



A Healthcare Provider's Guide To Parkinson's Disease Dementia (PDD):

Diagnosis, pharmacologic
management, non-pharmacologic
management, and other
considerations

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Diagnosis

Definition

Cognitive impairment may occur in Parkinson's disease. Parkinson's Disease Dementia (PDD) is clinically defined as a progressive decline in cognitive function in a patient with an established diagnosis of Parkinson's disease.

Etiology

The cause of PDD is unknown. Pathology from autopsy reveals the presence of Lewy bodies.

Course

The cumulative prevalence for PDD is at least 75% of PD patients who survive for more than 10 years.¹ Most experts now believe that all patients with PD who survive long enough will also eventually develop dementia. Parkinson disease dementia may affect multiple cognitive domains including attention, memory, visuospatial and constructional processing, and executive functions. Although it is difficult to predict the onset of cognitive decline when a patient is diagnosed with PD, those who have the gait dominant motor phenotype, sleep disorders, dysautonomia, MCI, specific gene haplotypes, and comorbid hypertension are more likely to develop dementia earlier.

Executive dysfunction typically occurs earlier and is more common in Parkinson disease dementia than in Alzheimer disease.

Psychiatric symptoms (e.g., hallucinations, delusions) appear to be less frequent and/or less severe than in Lewy body dementia (LBD). In Parkinson disease dementia, postural instability and gait abnormalities are more common, motor decline is more rapid, and falls are more frequent than in Parkinson disease without

dementia. Accompanying the cognitive decline, patients may also develop visual hallucinations. Visual hallucinations are sometimes a result of escalating doses of levodopa or other dopaminergic medications, but they can also be part of the progression of PDD. The hallucinations of PDD are similar to those that DLB patients describe. They are usually well formed and colorful, often taking the form of small animals, people or children. Visual misperceptions are also common, for example seeing a tree and thinking it is a person. Early in the disease, these hallucinations may not be distressful. As the disease progresses, these may become more prominent.

Cognitive impairment is important to monitor for and recognize in PD patients because dementia is one of the important risk factors for nursing home placement and also an independent predictor of mortality in patients with PD.¹

Differential Diagnosis

PDD needs to be differentiated from other diseases that also cause both parkinsonism and cognitive impairment such as progressive supranuclear palsy (PSP) and corticobasal syndrome (CBS). Distinguishing features of these conditions include:

- Poor response to dopaminergic medications such as levodopa
- Falls as a prominent, early symptom
- No tremor
- Rapid disease progression

PDD is distinguished from Dementia with Lewy bodies based on the time interval to onset of cognitive symptoms. PDD should be used to describe dementia that occurs in the context of

well-established Parkinson disease. In DLB, cognitive symptoms occur within 1 year of the onset of motor symptoms.

Delirium from systemic illnesses, medications side effects or metabolic abnormalities should be considered, especially if the onset is rapid.

Diagnostic Criteria

The following are the diagnostic criteria for the clinical diagnosis of Parkinson's disease dementia, as extracted from the report of the Movement Disorder Society Task Force for developing clinical diagnostic criteria for PDD:²

I. Core features (both are essential for a diagnosis of possible or probable PDD)

1. Diagnosis of Parkinson's disease according to Queen Square Brain Bank criteria³
2. A dementia syndrome with insidious onset and slow progression, developing within the context of established Parkinson's disease and diagnosed by history, clinical, and mental examination, defined as:
 - Impairment in more than one cognitive domain
 - Representing a decline from premorbid level
 - Deficits severe enough to impair daily life (social, occupational, or personal care), independent of the impairment ascribable to motor or autonomic symptoms

II. Associated clinical features

1. Cognitive features: (If deficits in at least two of the four typically affected domains are present in addition to both core features, a diagnosis of probable PDD can be made. A diagnosis of possible PDD can be made with an atypical profile of cognitive impairment with deficits in at least one cognitive domain.)
 - **Attention: Impaired**
Impairment in spontaneous and focused attention; poor performance in attentional tasks; performance may fluctuate during the day and from day to day.
 - **Executive functions: Impaired**
Impairment in tasks requiring initiation, planning, concept formation, rule finding, set shifting or set maintenance; impaired mental speed (bradyphrenia).
 - **Visuo-spatial functions: Impaired**
Impairment in tasks requiring visual-spatial orientation, perception, or construction.
 - **Memory: Impaired**
Impairment in free recall of recent events or in tasks requiring learning new material; memory usually improves with cueing; recognition is usually better than free recall.
 - **Language: Core functions largely preserved**
Word finding difficulties and impaired comprehension of complex sentences may be present.

2. Behavioral features: (The presence of at least one behavioral symptom supports the diagnosis of probable PDD but the lack of behavioral symptoms does not exclude the

diagnosis. Behavioral symptoms may or may not be present in possible PDD.)

- Apathy: decreased spontaneity; loss of motivation, interest, and effortful behavior
- Personality and mood changes: including depressive features and anxiety
- Hallucinations: mostly visual, usually complex, formed visions of people, animals or objects. In early stages, patients may report the sense that someone is looking over their shoulder or of movement in their peripheral vision.
- Delusions: usually paranoid, such as infidelity, or phantom boarder (unwelcome guests living in the home) delusions. Capgras is a delusional misidentification in which patients are convinced that a person close to them (often their spouse) is an imposter.
- Excessive daytime sleepiness

III. Unsupportive features (none can be present for a diagnosis of probable PDD; one can be present for a diagnosis of possible PDD.)

- Co-existence of any other abnormality that may by itself cause cognitive impairment, but judged not to be the cause of dementia, e.g. presence of relevant vascular disease in imaging
- Unknown time interval between the development of motor and cognitive symptoms

IV. Other causes of mental impairment (prevent reliable diagnosis of PDD, therefore the presence of any of these conditions excludes a diagnosis of possible or probable PDD)

- Cognitive and behavioral symptoms appearing solely in the context of other conditions such as:
 - a. Systemic diseases or abnormalities
 - b. Drug intoxication
- Major Depression according to DSM IV
- Features compatible with "Probable Vascular dementia" criteria according to NINDS-AIREN (dementia in the context of cerebrovascular disease as indicated by focal signs in neurological exam such as hemiparesis, sensory deficits, and evidence of relevant cerebrovascular disease by brain imaging AND relationship between the two as indicated by the presence of one or more of the following: onset of dementia within 3 months after a recognized stroke, abrupt deterioration in cognitive functions, and fluctuating, stepwise progression of cognitive deficits)

Probable PDD

A. Core features:

Both must be present

1. Parkinson's disease diagnosis
2. Dementia developing within the context of established Parkinson's disease

B. Associated clinical features:

Typical profile of cognitive deficits (impairment in at least two of the four core cognitive domains)

1. Impaired attention which may fluctuate
2. Impaired executive functions
3. Impaired visuospatial functions
4. Impaired free recall memory which usually improves with cueing

The presence of at least one behavioral symptom supports the diagnosis of Probable PDD (lack of behavioral symptoms does not exclude the diagnosis)

- Apathy
- Depressed or anxious mood
- Hallucinations or delusions
- Excessive daytime sleepiness

C. None of the group III features present

D. None of the group IV features present

Possible PD-D

A. Core features:

Both must be present

B. Associated clinical features:

Atypical profile of cognitive deficits (impairment in one or more domains):

- Prominent or receptive-type (fluent) aphasia
- Pure storage-failure type amnesia (memory does not improve with cueing or in recognition tasks)
- Preserved attention
- Behavioral symptoms may or may not be present

OR

C. One or more of the group III features present

D. None of the group IV features present

Pharmacologic Management

Medications to Use

There is no known cure for PDD. Medications can be used to mitigate the motor, psychiatric and cognitive symptoms in PDD. The pharmacological plan should be designed and implemented carefully as most medications used to treat the motor symptoms of PDD may worsen the neuropsychiatric ones and vice versa.

Parkinsonian symptoms can be treated with levodopa/carbidopa. The medication should be started at a low dose and slowly increased, watching closely for any worsening in visual hallucinations or cognitive symptoms.

Visual hallucinations are not always harmful or disruptive, in which case they may not necessarily need pharmacological treatment. That being said, if pharmacological treatment is necessary, cholinesterase inhibitors such as donepezil or rivastigmine can be attempted. Caution is advised as they may worsen the motor symptoms. If doses for cholinesterase inhibitors are maximized and there is still need for further pharmacological treatment, a trial of antipsychotic can be attempted. Although olanzapine and risperidone may be the most efficient at mitigating psychotic symptoms, they are also associated with worsening in parkinsonian

symptoms. Therefore, a trial of quetiapine may be wise as a first choice. Again, the doses should be started low and increased gradually, with close monitoring for worsening in motor symptoms.

If symptoms of depression or anxiety are present in people with PDD, selective serotonin reuptake inhibitors (SSRI) such as citalopram or escitalopram may be used as treatment. Other SSRIs are anticholinergic and may worsen the condition.

Medications to Avoid

Anticholinergic medications (including over-the counter antihistamines such as diphenhydramine) as well as psychotropic medications (especially pain medications such as opioids) should be avoided as they could lead to delirium in patients with PDD, who are already susceptible to medications by definition. Antidopaminergic medications (including antiemetics such as prochlorperazine and metoclopramide) should be avoided as they can worsen the motor symptoms of Parkinson's disease.



Non Pharmacologic Management

Behavioral Approach

Families can be counseled to recognize the hallucination and accept it. In addition, daily routines can be helpful to help reorient patients with PDD. It is advised that all curtains are closed and lights are turned off at night. Also, going to bed at the same hour every night may be helpful in establishing that routine. During the day, spending time in the daylight, avoiding naps, and engaging in stimulating activities, can be helpful. It can be virtually impossible to persuade a patient that their delusion is not real. Logic and reasoning are rarely effective and families need support and education on strategies for accepting the patient's delusion.

Healthy Lifestyle

There are lifestyle habits that promote health and well-being. Research suggests that the combination of good nutrition, physical activity, and mental and social engagement may provide benefit



in promoting health although more study is needed to determine the actual mechanisms.^{4,5} A heart-healthy diet (lower in sugar and fat and higher in vegetables and fruit) is considered good for both the body and the brain. An example is the Mediterranean diet that promotes nutrition based on fruit, vegetables, nuts, and grains with limits on consumption of red meat and saturated fats. Physical exercise has been associated with improvement of mood and mobility, and a decrease in the risk for falls.^{6,7} Physical activities that are socially engaging (walking or swimming with a friend and participating in exercise groups) can be especially enjoyable. Engagement in activities that are mentally stimulating (crossword puzzles, sudoku, computer games) is encouraged as long as the activity is enjoyable.

Several studies of exercise in Parkinson's disease have demonstrated improvements in executive function, improved goal-directed behavior, and decision-making, in addition to the known benefits of exercise for the motor symptoms of PD.⁸

Sleep

Disrupted sleep can negatively impact memory and thinking, though the mechanisms are not well understood.⁹

Components of sleep hygiene include:

- Avoid napping during the day
- Avoid stimulants such as caffeine, nicotine, and alcohol too close to bedtime
- Get regular exercise
- Avoid eating right before sleep
- Ensure adequate exposure to natural light
- Establish a regular relaxing bedtime routine
- Associate your bed with sleep. It's not a good idea to use your bed to watch TV, listen to the radio, or read

For more details on sleep hygiene, you can refer to the National Sleep Foundation at sleepfoundation.org/ask-the-expert/sleep-hygiene.

Other Considerations

Support Resources

- Lewy Body Dementia Association: lbd.org
- Alzheimer's Association: alz.org
- Family Caregiver Alliance: caregiver.org
- National Institute of Health/National Institute on Aging: nia.nih.gov/alzheimers
- National Institute of Neurological Disorders and Stroke: ninds.nih.gov/Disorders/All-Disorders/Dementia-Lewy-Bodies-Information-Page

Research and Clinical Trials

The National Institutes of Health maintains an extensive listing of clinical trials at clinicaltrials.gov. Academic medical centers may be engaged in research and clinical trials.

Safety

If wandering or getting lost is a concern, refer the patient and family to the MedicAlert+Alzheimer's Association Safe Return program (operated by the Alzheimer's Association) alz.org/care/dementia-medic-alert-safe-return.asp.

Other strategies for ensuring safety concerns may include door alarms and increased supervision.

Driving

Depending on cognitive and motor findings, the patient may be requested to stop driving, complete test of driving abilities through the Department of Motor Vehicles (DMV), or be referred to a driver's safety course that will assess driving ability. Reporting to the DMV should be consistent with state laws. Some states have mandatory reporting requirements: the diagnosis is reported to local health departments who then report to the DMV. Individual state requirements can be found at: dmvusa.com.

Living Situation and Environment

It is important to determine if the patient's residential setting best meets his or her functional and cognitive abilities. Areas of concern may include personal safety (ability to manage medications safely, ability to manage nutritional requirements, ability to manage personal hygiene) and quality of life (activities and engagement that match the person's needs and abilities).

Types of living situations range from living at home alone or living at home with supervision, to board and care, assisted living, or memory care units.

Elder Abuse

Patients with dementia and their caregivers are vulnerable to abuse. Refer to Adult Protective Services (APS) if there is concern for the well-being of the patient or the caregiver.

To locate an APS office in your state, see: napsa-now.org/get-help/help-in-your-area/.

Legal Planning

Provide information about advance directives and durable power of attorney while the patient is in the early stages of disease and able to articulate his or her wishes. Make referrals for legal and financial advice, especially if there are concerns about the patient's judgment, decision-making, or vulnerability. A formal evaluation for capacity may be warranted. The Alzheimer's Association provides a brochure that covers legal planning: http://www.alz.org/national/documents/brochure_legalplans.pdf.

- **Advanced Directives**

These documents allow individuals to state their preferences for medical treatments and to select an agent or person to make health care decisions in the event they are unable to do so or if they want someone else to make decisions for them.

- **Power Of Attorney**

A Power of Attorney (POA) is a legal document that gives someone of an individual's choosing the power to act in their place. POAs can be for medical or financial matters.

- **Living Will**

A living will is a written, legal document that spells out medical treatments that an individual would and would not want to be used to keep them alive, as well as other decisions such as pain management or organ donation.

Teaching Video for Providers

An example of a physician telling a patient she has dementia: alz.org/health-care-professionals/dementia-diagnosis-diagnostic-tests.asp#alzheimers_diagnosis.



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