Parkinson's disease/PSP Falls Management

Anglicare 7 May 2026

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Learning Objectives

- Recognize the key factors contributing to falls in people with Parkinson's disease including Motor / non-Motor Symptoms
- Recognize the key factors contributing to falls in resident with Progressive Supra-Nuclear Palsy (PSP) ,
- Identify common high-risk situations for falls within the aged care environment.
- Access resources and information that will enable you to improve the quality of life for people living with Parkinson's.

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The Pathophysiology of Parkinson's disease

- A *progressive, insidious neurodegenerative* disease

- Loss of cells dopamine in the substantia nigra (STN)
  - Contribute to the motor symptoms – tremor, slowness, stiffness, changes to posture
- The presence of Alpha synuclein misfolding proteins
  - Contribute to the non-motor symptoms such as constipation, REM sleep disorder, loss of smell, urinary dysfunction, sexual dysfunction

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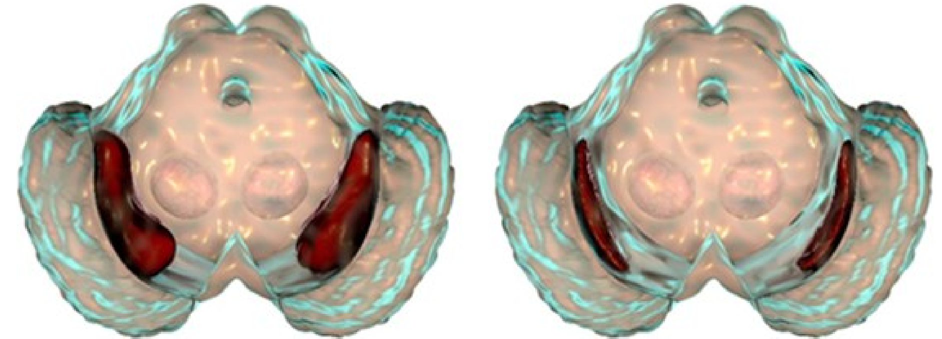
Pathophysiology of Parkinson’s disease?

- Loss of cells in the substantia nigra (STN) / projections into basal ganglia and striatum that produce dopamine
- Dopamine (neurotransmitter) is required for
  - voluntary movement
  - euphoria/ well-being
  - Autopsy of Neuromelanin in STN



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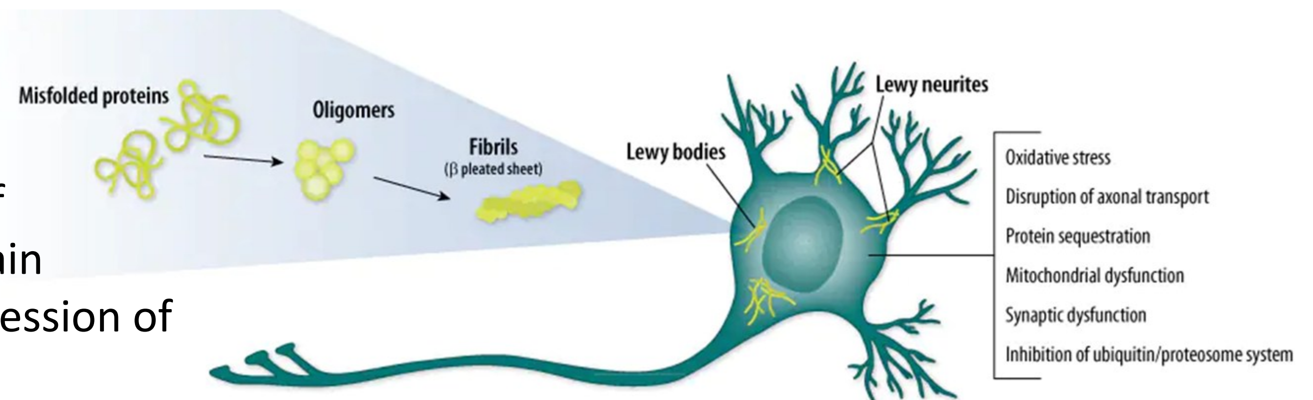
Pathophysiology of Parkinson’s disease

- Alpha synuclein involved in vesicle transport/ neurotransmitter release
- Alpha-synuclein protein that “misfolds” and aggregates (clumps) as Lewy Body pathology – (See SNCA and Braks Hypothesis)

abnormal aggregation of α-synuclein and spreading of pathology between the gut, brainstem, and higher brain regions probably underlie the development and progression of Parkinson's disease.



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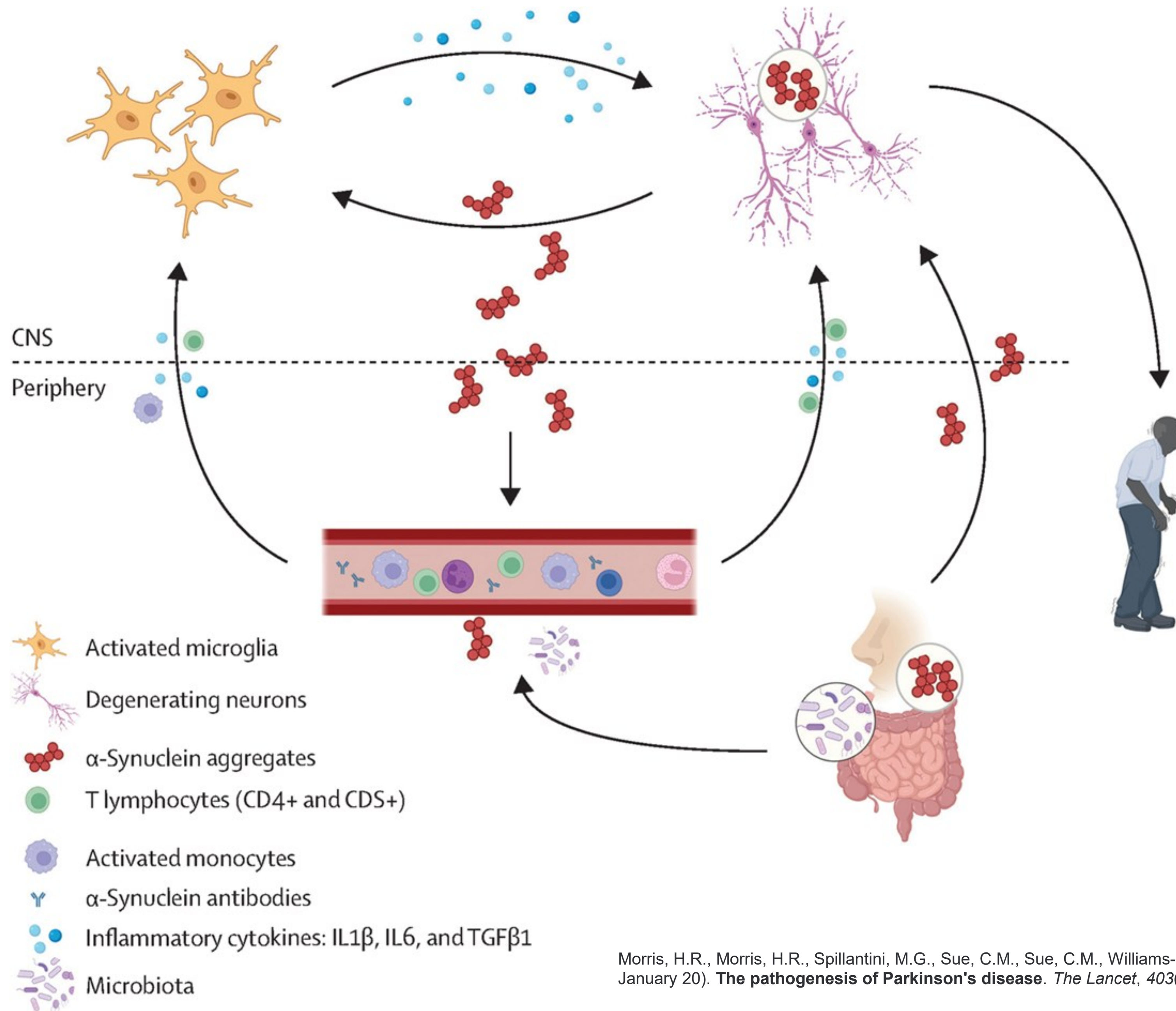
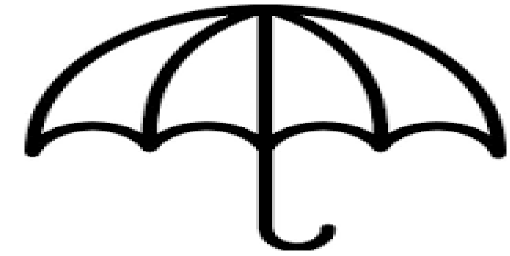


- Aggregation of abnormal α-synuclein spreads between the gut,
- brainstem,
- and higher brain regions

Morris, H.R., Morris, H.R., Spillantini, M.G., Sue, C.M., Sue, C.M., Williams-Gray, C.H., Morris, H.R., Spillantini, M.G., Sue, C.M., & Sue, C.M. (2024, January 20). **The pathogenesis of Parkinson's disease**. *The Lancet*, *403*(10423), 293-304. https://doi.org/10.1016/S0140-6736(23)01478-2

Parkinsonism-

umbrella term for disorders of the basal ganglia



- Idiopathic Parkinson's disease – most common, sporadic complex 60 years 90-95 %
- Early Onset > 50 years (genetic mutation) 5-10%
- Secondary Parkinsonism
  - (head injury, meningitis, drug induced, MTPT, vascular parkinsonism)
- Parkinson's Plus Syndromes (Atypical)
  - **Progressive Supranuclear Palsy, (tau-protein)**
  - Cortical Basal Syndrome (tau-protein) and
  - Multiple System Atrophy (α-synuclein in oligodendrocytes)

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Should Parkinson's be a SYNDROME

Heterogenous disease

No two people are the same;

Brain first- Body first (P Borghammer · 2023)

Braak's Hypothesis (Braak et al, 2003)

Dual Hit hypotheses (Bayer et al., 1999; Maynard et al., 2001)

Genetic mutation varieties – Autosomal dominant/ recessive

Changes to other neurotransmitters – actyl-choline, nor-ephedrine glutamate = Different phenotypes (Chaudhuri, Dr Ray)

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Diagnosis of Parkinson’s disease

A clinical diagnosis using

- 2- 3 cardinal motor features (exclude RED FLAGS)
- Queen Square Brain Bank Criteria
- MDS Clinical diagnostic criteria for "Clinically Established PD"
- MDS Clinical diagnostic criteria for "Clinically Probable PD"

- No biomarkers/ no cure (yet)

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Risk Factors for Parkinson’s disease

Aging is the greatest risk factor

1:1000 at 60 – 65 years and 1:100 at 75 years

Prodromal risk factors – Head trauma,; bacterial infection;

Environment – Air pollution, pesticides, insecticides, - TCE Paraquat N02

Genetics risk factors The genetics of Parkinson disease*

Smoking/Caffeine are considered neuroprotective

Men more than women

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Causes for people entering residential care

An insidious progressive neurodegenerative disease…….

- Falls and mobility decline
- Cognitive decline/ dementia – Parkinson's dementia/ Lewy Body dementia
- Neuro-psychosis – hallucinations/ paranoid delusions
- Sleep dysregulation

- Carer stress

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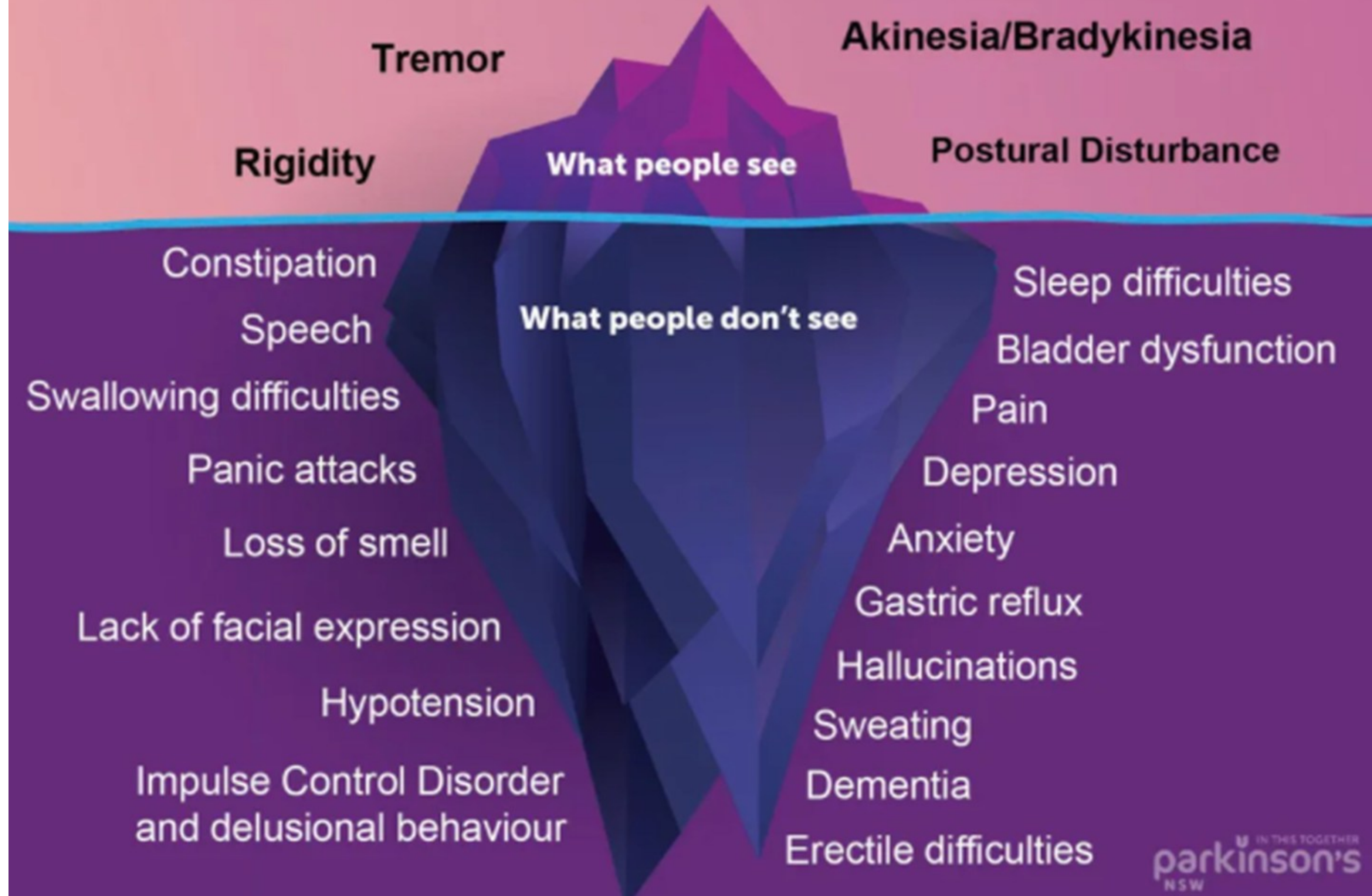

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Causes of falls in PD are multifactorial

A short shuffling gait

Anxiety

Stooped forward

motor fluctuations

Difficulty turning neck and head

Hallucinations

Freezing of Gait

Postural Hypotension

Cognitive impairment

Turning enbloc

Fear of falling

Inappropriate footwear

Urinary frequency and Urgency / Nocturia

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Motor Symptoms of Parkinson’s

Short shuffling gait – stride amplitude / speed , height of foot lift, heel strike, arm swing

Bradykinesia – slowness of movement

Akinesia (difficulty initiating movement)

Status Induced Akinesia (regardless of dose cycle)

Postural (Instability) – poor posture – flexion, scoliosis , leaning

Freezing of Gait / Festination

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Anti-Parkinson's medications

- Treat the motor symptoms – no cure nor do they slow the progression.
- Gold Standard – Dopaminergic therapy

- Levodopa/ Carbidopa
- (Sinemet 100/25mg,
- Kinson 100/25mg, Sinemet CR 200/50mg)

- Levodopa/ Benserazide
- (Madopar 100/25mg ,
- Madopar HBS 100/25mg , Madopar Rapid 50/12.5mg or 100/25mg)

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Anti-Parkinson's medications

- Dopamine Agonists
- MAO-B inhibitors
- COM-T inhibitors
- Anti-cholinergic
- Anti-viral medications

- Medications *are tailored to the person's version of Parkinson's disease*
- Become more complex as the disease progresses

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What can you do to assess response to meds?

- Is the person moving around spontaneously, or are they stiff and rigid?
- Is the person walking well, or shuffling and not picking up their feet?
- Can the person manage tasks of eating/dressing well?
- Requires more assistance with normal tasks than they did before?
- Have you noticed if a tremor has worsened?
- Is the person falling or falling more often?
- Is the person experiencing fluctuations?
- Is the person experiencing dyskinesia (involuntary wriggling movements) that is interfering with their ability to do their daily activities?

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Optimising medication responses

- Medications ON time every TIME - tailored to the person's response NOT TDS
- Avoid Maxolon and Stemetil (anti-emetics) and Haloperidol (antipsychotic)
- Preferably dopaminergic medications 30 minutes before food – on an empty stomach
- Timing of meals and types of food and protein meals
- Bowels opening daily
- Exercise and physical activity

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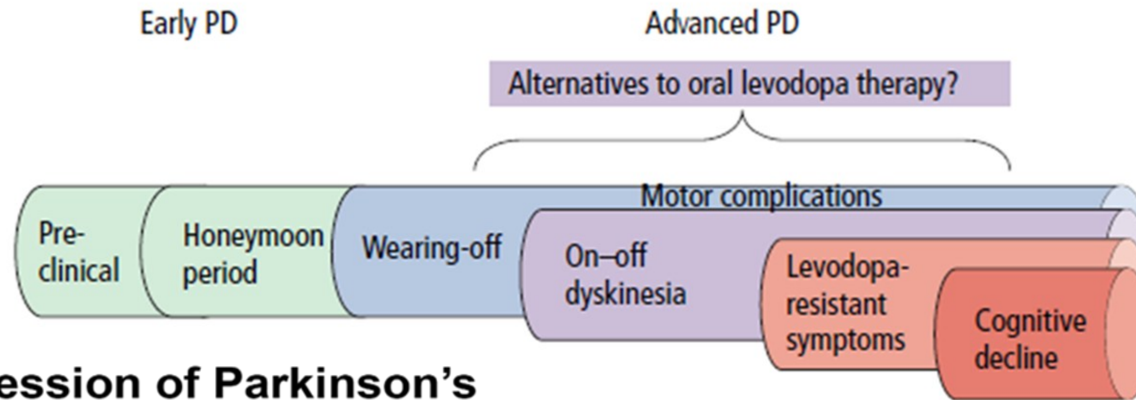
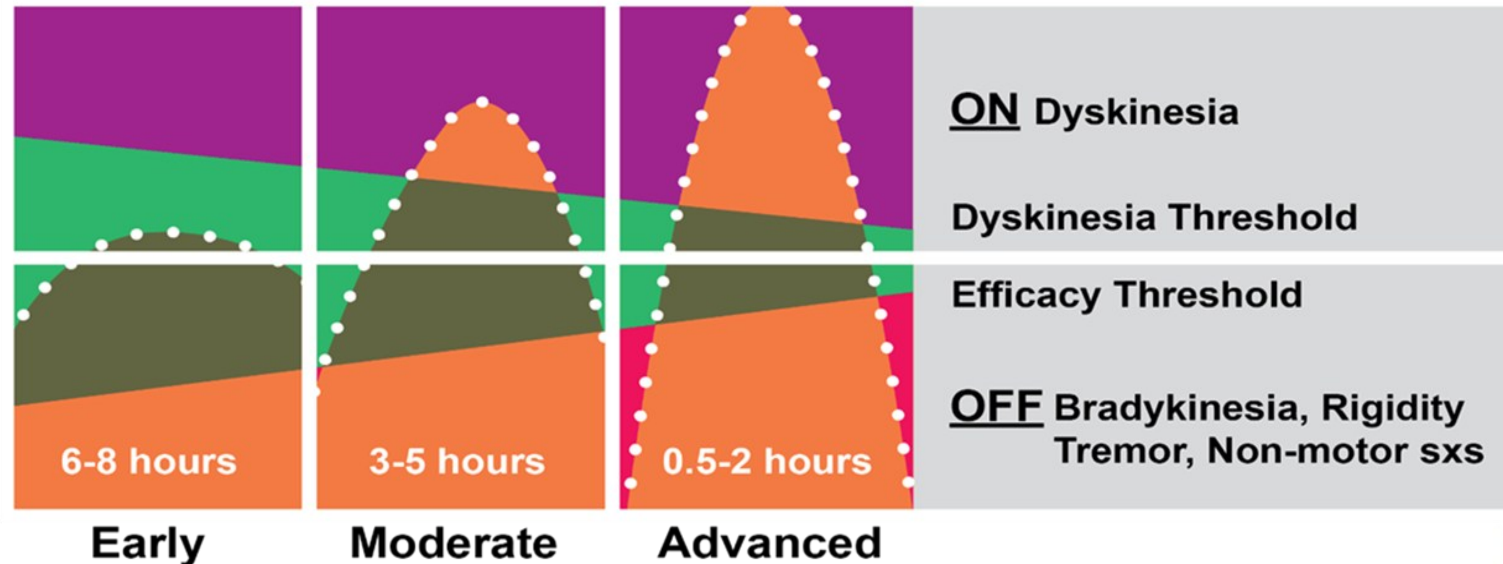
Why do medications become more complex?





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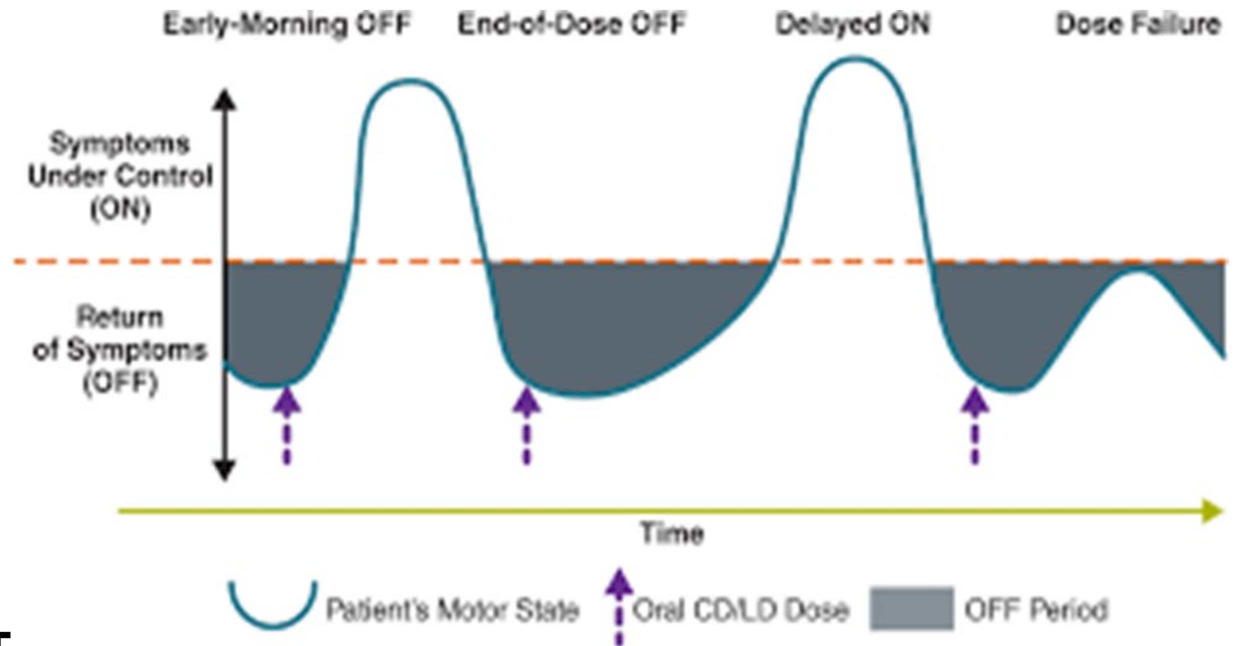
What to look for in progressive iPD?

- Dose failures
- Delayed ON’s
- Gut microbiome
- Fluctuating motor symptoms
- Early morning OFF
- Nocturnal Akinesias
- Dyskinesias/ Unexpected OFF’s



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Dyskinesia – peak dose, diph

- Involuntary, excessive movements- se
- Often look like chorea movements

- Throw balance off
- Increase fall risk when standing or wa
- Tip: Falls don't only happen when "stif
  when "too mobile"
- Permission from patient

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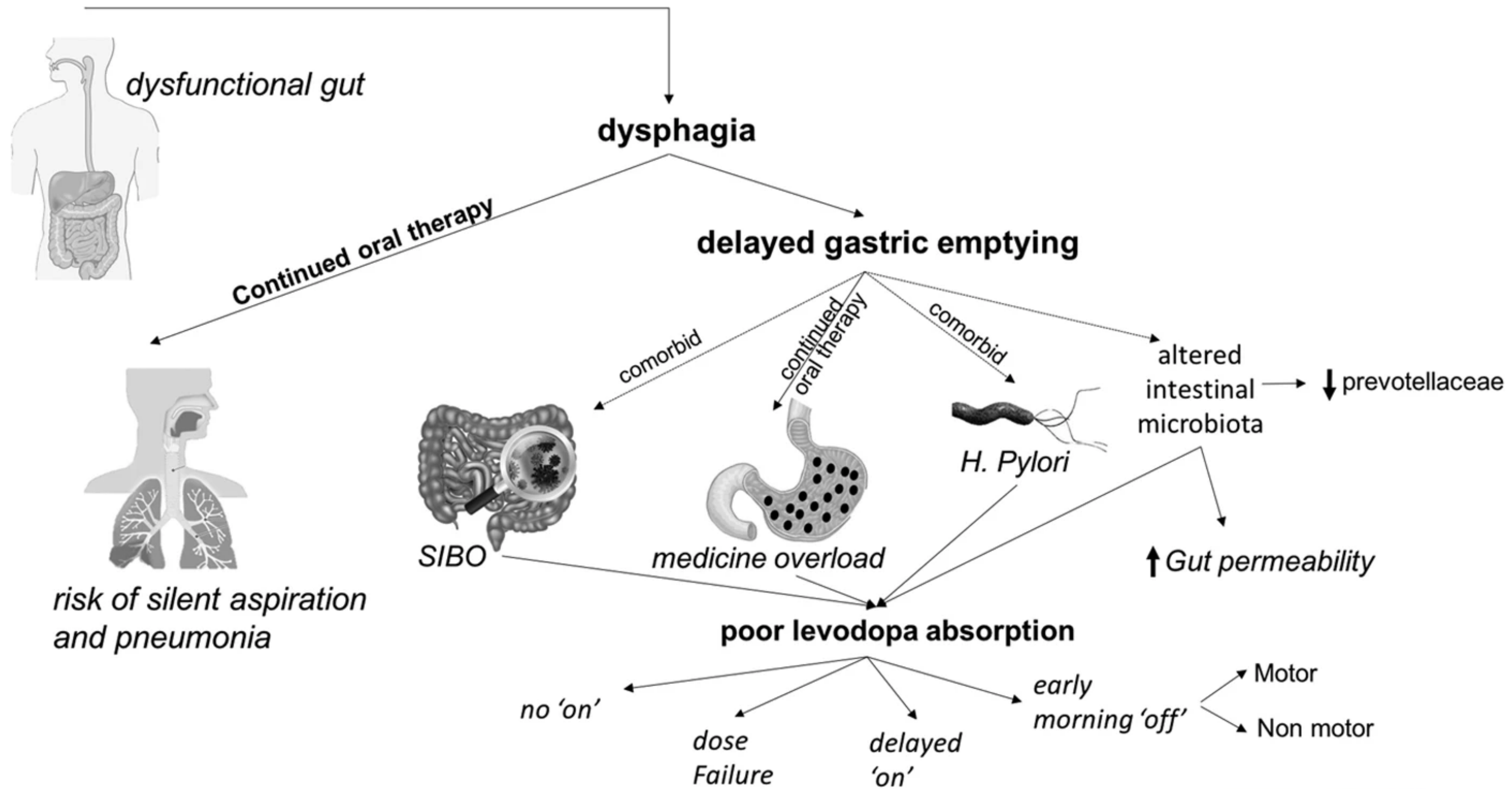
Pharmacokinetics and Poor Levodopa Absorption



Ray Chaudhuri, K., Qamar, M., Rajah, T. et al. Non-oral dopaminergic therapies for Parkinson's disease: current treatments and the future. npj Parkinson's Disease 2, 16023 (2016). https://doi.org/10.1038/npjparkd.2016.23

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Progressive disease – device assisted therapies

- The "5, 2, 1" screening guide

- **5** = taking **5 or more doses of levodopa per day**
- **2** = experiencing **2 or more hours of OFF time per day**
- **1** = having **1 or more hours of troublesome dyskinesia per day**
- If a person meets **one or more** of these criteria, it should prompt discussion about symptom control , QoL
- and whether oral therapy is no longer providing smooth control.

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Constipation

- Slowed colonic transit time
- Reduced mobility
- Alpha synuclein deposits – “leaky gut”
- Changes in gut microbiome
- Delayed /erratic gastric emptying
- Gastric reflux

- Ensure daily bowel movement – Movicol/ dietary fibre/ water

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Urinary Frequency and Urgency

- Bladder difficulties related to the fluctuations in level of dopamine
- Affecting bladder muscle – typically over-reactive bladder
- Nocturia – resulting in fatigue

- Urgency (like 5 minutes ago)
- Frequency

- Related to increased risk of falling

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Other Autonomic Dysfunction = Falls

- Postural Hypotension
- Orthostatic Hypotension – drop in Systolic 30mmHg , regular HR

- Light-headedness/ Dizziness / Weakness / Fatigue / Coat hanger pain = syncopal (fainting and falls)

- Worse in early morning, hot weather, post-prandial , bowels/ urinating /during physical exercise

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Impulsivity and reduced insight

- “ I can do this”

- Cognition impairment
- Inability to dual task especially when walking / talking
- Visuospatial difficulties

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Sleeping dysfunction

- Sleep fragmentation
- REM sleep behaviour disorder
- Vivid dreams and hallucinations
- Restless legs
- Nocturia
- Pain – early morning dystonia's

- Excessive daytime sleepiness
- Sleep hygiene practices
- Melatonin or Circadian SR (prescription)
- Mirtazapine

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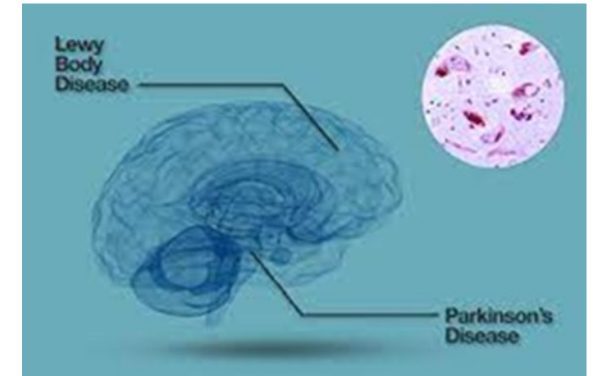
Neuro-psychosis



- Degree of cognition impairment / constipation
- Hallucinations – visual , olfactory and tactile
- Delusions – can be paranoid
- (typically those with more cognition impairment)
- Disease progression – Lewy Body in cerebral cortex

- Medications – gentle doses of Quetiapine 12.5mg titration

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Proactive Management - tips

- Get to know the person with Parkinson's – their version of PD
- Ensuring anti-Parkinson's medications are on-time
- Regular routine that provides
  - opportunities for socialisation,
  - exercise, and
  - activities that are of interest to the person
  - Don't rush a person living with Parkinson's = anxiety
- Communicate effectively with the person, their family, key stakeholders, and internal/external medical staff.

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Observe and monitor

- Being aware of the motor and non-motor symptoms
- Monitoring changes – worsening, responses to medications
- The *sands of the Kalahari change as the wind blows*
- Referring the person living with Parkinson's to their GP/ Neurologist/ Nurse if the medication/dosage is not working or needs adjustment.

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Case study: Mrs. F dx with Parkinson's - PSP variant

- Progressive Supranuclear Palsy (PSP-RS)
- 40 years older at onset of first PSP-related symptoms

- Cognitive change (apathy and impulsivity)
- Akinetic rigidity – neck and axial rigidity – sniffing the breeze
- Impaired balance – slow saccades and "round the house" vertical saccades
- Blurry or double vision (ocular motor dysfunction)

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Case study: Mrs. F dx with Parkinson's - PSP variant

- Progressive Supranuclear Palsy (PSP-RS)
- Postural instability – loose balance spontaneously / falls on the pull test (within three years) Rocket sign
- Cognitive change- speech/language disorders
- Falls – vertical supranuclear palsy (restrictions in voluntary eye movements in the vertical plane (up and or down)
- Dysphagia (drooling, sialorrhoea)
- Urinary urgency/ constipation
- Dysarthophonia

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Dopa responsive or not dopa responsive ?

- Progressive Supranuclear Palsy (PSP-RS)
- Recommends a trial of levodopa with significant akinetic rigidity
- 30% report some benefit / mild effect – mobility, speech or energy – no dyskinesia

- Managing bladder symptoms/ Depression/ pseudobulbar affects
- Sleep disturbance
- Blepharospasm / Prism glasses
- Maintaining mobility and walking
- Bone protection

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PSP

is not

Parkinson's disease

Tauopathy v. alpha synuclein

Table 2 Key differences in symptoms and signs in PSP and Parkinson's disease

	PSP	Parkinson's disease
Symmetrical	**Yes**	**No**
Rigidity	**Axial**	**Limb**
Akinesia	Severe, global Even in loose limbs	Mild to moderate
Tremor	**No**	**Yes**
Falls	**Early, spontaneous**	**Late, with freezing**
Eyes	**Vertical paresis**	**Normal***
Voice	Dysarthrophonia, distorted, poor volume control	Hypophonia, quiet
Cognition	Marked early executive changes Loss of fluency	Subtle early executive changes or later dementia
Levodopa	Poor response	Very good response
Gait	Head up, sniffing the air Leaning back	Head down, stooped, leaning forward
Looks like Parkinson's?	**No**	**Yes**

Bold text highlights the simplest quick-six to have in mind.
* Subtle oculomotor abnormalities occur

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Plan approach

- Talk to everyone involved in the care of the person
- Gather all the information you need to create a care plan.
- Incorporate the four components of living well
  - speech therapy,
  - exercise,
  - Medication (for Parkinson's) and
  - social activities.. into daily routines.

Resources

- Parkinson's NSW – Health Professional guides for PSP
- Healthline for consumers HCP
- Parkinson's Nurses
- Consulting Neurologists/ Movement Disorder Specialists
- Allied Health team members – PT , EP OT and SP
- Cure PSP https://www.psp.org/

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