

Parkinson's Disease (PD)

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Parkinson's Disease: From Symptoms to Latest Research

Context

Parkinson's disease (PD) is a **progressive neurodegenerative disorder** that primarily affects movement. It occurs due to the **gradual loss of dopamine-producing neurons** in the **substantia nigra**, a brain region responsible for movement control.

- **First identified** by Dr. James Parkinson in 1817, it remains an incurable condition.
- **Most common** among older adults, typically appearing after **60 years**.
- **Men are more affected** than women.
- **India accounts for 10%** of the global Parkinson's disease burden.

Causes and Mechanism

The exact cause of **PD is unknown**, but research suggests a **combination of genetic and environmental factors**.

- **Loss of dopamine-producing neurons** leads to movement difficulties.
- By the time symptoms appear, **60-80% of these neurons are already lost**.
- Exposure to **toxins, pesticides, and heavy metals** may increase risk.

Symptoms of Parkinson's Disease

1. Motor Symptoms (Affecting Movement):

- **Bradykinesia** - Slow movement.
- **Tremors** - Shaking of hands or legs, even at rest.
- **Muscle Rigidity** - Stiffness in limbs.
- **Impaired Balance and Posture** - Increased risk of falls.

2. Non-Motor Symptoms (Affecting Other Functions):

- **Cognitive Decline** - Memory issues, confusion.
- **Mental Health Issues** - Depression, anxiety.
- **Sleep Disturbances** - Insomnia, excessive sleepiness.
- **Sensory Problems** - Loss of smell, pain, fatigue.

Who is at Risk?

- **Age** - Common after **60 years**, but early-onset cases exist.
 - **Gender** - **Men** are more likely to develop PD.
 - **Family History** - Genetic factors may play a role.
 - **Environmental Factors** - **Toxin exposure, head injuries** increase risk.
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Diagnosis

Currently, **no definitive blood or imaging test** exists for Parkinson's disease.

- Diagnosed based on **clinical symptoms** and **neurological examination**.
 - **MRI or PET scans** may be used to rule out other disorders.
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Treatment Options

While **PD has no cure**, treatments help manage symptoms and improve quality of life.

- **Medications:**
 - **Levodopa/Carbidopa** - Most effective, increases dopamine levels.
 - **Dopamine Agonists** - Mimic dopamine function.
 - **MAO-B Inhibitors** - Slow dopamine breakdown.
 - **Surgical Interventions:**
 - **Deep Brain Stimulation (DBS)** - Electrodes implanted in the brain help regulate movement.
 - **Therapies & Lifestyle Changes:**
 - **Physical therapy, speech therapy, exercise, and diet** improve symptoms.
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Recent Research & Advancements

Scientists are exploring **genetic and neurological** factors to improve diagnosis and treatment.

- **Linkage Analysis** - Identifies rare genetic mutations, including **RAB32 Ser71Arg**.
 - **Genome-Wide Association Studies (GWAS)** - Found **92 genetic locations** linked to Parkinson's.
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World Parkinson's Day

- Observed on **April 11** every year to **raise awareness** about the disease.
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Other Neurological Disorders Related to PD

- **Alzheimer's Disease** - Memory loss and cognitive decline.
 - **Multiple Sclerosis (MS)** - Autoimmune nerve disorder.
 - **Huntington's Disease** - Genetic movement disorder.
 - **Cerebral Palsy** - Movement impairment from birth.
 - **Guillain-Barré Syndrome** - Nerve damage due to immune response.
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Conclusion

Parkinson's disease is a **chronic, progressive condition** that severely affects movement and daily life. **Early diagnosis and proper treatment** can slow its progression and improve quality of life. With **advancements in research, medications, and therapies**, there is hope for better management and future treatments.

