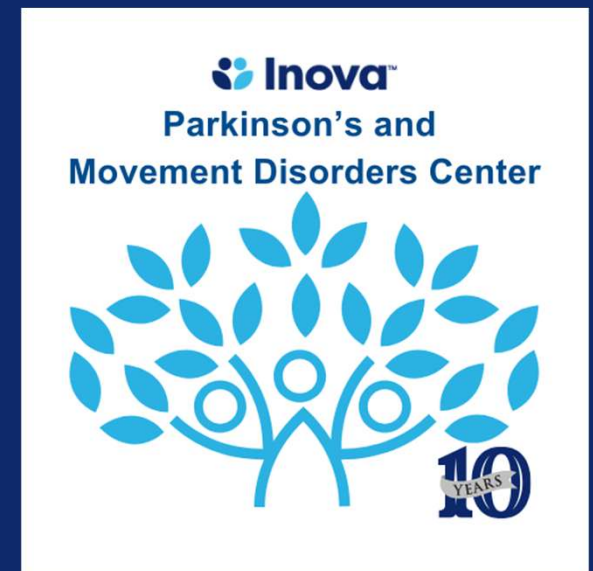


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# What is this thing called Parkinson's? plus Update on Parkinson's Treatments



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# Speakers:

Parkinson's and Movement Disorders Center



- **David Whitney, MD**

Associate Neurology Clerkship Director

UVA School of Medicine – Inova Campus

- **Abigail Lawler, MD**

IPMDC Autonomics Director

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# What's on Tap?

## Living Well With Parkinson's

- Specialist Care
- Medications and technology
- Exercise & community
- Lifestyle

*\*\* Slide deck is updated and newer than it appears!*

# What is Parkinson's?

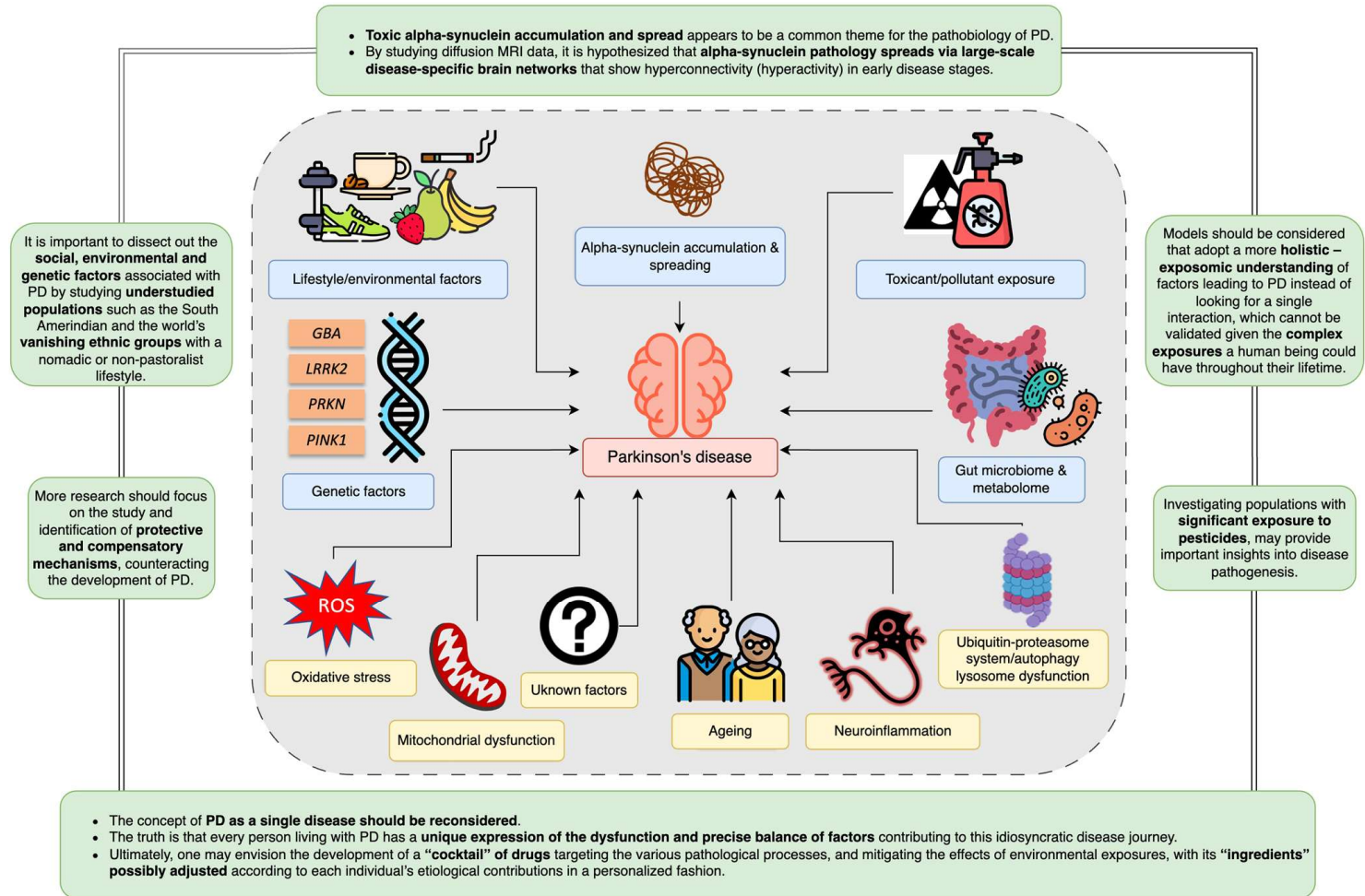


Simply a chemical deficiency!

# Causes?

Classically NOT inherited

~ 10%



## How do we diagnose Parkinson's?

### Movement disorder specialist

- Additional fellowship training in movement disorders
- Focus is primarily on movement disorders = more up to date on latest treatments and understand the variation in movement patients
- Knows the questions to ask patients
- General neurologist sees a wider range of neurological conditions, like headache, stroke, epilepsy, MS, etc.

An expert general neurologist  
≠ a Movement Disorders Specialist

- Symptoms/History/Exam  
+ Response to Medications

- DaTscan

(GE Healthcare is a sponsor)

Syn-One Skin Biopsy

(details to follow)

- “Parkinsonism”

is not a diagnosis

*Life expectancy is the same  
as someone without Parkinson's  
if adequately treated.*

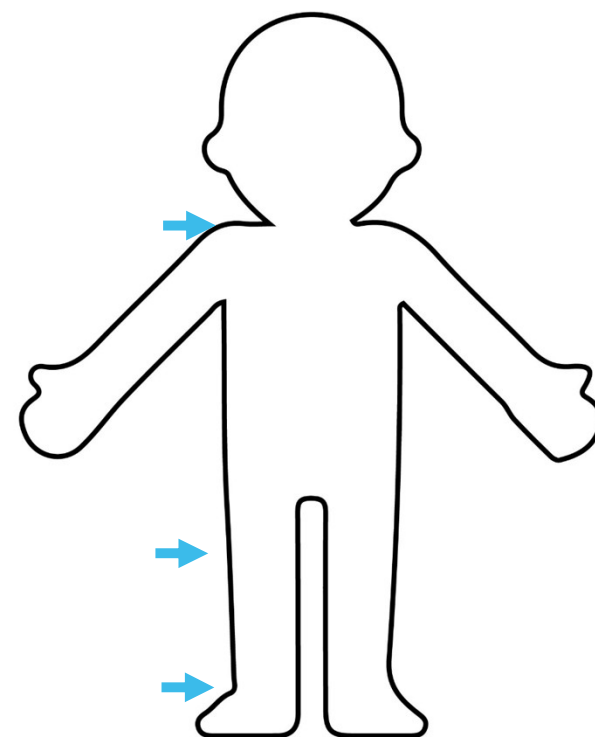
## Syn-One skin biopsy

Checks for the deposit of phosphorylated alpha-synuclein in the skin

FDA approved to assist with a diagnosis of Parkinsonism.

95% accuracy

*Life expectancy is the same as someone without Parkinson's if adequately treated.*



# What happens if you have reduced dopamine?

## Motor and Non-motor Symptoms

Systems which function inappropriately due to reduction in Dopamine or one of its byproducts

### Motor Symptoms

- Resting tremor
- Tremor with position
- Bradykinesia (slowness)
- Rigidity (stiffness)
- Slow walking, shuffle, reduced arm swing
- Balance issues
- Reduced facial expression
- Speech changes (hypophonia)

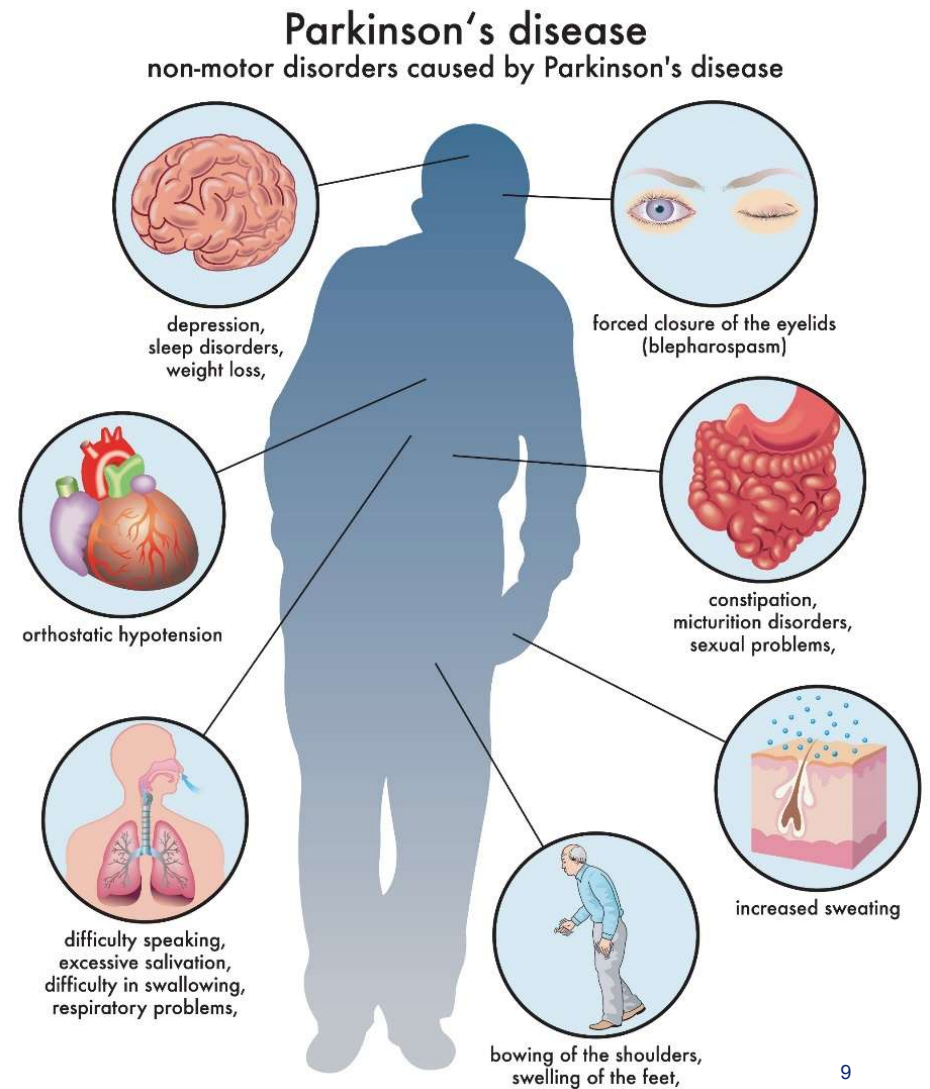


# Examples of Non-motor symptoms

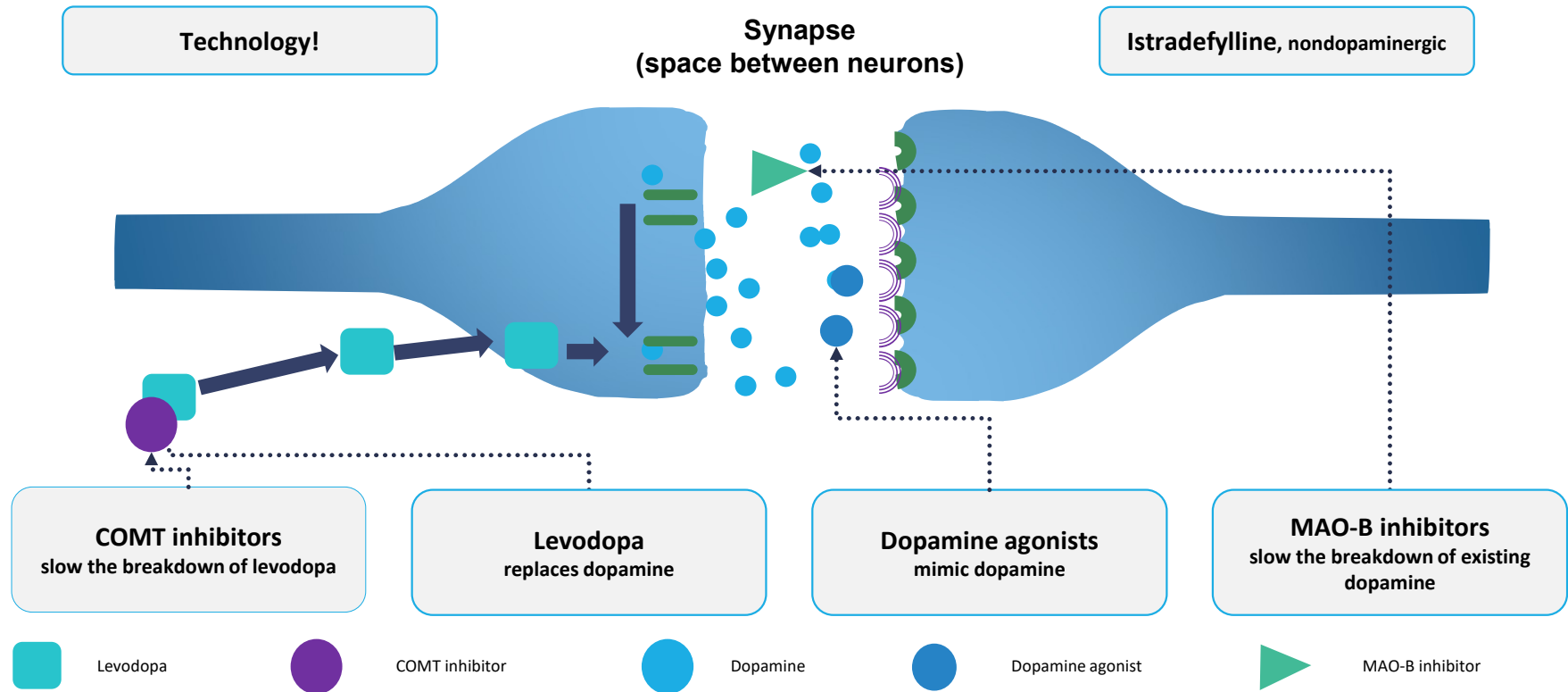
**\*\*Can present years before diagnosis\*\***

- Loss of sense of smell\*
  - Constipation\*
  - Talking in sleep or acting out dreams\*
  - Anxiety / depression\*
- 
- Bladder issues
  - Excessive saliva/drooling
  - Vision changes
  - Problems sweating
  - Lightheadedness / dizziness on standing
  - Fatigue
  - Skin problems
  - Cognitive changes

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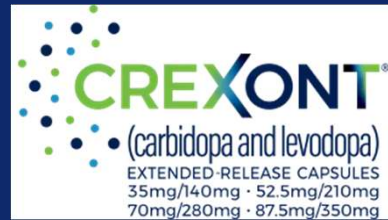
# Different avenues of treatment



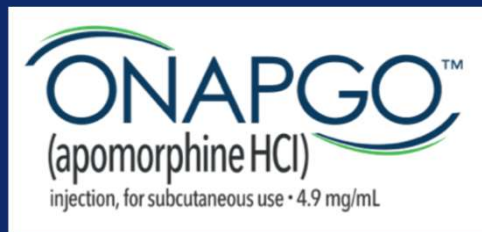
COMT = catechol-O-methyltransferase.  
MAO-B = monoamine oxidase-B.

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

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# New toolbox and growing



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Dopamine Agonist

Carbidopa/Levodopa formulation

MAOB inhibitor

COMT inhibitor

A2a agonists

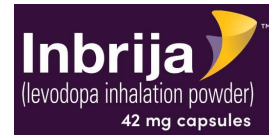
Amantadine derivatives

Rescue Therapies

Symptom specific therapies



Parkinson's and Movement Disorders Center



## Tablets



Sinemet



Dhivy

**PARCOPA**<sup>®</sup>  
(carbidopa and levodopa  
orally disintegrating tablets)

Parcopa

# Carbidopa/Levodopa



## Capsules

**RYTARY**<sup>™</sup>  
(carbidopa and levodopa)

EXTENDED-RELEASE CAPSULES

23.75 mg/95 mg • 36.25 mg/145 mg

48.75 mg/195 mg • 61.25 mg/245 mg

*Now generic  
Carbidopa/  
Levodopa ER*

*Brand name is still available  
Ask for "authorized generic".*

**CREXONT**<sup>®</sup>  
(carbidopa and levodopa)  
EXTENDED-RELEASE CAPSULES  
35mg/140mg • 52.5mg/210mg  
70mg/280mg • 87.5mg/350mg

## Technology



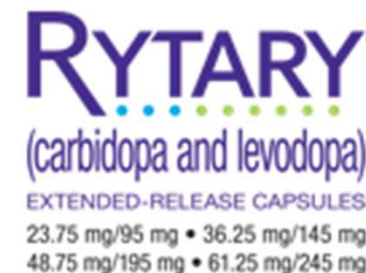
**VYALEV**<sup>™</sup>

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



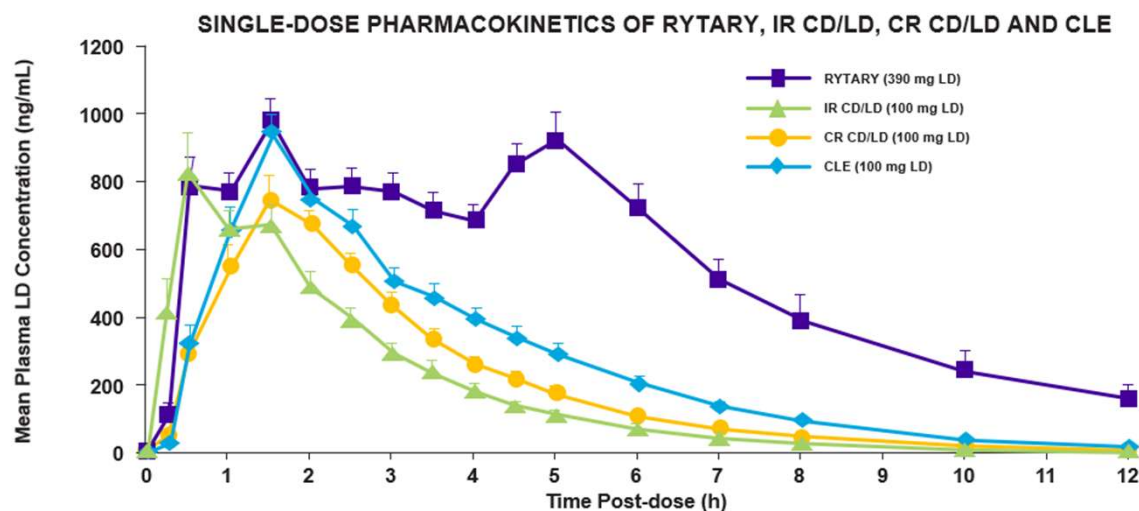
# Longer lasting carbidopa/levodopa 2015

## Rytary™ (carbidopa/levodopa) Amneal



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

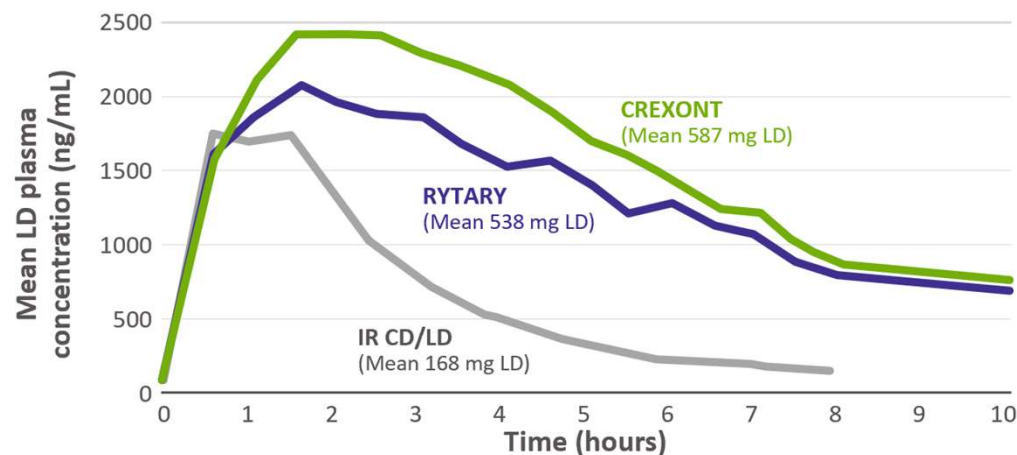
- Equivalent dose of Rytary on average 1.2 more hours of “on time” compared to IR.



# Longer lasting carbidopa/levodopa 2025

## 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)



## Rescue options

**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

**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

## 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

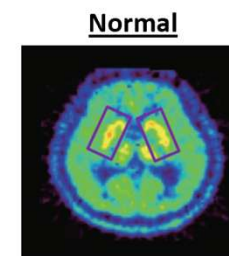
## Nourianz™ (istradefylline)



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

- Indirect pathway – adenosine A<sub>2a</sub> receptor antagonist
- Addition reduced levodopa dose escalation over 37 weeks<sup>1</sup> and 72 months<sup>2</sup>
- Effective in tremor dominant and postural instability and gait difficulty subtypes (*post hoc*)<sup>3</sup>.

A<sub>2a</sub> Receptor PET imaging<sup>1</sup>



Increase in A<sub>2a</sub> Receptors with PD progression<sup>1</sup>



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.

## 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



## 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

**ONAPGO™**  
(apomorphine HCl)  
injection, for subcutaneous use • 4.9 mg/mL

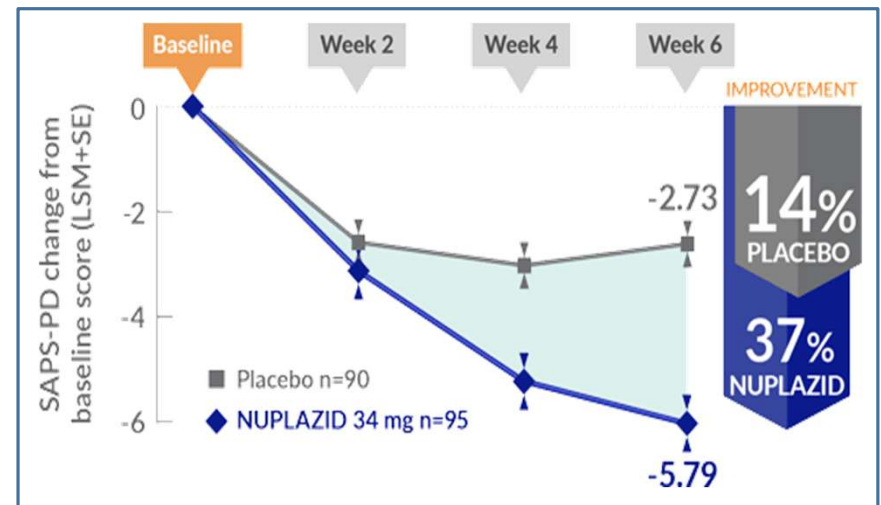


# Hallucinations and Psychosis

## 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
- Timing of protein and meals with some oral medications



# Why do medicines not work for some people?

- Progression of the disease
- Parkinsonism (PSP, MSA, CBD)
- Other conditions
- Expectations:  
Some symptoms don't respond that well  
e.g. fatigue, mood, cognition
- Not taking meds as prescribed
- Not on optimal combination of meds
- Meds are underdosed
- Not enough time has lapsed to allow  
meds to work

## How the gut impedes absorption

- Diet
- Dehydration
- Constipation



# Therapies Are Important

Therapies are key to helping people with Parkinson's keep doing things and have a better life.

## Physical Therapy (PT):

Helps with balance, walking, strength, and stopping falls. (lower body)

Check out

[ipmdc.org/therapy](https://ipmdc.org/therapy)

For our list of teams with experts.



## Speech-Language Pathology (SLP):

Helps with clear talking, voice loudness, trouble swallowing, and cognition.

## Occupational Therapy (OT):

Helps with daily tasks and activities, finding tools to make things easier, and staying independent. Driver rehabilitation. (upper body)

## What about when the medicines 'stop working'?



Longer acting  
medicines



Complimentary  
medicines



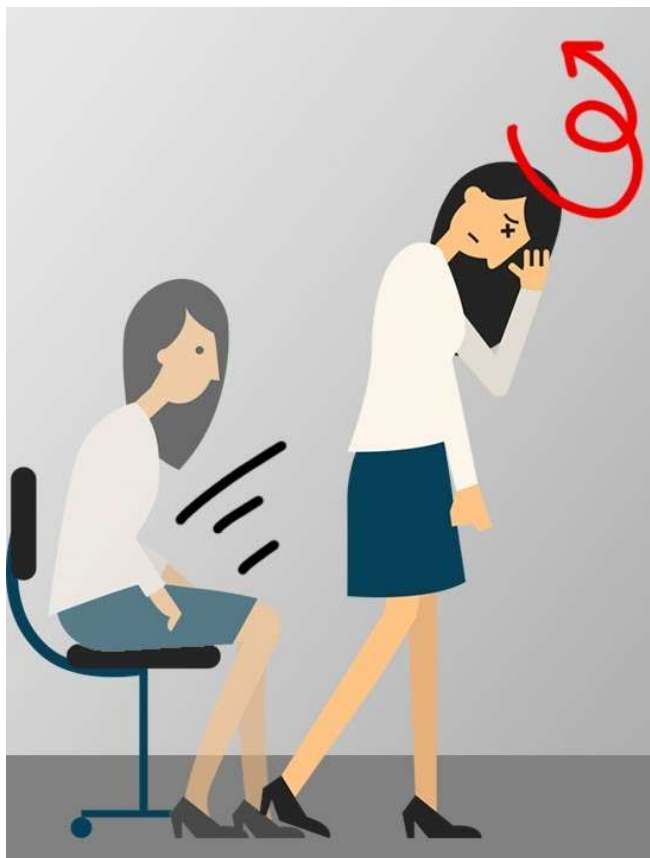
Targeted  
Technologies

# Targeted Technology

- Botulinum toxin injections
- Vyalev / Onapago Subcutaneous Pump
- Focused Ultrasound (FUCS)
- Deep Brain Stimulation



## Non-motor symptom tips for low blood pressure



### Orthostatic Hypotension:

- Feeling dizzy, lightheaded, faint, weak, unsteady or even falling.
- **Move Slowly:**  
Sit for a moment before trying to stand up, then try to get up slowly and steadily.
- **Check blood pressure** if person feels lightheaded.  
Best time to take it is an hour after medications.  
First seated, then standing.  
Record time it was taken.  
More accurate when meds are working.
- **BP raising medications:**
  - Midodrine, Fludrocortisone, Droxidopa, Pyridostigmine**\*\* Limit use of medications that lower BP:** anti-hypertensives, bladder/prostate meds, diuretics

# Understanding Cognitive and Behavioral Changes

Parkinson's sometimes affects a person's thinking and behavior. These changes are part of the disease and are not the person's fault.

## Possible Changes:

- **Memory Problems:** Difficulty remembering recent events or instructions.
- **Confusion or Difficulty Focusing:** Trouble concentrating, getting easily distracted or feeling disoriented.
- **Hallucinations:** Seeing or hearing things that are not actually there. These can be unsettling for the client.
- **Delusions or Paranoia:** Holding beliefs that are not based in reality or feeling that others are "out to get them."



## Sudden changes are usually not Parkinson's

Be aware that sudden changes (in a few hours or even a few days) can be caused by:

- Dehydration
- Bacterial infection, for example:  
urinary tract infection (UTI), or pneumonia

Sometimes these changes are mistaken as medications not working, but if left undiagnosed can lead to a medical emergency.



Parkinson's and  
Movement Disorders Center



## CARING FOR PATIENTS WITH PARKINSON'S



### Medications - On time, every time:

- Parkinson medications must be given **on time every time** as prescribed by their neurologist.
- There is no "window" with prescribed times
- A Parkinson's patient's medications should NOT be changed without consulting the patient's neurologist.
- Changing the patients medications to formulary meds can exacerbate their Parkinson's disease, create harm and extend their hospitalization.

For patients with Parkinson's disease, it is important that in addition to being treated for the condition that led to their hospitalization, their treatment for Parkinson's disease continues as prescribed by their neurologist.



### Contraindicated medications to avoid:

#### Haloperidol (Haldol) and most neuroleptics

- Phenthiazines & antiemetics: prochlorperazine (Compazine), metoclopramide (Reglan), promethazine (Phenergan) and droperidol (Inapsine)
- Commonly prescribed opioid medications are contraindicated with selective MAO-B inhibitors such as rasagiline (Azilect), selegiline (l-deprenyl, Eldepryl), and selegiline HCL oral disintegrating (Zelapar)

### → Medications considered safe ←

- Pimavanserin (Nuplazid), quetiapine (Seroquel) and clozapine (Clozaril)
- Trimethobenzamide (Tigan) and ondansetron (Zofran)

### We recommend:



- The patient and/or caregiver be allowed to self-administer the patient's Parkinson medications.
- Patients be permitted to use medications from their home supply, in their original containers.
- The caregiver be present where possible, to advocate for the patient.
- Should a nasogastric tube be required, carbidopa/levodopa 25/100 immediate release tablets can be crushed and administered via the tube.

More information at  
[ipmdc.org/hospital](http://ipmdc.org/hospital)



Sonia Gow  
Program and Community Care Manager  
Inova Parkinson's and Movement Disorders Center (IPMDC)  
[sonia.gow@inova.org](mailto:sonia.gow@inova.org) | 703.375.9987 | [ipmdc.org](http://ipmdc.org) | [inova.org/move](http://inova.org/move)

Contact Inova Neurosciences 24/7  
571.472.4200

## Caring for Patients With Parkinson's

### AVOID:

**haloperidol (Haldol™) and most neuroleptics**  
(blocks dopamine – can impact swallowing)

Forms available at: [ipmdc.org/hospital](http://ipmdc.org/hospital)

- For emergency responders
- Emergency contact into
- Medications list
- Medical history
- Hospital Go Bag check list
- Communication card

# Hospital and Rehabilitation

- Patients are in the care of the hospital medical team.
- IPMDC doctors can consult, but only at their request.
- Parkinson medications will not go with patient from hospital to rehab.
- Timing of meds in rehab is important.
  - Patients will have better chance of recovery if meds are working and patients are “on”.
  - Schedule rehab according to when patient takes Parkinson medications.



While the right medications and treatments for each person are key to living well with Parkinson's, the other part of the equation, just as important as clinical care, are the lifestyle choices that people can make.

***What can people do to help themselves?***

Patients are  
people too.

# Living well with Parkinson's

The right medications

+

Challenging Exercise

Social interaction

Eating well

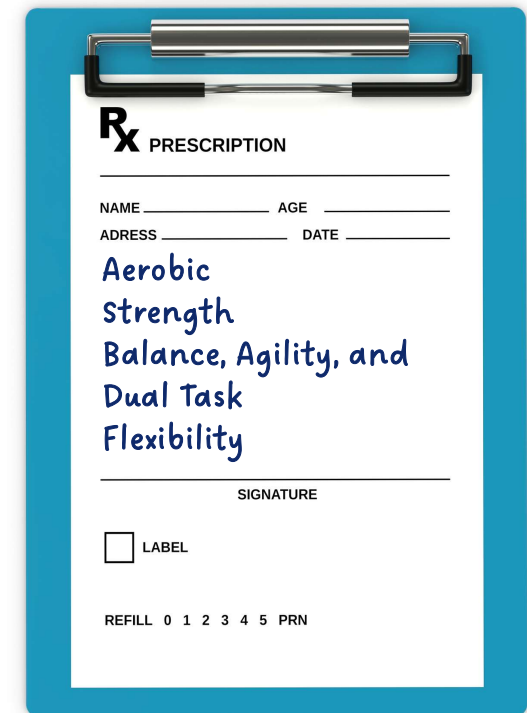
Reducing stress

Getting enough sleep

Staying mentally active



*Movement is medicine!*





Brain Health and Memory Disorders Program  
Jenn Pauldurai, MD, Director

# Healthy Brain Habits

Join in Dr. Pauldurai's *Let's Chat About Thinking* program on the 2<sup>nd</sup> Thursday of each month.

[ipmdc.org/thinking](http://ipmdc.org/thinking)

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## 6 Healthy Brain Habits

1

### Be Social



Keep in touch with friends and family don't let yourself get self-isolated.

4

### Ongoing Exercise



Move throughout the day aim to reach 2 and a half hours of moderate physical activity a week.

2

### Engage Your Brain



Find ways to stimulate your thinking and explore new interests and hobbies.

5

### Restorative Sleep



Get 7 to 8 hours of restful sleep every day.

3

### Manage Stress



Practice relaxation, and maintain a daily schedule.

6

### Eat Right



Choose a nutritious heart healthy diet including fish veggies fruits.

For information on resources in your area, contact your local Area Agency on Aging or the Alzheimer's Association.



To find your Area Agency on Aging, call 1-800-552-3402  
Alzheimer's Association 24/7 Helpline: 1-800-272-3900



The information on this tipsheet is taken from *Virginia Dementia Road Map: A Guide for People Impacted by Dementia*.  
Download your copy of the Road Map by scanning the QR code or visit: [vda.virginia.gov/DementiaCapableVA.htm](http://vda.virginia.gov/DementiaCapableVA.htm)



[HealthyBrainVA.com](http://HealthyBrainVA.com)