Parkinson's disease

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Learning Objectives

- Understand the nature of motor and non-motor symptoms of Parkinson's
- Assessment and recognition of the individual needs of a person living with Parkinson's
- Identify key multidisciplinary care team members to maintain Quality of Life
- Access resources and information that will enable you to improve the quality of life for people living with Parkinson's.

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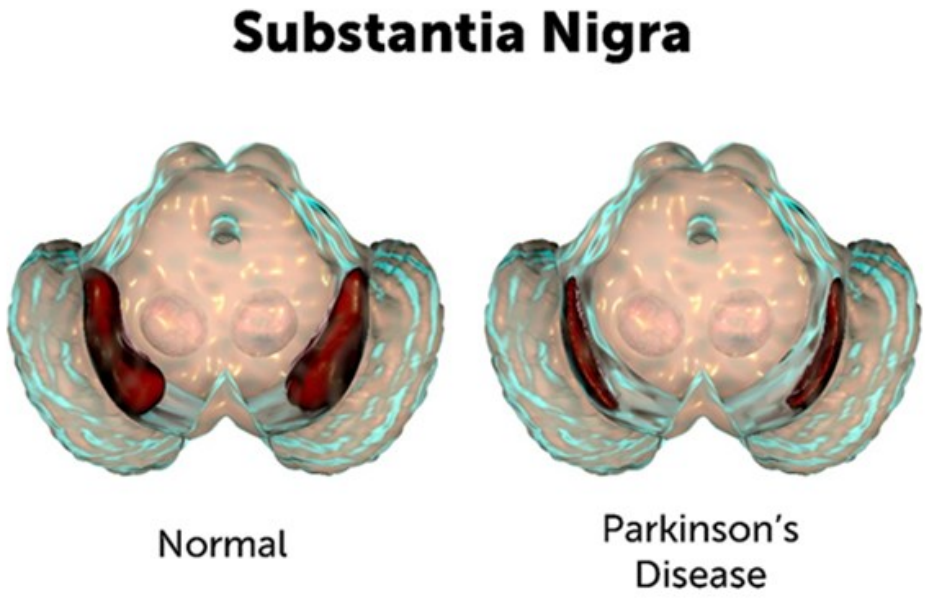
The Pathophysiology of Parkinson's disease

- 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

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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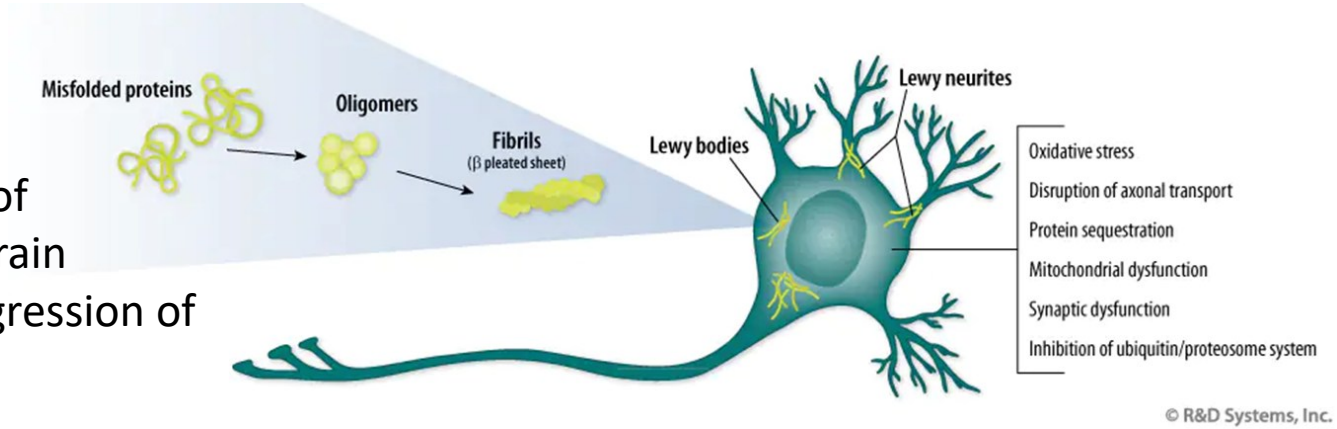
Pathophysiology of Parkinson's disease

- 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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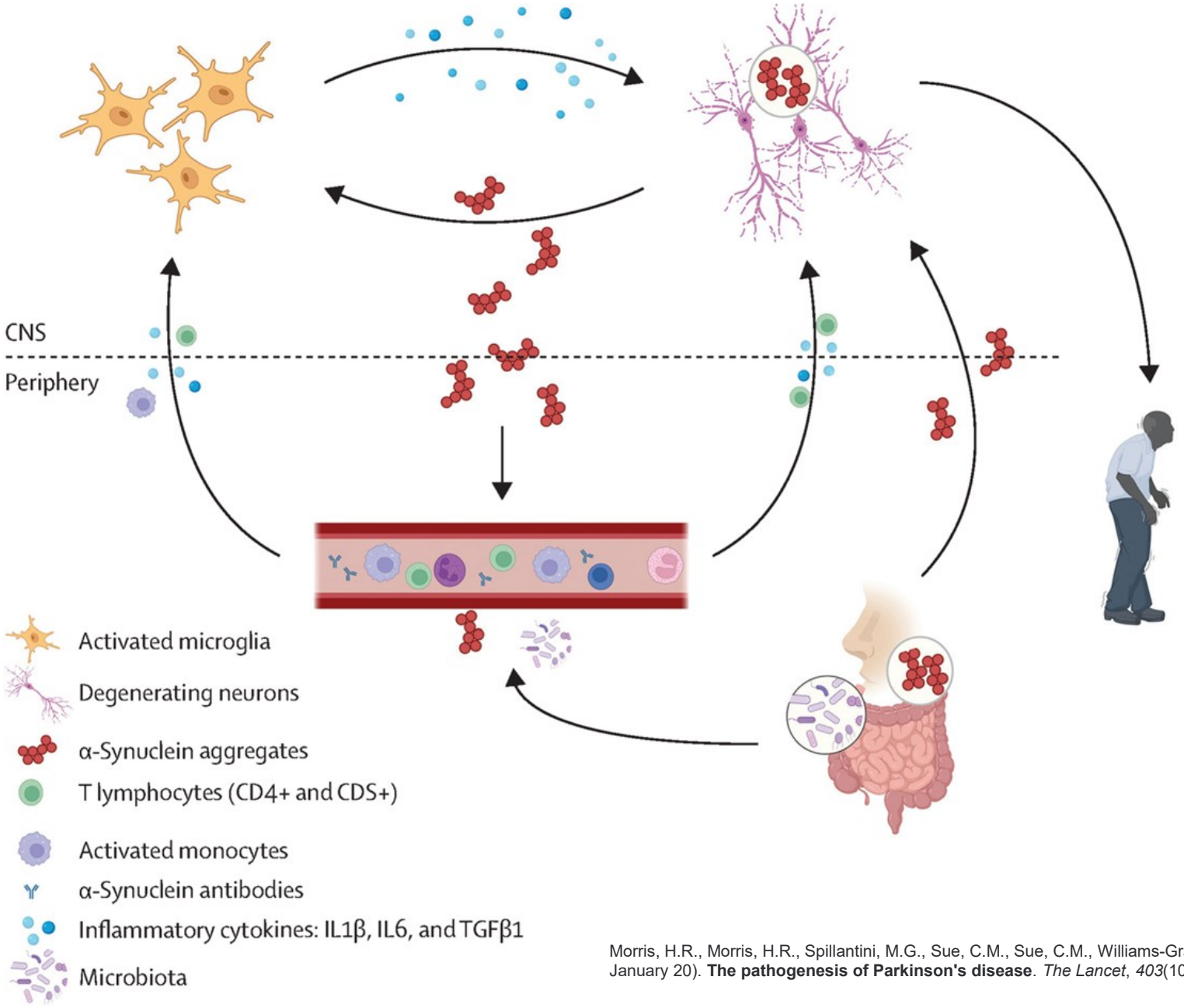

- Aggregation of abnormal α-synuclein spreads between the gut,
- brainstem,
- and higher brain regions

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)

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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People living with Parkinson's disease

- Benefit from a comprehensive, team-based healthcare approach
- Encourage early access to allied heath & MDT implementation

Goals

- *effective management of Parkinson's disease symptoms*
- *maximizing quality of life.*

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The Parkinson's Iceberg
Tremor
Akinesia/Bradykinesia
Rigidity
Postural Disturbance
What people see
What people don't see
Constipation
Speech
Swallowing difficulties
Panic attacks
Loss of smell
Lack of facial expression
Hypotension
Impulse Control Disorder and delusional behaviour
Sleep difficulties
Bladder dysfunction
Pain
Depression
Anxiety
Gastric reflux
Hallucinations
Sweating
Dementia
Erectile difficulties
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Living well with Parkinson's disease

1. Medication on time/ every time 
2. Maintaining social connections 
3. Speech Therapy 
4. Exercise 

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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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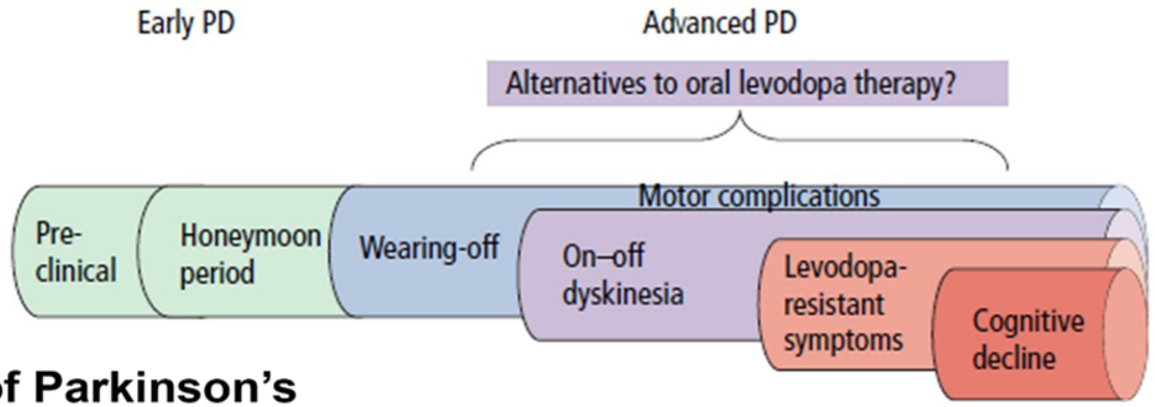
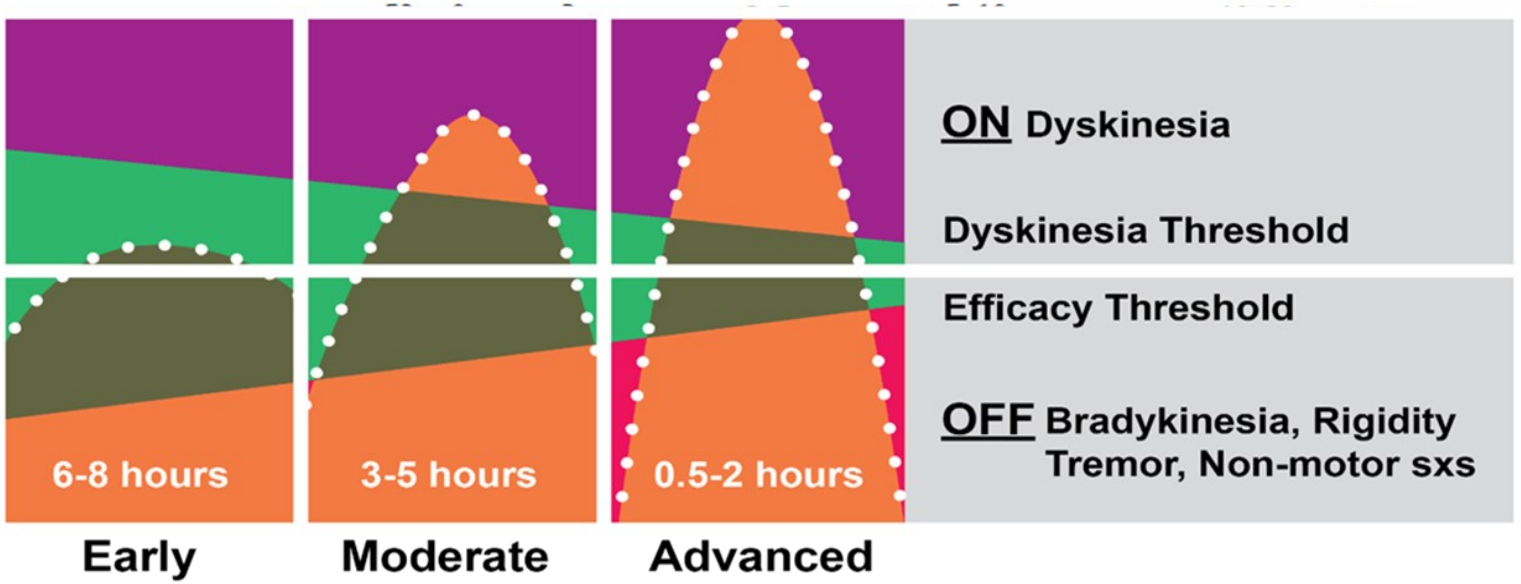
Why do medications become more complex?





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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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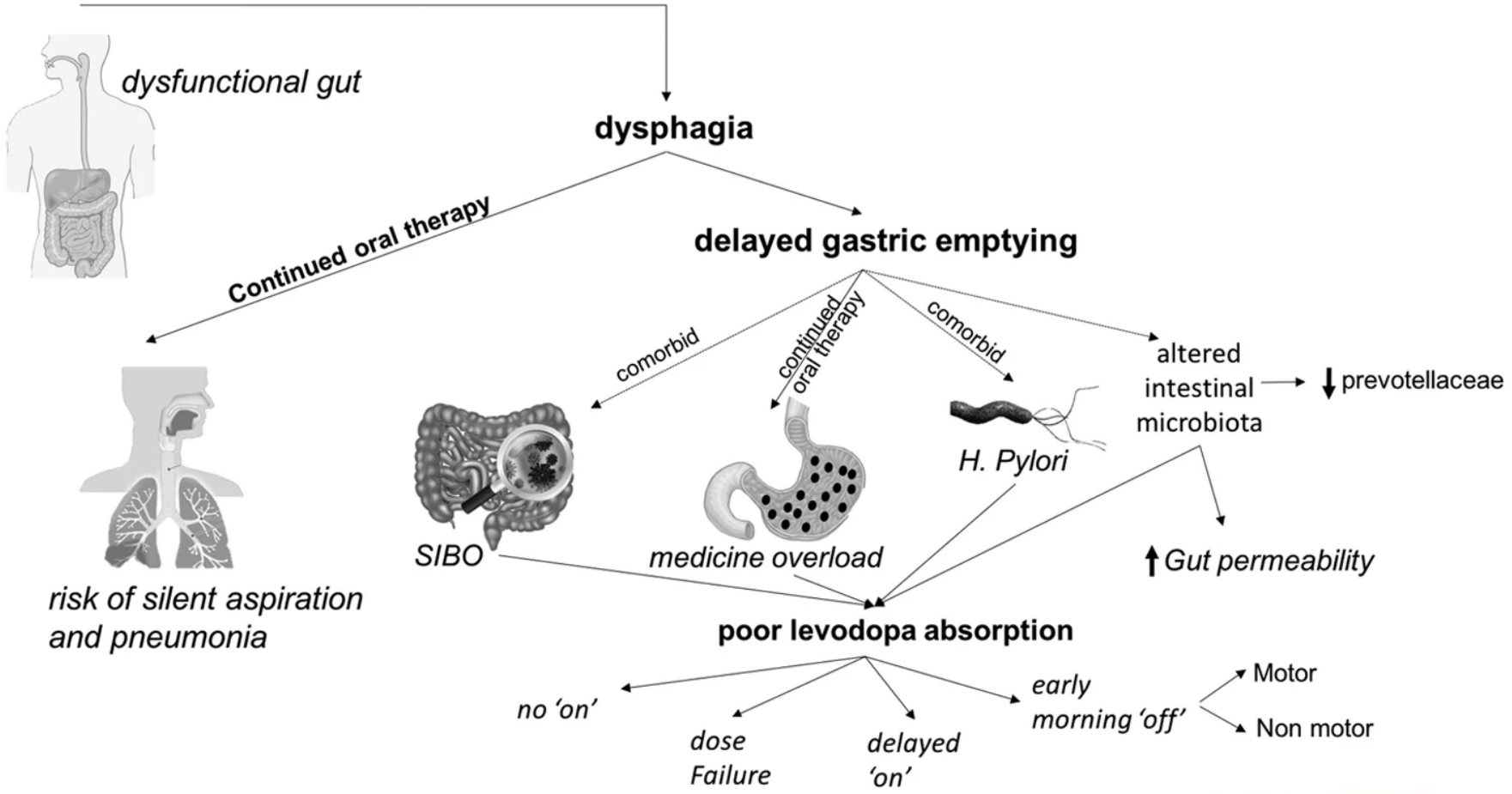
Optimising medication responses

- 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

When to consider Device Assisted therapies



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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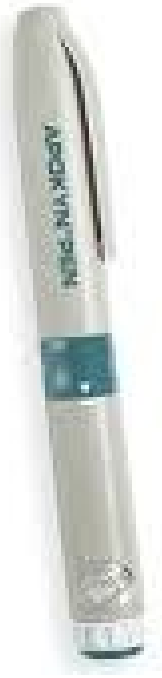
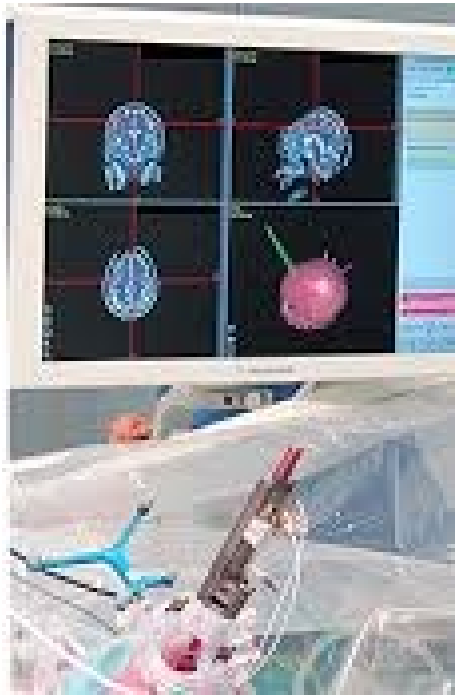
Device assisted therapies - DATs

- Apomorphine
- Duodopa
- Deep Brain Stimulation
- Levodopa/Carbidopa S/C infusion (Vyalev)





Falls Risks

A short shuffling gait? Anxiety

Stooped forward

Difficulty turning neck and head Hallucinations

Suffer from Freezing of Gait?

Postural Hypotension Cognitive impairment

Turning enbloc

Fear of falling Inappropriate footwear

Urinary frequency and Urgency / Nocturia

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The importance of exercise – improves

- improved walking, transfers, and balance
- muscle strength
- fitness
- ability to do daily activities
- helping to manage the related issues of apathy and depression.

Barriers to communication

- Voice and speech concerns including low volume, increased speech rate, stuttering, slurring, or difficulties in initiation of speech
- Reduced facial expression
- Memory problems
- Issues with concentration
- word finding, verbal planning, and language comprehension.

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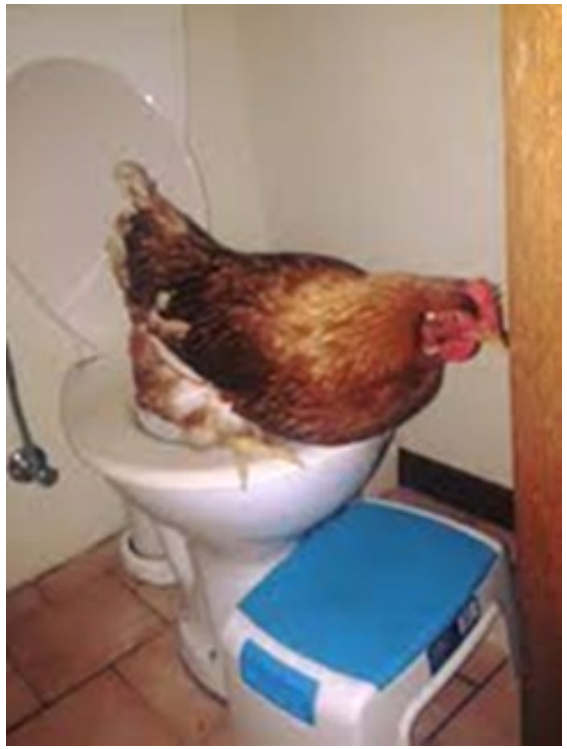
Gastrointestinal Tract



- 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

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Swallowing issues

- Taking a longer time to eat
- Coughing at mealtimes
- Difficulty swallowing tablets
- Can lead to malnutrition, dehydration and aspiration

Sleeping dysfunction

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

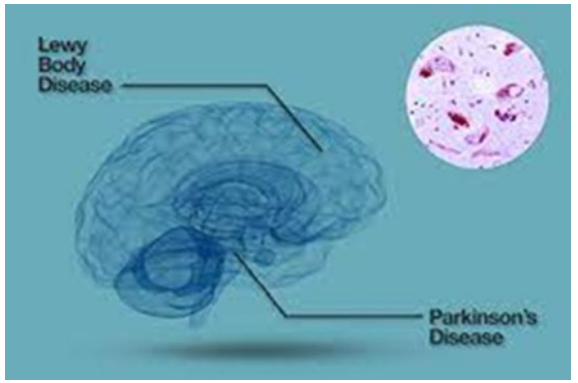
- Excessive daytime sleepiness
- Sleep hygiene practices
- Melatonin or Circadian SR (prescription)
- Mirtazapine

Anxiety and Depression

- Higher risk in PD with clinically significant symptoms in 30-35%
- Depression common at onset and increases in prevalence throughout disease course
- Anxiety as generalized anxiety disorder but also panic attacks, social phobia and agoraphobia
- Occurs as part of medication OFF periods in 35% of people with PD (Weintraub et al, 2022)
- Apathy occurs with and can overlap depression and dementia

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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Nutrition

- Weight loss is common in people with Parkinson's’
- decreased appetite
- increased energy expenditure (tremor and/or dyskinesia)
- swallowing difficulties
- poor gut motility

Care Teams

Identify useful members of a care team?

How can they contribute to managing/ maintaining Quality of Life ?

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Verida

- **Resources**
- The Parkinson's NSW Infoline: 1800727567
- Parkinson’s NSW website
- Parkinson's NSW aged-care resources

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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
- 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.

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, and
  - social activities.. into daily routines.
- Don’t rush a person living with Parkinson’s = anxiety

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Test and learn

- Implement the plan but be flexible and adaptable.
- Where possible, enable independence
- Empathize and listen
- Reassess and try something new if things don’t work.
- Consult the appropriate medical staff or GP if further advice is needed.