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# ELDER CARE

## A Resource for Interprofessional Providers

### Parkinson's Disease

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Parkinson's disease (PD) is a neurodegenerative disorder that affects 1% of people aged 65-74, increasing to 4% in those over 85. Onset is typically after age 55; the average age at diagnosis is 70. Disability usually occurs 3-7 years after diagnosis, but the course is quite variable and some patients have the disease for a decade or more without disability. In late stages of PD, patients may have difficulty completing activities of daily living and trouble swallowing. The risk of death is 2-5x higher in patients with PD than in age-matched peers. Ongoing goals of care discussions are a key part of management.

PD is caused by degeneration of neurons in the basal ganglia with resulting dopamine deficiency. Why these changes occur is unknown, although there are some familial cases in which genetic mutations have been identified. Parkinsonism is a general term describing findings of rest tremor, rigidity, bradykinesia and postural instability. Although most often caused by idiopathic neurodegeneration, parkinsonism may be due to toxins, medications, and structural changes such as stroke or normal pressure hydrocephalus. Environmental toxins in particular are implicated in new research and Parkinson's cases are on the rise.

Although this disease is most well-known for motor impairments, changes in other neurochemicals such as norepinephrine are implicated in many other debilitating symptoms. They include falls, cognitive impairment, depression, anxiety, urinary incontinence, orthostatic hypotension, constipation, sleep disorders and others.

#### Diagnosis

PD is a clinical diagnosis. Early signs and symptoms may include a subtle one-sided rest tremor, decreased arm swing, loss of facial expression, hypophonia (soft voice), loss of dexterity and small handwriting. It can progress to classical stooped posture, freezing gait and festination. There are no lab or imaging tests that definitely confirm the presence of PD. When the diagnosis is uncertain, a dopamine transporter (DaT) scan can help confirm the diagnosis.

#### Treatment

There is no cure for PD, but several medical, surgical, and physical therapies can improve symptoms.

#### Medical Therapy

Several medications can improve motor and non-motor symptoms. Patients with idiopathic PD have a robust response to a trial of levodopa, the first-line treatment for motor symptoms. It is typically administered in combination with carbidopa to improve drug availability in the brain.

Even with combination levodopa/carbidopa, patients may experience involuntary movements, hallucinations, compulsive behaviors, hypotension, and other symptoms. Furthermore, as PD progresses, higher doses of levodopa are needed, and with higher doses and prolonged use, patients can develop "on-off" fluctuations, and worsening of hallucinations or hypotension.

For patients with symptoms not adequately controlled with levodopa, adjunctive medications can be used (Table 1).

For non-motor symptoms, a number of treatments are used and provide variable benefit (Table 2).

<b>Table 1. Medications Used to Treat Parkinson's Disease</b>			
<b>Medication</b>	<b>Class</b>	<b>Mechanism of action</b>	<b>Tips</b>
Levodopa/ Carbidopa	Dopamine replacement	Levodopa is converted to dopamine in the brain to increase the amount of dopamine. Carbidopa inhibits the breakdown of levodopa outside of the brain.	First-line treatment. Helps motor symptoms. Available in immediate and extended release oral formulations, as well as inhaled and injected.
Pramipexole, ropinirole, rotigotine patch	Dopamine agonist	Mimic the effects of dopamine in the brain	Less potent than levodopa. Can be used as monotherapy or in combination with levodopa.
Selegiline, rasagiline	MAO-B inhibitor	Block the breakdown of dopamine in the brain	Useful for motor symptoms and on-off fluctuations. May be used in addition to levodopa.
Benzotropine, trihexyphenidyl	Anticholinergic	Block acetylcholine activity in the brain and inhibit uptake of dopamine.	Works well for tremor. Usually used in younger patients. Risk of confusion, especially in older adults.
Entacapone, tolcapone	COMT inhibitor	Block the metabolism of levodopa	Useful for on/off fluctuations. Should always be used in combination with levodopa, as a last resort treatment of motor symptoms.

#### TIPS FOR DEALING WITH PATIENTS WHO HAVE PARKINSON'S DISEASE

- There is no cure for Parkinson's disease, only symptomatic treatments. For patients whose motor symptoms do not respond to medication, consider evaluation for deep brain stimulation.
- Besides motor impairment, be alert for mood disorders, cognition decline, orthostatic hypotension, and urinary incontinence, all of which should be treated if present.
- Recommend that patients seek out Parkinson's exercise and support groups to reduce the risk of falls.

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## Surgical Therapy

In addition to medications, a procedure called deep-brain stimulation (DBS) can be helpful in certain cases. It involves surgically implanting electrodes in parts of the brain affected by PD to reduce motor symptoms. Deep brain stimulation should be considered for patients who are initially responsive to levodopa, but whose symptoms are not adequately controlled with medical therapy and who have failed several classes of medications. Symptoms most likely to improve with DBS are tremor, on-off fluctuations, and involuntary movements.

## Falls in Parkinson's Disease

Movement disorders, muscle restrictions, and reduced balance are all common in PD and can lead to falls. Physical and occupational therapists can address these limitations by teaching new movement techniques, compensatory strategies, and use of adaptive equipment. In addition to the potential to improve strength, flexibility, and balance, PD patients and families find the group support and encouragement valuable. Of note, Tai Chi has been shown to improve postural stability and reduce falls in patients with PD.

## Cognition in Parkinson's Disease

Cognitive impairment is common in PD; 40-80% of patients eventually develop dementia. The risk increases with duration of illness and older age. In contrast to Alzheimer's disease, patients

with PD dementia most commonly have deficits in attention, processing speed, executive functions, and visual-spatial function while language skills are preserved. And, while patients may have difficulty with information retrieval, severe memory loss does not occur. Clinicians should monitor for cognitive decline and facilitate financial planning and early completion of advanced directives. Cholinesterase inhibitors such as donepezil and rivastigmine are effective in PD dementia resulting in moderate improvements in cognition and hallucinations.

## Depression and Parkinson's Disease

Depressive symptoms occur in up to half of PD patients, and major depression in 10-20%. However, some patients appear to be depressed because they have difficulty with initiating activities or lose their facial expressions. Patients should be routinely screened for depression, but the aforementioned behavior should be distinguished from true depression. PD patients with depression should be offered CBT and/or medications, such as an SSRI or SNRI. Ropinirole and pramipexole have also been shown to improve depressive symptoms. They may be used instead of or in combination with levodopa. These drugs are also effective for treating restless leg syndromes in patients with PD. Patients with difficulty initiating activities should be supported by care partners to participate in enjoyable activities.

**Table 2. Treatment Options for Non-Motor Symptoms of Parkinson's Disease**

<i>Symptom</i>	<i>Treatment Options</i>
Psychosis and hallucinations	Consider a reduced dose of anti-PD medications. Aripiprazole or quetiapine may help. Clozapine should be considered in refractory cases.
Daytime sleepiness	Sleep hygiene and treatment with stimulants (modafinil or methylphenidate) or caffeine.
Fatigue	Differentiate between sleepiness, depression, and fatigue. Amantadine or methylphenidate may help.
REM sleep behavior disorder	Melatonin is an effective therapy and can be used as the first line, benzodiazepines are also effective.
Falls and postural instability	Tai Chi, Parkinson's disease exercise groups, physical and occupational therapy.
Constipation	Osmotic laxatives are effective and well tolerated. Encourage adequate hydration, high-fiber diets, and exercise.
Rhinorrhea	Ipratropium nasal spray 2-3x daily is effective.
Sialorrhea	Sublingual atropine drops 1-2x daily or glycopyrrolate 3x daily. Consider salivary gland botox injections in severe cases.
Pain	Pain and sensory disturbance are common. Routinely evaluate and treat pain.
Orthostatic hypotension	If symptomatic, consider compression stockings, lifestyle modifications, or medication.

## References and Resources

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