

## Not Just a Movement Disorder: Cognitive Changes in PD

Distractibility, disorganization, forgetfulness, and difficulties with planning: it frequently comes as a surprise to people with Parkinson's disease (PD) and their families that "cognitive changes" — alterations in memory, attention, and thinking — are often part of PD. While some physicians are increasingly recognizing the importance of addressing cognitive and other nonmotor symptoms, many still primarily focus on treating physical (motor) symptoms. This means that cognitive changes may go under-treated or untreated.

### Prevalence and Forms of Cognitive Changes in PD

'Cognition' is a general term used to refer to the various mental abilities involved in processing and using information. Examples include memory, attention, abstract thinking, problem-solving, language, and visual-perceptual abilities.

Nearly every person with PD experiences some degree of cognitive change, which can range from mild to severe. The terms, 'mild cognitive impairment' (MCI) and 'cognitive impairment' are generally used when changes are not severe and affect fairly narrow aspects of memory or thinking abilities. Some people who experience cognitive impairment may note that changes in mental abilities are merely a nuisance, while others report symptoms noticeable enough to affect performance at work or in managing things at home.

'Dementia' is used to describe more extensive difficulties that affect multiple areas of cognitive function. People living with PD with dementia (PD-D) may be unable to live independently, even if their physical symptoms are not advanced. In general, large-scale population-based studies show that PD-D usually develops many years after the initial onset of PD. When a dementia syndrome develops before or concurrently with PD motor signs, this is diagnosed as dementia with Lewy Bodies (DLB).

At any given time, nearly all individuals with PD have some form of cognitive impairment, while dementia is estimated to affect only one-third. The

exact prevalence is unclear since there is not currently a single established measurement system for diagnosing cognitive impairment or PD-D.

### Types of Cognitive Difficulties in PD

PD affects a variety of cognitive functions. However, most people retain their general intellectual abilities and knowledge as well as the short and long-term memories they acquired prior to the onset of PD.

**Executive dysfunction:** Executive functions are higher-order mental processes such as problem-solving and planning, initiating and following through on tasks, and multi-tasking ideas or projects. People with PD may describe getting overwhelmed or 'freezing' in situations that require the formulation of a series of strategic choices, yet they appear to function perfectly when someone else helps them initiate and persist with a task. In the absence of some sort of "intellectual scaffolding," it is more efficient for the person with PD to focus on one goal or concept at a time.

**Memory disturbances:** Remembering information that has already been learned is the most common difficulty for those with PD and can be improved through use of memory cues. For a person with PD to effectively learn and retain new information, repetition may be needed. PD-D affects both short-term and long-term memory functions more severely.

**Attention difficulties:** As the complexity of a situation increases, it can be difficult for a person with PD to maintain his or her focus or divide his or her attention. For example, patients may find they can no longer "walk and chew gum at the same time." This affects intellectual pursuits and everyday activities such as walking, maintaining balance, and carrying on a conversation.

**Bradyphrenia (slowed mental processing):** People with PD say that the disease affects how quickly they can process and respond to information. Slowness in information processing impacts both other cognitive processes (such as problem-solving and retrieving information) and daily activities (such as conversing).

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**Language dysfunction:** The most common language-related difficulty for people with PD is word-finding. As a person's PD progresses, he or she may also experience problems with naming or mis-naming, may have difficulty comprehending complex information, and may use more simplified and less spontaneous speech.

**Visual-spatial disturbances:** Trouble perceiving, processing, discriminating, and acting on visual information in the environment can affect daily life. For example, it may become difficult to navigate around the house or estimate distances when reaching for something, thereby increasing the risk of falls. In some cases, visual-spatial impairment in PD may also lead to visual misperceptions, or illusions.

### **Causes of Cognitive Changes in PD**

Our understanding of the causes of cognitive changes in PD is incomplete. We do know that problems with cognition are related to the same underlying brain changes that result in motor symptoms — that is, premature death of nerve cells, changes in brain neurochemistry, and subsequent alterations in brain circuitry between different brain regions. In addition, Lewy bodies, the abnormal collections of proteins that are found in nerve cells in PD, are related to changes in motor pathways and to pathways affecting cognitive processes.

Other elements can cause and aggravate cognitive changes. Untreated depression, anxiety, psychosis, sleep, and other behavioral difficulties can exacerbate cognitive difficulties. Also, some medications, whether for PD or other conditions, can cause negative cognitive effects as can some non-PD-related general medical conditions, such as infections.

### **Treatment of Cognitive Changes in PD**

The basis of all effective treatment is a thorough diagnostic evaluation. When an initial history is taken, by a primary care physician or a neurologist, it is important for a person with PD (and his or her caregiver) to bring up any observations or concerns about cognitive changes. Referral to a neurologist, neuropsychiatrist, or geriatric psychiatrist who specializes in the treatment of cognitive problems or dementia can be helpful. Additional tests may also be conducted to ascertain if a person's difficulties are due to PD or to other reversible causes. Once other

causes are excluded, a neuropsychological exam, involving paper-and-pencil tests, will be performed by a neuropsychologist to characterize the quality and extent of problems and to identify areas of strength.

Treatments for cognitive changes aim to reduce symptoms or improve daily life through using compensatory strategies (that is, coping mechanisms that help a person adapt to his or her cognitive limitations). For instance, clocks or timers may help a person remember when to take medication, and devices such as planners or voice recorders may help him or her recall an appointment.

Occupational therapists can also assist, by providing insights into how cognitive difficulties impact daily life, suggesting adaptive strategies, or providing formal treatment programs. Speech therapists can help with language functions and information processing.

Medications used to treat cognitive dysfunction in Parkinson's are largely based on treatments used for Alzheimer's disease and are usually reserved for these patients who already have dementia. At present, rivastigmine (Exelon®) is the only medication approved by the US Food and Drug Administration for the treatment of dementia in PD. Further research is needed to identify treatments that can help those who experience less severe cognitive impairments that occur earlier in the course of PD.

### **Conclusions**

Cognitive changes are present to some degree in almost every person with PD and are a prominent feature of PD over its course. Although they have received less attention than motor symptoms, cognitive changes have obvious effects on daily life, including how people adapt to their motor symptoms. While we do not yet have definitive treatments for cognitive dysfunction in PD, recognition of what changes have occurred is important in order to take advantage of currently available medication and behavioral strategies.

*Laura Marsh, M.D., is a geriatric psychiatrist, an Associate Professor of Psychiatry and Neurology at Johns Hopkins University School of Medicine, and director of the Clinical Research Program of the Johns Hopkins Morris K. Udall Parkinson's Disease Research Center of Excellence.*

If you have or believe you have Parkinson's disease, then promptly consult a physician and follow your physician's advice.

This publication is not a substitute for a physician's diagnosis of Parkinson's disease or for a physician's prescription of drugs, treatment or operations for Parkinson's disease.

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