

# Parkinson's Disease

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## DISEASE/SKILL OVERVIEW

- Chronic, progressive, disabling motor and nonmotor symptoms.
- Second most prevalent neurodegenerative condition
- Affect millions worldwide, will double by 2030
- Mostly men; white; median age >65
- Cause is multiple factors of deterioration of dopamine neurons; 10% genetic etiology; environmental and toxic exposure
- Caffeine and smoking protective
- Symptoms: Motor- tremor, bradykinesia, rigidity, imbalance; Nonmotor- sleep and mood disorders
- Four cardinal motor symptoms: TRAP: tremor, rigidity, akinesia (bradykinesias), postural instability
- Dyskinesias can occur with levodopa use

## NEURO EXAM PEARLS

- Premotor when used in this context describes the period of prodrome before motor symptoms are evident
- Assess first cranial nerve for anosmia (a **premotor** symptom)
- Assess constipation, poor REM sleep and depression as premotor symptoms.
- Look for: Secondary motor symptoms: diminished arm swing, decreased blink rate, facial expressions (hypomimia), decreased voice volume (hypophonia), difficulty turning in bed

- Tremor is resting, rhythmic oscillation and 1st motor symptom in 90%.; initially, asymmetric
- Watch for atypical Parkinsonisms: early speech difficulties, imbalance, lack of tremor, symmetry of symptoms, poor response to levodopa
- Assess: falls, swallow, comorbid conditions, hospitalization, changes in living arrangements
- Assess: nonmotor constipation, pain, mood
- Postural instability occurs 10 years from dx., correlates with dz. severity and levodopa resistance
- Also watch for orthostatic hypotension in progressive disease

## MANAGEMENT STRATEGIES/ NURSING IMPLICATIONS

- Aim: optimize "on time" and reduce "off time" while minimize levodopa induced dyskinesias
- During the hospital admission medication reconciliation, adhere to patient's home dose times rather than conventional hospital does times
- Medications indicated when symptoms become bothersome (cause suffering or interfere with QOL)
- Levodopa remains the gold standard
- Early use of levodopa leads to better long-term motor outcomes
- Immediate release may offer best benefit over controlled or extended release options.
- Several mechanisms of delivery exist that bypass the stomach and enhance drug absorption

- Dopamine agonists (DA) worsen daytime sleepiness and psychiatric symptoms
- Avoid DA in newly diagnosed; use lowest effective doses; avoid starting DA in elderly
- Advocate for lowest effective dose (gives benefit, minimizes dyskinesias, other adverse events)
- Levodopa provides greatest effect on motor symptoms up to 5 yrs.
- No difference in efficacy between DA medications, choice by patient preference, mode of administration and cost
- Motor fluctuation and "off time" – advocate for more frequent levodopa dosing; use of ER forms, catechol-O-methyltransferase (COMT) inhibitor or MAO-BI or DA.
- Dyskinesias may be managed with amantadine; caution in elderly (SE: hallucinations)
- Consider intestinal gel levodopa and surgery
- Management is all about timing. Seek a true understanding of "off/on." Have patient keep a diary. Ask: How long until meds take effect?; How long does effect last?; When do dyskinesias occur?; When does "wear off" occur?; Any dystonia in early am?; Any time meds do not work such as meal time?
- For predictable wearing off: advocate for medication increase, give more frequently, or use other formulations
- For am dystonia: use levodopa CR at HS
- If less med effect occurs after protein meal – space protein intake throughout day
- Dyskinesias: use NMDA antagonist

### Non-pharmacological nursing management

- Educate patient and family on disease and treatment plan (medication, side effects)
- Encourage participation in support groups
- Refer to physical and occupational therapy (Fall prevention, gait aids, balance, adaptive equipment)

- Exercise: Tai chi, yoga, walking, strength training, dance tx., boxing; maintain safety
- Long term aerobic exercise known to slow progression
- Encourage cognitive training (computer games)
- Guide patients to participate in clinical trials
- Discuss nutrition and diet (specific to protein intake that might decrease med effect or onset)
- Refer to speech therapy for swallow evaluation
- Encourage supplements Vitamin D, vitamin C and calcium for bone health
- Discuss nonmotor symptoms: mood changes and sleep disturbance
- Assist family in coordinating social services
- Assist with advanced medical directives

### MEDICATION/SPECIALIZED LABS

Medication information does not constitute treatment advice. Consult with expert provider's opinion and FDA guidelines.

- Gold standard: levodopa administered with dopa decarboxylase inhibitor (carbidopa) to reduce breakdown and lessen nausea. (tx. *Motor fluctuations*)
- Formulation: IR, ER and oral disintegrating tabs and IPX-o66 (ER rapid absorption); enteral and inhalation
- **Initial preferred treatment:** Levodopa for motor symptoms in early disease (H&Y stage 1,2)- more beneficial than dopamine agonists
- Benefit seen with levodopa at 300mg/d
- Lower risk of dyskinesias with doses <400mg/d
- COMT inhibitor (*adjunct tx.*): entacapone; tolcapone
- Levodopa + COMTI

**All Neuroscience Nursing Primer references listed on special reference page.**

- Dopamine agonist (tx *PD sx.*): pramipexole IR & ER; ropinirole IR & ER; rotigotine; apomorphine HCL.
- MAO-B Inhibitors (*add on tx to levodopa*): selegiline & oral disintegrating; rasagiline; safinamide.
- NMDA antagonist (*tx PD and dyskinesias*): amantadine IR & ER cap and tab.
- Anticholinergic (*tx tremor*): trihexyphenidyl; benztropine

## TEAM QUESTIONS/COMMUNICATION

- Aim of Tx to optimize on time and reduce off time while minimizing dyskinesias
- Tremor less responsive to meds than other symptoms.
- Nonmotor symptoms: neuropsychiatric (depression, anxiety, psychosis, impulse control); cognitive; autonomic (orthostatic hypotension, constipation); sleep disorders (vivid dreams, insomnia); sensory abnormalities (paresthesias, ageusia, anosmia)
- Assess for UTI
- Refer for surgical treatment, such as stimulator implantment, as indicated
- Advanced Parkinson's Disease: reduced med benefit; wearing off syndrome; uneven absorption due to gastric emptying issues
- Refer palliative care as necessary

## PATIENT/FAMILY/CAREGIVER TEACHING SUPPORT

- Counsel adverse effects of dopamine agonist (impulse control disorders; somnolence, cognitive decline, hallucinations)
- Educate re: nonmotor symptoms and encourage reporting for management
- Dispel myths of levodopa phobia or fear of dyskinesias
- Teach fall avoidance
- Encourage visit to PCP and mental health providers
- Changes in protein intake or GI illness may impact levodopa absorption
- With decline in function prepare family for behavioral changes (dementia, psychosis, wandering; maintaining nutrition, skin integrity, hydration; bowel maintenance (constipation, diarrhea); incontinence management; aspiration precautions

## TOOLS/SUPPLIES

- Hoehn and Yahr staging
- Alternative medication delivery systems
- Exercise
- Deep Brain Stimulation