED SAFE:

- pimavanserin (Nuplazid)
quetiapine (Seroquel)
clozapine (Clozaril)
- trimethobenzamide (Tigan)
ondansetron (Zofran)
- To avoid potential interactions, it may be appropriate to hold the MAO B inhibitor for 2 weeks prior to surgery and resume when pain is under control. If surgery is imminent, please use alternative medications for pain and check with the pharmacy or our neurologists for other potential drug interactions.



New toolbox and growing



©2025 Inova. All rights reserved.



Parkinson's and Movement Disorders Center



Dopamine Agonist

Carbidopa/Levodopa formulation



MAOB inhibitor

COMT inhibitor



A2a agonists

Amantadine derivatives



Rescue Therapies



What about when the medicines ‘stop working’

- Longer acting medicines
- Complimentary medicines
- Targeted Technologies

Targeted Technology, NOT “Advanced Treatments”

- Botulinum toxin injections
- DUOPA Intestinal Gel Carbidopa/Levodopa
- Vyalev Subcutaneous Pump
- Focused Ultrasound
- Deep Brain Stimulation

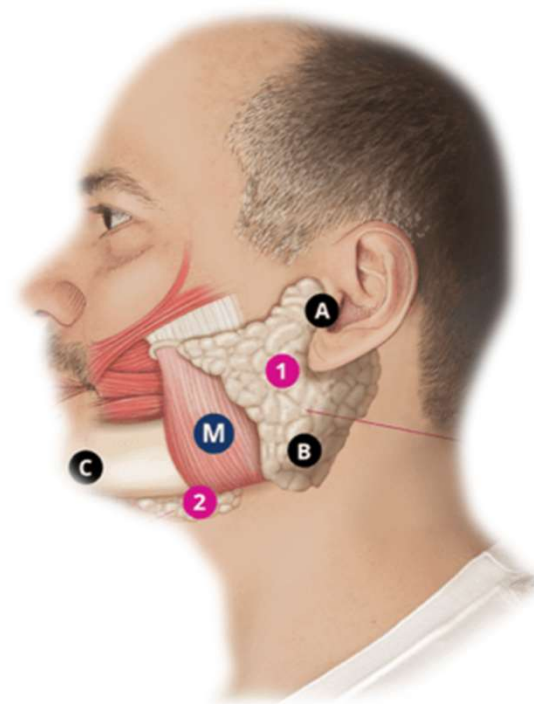


Botulinum Toxin for Chronic Drooling (Sialorrhea)

Botox® - Abbvie



Xeomin® - Merz



Constant Delivery of Levodopa - *New*

Vyalev

Abbvie

- 24 hours of continuous Levodopa-based therapy
- Non-surgical Subcutaneous Pump
- Provides steady delivery of levodopa without the fluctuations of oral medication



VYALEV™

240 mg/mL+12 mg/mL solution for infusion
foslevodopa/foscarbidopa

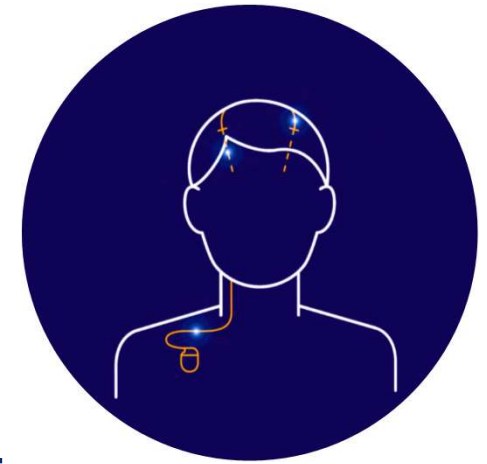
<https://www.vyalev.com/>



Technology – Deep Brain Stimulation

Three companies, different perks

- Recent onset motor complications – 2+ more ON time
- Longer term motor complications – 5+ more ON time
- Significant quality of life improvement and medication reduction



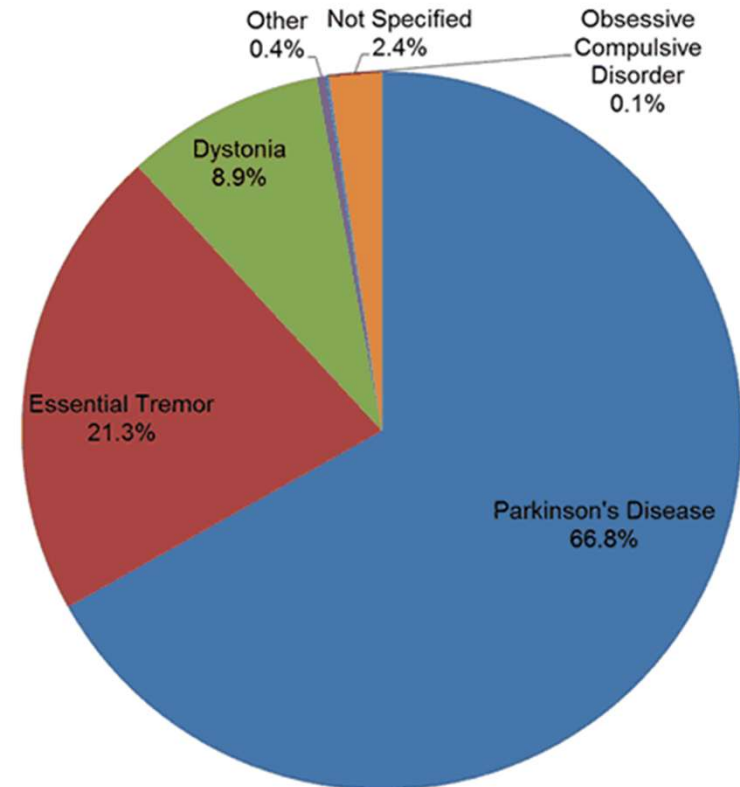
DBS Indications

FDA indicated for:

- Parkinson's Disease
- Essential Tremor
- Dystonia

FDA approval:

- Essential tremor - 1997
- Parkinson's disease - 2002
- Dystonia - 2003



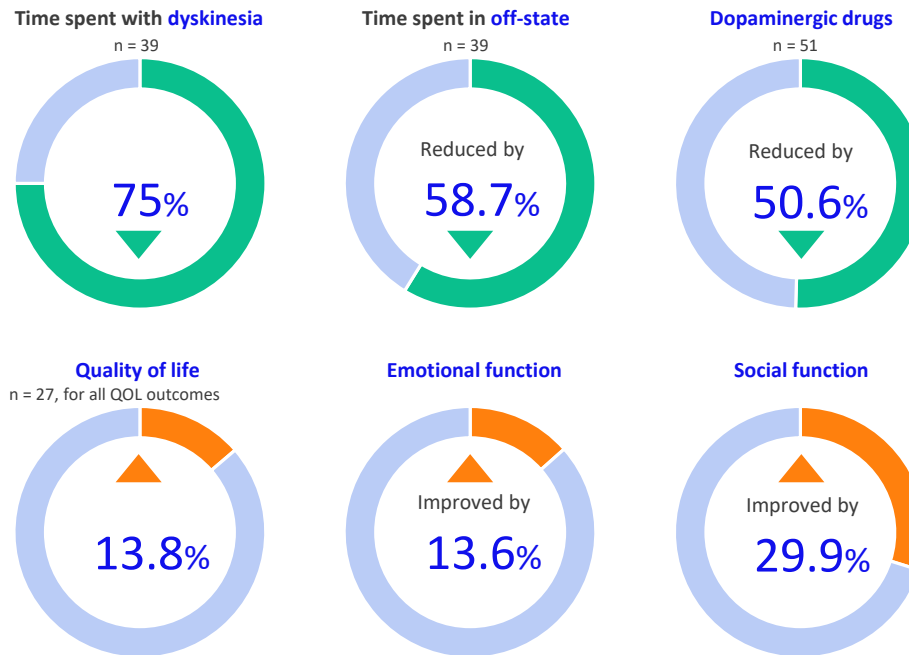
Covered by all insurance providers.

Implantable Systems Performance Registry (ISPR) for deep brain stimulation systems. July 2009 - July 31, 2013.

©2025 Inova. All rights reserved.

Long term effects of deep brain stimulation in PD

- 15 years and beyond after surgery:



An expanding field – pick your fit

- Directional stimulation.
- Remote programming.
- Improved technology and wireless.
- Smaller technology, thinner.
- Longer battery life and rechargeable systems.
- Variety of rechargeable systems.



Technology – Focused Ultrasound

Nonsurgical Lesioning – sustained efficacy?

- Only for tremor
- Outcomes over 16 months:
 - Immediate tremor improvement – 96%
 - Sustained improvement 63%
 - Complete tremor recurrence – 17%



- Stanford University
- Vibratory feedback.
- Has potential to ease symptoms.
- Still early, in trials.



*Illustration by Harry Campbell from
Stanford Medicine Magazine's
'Can Parkinson's Symptoms Be Stopped?'*

To the future!

Nonsurgical Lesioning

- New inhibitors, oral therapies
- Pump-based and sub-cutaneous formulations
- Improved technology
- Targeted protein therapy
- Cure





Parkinson's and
Movement Disorders Center

Contact Us!

To schedule an appointment
please call **571.472.4200**

©2025 Inova. All rights reserved.

Sonia Gow

Program and Community Care Manager

Inova Parkinson's & Movement Disorders Center

Sonia.Gow@inova.org | (703) 375-9987

www.inova.org/move - clinical

www.ipmdc.org – programs and resources

Find us on Facebook! [@InovaMove](https://www.facebook.com/InovaMove)

Subscribe to our weekly e-newsletter!

IPMDC News

www.ipmdc.org/newsletter

Thank you

