

# Cognitive Changes in Parkinson's Disease

## Cognitive symptoms

Cognitive symptoms in Parkinson's disease (PD) are common, though not every person experiences them. Cognitive changes range from mild problems to more severe deficits, which may impact daily functioning.

Cognition refers to the mental abilities we use to process information and apply knowledge. There are many different kinds of cognitive skills. Attention, working memory, executive function, memory, language and visual reasoning are the cognitive skills most frequently affected in PD. These skills allow us to perform daily functions such as paying attention, solving problems, remembering where items are and how to do certain tasks.

**Attention and working memory:** Attention is the ability to selectively focus on a particular part of one's environment, even in the face of distraction. In PD, people may find it difficult to concentrate on a conversation, read a book, or talk to someone while walking. Working memory refers to the process of temporarily storing information in one's mind and manipulating it over a short period; doing mental arithmetic requires working memory, as does carrying on a conversation.

**Executive function:** Executive function includes the ability to plan, organize, initiate, and regulate activities with a specific goal in mind. These activities may include solving problems, starting new tasks, and switching tasks. Reduced executive function is one of the most common cognitive changes in PD.

**Memory:** Memory is the ability to learn and remember information, such as names or places, and to remember how to perform a learned task, such as tying one's shoes. People with PD may have trouble recalling information, but in general, have less memory impairment than people with Alzheimer's disease. In PD, people frequently recall information more readily when given cues or choices.

**Language:** The most common language problem in PD is finding the "right" words. This is sometimes referred to as tip of the tongue syndrome. People with PD also tend to speak less and use simpler speech. Language

difficulties can be frustrating for the person with PD and care partners because verbal communication is such an important part of human interaction.

**Visual reasoning:** Visual reasoning allows us to estimate distances, use mental imagery, copy drawings, or construct objects. Examples include being able to give someone directions by tracing the route in your mind, or putting together a puzzle.

## Cognitive evaluation

There are several ways to assess cognition. Reports from the person with PD and the care partner are important. The physician may ask questions about cognitive function, whether the person with PD's cognitive problems represent a change from prior functioning, and what impact the problems are having on activities of daily living or work. In some cases, the physician will want to refer the person with PD for a comprehensive neuropsychological evaluation. This includes multiple tests with oral or written answers, and assesses different cognitive domains. Evaluations range from about 45 minutes to several hours.

## Mild cognitive impairment and dementia

Cognitive deficits that are mild and do not impair one's ability to carry out activities of daily living are termed "mild cognitive impairment." Mild cognitive impairment may occur in about 25% of persons with PD. We now recognize that mild cognitive changes can occur early in the course of PD and even at diagnosis.

Dementia refers to deficits in more than one cognitive area which significantly impair everyday functioning. Forty percent or more of persons with PD develop dementia over the long term. When dementia develops early in PD, the correct diagnosis may be "dementia with Lewy bodies."

## Causes of cognitive impairment in PD

PD is characterized by abnormal protein accumulation in multiple brain regions. In some people, this occurs in brain regions responsible for cognitive processes, and this is believed to contribute to cognitive impairment in PD. People with PD may also develop the kind of brain changes seen in Alzheimer's disease, or they may have

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cerebrovascular disease (impaired blood flow in the brain), both of which cause cognitive impairment.

Other important causes of or contributors to cognitive dysfunction include: medical illnesses (including thyroid disease, vitamin B12 deficiency, urinary tract infections, pneumonia); seizures; strokes; head trauma; medications (including those causing sleepiness or confusion); poor sleep and excessive daytime sleepiness; anxiety; and apathy. Depression may mimic cognitive impairment. Correcting the underlying problem where possible generally leads to improvement.

Dopamine agonists and anticholinergic medications used to treat PD may increase the risk for hallucinations and confusion, especially in older people. Dopamine agonists include ropinirole (Requip<sup>®</sup>) and pramipexole (Mirapex<sup>®</sup>). Anticholinergics include trihexyphenidyl (Artane<sup>®</sup>) and benztropine (Cogentin<sup>®</sup>). Other anti-PD medications may improve some aspects of cognition.

## Management strategies

If cognitive problems develop abruptly, the physician may first search for an infection, new neurological problem (e.g., stroke), or newly prescribed medication. If the cognitive problems gradually develop, the evaluation may differ, and examination by a neurologist, neuropsychologist, or specialist in cognition may be helpful.

Medications used to treat dementia in PD are the same as those used in Alzheimer's disease. The medications include: donepezil (Aricept<sup>®</sup>), rivastigmine (Exelon<sup>®</sup>), and galantamine (Razadyne<sup>®</sup>). To date, only rivastigmine is FDA-approved specifically for PD dementia. Cognitive benefits of these medications in clinical research studies have been modest. Side effects include nausea, diarrhea, and in some,

worsened tremor. Memantine (Namenda<sup>®</sup>) is another Alzheimer's medication; it requires further study in PD dementia.

Non-medication strategies may help persons with PD with cognitive tasks, communication, and daily activities, and improve quality of life. Pill reminders, clock alarms, and timers are useful. Simplifying activities into smaller steps, using daily planners to keep track of events and time, and making "to do" checklists are good strategies. Maintaining a regular routine for daily activities and exercise is important. Household items (e.g., utensils, glasses, keys) should be kept in the same place every day, and drawers can be labeled. Persons with PD often respond better when given choices or cues, particularly if word-finding difficulties or slowed thinking is present. Just like physical exercise, mental "exercise" is important. Mental activities can include doing puzzles, playing cards, reading books, going to lectures or concerts, or learning a new activity. These can be coupled with physical exercise such as learning new dance steps. Just like with physical exercise, there is no single "right" mental exercise. Social interactions are an important source of mental stimulation, and many activities can be done with friends or family members.

Driving is an important safety issue to address as it involves many cognitive and motor processes. Some occupational therapists perform simulated or on-the-road driving tests that can help physicians and families make decisions about driving abilities. For persons with PD with more advanced dementia, adult day care programs and group activities in the nursing home can enhance social interaction. Social workers can be valuable assets to help patients and care partners deal with stressors and frustrations.

The information contained in this supplement is solely for the information of the reader. It should not be used for treatment purposes, but rather for discussion with the patient's own physician.

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