



## PARKINSON'S DISEASE

# SPOTLIGHT ON PARKINSON'S DISEASE: WHAT'S NEW IN PD TREATMENT

TUESDAY, SEPTEMBER 22, 2020

DEVELOPED BY: REBECCA GILBERT, MD, PHD  
VICE PRESIDENT, CHIEF SCIENTIFIC OFFICER, APDA

1

## WELCOME AND INTRODUCTIONS



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*Assistant Clinical Professor of Neurology  
Program Director, Parkinson's Disease and Movement Disorders Center  
Boston University Medical Campus (BUMC)  
Coordinator, American Parkinson Disease Association  
Information & Referral Center at BUMC*

2

2



## PRESENTATION



**Marie Saint-Hilaire, MD, FRCPC**  
*Professor of Neurology  
 Medical Director for the Parkinson's Disease and Movement Disorders Program  
 Director, APDA Center for Advanced Research at Boston University  
 Boston University Medical Campus  
 Boston, MA*



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3

## FINANCIAL DISCLOSURES

**Marie Saint-Hilaire, MD, FRCPC**

**Salary & Grant Support:** NIH, PSG, APDA, MJFF, Neuraly

**Honoraria:** Acorda, Watermark

**Speaker's Bureau:** N/A

**Equity & Consulting Agreements:** N/A

**Cathi A. Thomas, MS, RN, CNRN**

**Salary & Grant Support:** APDA, NIH

**Honoraria:** Acorda

**Speaker's Bureau:** N/A

**Equity & Consulting Agreements:** N/A

4



## OUTLINE

- Quick overview of Current Treatments
- Treatment Highlights & Recent Developments in medical and surgical therapies

5

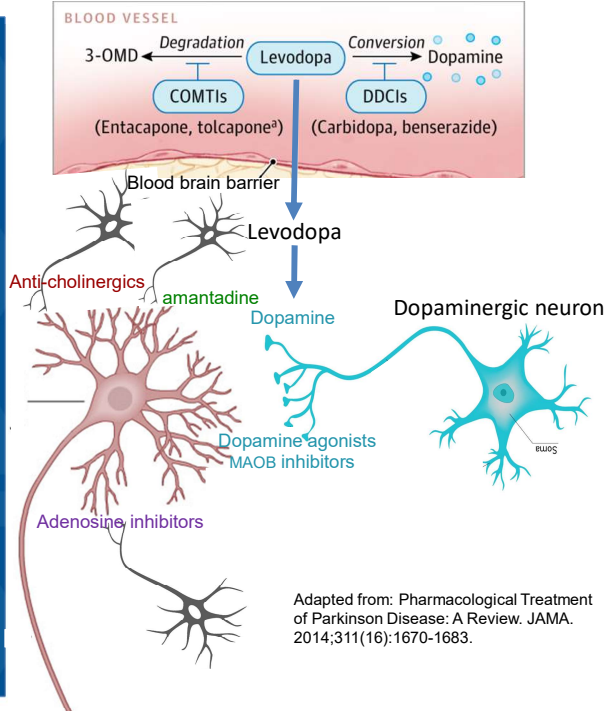
# PARKINSON'S DISEASE: OVERVIEW OF CURRENT TREATMENTS

6



## AVAILABLE PHARMACOLOGIC TREATMENTS FOR MOTOR SYMPTOMS:

- Levodopa formulations
- Dopamine agonists (pramipexole, ropinirole, rotigotine)
- MAOB inhibitors (selegiline, rasagiline, safinamide)
- COMT inhibitors (entacapone, tolcapone)
- Amantadine, amantadine ER
- Anticholinergics
- Adenosine inhibitors



7

## TREATMENTS FOR MOTOR SYMPTOMS OF PARKINSON'S DISEASE

Drug Category	Generic Name	Brand Name
Dopamine precursor	Carbidopa/levodopa	Sinemet
	Carbidopa/levodopa extended release	N/A (generic only)
	Carbidopa/levodopa orally disintegrating	Parcopa
	Carbidopa/levodopa extended release capsules	<b>Rytary</b>
	Levodopa carbidopa intestinal gel	<b>Duopa</b>
	Levodopa inhalation powder	<b>Inbrija</b>
COMT inhibitor	Entacapone	Comtan
	Tolcapone	Tasmar
	Opicapone	<b>Ongentys</b>
	Carbidopa/levodopa/entacapone	Stalevo

8



## TREATMENTS FOR MOTOR SYMPTOMS OF PARKINSON'S DISEASE

Drug Category	Generic Name	Brand Name
Anti-cholinergic	Trihexyphenidyl	N/A (generic only)
Dopamine agonist	Ropinirole	Requip
	Ropinirole XL	Requip XL
	Pramipexole	Mirapex
	Pramipexole ER	Mirapex ER
	Apomorphine injectable	Apokyn
	Apomorphine sublingual	<b>Kynmobi</b>
	Rotigotine patch	Neupro

9

## TREATMENTS FOR MOTOR SYMPTOMS OF PARKINSON'S DISEASE

Drug Category	Generic Name	Brand Name
Adenosine 2A inhibitor	Istradefylline	<b>Nourianz</b>
MAO-B inhibitor	Selegiline	N/A (generic only)
	Selegiline orally disintegrating	Zelapar
	Rasagiline	Azilect
Mixed mechanism	Amantadine	N/A (generic only)
	Amantadine extended release	<b>Gocovri</b>
	Amantadine extended release	<b>Osmolex ER</b>
	Safinamide	<b>Xadago</b>

10



## TREATMENTS FOR NON MOTOR SYMPTOMS OF PARKINSON'S DISEASE

Symptom Treated	Drug Category	Generic Name	Brand Name
Parkinson's disease psychosis	Inverse serotonin agonist	Pimavanserin	Nuplazid®
Neurogenic orthostatic hypotension	Norepinephrine precursor	Droxidopa	Northera®
Parkinson's disease dementia	Acetylcholinesterase inhibitor	Rivastigmine	Exelon®

11

## PARKINSON'S DISEASE: TREATMENT HIGHLIGHTS & RECENT DEVELOPMENTS

12



## RYTARY® - CARBIDOPA/LEVODOPA EXTENDED-RELEASE CAPSULES

### What is it?

- A Carbidopa/levodopa formulation
- Contains both immediate release and extended release beads
- Different sized beads dissolve at different rates
- Allows a more prolonged release of the medication from the stomach
- Capsules can be opened and added to food without losing their extended release properties

### What doses are available?

- Four carbidopa/levodopa strengths are available:
  - 23.75/95, 36.25/145, 48.75/195, 61.25/245
- Three capsules, three to four times a day



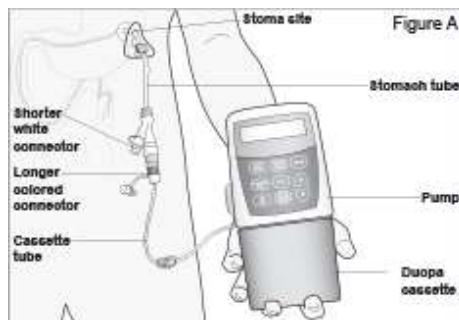
Each capsule contains both:

- Immediate-release beads.
- Extended-release beads.<sup>2</sup>

<http://rytaryhcp.com/what-is-rytary>

13

## DUOPA® - CARBIDOPA/LEVODOPA ENTERAL SUSPENSION



- Carbidopa/levodopa enteral suspension 16 hrs/day
- A tube is surgically inserted into the small intestine and connected to a pump which continuously infuses the medication directly into the gut
- Issues can arise with the surgically-inserted tubing such as infection of the insertion site.
- Can be programmed to deliver a wide range of infusion rates as well as boluses as needed.

14



## INBRIJA™ - LEVODOPA INHALATION POWDER

**What is it?** Levodopa inhalation powder is used when needed for OFF episodes in adults with Parkinson's treated with regular carbidopa/levodopa medicine.

Dose is taken by patient when Parkinson's symptoms start to return. There is absorption of the medication through the lungs.

**What doses are available?** One dose is two 42 mg capsules, with no more than one dose per OFF period, up to 5 times a day



<https://www.acorda.com/products/products/inbrija>

15

## INBRIJA™ - LEVODOPA INHALATION POWDER

**When should I ask my doctor about it?** If your regular dose of carbidopa/levodopa is not lasting until the next scheduled dose or you're experiencing a return of PD symptoms

**Extra notes:** Device can't be preloaded. Levodopa capsules should only be used with the INBRIJA inhaler and must stay in their blister package until immediately before use. Pulmonary absorption bypasses the GI tract.



<https://www.acorda.com/products/products/inbrija>

16





## GOCOVRI® - AMANTADINE EXTENDED-RELEASE

### What is it?

- Amantadine extended-release capsules
- For treating dyskinesias in PD patients treated with levodopa therapy
- Also reduces OFF time
- It is designed to provide an initial lag, a slow rise in amantadine concentration during the night, and a high concentration in the morning and through the waking day

### What doses are available?

- 68.5 mg and 137 mg tabs
- Target dose in 274 mg (2 tabs) before bed

17

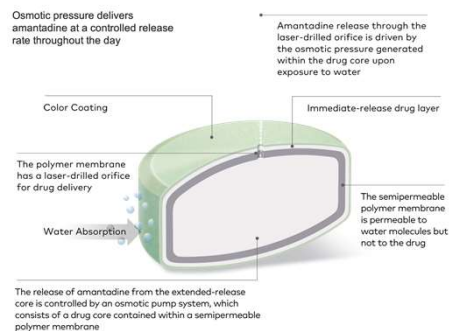
## OSMOLEX ER® - AMANTADINE EXTENDED-RELEASE

### What is it?

- Amantadine extended-release capsules
- For treatment of PD and drug-induced parkinsonism
- It has an immediate-release outer layer and an extended-release inner core

### What doses are available?

- 129 mg, 193 mg, and 258 mg
- Maximum dose is 322 mg



<https://www.osmolexhcp.com/About>

18



## XADAGO® - SAFINAMIDE

### What is it?

- A medication with multiple mechanisms of action used as an add-on treatment to carbidopa/levodopa for those experiencing OFF periods

### What doses are available?

- 50 mg and 100 mg tablets
- Given once daily

### When should I ask my doctor about it?

- If you are experiencing OFF time between doses

### Extra notes:

- Xadago has MAOB inhibitor properties so it cannot be taken with other MAOB inhibitors such as rasagiline or selegiline

19

## NOURIANZ® – ISTRADefylline

### What is it?

- A medication with a new mechanism of action, adenosine inhibition, to be used as an add-on treatment to carbidopa/levodopa for those experiencing OFF periods

### What doses are available?

- 20 mg and 40 mg tablets
- Recommended dose is 20 mg (up to a maximum of 40 mg)

### When should I ask my doctor about it?

- If you are experiencing OFF time between doses

20



## ONGENTYS® – OPICAPONE

### What is it?

- A once daily Catechol-O-methyltransferase (COMT) inhibitor to be used in those taking carbidopa/levodopa and experiencing OFF periods

### What doses are available?

- 25 mg and 50 mg
- Recommended dose is 50 mg

### When should I ask my doctor about it?

- If you are experiencing OFF time between doses

21

## KYNMOBI – APOMORPHINE SUBLINGUAL

### What is it?

- A sublingual film containing the dopamine agonist apomorphine, that dissolves under the tongue. It is used when needed if there is wearing OFF between doses of Levodopa

### What doses are available?

- 10 mg, 15 mg, 20 mg, 25 mg, 30 mg

### When should I ask my doctor about it?

- If you are experiencing OFF time between doses



22



## NUPLAZID® - PIMAVANSERIN

### What is it?

- A serotonin inverse agonist used to reduce the frequency and/or severity of hallucinations and delusions associated with PD psychosis
- It is different from other anti-psychotic medications because it does not block dopamine receptor

### What doses are available?

- 10 mg and 34 mg tablets
- Recommended dose is 34 mg daily

### When should I ask my doctor about it?

- If you are experiencing hallucinations or delusions associated with PD

23

## NORTHERA® – DROXIDOPA

### What is it?

- Used to reduce symptoms of significant drops in blood pressure when changing positions or standing also known as neurogenic orthostatic hypotension (nOH)

### What doses are available?

- 100 mg, 200 mg and 300 mg tablets

### When should I ask my doctor about it?

- If you have lightheadedness, dizziness or a feeling like you are going to pass out associated with PD

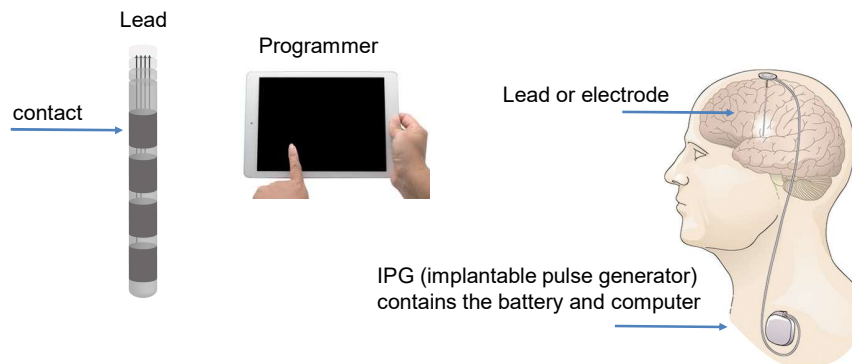
### Extra notes:

- Exact mechanism of action is unclear
- Northera is a norepinephrine precursor

24



## DEEP BRAIN STIMULATION (DBS)



25

## NEW DEVELOPMENTS IN DEEP BRAIN STIMULATION

Three companies offer DBS for PD:

- Medtronic
- Abbott
- Boston Scientific
- In 2016, FDA approved DBS for **earlier stage Parkinson's disease**
- All newly-implanted systems are now **MRI-conditional**
- Medtronic and Boston Scientific have a choice of a **rechargeable battery**
- One **dual channel IPG** can control electrodes on both sides of the brain
- Surgery can be performed in the bore of a CT scanner or MRI machine
  - Allows for visualization of the advancing electrode
  - Allows for the patient to be **asleep during the procedure**

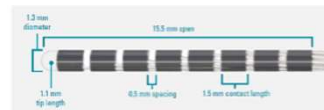
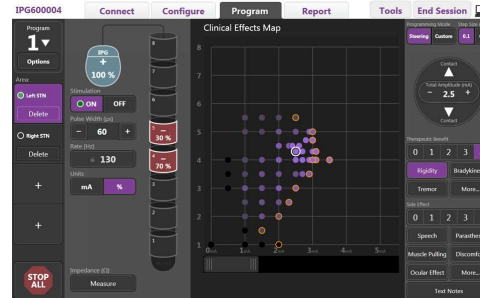
26



## NEW DEVELOPMENTS IN DEEP BRAIN STIMULATION

### Boston Scientific

- Vercise™ system approved in 2017
- Electrode has 8 contacts
- MICC – multiple independent current control
  - Each electrode has its own energy source
  - Much more customizable field of stimulation
- Patient can make some changes on their own



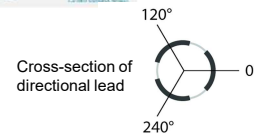
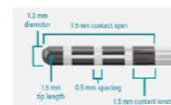
<https://www.bostonscientific.com/en-EU/products/deep-brain-stimulation-systems/Vercise-PC-DBS.html>

27

## NEW DEVELOPMENTS IN DEEP BRAIN STIMULATION

### Boston Scientific

- The Cartesia™ lead was approved in 2019
- Uses directional leads
  - The two middle contacts are divided into three sections around the circumference of the electrode
  - Stimulation can be applied to one, two or three of the sections
  - Allows for the field of stimulation to be steered in a particular direction, thereby reducing side effects of stimulation



<https://www.bostonscientific.com/en-EU/products/deep-brain-stimulation-systems/vercise-gevia-with-neural-navigator.html>

28



## NEW DEVELOPMENTS IN DEEP BRAIN STIMULATION

### Abbott

- Infinity™ system approved in 2016
- First to introduce directional leads
- Wireless communication system between the programmer and the patient
  - Allows patient to move around during programming
- Patient can make some changes on their own (via Ipad)
- No rechargeable battery



<https://www.neuromodulation.abbott/us/en/hcp/products/dbs-movement-disorders/st-jude-medical-infinity-dbs-system>

29

## NEW DEVELOPMENTS IN DEEP BRAIN STIMULATION

### Medtronic

- Percept™ PC Neurostimulator with Brainsense™ Technology approved in 2020
- The system captures local field potentials (LFPs) from the neurons that are in contact with the DBS electrode
- DBS adjustments can be made based on LFP patterns of an individual patient as they correlate with reported symptoms and medication ingestion
- Device is 20% smaller and thinner than the previous Medtronic model.
- Battery life is longer and prediction of battery life is more accurate.
- The patient programmers have been upgraded.



Medtronic.com/percept

30



## FOCUSED ULTRASOUND

- Focused beams of ultrasound energy converge within the brain tissue to form a small lesion that interferes with the brain circuitry
- Approved for tremor control in PD in 2018
- Clinical trials are underway for other symptoms of PD



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

31

## AMERICAN PARKINSON DISEASE ASSOCIATION

Every day, we provide the support, education, and research that will help everyone impacted by Parkinson's disease live life to the fullest.

Toll-free: 800-223-2732  
[apdaparkinson.org](http://apdaparkinson.org)



32





## QUESTION & ANSWER



**Marie Saint-Hilaire, MD, FRCPC**  
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33

## CLOSING REMARKS



**Cathi A. Thomas, RN, MS, CNRN**  
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Information & Referral Center at BUMC*

34



## APDA SYMPTOM TRACKER APP



Introducing an easier way to track your symptoms and manage your care.

Download the free APDA Symptom Tracker mobile app today.




35

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ANSWERS TO YOUR QUESTIONS,  
OR FOR ADDITIONAL RESOURCES**

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[apdaparkinson.org](http://apdaparkinson.org)

Or call us  
**1-800-223-2732**

36



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