

# Parkinson's disease clinical features

see [Parkinsonism](#)

Classic triad of [Parkinson's disease](#):

- [tremor](#) (resting, 4–7/second)
  - [rigidity](#) (cogwheel)
  - [bradykinesia](#)
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[Parkinson's disease](#) (PD) is a neurodegenerative disease with a long preclinical phase.

It's a disorder of [muscle tone](#), abnormal fluency or speed of [movement](#) (called dyskinesia) may involve excessive or involuntary movement (hyperkinesia) or slowed or absent voluntary movement (hypokinesia).

Dynamic adaptations in synaptic plasticity are critical for learning new motor skills and maintaining memory throughout life, which rapidly decline with Parkinson's disease (PD).

[Axial motor impairments](#) are a common cause of disability in patients with Parkinson's disease, become more prominent with longer disease duration.

The disability associated with Parkinson's disease arises from a broad spectrum of motor symptoms (masked face, soft voice, tremor, small handwriting, rigidity, bradykinesia, dystonia, balance issues, and shuffling steps) and nonmotor symptoms (depression, anxiety, apathy, disordered sleep, and cognitive difficulties), as well as problems of the autonomic nervous system (sexual dysfunction, constipation, gastrointestinal problems, and orthostatic hypotension). Of every three patients diagnosed with Parkinson's disease, one will become unemployed within 1 year, and most will be unemployed after 5 years. On average, patients with Parkinson's disease will spend \$1,000 to \$6,000 per year on medications, and their annual risk of hospitalization exceeds 30%.

Pain is a common non-motor symptom of Parkinson's disease.

see [Visual misperception](#)

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The clinical assessment of Parkinson's disease (PD) symptoms is typically performed with [neurological examinations](#) and simple motor tests. However, this only takes into account the severity of motor symptoms during the length of the recording and fails to capture variations in a patient's motor state, which change continuously during the day. Most of the current methods for long-term monitoring of [extrapyramidal symptoms](#) are based on the use of a wearable magneto-inertial device that evaluates the frequential content of signals in the range of [movement disorders](#). However, the typical daily motor activities performed by patients may have a power spectrum into the same range of motor symptoms, and habitual activity may be indistinguishable from that due to movement disorders.

# Parkinson's disease tremor

[Parkinson's disease tremor](#).

## Parkinsonian Gait

see [Parkinsonian Gait](#).

## Speech disorders

One of the secondary motor symptoms that people with PD may experience is a change in [speech](#), or speech difficulty. Not everyone with PD experiences the same symptoms, and not all patients will have changes in their speech. However, for those who are affected, it can be a significant problem, causing difficulties in communication and possibly leading to reduced social interactions.

There are several ways PD may affect speech:

The voice may get softer, breathy, or hoarse, causing others difficulty hearing what is said.

Speech may be slurred.

Speech may be mumbled or expressed rapidly.

The tone of the voice may become monotone, lacking the normal ups and downs.

The person may have difficulty finding the right words, causing speech to be slower.

The person may have difficulty participating in fast-paced conversations.

Some of the medical terms that describe the speech changes that can occur with PD include:

[Dysarthria](#), which is a motor speech disorder or impairment in speaking due to PD affecting the muscles required for speech

[Hypophonia](#), which means soft speech, is an abnormally weak voice caused by the weakening muscles

[Tachyphemia](#), also known as cluttering, is characterized by an excessively fast speed of talking and a rapid stammering that makes it difficult to understand the person speaking

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Tankus and Fried performed [Single-unit recording](#) intraoperatively in the [subthalamic nucleus](#) of 18 neurosurgical patients with Parkinson's disease undergoing implantation of deep brain [stimulator](#) while patients articulated 5 vowel sounds.

They report that single subthalamic neurons encode individual vowel phonemes and employ 1 of 2

encoding schemes: broad or sharp tuning. Broadly tuned units respond to all examined phonemes, each with a different firing rate, whereas sharply tuned ones are specific to 1 to 2 phonemes. They then showed that in comparison with patients without speech deficits, the spiking activity in patients with speech disorders was lower during speech production, overt or imagined, but not during perception. However, patients with speech disorders employed a larger percentage of the [neurons](#) for the aforementioned tasks. Whereas the lower firing rates affect mainly sharply tuned units, the extra units used a broad tuning encoding scheme.

This findings suggest mechanisms of neuronal degradation due to Parkinsonian speech disorders and their possible compensation. As impairment in sharply tuned units may be compensated by broadly tuned ones, the proposed compensation model appears to be suboptimal, lending support to the persistence of speech disorders in the course of the disease <sup>1)</sup>.

## Bladder dysfunction in Parkinson's disease

see [Bladder dysfunction in Parkinson's disease](#).

## Sleep in Parkinson's disease

[Sleep in Parkinson's disease](#).

## Cognitive functioning in Parkinson's disease

[Cognitive functioning in Parkinson's disease](#)

<sup>1)</sup>

Tankus A, Fried I. Degradation of Neuronal Encoding of Speech in the Subthalamic Nucleus in Parkinson's Disease. *Neurosurgery*. 2019 Feb 1;84(2):378-387. doi: 10.1093/neuros/nyy027. PubMed PMID: 29566177.

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