OLTCC ANNUAL CONFERENCE 2022
APPROACH TO PARKINSONISM IN THE OLDER ADULT IN LONG TERM CARE
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DISCLOSURES

- Both speakers have no current or past relationships with commercial entities

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- Greta has received a speaker's fee from Canadian Society of Hospital Pharmacists for learning activity
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COMMERCIAL SUPPORT DISCLOSURE

- This program has received no financial or in-kind support from any commercial or other organization

APPROACH TO PARKINSONISM IN OLDER ADULTS

Learning Objectives:

After this workshop, participants will be more informed about:

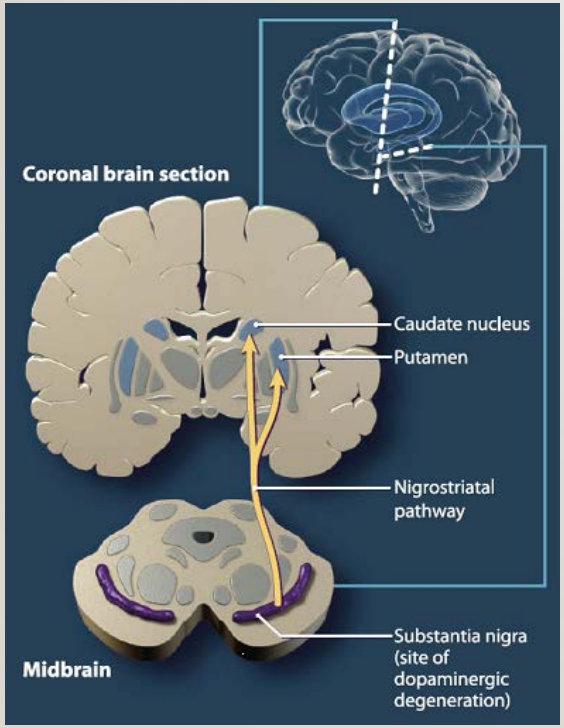
* 1. Approach to Parkinsonism in older adults.
* 2. Diagnosis of Parkinson disease (PD), in context of Long-Term care.
* 3. Initiation and monitoring of treatment.
* 4. Common non-motor symptoms of PD.

WHY IS PARKINSON DISEASE RELEVANT TO GERIATRICS?

- Prevalence = 1% over age 60[1]
- Fastest growing neurological disease (>AD) - Prevalence projected to double from 2015 to 2040 [2]
- Over 90% of persons with parkinsonism ≥ 60 y.o. [3]
- Complexity of PD with motor and non motor features, and high prevalence of frailty = "Geriatric Syndrome" [4]

1. Connolly, B et al. JAMA 2014; 311 (1) 1670-83
2. Dorsey ER, Bloem BR. *JAMA Neurol.* 2018;75(1):9–10.
3. Guttman, M. et al:. Mov. Disord. 2003, 18: 313-19..
4. Lauretani F. et al. Arch Ger and Geriatrics 54(2012): 242-246

PATHOPHYSIOLOGY OF PD



- Progressive degeneration of dopamine producing neurons in substantia nigra
- By the time motor symptoms emerge, 80% of neurons are lost

Guttman M, et al: CMAJ 2003; 168(3):293-301

APPROACH TO DIAGNOSIS

Recognize "parkinsonism": bradykinesia + one or both of rigidity and rest tremor

(*gait/postural changes)

Consider

1. exclusion criteria and red flags = Atypical/secondary

2. Supportive (typical) criteria for PD

MOTOR FEATURES OF PD

- Cardinal features: TRAP (tremor, rigidity, bradykinesia/akinesia, postural instability)
- Other motor features:
  - Masked face
  - Reduced blink rate
  - Hypophonia
  - Drooling
  - Micrographia
  - Hypokinetic dysarthria
  - Reduced spontaneous gesturing while talking
  - Stooped posture
  - Difficulty turning over in bed
  - Dystonia

NON-MOTOR FEATURES OF PD

Neuropsychiatric:

- Dementia – not typical in early PD
- Hallucinations – not typical in early PD, may be exacerbated by meds
- Depression – present in 10% of early PD patients; 50% during course of illness
- Anxiety/panic attacks
- Sleep disorders – RBD, RLS (may predate PD dx x yrs)
- Excessive daytime sleepiness/fatigue

NON-MOTOR FEATURES OF PD

Autonomic: may be absent/mild in early PD but increase with progression

- Orthostatic hypotension
- Constipation
- Urinary urge with frequency
- Sexual dysfunction
- Thermodysregulation & sweating
- Pain (burning, numbness) – may be off symptom; or associated with rigidity, dyskinesia/dystonia
- Dysphagia

An algorithm for the management of PD: treatment guidelines. Neurology 2001;56(11 suppl 5): S1-88

NON MOTOR FEATURES - PREVALENCE

- Early:
  - Hyposmia: 25 – 97%
  - Fatigue: 60%
  - Depression: 25%
  - RBD: 30%
  - Constipation: 30%
- Late:
  - Dysphagia: 50% (15y)
  - Freezing/falls: 90% (15y)
  - Anxiety/dep: 55%
  - Orthostasis: 15%
  - *Urinary urge: 35%
  - *Nocturia: 35%
  - **Urine incontinence: 33%
  - Sexual dysfunction: 20%
  - Cognitive impairment/dementia: 80% (10y +)

*Connelly, Lang. JAMA 2014; 311(16)1670-1683;
**Ruffion et al. Neuroepidemiology 2013;41:146–155

Parkinson Disease: M-A-N

Motor Symptoms:
Early

Shaking Stiff Muscle Shuffling Gait
(Tremor 70%) ↓ arm swings

Moderate

Slow Movement
Axial rigidity

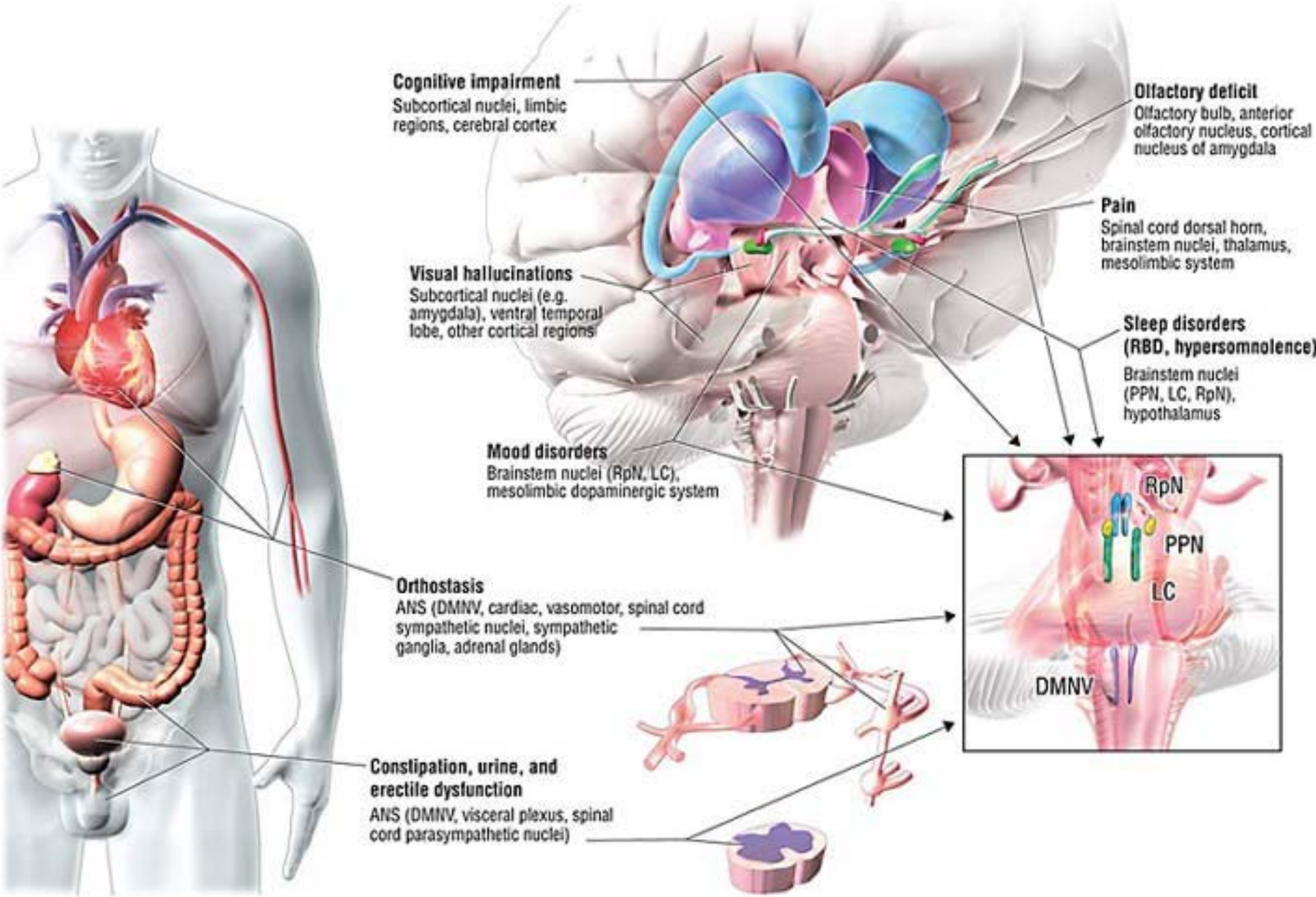
Advanced

Freezing of Gait, Falls
Postural Instability
Swallowing Difficulty

Autonomic Dysfunction:
Bowel: Constipation (60%) w slow GI motility
Bladder: (30%) Nocturia, OAB
BP: (30%) Orthostatic Hypotension

Neuropsychiatric Symptoms:
Deprivation of Sleep (60%): RLS, RBD(50%), OSA
Depression and/or Anxiety (40%)
Dementia w/wo Psychosis (40% or more)

RBD (often preceding PD by median of 14 years)


Cognitive impairment
Subcortical nuclei, limbic regions, cerebral cortex
Olfactory deficit
Olfactory bulb, anterior olfactory nucleus, cortical nucleus of amygdala
Pain
Spinal cord dorsal horn, brainstem nuclei, thalamus, mesolimbic system
Visual hallucinations
Subcortical nuclei (e.g. amygdala), ventral temporal lobe, other cortical regions
Sleep disorders (RBD, hypersomnolence)
Brainstem nuclei (PPN, LC, RpN), hypothalamus
Mood disorders
Brainstem nuclei (RpN, LC), mesolimbic dopaminergic system
RpN
PPN
LC
DMNV
Orthostasis
ANS (DMNV, cardiac, vasomotor, spinal cord sympathetic nuclei, sympathetic ganglia, adrenal glands)
Constipation, urine, and erectile dysfunction
ANS (DMNV, visceral plexus, spinal cord parasympathetic nuclei)

CGPD 2019: DIAGNOSIS AND PROGRESSION

- PD should be suspected in people presenting with tremor, stiffness, slowness, balance problems or gait disorders (Grade: D; GPP; Source: NICE)
- PD can be diagnosed using MDS clinical diagnostic criteria (Grade: GPP; Source: CAN)*
- Patients considered to have possible PD may benefit from trial of dopamine replacement therapy (Grade: GPP, Source: SIGN)

CGPD 2019: DIAGNOSIS AND PROGRESSION

- Patients with suspected PD with substantial disability or exclusion criteria/red flags should be seen by a specialist with expertise in movement disorders (Grade C, GPP; Source: SIGN)*
- CT/MRI should not be used routinely to diagnose PD (C; SIGN)
- Long term, regular follow up to review Dx and ongoing benefits of Tx (GPP; SIGN)
- Recognize poor specificity of Dx of PD in early stage (C; SIGN)

EXCLUDE OTHER CONDITIONS (SECONDARY/STRUCTURAL CAUSES AND ATYPICAL SYNDROMES)

- Hx of Strokes
- Repeated head injury
- Antipsychotic/antidopaminergic drugs
- Negative response to large doses of levodopa
- Other "atypical" neurological features
- Exposure to known neurotoxin
- Presence of cerebral tumor or communicating hydrocephalus on neuroimaging
- Definite encephalitis and/or oculogyric crises on no drug treatment
- More than 1 affected relative
- Sustained remission

UK PDS Brain Bank Clinical Diagnostic Criteria.
Parkinson's Toolkit. National Parkinson Foundation.
www.parkinson.org

ATYPICAL NEUROLOGICAL FEATURES

Presence of these features in early stages of disease can help distinguish PD from other parkinsonian syndromes: (CGPD 2012 – AAN Level B):

- Falls at presentation and early in course
- Poor response to levodopa
- Symmetry at onset
- Rapid progression (to Hoehn and Yahr Stage 3 at 3 y)
- Lack of tremor
- Dysautonomia (urinary ugency/incontinence and fecal incontinence, urinary retention requiring catherization, erectile dysfunction and orthostatic hypotension)

** Refer to specialist for evaluation if above present

CGPD – Canadian Guidelines on Parkinson Disease
Download at parkinsonclinicalguidelines.ca

ATYPICAL PARKINSONISM

- Progressive supranuclear palsy (PSP)
- Multiple Systems Atrophy (MSA-P, MSA-C)
- Dementia with Lewy Bodies (DLB)
- Corticobasal syndrome/degeneration (CBS/CBD)

DDX OF PARKINSONISM

Drug-induced Parkinsonism

- Typical antipsychotics or high dose atypical antipsychotics
- Antiemetics (metoclopramide, prochlorperazine)
- Bilateral symptoms, usually UE>LE
- Withdrawal usually leads to gradual improvement of Sx

Vascular Parkinsonism

- Gait instability and mild parkinsonian features in elderly patients felt to be due to subcortical macro/microangiopathic disease
- Vascular RF present; Imaging findings
- Often cognitive impairment

DDX OF PARKINSONISM

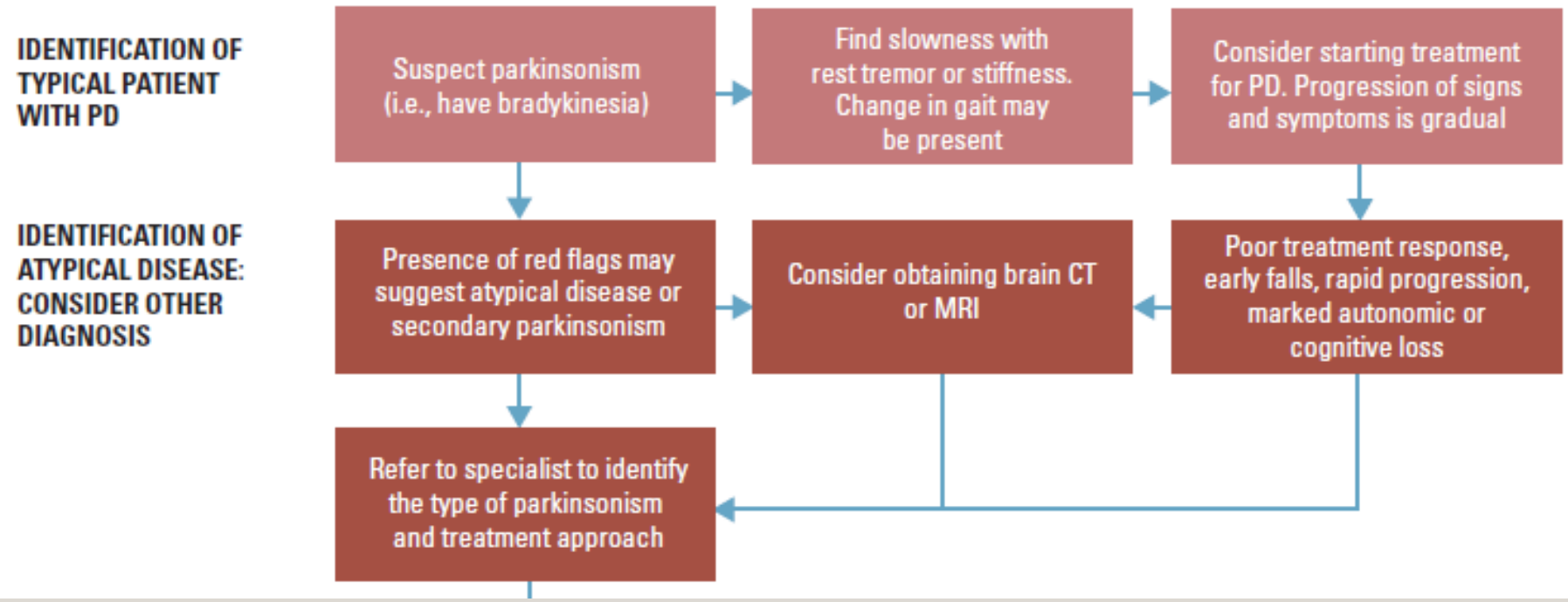
Essential Tremor

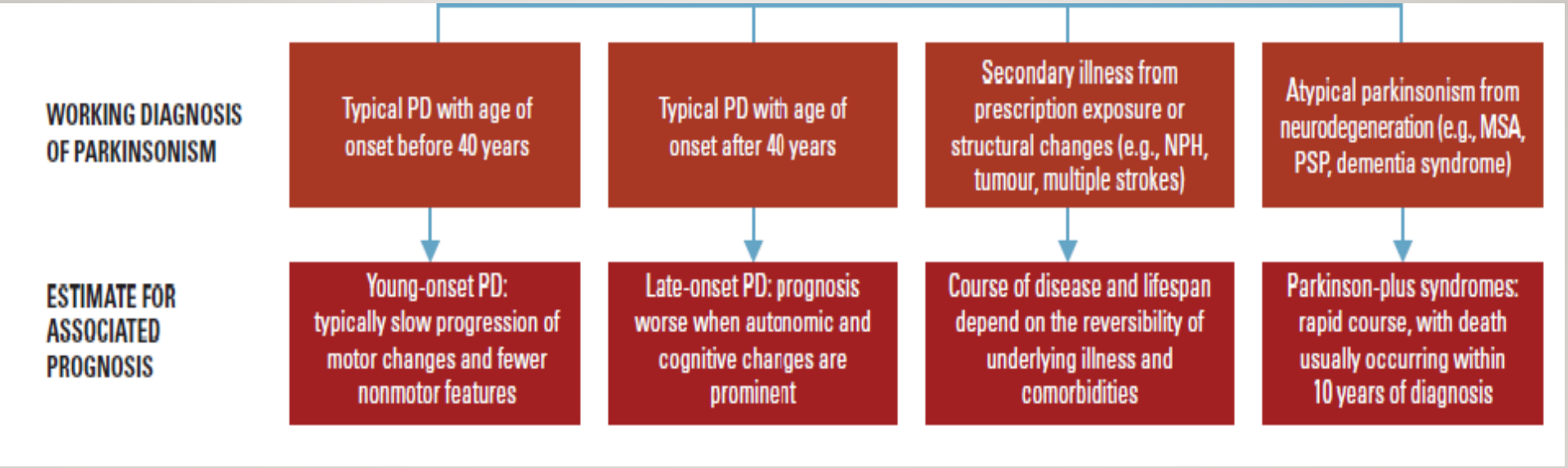
- Action and postural (flexion/extension), lessened by alcohol, no gait abnormality, other signs of PD absent, bimodal onset (20s and 60s)

Normal Pressure Hydrocephalus

- Rapid dementia, urinary urge/inc, magnetic/apraxic gait; CT/MRI shows hydrocephalus

Figure 2. Diagnosis and prognosis of Parkinson disease




WORKING DIAGNOSIS OF PARKINSONISM
Typical PD with age of onset before 40 years
Typical PD with age of onset after 40 years
Secondary illness from prescription exposure or structural changes (e.g., NPH, tumour, multiple strokes)
Atypical parkinsonism from neurodegeneration (e.g., MSA, PSP, dementia syndrome)
ESTIMATE FOR ASSOCIATED PROGNOSIS
Young-onset PD: typically slow progression of motor changes and fewer nonmotor features
Late-onset PD: prognosis worse when autonomic and cognitive changes are prominent
Course of disease and lifespan depend on the reversibility of underlying illness and comorbidities
Parkinson-plus syndromes: rapid course, with death usually occurring within 10 years of diagnosis

HOEHN AND YAHR STAGES

- Stage 1: unilateral
- Stage 2: bilateral
- stage 3: Bilateral with impaired of balance
- Stage 4: need gait aids, gait Impairment (FOG) and postural instability predominate.
- less responsive to PD treatment (likely related to nondopaminergic cell loss) → Increased caregiver stress
- Stage 5: bed bound or wheelchair dependent

Atypical Parkinsonism often start from stage 3

CONSIDERATIONS FOR LONG TERM CARE

- Highly frail population - Clinical frailty scale ≥ 6 out of 9
- High prevalence of dementia
- High prevalence of mobility issues, falls risk
- Dependent for ADLs and IADLs
- High risk of drug-drug interactions, adverse drug effects and drug-disease interactions
- Goals of care

CASE STUDY: MARIA

- Maria is a 75 y.o. right-handed retired teacher, single, G0P0
- Admitted to LTC 1 year ago after R hip fracture, and surgical complication, needs help with ADLs, mobilizes with a walker with R hip pain
- PMH:
  - HTN x 20 years
  - Afib x 5 years
  - Type 2 DM x 7 years
  - OA - knees
  - Hearing loss – wears aids
  - Medications: atenolol 50 mg daily, amlodipine 5 mg daily, rivaroxaban, metformin 500 mg bid, gliclazide MR 30 mg daily, acetaminophen 650 mg po qid

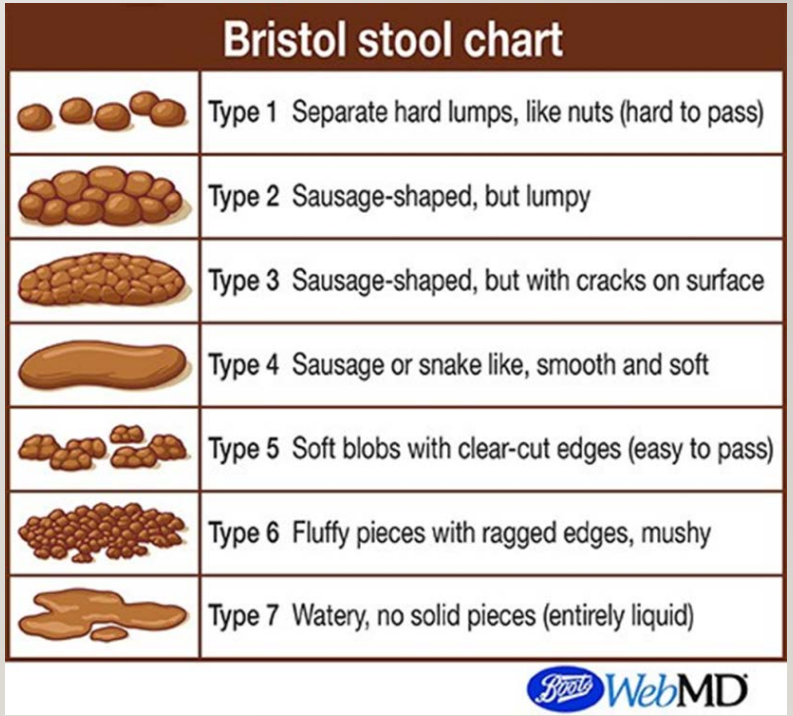
CASE STUDY: MARIA

- 6 month history of left hand pill rolling tremor at rest, increasing slowness in movement, drooling, and shuffling gait
- Several near falls despite using walker due to freezing of gait while turning

CASE STUDY: MARIA

Autonomic symptoms:

- BM: Bristol type 2 BM every 2-3 days, already on fibre and fluids
- Urine: Nocturia twice; some urge symptoms during day
- No dysphagia
- No orthostatic dizziness
- Thermal reg: No Sx



CASE STUDY: MARIA

Neuropsychiatric symptoms:

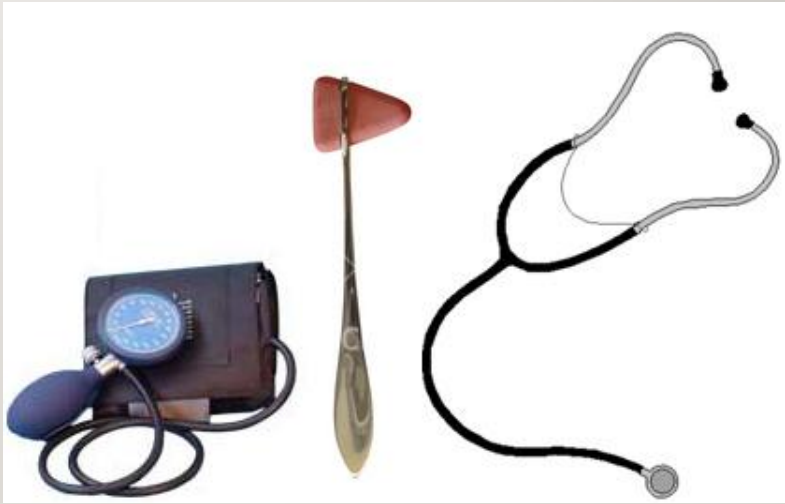
- No depression and anxiety
- Daytime sleepiness: trouble staying awake during activities
- REM sleep behaviour: Nurses report she yells in her sleep and when woken, seems dazed for a while
- Cognition: Nurses report no recent obvious confusion, no hallucinations or paranoia

PHYSICAL EXAM

Unified Parkinson Disease Rating Scale (UPDRS)

- I. Mental effects
- II. Activities of Daily Living
- III. Motor Impairment
- IV. Complications

(dyskinesia, % off time, on/off)



UPDRS PART III - MOTOR

- Facial expression, speech
- Rest tremor – jaw/head, R/L UE, R/L LE
- Action/postural tremor – R/L UE
- Rigidity – neck, R/L UE, R/L LE
- Hand movements – finger tap, hand grips, pronation/supination
- Leg agility – stamp heel into ground 10 x
- Get up from chair
- Posture
- Gait
- Balance – Pull Test
- Overall bradykinesia

PHYSICAL EXAM

- Other things to check:
  - Orthostatic vitals
  - EOM
  - Pronator Drift, Finger to Nose
  - Power
  - DTRs, Babinski
  - Light touch, Proprioception
  - Graphesthesia (abnormality = cortical sensory loss =atypical)
  - Quick mental status – serial 7s, clock

PHYSICAL EXAM: MARIA

- BP 130/80 HR 64/min – no orthostatic drop on immediate or standing after 2 min
- EOM full with no saccadic intrusion
- Weight = 55 kg
- MDS -UPDRS Motor Exam III: 34

Masked facies, L hand moderate rest and postural tremor, L>R bradykinesia, Gait – slow, shuffling, turns en bloc

- DTRs 2+ symmetric, Babinski Flexor, Power – R hip flexor 3+/5, exam otherwise unremarkable

MDS CLINICAL DIAGNOSTIC CRITERIA (2015) – CLINICALLY ESTABLISHED PARKINSON'S DISEASE

Specificity at least 90%

- Parkinsonism – bradykinesia plus either rigidity or rest tremor[1]
- **Clinically established PD:**[1]
  - **Absence of absolute exclusion criteria; at least 2 supportive criteria; no 'red flags'**

Absolute exclusion criteria[1]

- Cerebellar signs
- Supranuclear gaze palsy
- Established diagnosis of BVFTD
- Parkinsonism restricted to the lower limbs only for >3 years
- Treatment with an antidopaminergic, or with dopamine-depletion agents
- Absence of response to levodopa
- Sensory–cortical loss
- No evidence for dopaminergic deficiency on functional imaging
- Other parkinsonism-inducing condition

Red flags[1]

- Rapid deterioration of gait
- Absence of motor symptom progression over 5 years
- Early bulbar dysfunction
- Respiratory dysfunction
- Early severe autonomic failure
- Early recurrent falls due to misbalance
- Disproportionate anterocollis
- Absence of common non-motor features of disease during >5 years
- Pyramidal tract signs
- Bilateral symmetric presentation

Supportive criteria[1]

- A clear and dramatic positive response to dopaminergic therapy
- Levodopa-induced dyskinesia
- Documentation of resting tremor of a limb
- A positive diagnostic test of either olfactory loss or cardiac sympathetic denervation on scintigraphy

BVFTD=behavioural variant-frontotemporal dementia; MDS=movement disorder society

1. Postuma et al. Mov Disord 2015;30(12):1591–1601

TYPICAL FEATURES (PD)

MDS 2015 CRITERIA

- A clear and dramatic positive response to dopaminergic therapy
- Levodopa-induced dyskinesia
- Documentation of resting tremor of a limb
- A positive diagnostic test of either olfactory loss or cardiac sympathetic denervation on scintigraphy

UK BRAIN BANK CRITERIA

- Unilateral onset.
- Rest tremor present.
- Progressive disorder.
- Persistent asymmetry affecting the side of onset most.
- Excellent response (70–100%) to levodopa.
- Severe levodopa-induced chorea.
- Levodopa response for 5 years or more.
- Clinical course of 10 years or more.

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FEATURES SUGGESTIVE OF ATYPICAL OR SECONDARY PARKINSONISM - MDS

ABSOLUTE EXCLUSION

- Cerebellar signs
- Supranuclear gaze palsy
- Established diagnosis of BVFTD
- Parkinsonism restricted to the lower limbs only for >3 years
- Treatment with an antidopaminergic, or with dopamine-depletion agents
- Absence of response to levodopa
- Sensory–cortical loss
- No evidence for dopaminergic deficiency on functional imaging
- Other parkinsonism-inducing condition

RED FLAGS

- Rapid deterioration of gait
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- Pyramidal tract signs
- Bilateral symmetric presentation

CASE STUDY: MARIA

Apply the Dx criteria to Maria's presentation - what do you conclude?

IMPRESSION: MARIA

- You diagnose:
  - Clinically probable PD
  - If she has a dramatic improvement on levodopa, it will become Clinically Established PD

CASE STUDY: MARIA

- What are the **non-motor symptoms** identified?

CASE STUDY: MARIA

- Constipation
- Nocturia
- Possible REM sleep behaviour disorder leading to daytime fatigue

PHARMACOLOGIC THERAPY IN EARLY PD

- Individualize therapy based on patient lifestyle, needs, goals, clinical circumstances, frailty, risks from medications (GPP; NICE)
- Levodopa can be used in early PD (A; NICE) at as low a dose as possible to maintain function (A: NICE)
- DA agonists may be used in early PD (A, NICE) – but due to higher risk of A/E, discourage use in older patients over 70
- MAO-B I can be used in early PD (A, NICE)

Grimes et al. CMAJ Sept 2019; 191: E 989-1004

PHARMACOLOGIC THERAPY IN EARLY PD

- Insufficient evidence to recommend amantadine in early PD (A; SIGN)
- Anticholinergics should not be used as first line tx in early PD (B: SIGN)

Grimes et al. CMAJ Sept 2019; 191: E 989-1004

MOTOR SYMPTOMS TREATMENT GENERAL CONSIDERATIONS (ABBREV FOR LTC CONTEXT)

- No sudden withdrawal of Dopa therapy (NMS) (D, GPP; NICE)
- On time administration of meds in care facilities (D, GPP; NICE)
- Impulse control disorders should be discussed in verbal and written form with patient/caregiver when starting DA agonist therapy (GPP; NICE)
- ICD can develop in a person with PD on dopaminergic therapy at any stage in disease course (GPP, NICE)

Grimes et al. CMAJ Sept 2019; 191: E 989-1004

DOPAMINERGIC THERAPY FOR EARLY PD

- **Efficacy: Levodopa > Dopamine agonists > MAO-B inhibitors**

CMAJ 2019 September 9;191:E989-1004

- Dopaminergic Adverse Effects:

- nausea, dizziness (↓bp), fatigue and psychosis * (sp. caution in dementia)

Drug Class	Frequency	MOA	Adverse Effects
Levodopa	≥3x/day	becomes dopamine in brain	++
Dopamine agonists	3x/day	mimic dopamine	++++
MAO-B inhibitors	1x/day (Selegiline 1-2x/day)	block dopamine metabolism	+

LEVODOPA/ CARBIDOPA DOSING

Initial (for frail elderly) :

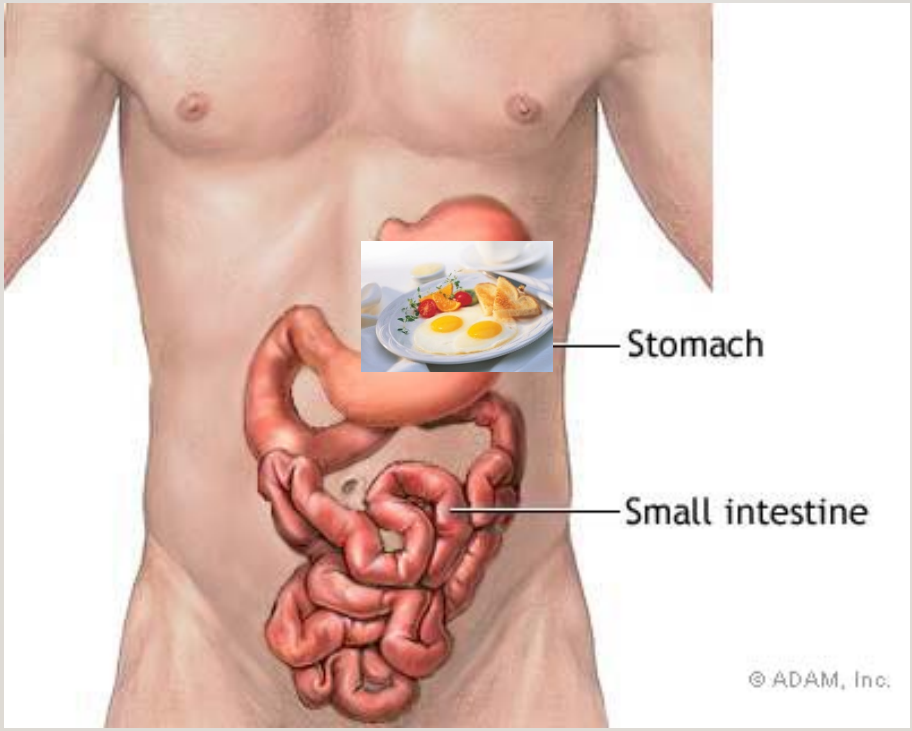
- sinemet IR 100/25 ½ tab tid for 1 week then
- increase by ½ tablet/week until 1 tab tid
- 30 – 45 min ac if possible (protein interaction)
- Nausea → may try Prolopa (l-dopa/benzerazide)

- Crush Sinemet tablet & mix in carbonated drink to speed up onset
- Sinemet CR – for hs dosing only, 70% bioavailability, can't be crushed
- SE: nausea (take with non-protein snack), hypotension

(may need to ↓ antihypertensive med), psychosis

- Drug interaction: iron ↓ absorption

DELAYED ON DUE TO A LARGE MEAL/PROTEIN/CONSTIPATION



IS LEVODOPA NEUROTOXIC OR DISEASE-MODIFYING?

- Neither – it seems to be symptomatic only
- Start levodopa when clinically warranted (Sx enough to bother/affect function)
  - ELLDOPA trial NEJM 2004
  - Randomized Delayed-Start Trial of Levodopa in Parkinson's Disease (LEAP trial) - NEJM 2019

LEVODOPA/ CARBIDOPA TREATMENT CONSIDERATIONS

- Reassess in 3 months
- Monitor for:
  - Motor:
    - Benefit on TRAP (UPDRS Motor exam)
    - Motor fluctuations: wearing off, dyskinesias (long term)
  - Autonomic:
    - Orthostatic vitals
    - GI: constipation, nausea (add bowel routine)
  - Neuropsych:
    - Confusion, hallucinations, somnolence

DOPAMINE AGONISTS (DA)

- Pramipexole, ropinirole, transdermal rotigotine
- Mimic dopamine & directly stimulate dopamine receptors in the brain
- DA cause less dyskinesias than Levodopa
  - (20% vs 45%) in studies up to 2 years
- Eventually require addition of Levodopa
- DA should be used with caution, if not avoided completely, in older patients (over 70) (CGPD 2019)

DOPAMINE AGONISTS: ADVERSE EFFECTS

- Visual hallucinations (17% vs 6 % with Levodopa)
- Nausea, Orthostatic Hypotension, Ankle edema
- Sudden sleep attacks (driving concerns)
- Impulse control disorder: hypersexuality, food compulsions, pathological gambling, shopping, pornography even without prior hx (13% vs 0.6% with l-dopa)
- Dopamine Agonist Withdrawal Syndrome (DAWS) – dysphoria, anxiety, depression plus motor Sx

(*Prevalence of repetitive & reward-seeking behaviors in PD. Neurology 2006; 67:1254-1257)*

MAO-B INHIBITORS:

SELEGILINE

RASAGILINE

SAFINAMDE

Selegiline 5mg qam and noon

- Avoid hs dose – insomnia from amphetamine metabolites

Rasagiline: 0.5 – 1mg daily

- (Adagio study) "may" slow down PD progression
- 0.5mg daily if liver disease or taking ciprofloxacin (CYP1A2 inh)

- Contraindicated with:

  St. John's Wort & cyclobenzaprine

  DM cough syrup: psychosis or bizarre behavior
- Avoid Meperidine, Tramadol, Methadone, Propoxyphene

(OK with benzodiazepine, morphine, fentanyl, codeine)

Am J Health-Syst Pharm. 2006;63(10):915-928; Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2016 Dec; 160(4):549-552. Tempo Study. Arch Neurol 2002;59:1937-1943

POTENTIAL SEROTONIN SYNDROME

Substrates for monoamine oxidase enzymes

	MAO-A	MAO-B
Substrates	Serotonin Norepinephrine Dopamine Tyramine	Dopamine Phenylethylamine
Tissue localization	Brain, gut, liver, placenta, skin	Brain, platelets, lymphocytes

MAO: monoamine oxidase

- Contraindicated w MAO-I: Linezolid, moclobemide
- SSRI/SNRI is ok, keep dose low & monitor
  ≤ 20 mg citalopram, ≤ 100 mg sertraline, ≤ 100 mg trazodone
- Avoid fluoxetine (long T1/2) and fluvoxamine (CYP1A2 inh)

Innov Clin Neurosci.2012;9(11–12):39–41

CONSTIPATION IN PD

- Dietary fibre
- Increase fluid intake: 6 – 8 glasses per day (min)
- Exercise
- Meds:
  - Most evidence: PEG 3350 8.5 GM DAILY TO 17 GM BID (titrate to response)
  - Senokot 2 tab hs/Dulcolax 5 – 10mg 4 TIMES WEEKLY
  - NO Docusate – little evidence
  - NO psyllium

REM SLEEP BEHAVIOUR DISORDER

- Lack of large muscle atonia during REM sleep leads to acting out dreams, and poor sleep quality (35% of PD pt)
- Options:
- Clonazepam 0.25 mg hs, titrate dose up as needed
  - Evidence: case reports and case series in PD only
  - A/E: sedation, confusion, falls
  - Relative contraindication: elderly, frail patients with falls and cognitive impairment
- Melatonin Dual action or Timed Release 5 - 15 mg hs
  - Evidence: 1 small RCT on patients with RBD (not in PD)
  - A/E: daytime sleepiness, dizziness, headache
  - Use as first line in older patients who may be at risk for falls

2019 CDN PD GUIDELINES: TEAM SERVICES

- Refer people with early PD to PT with expertise in PD for assessment and advice, including info about exercise (B, NICE) and OT with expertise in PD (B, NICE)
- PT should be offered to patients with balance or motor function issues (A; NICE)
- OT specific to PD should be offered to people having difficulty with ADL (A, NICE)
- SLP should be offered to PWP who have issues with communication, dysphagia or drooling (A: NICE)

CASE STUDY: MARIA

You referred Maria to the Movement Disorders Specialist (wait time 1 year); in the meantime prescribe:

- Levodopa/carbidopa 100/25 ½ tab tid, going up weekly by ½ tab to 1 tab tid 30-45min ac
- PEG 3350 17 gm daily with fluids
- Melatonin dual action 5 mg hs
- Referral to PT, OT and SLP in facility

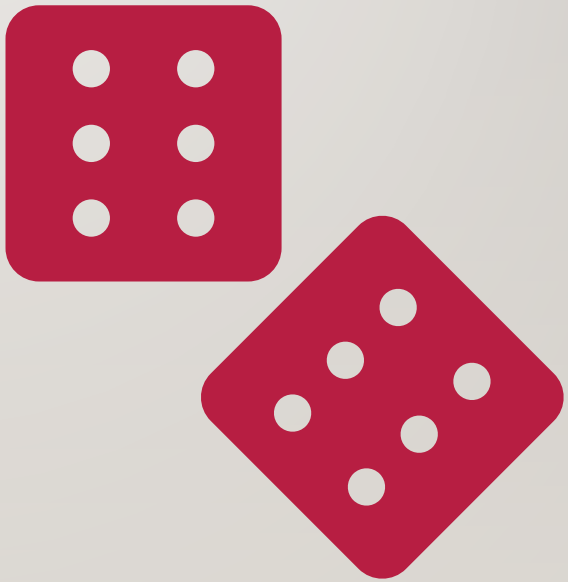
OTHER CONSIDERATIONS

- Bone Health
  - Vitamin D 1000 – 2000 iu po daily +/- Ca supp
  - Baseline BMD (higher risk of Osteoporosis, falls, # in PD)
- Skin check for melanoma (increased risk)
- Refer to Parkinson Canada for support groups for appropriate patients/family caregivers
- GCD discussions

CASE - PAUL

65 yo retired accountant admitted to LTC for 3 years – 20 year Hx of PD, frequent falls, 5 years of hallucinations with recent worsening paranoia

- He won't go to sleep at night and is agitated, calling nurses frequently
- Hypersexual with nurses – inappropriate touching and comments
- He has lost 10 lb recently and has moderate almost continuous writhing dyskinesias



IMPULSE CONTROL DISORDERS (ICDS)

* Failure to resist an impulse or temptation to perform an act (that is harmful to the person or to others)
* Anxiety & obsessive symptoms often coexist
* Higher risk in younger males with impulsive personality
* Pt tends to hide/downplay ICDs

ICD SYMPTOMS

- Gambling
- Sex
- Buying
- Eating
- Hobbyism
- Punding (repeating task with no particular purpose)
- Increase use of PD drugs

WEIGHT LOSS / LOW BODY WEIGHT

- Levodopa dosing is weight based
- WEIGHT LOSS = excessive dopamine stimulation with same dose →

ICD, psychosis and dyskinesias

- Dyskinesias drive more weight loss → vicious cycle

ICD - MANAGEMENT

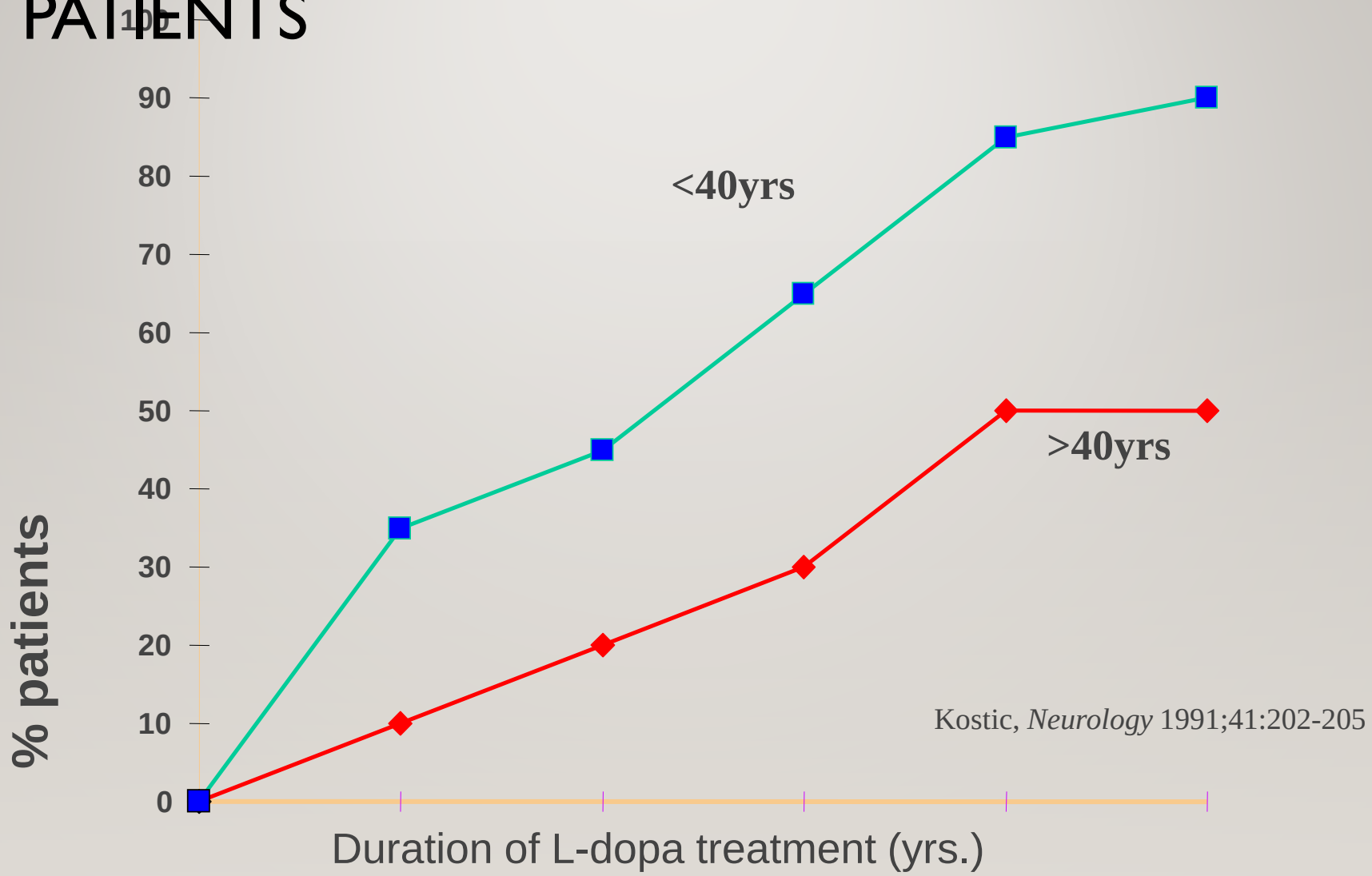
- Taper down Dopamine Agonist as soon as ICD is identified.
- Gradual dose reduction is essential to avoid dopamine agonist withdrawal syndrome (DAWs): panic attacks, sweating, dysphoria, pain, craving for DA.
- If on levodopa and MAO-I (rasagiline) or entacapone, stop rasagiline or entacapone
- Last thing to reduce - levodopa

Neurol Clin Pract 2012, 2(4):267-274
Mov Disord 2008,23:75-80

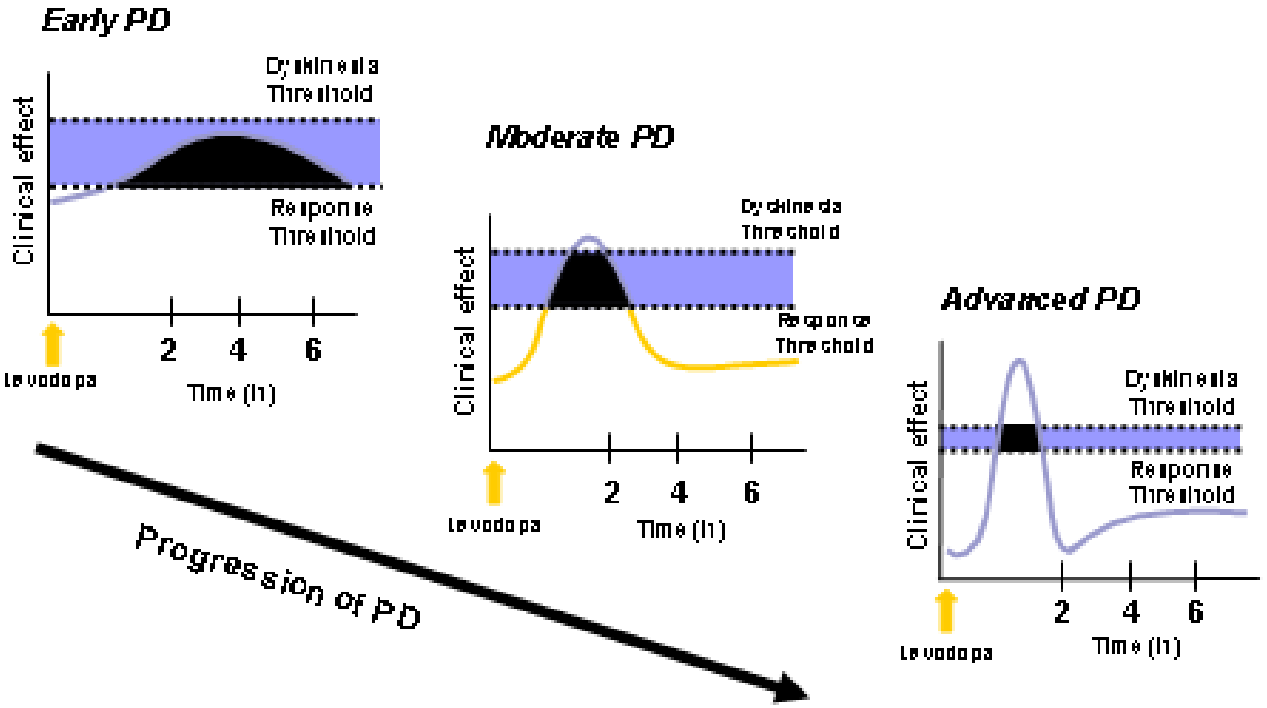
DYSKINESIA

- Involuntary movements: mild jerks to twisting movements
- abnormal response by the dopamine-deprived brain to non-physiologic pulsatile levodopa stimulation
- May occur at any time, but usually at peak levodopa level (1 hr after taking the dose)

DYSKINESIA MORE COMMON IN YOUNG PATIENTS



Why Does "Wearing Off" Appear Over Time?



Olanow CW, *et al. Neurology* 2001; 56: S1-88.

OPTIONS FOR "WEARING OFF"

1. Ensure no constipation and take dopa 30 – 45 min ac
2. Increase dosing frequency
3. Increase individual dose
4. Add adjunct or refer for advanced therapies

Arch Neurol 2005;62:241-8

Lancet 2005;365:947-54

Neurology 2006;66:983-95

CGPD 2019 THERAPY FOR MOTOR SX IN LATER PD

- COMT-I (entacapone) and MAOB-I (rasagiline) may be used to reduce off times (A, SIGN)
- Sinemet CR may improve nighttime wearing off (GPP)
- Intestinal levodopa gel through PEG may be considered for reduction of off time or for dyskinesias (C; EFNS)
- Amantadine is used for dyskinesias (200 – 400 mg /d) (A, EFNS)
- DBS of STN or Gpi is effective against motor fluctuations and dyskinesias (A, EFNS)

Grimes et al. CMAJ Sept 2019; 191: E 989-1004

Freezing of Gait

FREEZING OF GAIT

- Extremely difficult problem with multiple contributing factors, including deficits in attention, cognition, anxiety, motor programming
- Common in late stage PD, as well as atypical parkinsonism, vascular parkinsonism/dementia, NPH
- Physical therapy, gait training, improvement of balance can help
- Multiple therapies are being investigated: some evidence for use of CI (improvement of attention)

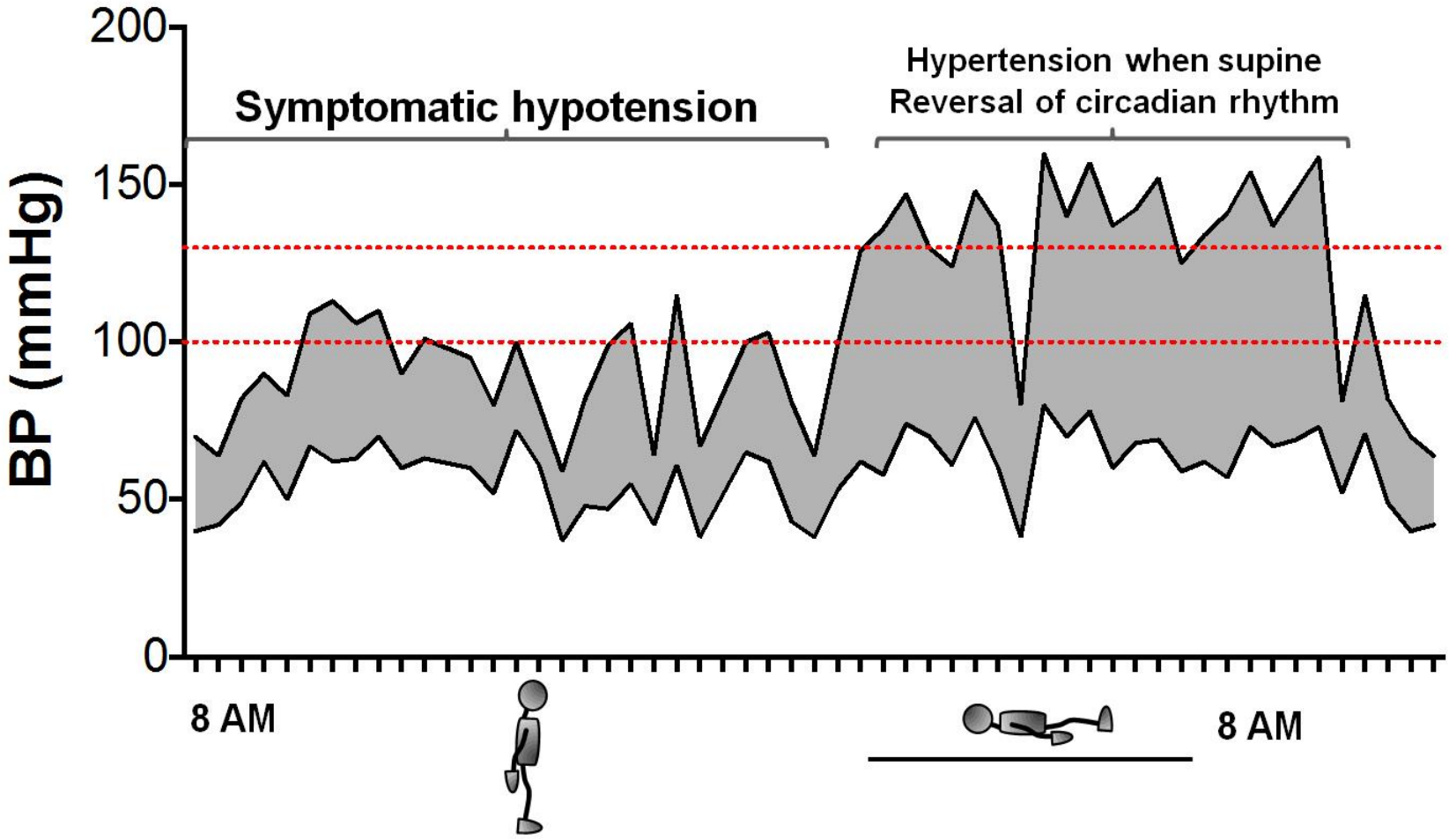
CGPD 2019 – COGNITION AND PSYCHOSIS

- Presence of psychosis (hallucinations (usually visual)/ delusions) should trigger a medical and cognitive assessment (GPP; NICE)
- Reduce/stop culprit medications:
  - stop anticholinergics -> stop amantadine -> reduce/stop dopamine agonists - > reduce/stop MAO-B/entacapone -> lastly reduce levodopa (CGPD 2019 - EFNS GPP*)
- If PDD diagnosed, then consider donepezil or rivastigmine(A, EFNS), galantamine (C; EFNS); memantine can be added or sub'd if CI not tolerated or efficacious(C, EFNS)
- Avoid all antipsychotics other than quetiapine (GPP) and clozapine (A; CFNS); Clozapine needs monitoring.

Pronounced BP Variability

Orthostatic Hypotension (OH)

after standing : drop in SBP >20 mm Hg, DBP >10 mmHg within



MEDICATIONS KNOWN TO AGGRAVATE OH

- α blockers
- Tricyclic antidepressants
- Anticholinergics
- Nitrates
- Diuretics
- Antihypertensive agents
- Beta-blockers
- SGLT-2 inhibitors
- Parkinson's medications (to a less extent with levodopa)

NON-PHARMACOLOGICAL MANAGEM

- Education: identify triggers - big meals, defecation, symptoms, check BP
- Goals: increase blood volume and vasoconstriction without supine HT, decrease venous pooling
- Non-pharm Mgn:

  ↑ blood volume: fluid intake – 5-8 eight ounce glasses/day,

  salt 2g tid if no CV contraindication

  Raise head of the bed by 4 inches to ↓ nocturia & supine HT.

  ↓ venous pooling: elevate legs,

  compression stockings, **abdo. binder (wear while out of bed)**

Cleve Clin J Med 2010 77(5):298-306
Lancet Neurol 2008 7(5):451-458

OH – MEDICATION MANAGEMENT

1. REDUCE/ELIMINATE CULPRIT MEDS
2. CONSIDER if symptomatic/falls due to OH:

- **Midodrine (vasoconstrictor)** 2.5 -10 mg at 8am, 12pm, 4pm
  Avoid lying down within 4 hrs to prevent supine hypertension
- **Fludrocortisone (vol. expansion)** 0.05 mg – 0.2 mg qam
  Contraindicated in CHF/CRF; monitor **hypokalemia** & edema
  DO NOT USE fludrocortisone if supine hypertension
- **Pyridostigmine** 30-60mg tid or Mestinon Timespan 180mg daily

modest vasoconstrictor effect especially during standing, will not cause supine hypertension, SE: diarrhea, abdominal colic, nausea, sialorrhea

MANAGEMENT OF SUPINE HTN

Captopril 6.25-12.5mg po qhs or

Nitro-patch 0.2 mg -0.4 mg (remove 30min before getting up)

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CGPD 2019 - PALLIATIVE CARE

- People with PD and their family should be offered opportunities to discuss prognosis, promoting their priorities, shared decision-making and patient-centred care. (D, NICE)
- Patients and caregivers should be given info (verbal and written) about progression, possible drug A/E, ACP, what could happen at end of life, support services (D; NICE)
- Consider referring people at any stage of PD to palliative care team to allow the opportunity to discuss end of life choices and care. (D; NICE)
- Palliative care requirements of people with PD, including options in MAID should be considered throughout all phases of disease (CGPD 2019 – GPP; CAN)

RECTAL ADMINISTRATION OF LEVODOPA (PALLIATIVE/NPO SITUATIONS)

Preparation of rectal suspension:

- Crush 10 tablets of levodopa-carbidopa 100/25
- Mix with 10 mL of 50% water + 50% glycerin mixture (2 tablets = 2mL)
- Lower pH to 2.3-2.4 using 1 g of citric acid
- Administer levodopa-carbidopa suspension (1 tablet per mL) using a 3-mL syringe attached to a 6-cm catheter
- Store between 2°C-8°C in an amber bottle
- Use within 24 hours Shake well before use

Canadian Family Physician 2001 (47) 112-3

LATE STAGE PD - ROLE OF THE LTC PHYSICIAN

- Recognize and help manage motor and non-motor complications (esp. hypotension and constipation)
- Referral to OT/PT/SLP
- Recognize that cognitive impairment/dementia makes optimal tx of motor symptoms difficult due to dopa → confusion
- Support patient and caregiver in
  - Goals of care discussion - realistic expectations
  - Support decision making using Clinical Frailty Scale
  - GCD should be mainly comfort/QOL
  - Prioritize clear mentation > motor "On"

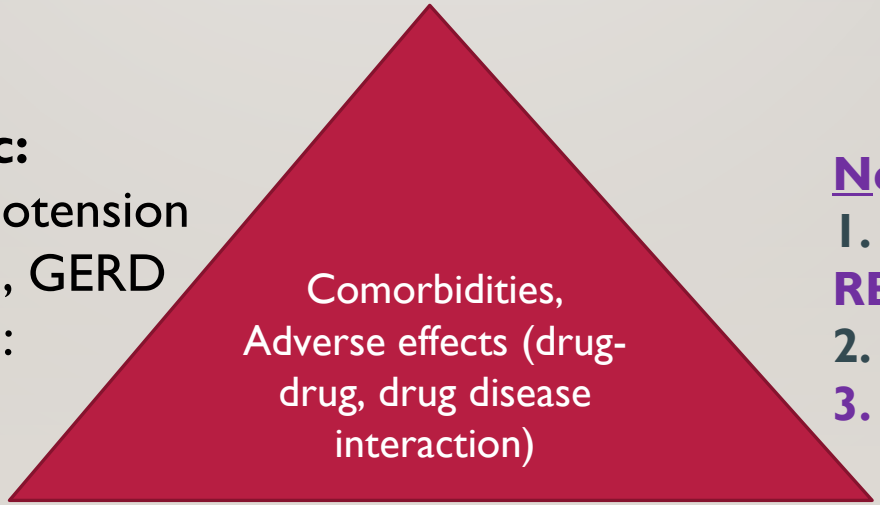
COMPREHENSIVE PARKINSON'S ASSESSMENT: M-A-N

Motor:

1. **TRAP, Motor fluctuations**
2. **Bone health, falls risk**
3. **Swallowing problem**

Autonomic:

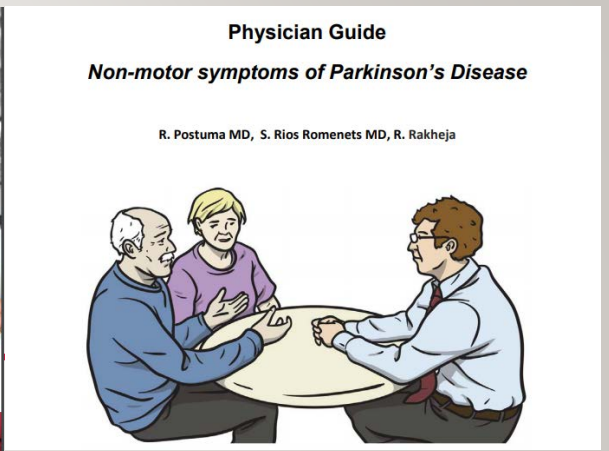
1. **B**P: Orthostatic Hypotension
2. **B**owel: Constipation, GERD
3. **B**ladder Dysfunction: OAB, UTI



Neuropsychiatric:

1. **D**isturbed Sleep: RBD,RLS,OSA
2. **D**epression/Anxiety
3. **D**ementia/ Psychosis

RESOURCES



- http://www.parkinson.ca/wp-content/uploads/Medications-to-treat-Parkinson%E2%80%99s-disease.pdf

- http://www.parkinson.ca/wp-content/uploads/Physician_Guide_to_Non_Motor_Symptoms_of_Parkinson_Disease.pdf

BONUS SLIDES

VASCULAR PARKINSONISM

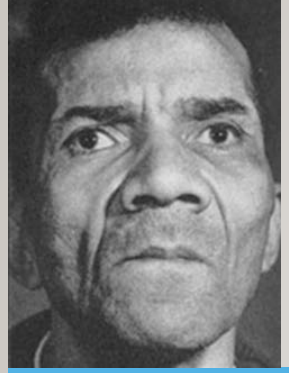
- Common among the elderly : (3–6%) of all Parkinsonism
- Caused by cerebrovascular disease: subcortical white matter disease or lacunar infarcts affecting the substantia nigra or its projections
- Associated with increasing age and vascular risks (hypertension, previous TIAs, ↑ lipid & DM)

VASCULAR PARKINSONISM

- Motor symptoms: usually **bilateral and affects the lower limbs, wide base gait, normal arm-swing**, (compared to the stooped posture, narrow base, and reduced arm-swing of PD).
- Rare tremor
- Increased tone = spasticity and rigidity
- Concurrent vascular dementia & depression common
- Most patients don't respond to Levodopa (No obvious ON/OFF)

- Management: ↓ vascular risk factors (HT, LIPID, DM) ECASA) & a "trial" of Levodopa

Ref:Parkinson's Disease Pathogenesis and Clinical Aspects
Edited by STOKER TB, JULIA C. GREENLAND JC ,Van Geest J, Centre for Brain Repair, Department of Clinical Neurosciences, University of Cambridge, UK



70 YO DAVE PROGRESSIVE SUPRANUCLEAR PALSY (PSP)

- Vertical gaze palsy (trouble looking down)
- Early falls (tends to fall backward instead of tripping over)
- body > limb stiffness, Usually no tremor

PROGRESSIVE SUPRANUCLEAR PALSY (PSP)

- Some response to levodopa in PSP-parkinsonism
- Prognosis – rapidly progressive
- Falls & Asp. Pneumonia (A/S which drugs are crushable)
- Totally dependent in 3-4 years

PSP

Non-motor Features:

* Impulsive behaviour (move/eat too quickly)
* Cognitive decline with poor judgement & memory
* May be depressed
* Dysphagia, dysarthria (speech problem)