



جامعة الإمام عبد الرحمن بن فيصل  
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

مستشفى الملك فهد الجامعي  
King Fahad Hospital The University

# Guide of Parkinson





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## What is it Parkinson Disease ?

Parkinson disease is defined as a chronic and progressive neurodegenerative disease.

- Millions of people around the world are affected by it and it is the second most common neurodegenerative disease next to Alzheimer disease.
- The global and local age-standardized prevalence rate of Parkinson disease per 100,000 was 106.28 and 100.6, respectively.
- Its occurrence is less common before the age of 50, but as individuals grow older their risk increases.
- Males carry a greater risk of developing Parkinson disease than females.
- There is no clear cause of the disease, but several genetic and environmental risk factors play a role.

### Non-motor Symptoms.

- Reduced arm swing.
- Decreased blink rate.
- Masked facial expression.
- Decreased voice volume.
- Difficulty turning over in bed.

### Progressive Motor

- Features consist of tremor.
- Rigidity.
- Bradykinesia.
- Postural instability.

The 21st century has witnessed many advancements in research related to Parkinson disease by diagnosing it early and delaying its progression.



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## What is Non-motor PD symptoms



Dopamine is a neurotransmitter that gradually decreases with progression of Parkinson disease. It has multiple functions, and its deficiency results in slow movement and other non-motor symptoms

### These symptoms include:

- **Autonomic dysfunction:** varies according to the system involved, like postural hypotension, constipation, urinary incontinence, sexual dysfunction, declined sense of smell, and sweating.
- **Sleep disturbances:** including increased or decreased desire to fall asleep, Rapid Eye Movement (REM) sleep behavior disorder (as punching and acting the dream), and restless legs syndrome.
- **Cognitive decline:** ranging from executive dysfunction to memory loss and dementia.
- **Sensory abnormalities:** such as pain, numbness, and fatigue.
- **Neuropsychiatric:** such as depression and anxiety, mood disorders, impulse control disorders, psychosis, apathy, and paranoia.

Note: these symptoms fluctuate over time depending on the PD state.



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# Diagnosis of Parkinson's Disease



## What is MDS-PD criteria?

MDS-PD criteria involves both motor and non-motor symptoms. The most important and essential criterion is parkinsonism which consists of bradykinesia with at Least 1 of rest tremor or rigidity.

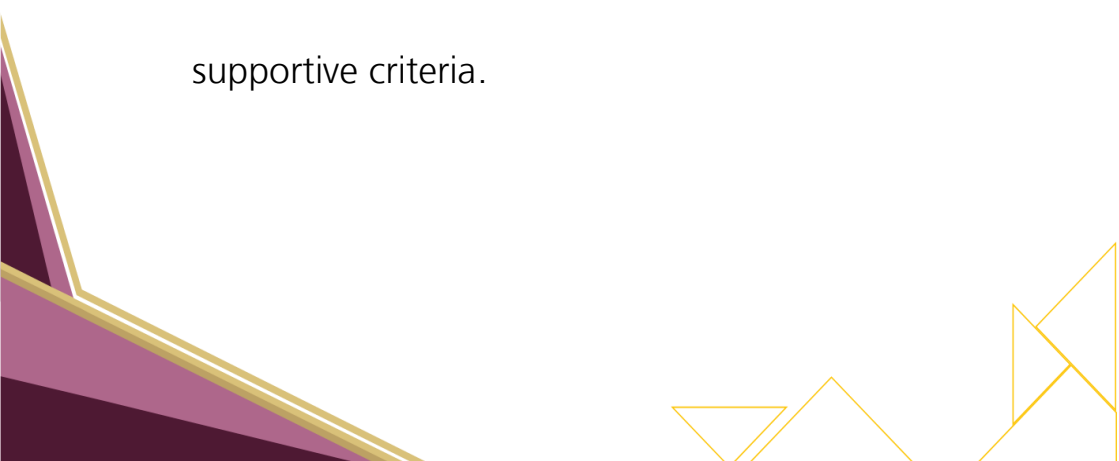
To have a diagnosis of **Clinically Established PD**, it needs:

1. Absence of absolute exclusion criteria
2. At least two supportive criteria
3. Absence of red flags



## What is MDS-PD criteria?

To have a diagnosis of **Clinically Probable PD**, it needs:

1. Absence of absolute exclusion criteria
  2. Presence of red flags counterbalanced by supportive criteria (maximum number of red flags is two):
    - If one red flag is present, there should be at least one supportive criterion.
    - If two red flags are there, then there should be two supportive criteria.
- 

## How to Diagnosis of Parkinsonian disease?

Bradykinesia (slowness of initiation of voluntary movement) and at least one of the following:

- Muscle rigidity.
- Rest tremor.
- Postural instability.

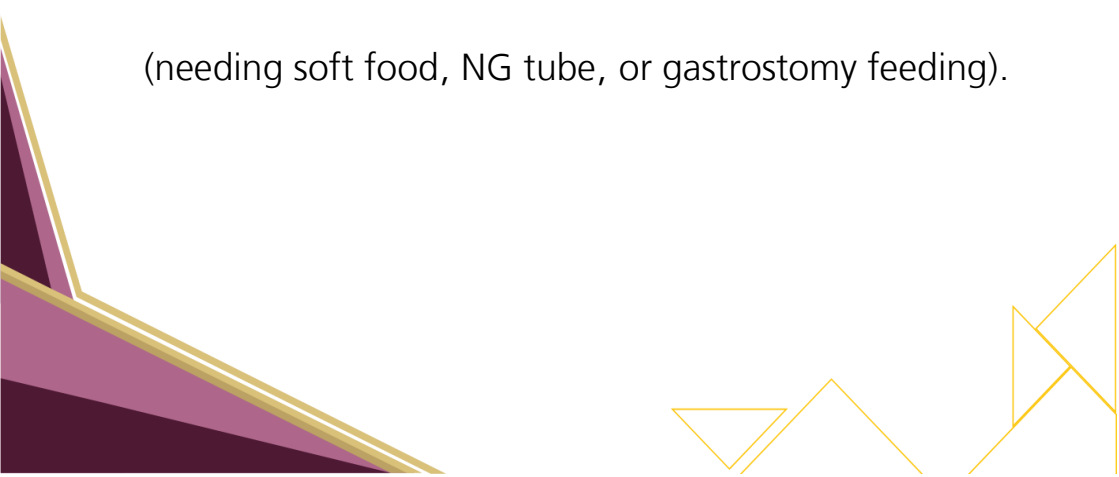
## What are the red flags about Parkinson's disease?

1. Rapid progression of gait impairment requiring regular use of wheelchair within 5 years of onset.



# What are the red flags about Parkinson's disease?

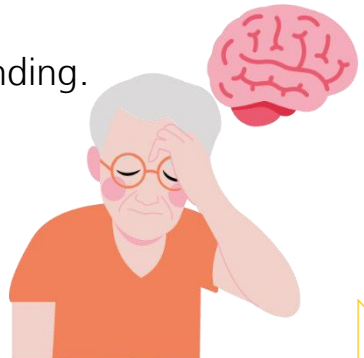
2. A complete absence of progression of motor symptoms or signs over **5 or more years** unless stability is related to treatment.
3. Early bulbar dysfunction is characterized by the presence of one of three symptoms within the **first five years** of the disease: severe dysphonia, dysarthria (mostly incomprehensible speech), or severe dysphagia (needing soft food, NG tube, or gastrostomy feeding).





# What are the red flags about Parkinson's disease?

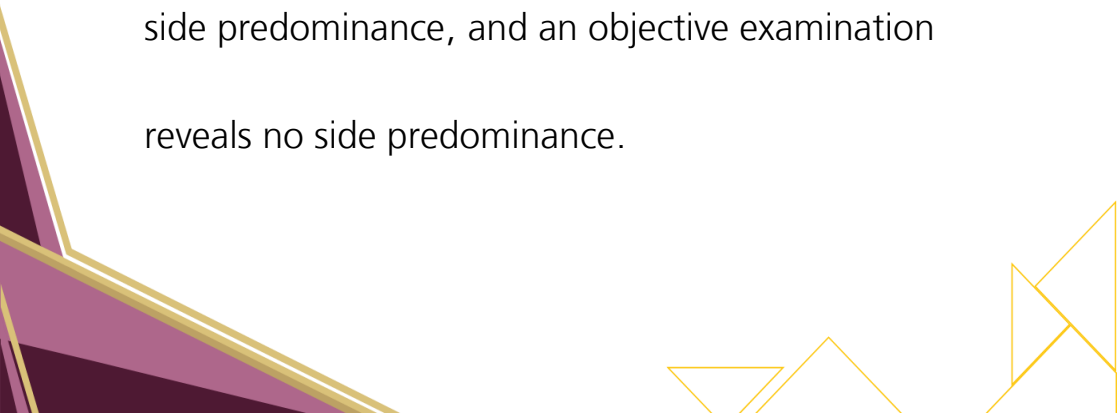
4. **Inspiratory respiratory dysfunction** which is defined as either throughout-day or night-time inspiratory stridor or frequent inspiratory sighs
5. Severe autonomic failure during the **initial five years** of disease. This may include:
  - **Orthostatic hypotension**: orthostatic drop in blood pressure of at least **30 mm Hg systolic** or **15 mm Hg diastolic** within **3 minutes** of standing.



# What are the red flags about Parkinson's disease?

- Severe urinary incontinence or retention in the first five years of the disease, which is not just functional incontinence, except for long-term stress incontinence in females. Urinary retention in males must be accompanied with erectile dysfunction and not be the result of prostate disease.
- 6. Repeated falls (more than once per year) within 3 years of onset
- 7. The presence of disproportionate anterocollis (dystonic in nature) or contractures of hand or feet.

# What are the red flags about Parkinson's disease?

8. **Unexplained pyramidal tract signs** (pyramidal weakness or clear pathologic hyperreflexia, with the exclusion of mild reflex asymmetry and isolated extensor plantar response).
  9. **Bilateral symmetric Parkinsonism** during the course of the disease. Both the patient and the caregiver report symmetric onset of symptoms without any apparent side predominance, and an objective examination reveals no side predominance.
- 

# What are the red flags about Parkinson's disease?

10. The absence of any common non-motor disease signs after five years of disease, including Sleep dysfunction (rapid eye movement sleep behavior disorder, and insomnia related to maintaining sleep) or autonomic dysfunction (symptomatic orthostasis, daytime urinary urgency) or Psychiatric disorders (anxiety, or hallucinations.)



# What are the methods of x-ray diagnosis?

Imaging for PD include:

- Dopamine transporter single-photon emission computed tomography (SPECT) scan.
- Dopamine transporter scan (DaT-scan).
- Magnetic resonance imaging of brain (MRI brain).





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## What is it Role of Exercise in Parkinson's Disease ?

One of the non-pharmacological treatment options for Parkinson's Disease is exercise.

Exercise can improve the quality of life through various benefits.

These benefits include alleviating motor symptoms such as:

- Rigidity and slow movement (bradykinesia.
- Postural stability,
- Gait, balance
- Even non-motor symptoms like cognitive impairment.

### The recommended exercise regimen:

Karate



Tai chi

Brisk walk



Yoga

swimming and water aerobic exercise



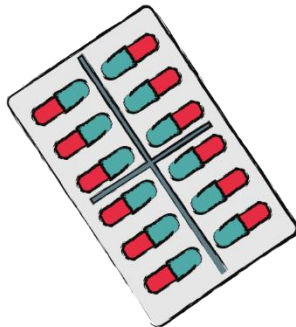
Exercise also plays a role in increasing independence for patient which in turn reduces care givers burnout.



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# Treatment of Parkinson Disease



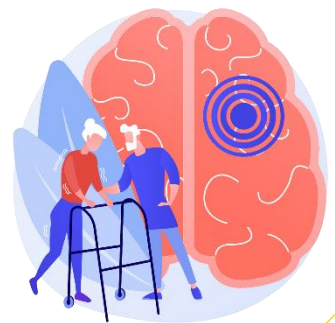
## **What is the treatment for Parkinson's disease?**

Parkinson's disease has no cure at present. But there are ways to help ease its symptoms, such as Supportive therapies, medications, or surgery. Treatments aim to improve the patient's life quality, ease suffering, manage symptoms, and slow disease progression.

## **What methods help relieve the symptoms of Parkinson's disease?**

### 1. Supportive therapies:

Supportive therapies can assist in managing Parkinson's symptoms and daily challenges.





# What methods help relieve the symptoms of Parkinson's disease?

These may include

- **Physiotherapy:** for muscle stiffness and joint pain relief.
- **Occupational therapy:** an occupational therapist can identify areas of difficulty in patient everyday life, such as **dressing** or **getting to the local shops**.

Such as:

- Speech and language therapy teaches
- Exercises to improve swallowing and speech difficulties.
- Dietitians can suggest dietary changes to alleviate certain symptoms for some individuals with Parkinson's.

# What methods help relieve the symptoms of Parkinson's disease?

## Parkinson's disease?

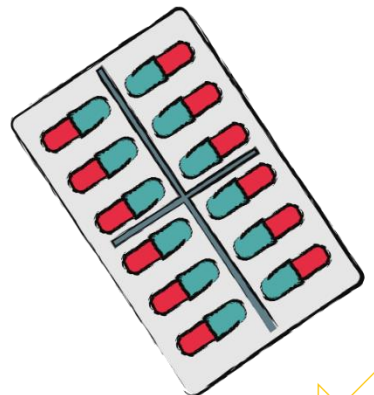
### 2. Medications:

Medications can help alleviate Parkinson's symptoms like tremor and movement issues.

Note: Not all medications work for everyone, and each has different short- and long-term effects.

The three main types of medications commonly used:

- levodopa
- dopamine agonists
- Monoamine oxidase-B inhibitors.



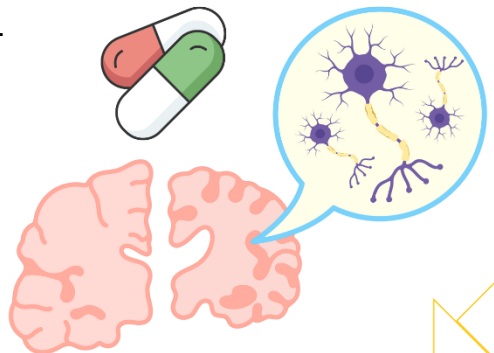
# What methods help relieve the symptoms of Parkinson's disease?

Patients with Parkinson's lack sufficient dopamine in their basal ganglia.

Treatment involves providing dopamine replacement through **levodopa**.

- **Levodopa:**

Is the most commonly used medication in patients with Parkinson's the mechanism of action is that levodopa is converted into dopamine by nerve cells in the brain, facilitating communication between brain regions and nerves that control movement.



# What methods help relieve the symptoms of Parkinson's disease?

## Parkinson's disease?

- Levodopa:

Levodopa is administered orally and should be taken either **one hour before or after a meal** to avoid prolonged or reduced absorption. Common side effects include gastrointestinal symptoms like:

- nausea
- vomiting
- anorexia
- constipation



In the initial stages of treatment, which typically subside after two to three weeks.

# What methods help relieve the symptoms of Parkinson's disease?

## Parkinson's disease?

Less common side effects may include:

- tachycardia
- orthostatic hypotension
- anxiety
- sleep disturbances
- mood changes
- hallucination



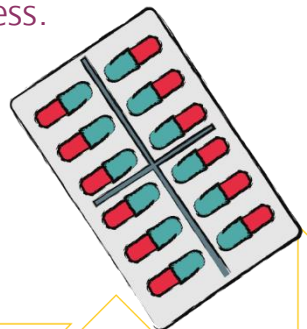
Initially, levodopa can provide significant symptom relief, but its effectiveness may decrease over time due to the loss of nerve cells in the brain, necessitating occasional dose adjustments.

# What methods help relieve the symptoms of Parkinson's disease?

Long-term use of levodopa can lead to complications such as:

- uncontrollable, jerky muscle movements known as dyskinesias.
- "On-off" effects: where individuals experience rapid shifts between mobility (on) and immobility (off).
- Dopamine agonists:

Act as a milder substitute for dopamine in the brain, available as tablets or skin patches (like rotigotine). They may be used alongside levodopa and can cause side effects like nausea, fatigue, and dizziness.

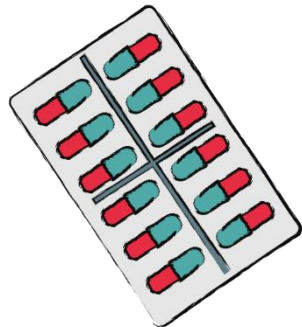


# What methods help relieve the symptoms of Parkinson's disease?

- Monoamine oxidase-B (MAO-B) inhibitors:

Are an alternative to levodopa for early Parkinson's treatment. They increase dopamine levels by blocking an enzyme in the brain. While effective, their impact is less than levodopa. They can be used with levodopa or dopamine agonists. MAO-B inhibitors are usually well tolerated but may occasionally lead to side effects such as

- Nausea and headaches.
- Abdominal pain, or fluctuations in blood pressure.



# What are the surgical treatment method for Parkinson's disease patients?

There are several surgical procedures that are resorted to in the event that treatment becomes frequent several times a day and to solve the problem of motor fluctuations, the most important of which are:

1. **Deep brain stimulation**, which is a device that is implanted in the brain and connected to a device in the chest to send electrical pulses to specific areas of the brain to control the reduction of tremors, stiffness, and slow movement.
2. **Doudopa pump**, which is a treatment with levodopa/carbidopa in the form of a gel that is pumped through a tube connected to the intestine. It helps reduce motor fluctuations in patients.





# What are the surgical treatment method for Parkinson's disease patients?

Note:

Either procedure is chosen by the specialist after conducting several tests, including a memory and mood test, a levodopa test, and other tests.





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# Common Asked Question in Parkinson's



## What are the Common Causes and Risk Factor in Parkinson's?

The exact cause of Parkinson's disease still remains uncertain, it usually occurs due to a multifactorial including:

- ❖ Age: Parkinson's usually affects people > 60 years old.
- ❖ Deficiency in dopamine, a neurotransmitter facilitating nerve signal transmission.
- ❖ Degeneration and impairment of neuronal terminals responsible for the synthesis of Norepinephrine, crucial for neural impulse transmission, voluntary nervous system control, and blood pressure regulation.

# What are the Common Causes and Risk Factor in Parkinson's?

- ❖ Exposure to hazardous substances.
- ❖ Genetic predisposition.
- ❖ Prior head traumas.
- ❖ Viral infections affecting the nervous system.
- ❖ Certain pharmacological agents known to elevate disease risk by diminishing dopamine levels or blocking its receptors, such as certain medications used in the management of psychiatric disorders.



## Can Parkinson's disease be inherited?

Not all genetic cases of Parkinson's disease are hereditary. Minority cases only have the potential to be transmitted. However, genetics may increase the risk of Parkinson's disease among siblings when one family member is affected by the disorder. Such cases often manifest at a considerably younger age.

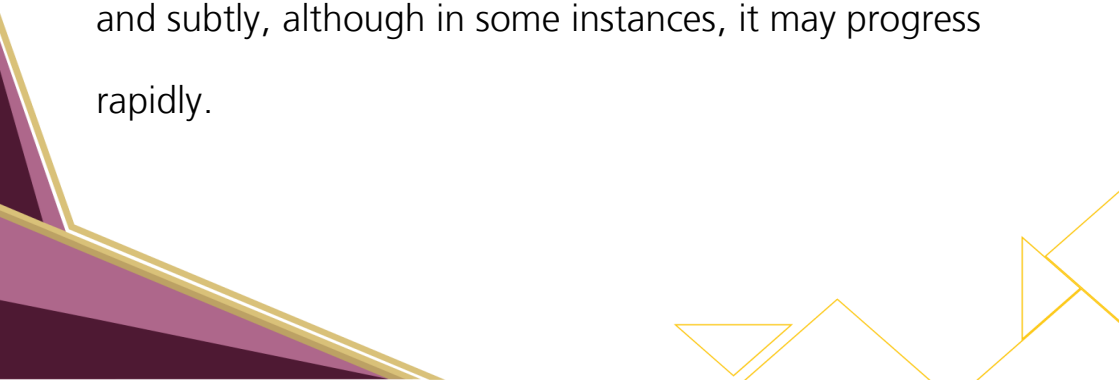


## **What is the Life expectancy of Parkinson's disease?**

Parkinson's disease itself doesn't consider as a fatal disease. However, affected individuals become more susceptible to severe and life-threatening infections. Therefore, the life expectancy of individuals with Parkinson's disease is typically shortened compared to the general population.

## **Does Parkinson's affect memory?**

Mild cognitive impairment may be developed in patients with Parkinson's disease, yet not all cases will progress to dementia. Cognitive impairment usually occurs gradually and subtly, although in some instances, it may progress rapidly.



## How Quickly does Parkinson's Progress?

Motor fluctuations can be experienced by patients within a time frame ranging from 5-10 years after the Initial diagnosis of Parkinson's disease. It is important to note that the progression of Parkinson's disease is unpredictable and can vary significantly among individuals, displaying a wide range of clinical manifestations.

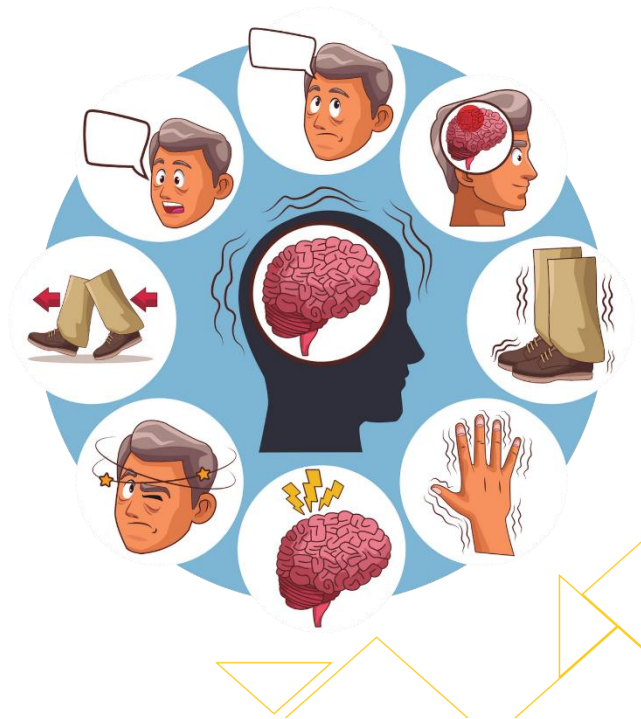
### Note:

- ❖ **Stage 1:** Unilateral involvement only.
- ❖ **Stage 2:** Bilateral involvement without impairment of balance.



## How Quickly does Parkinson's Progress?

- ❖ **Stage 3:** Mild to moderate bilateral disease, some postural instability, physically independent.
- ❖ **Stage 4:** Severe disability, still able to walk or stand unassisted.
- ❖ **Stage 5:** Uses wheelchair or bedridden unless assisted and The Movement Disorders Society Unified Parkinson's Disease Rating Scale (MDS-UPDRS) as an Instrument for quantification of Parkinson's severity.





# What are the Prevention methods of Parkinson's disease?

Primary prevention of Parkinson's disease quite challenging since most significant risk factors for Parkinson's are considered non modifiable such as:

- ❖ Aging process.
- ❖ Genetics.
- ❖ Pesticide exposure
- ❖ Dairy products consumption
- ❖ Residing within rural areas have shown an increased risk of Parkinson's disease incidence



# What are the Prevention methods of Parkinson's disease?

Environmental factors contribute in reducing the risk of developing Parkinson's such as:

- ❖ Drinking coffee.
- ❖ Physical exercise.
- ❖ Use of non-steroidal anti-inflammatory drugs.



## When to seek help?

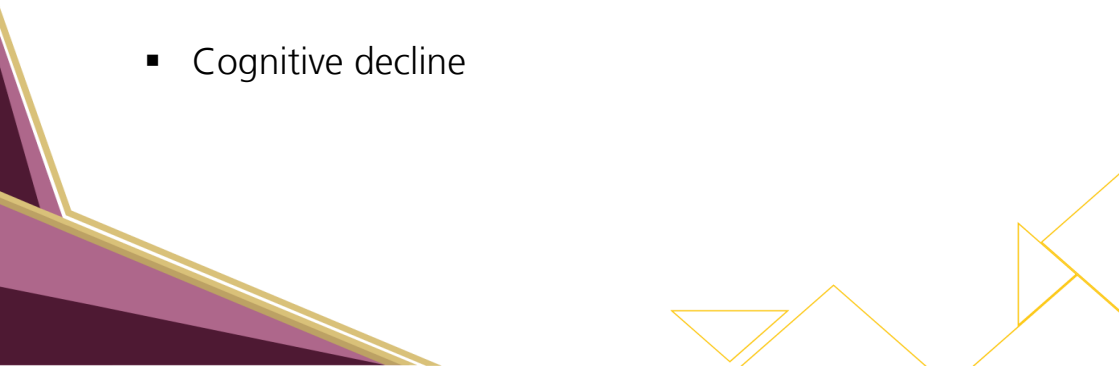
Making a decision to seek medical attention in case of Parkinson can be complex and relies on several factors. Parkinson's is characterized by its core motor manifestations including bradykinesia, rest tremor and rigidity, in case patients already diagnosed with Parkinson experience rapid progression and worsening of such symptoms, this might be alarming and could indicate the need to approach medical help.



## When to seek help?

### Note:

Certain red flags might raise suspicion and the need for Immediate such as rapidly progressive gait impairment resulting in difficulty walking and frequent falls, speech and swallowing difficulties indicative of early bulbar palsy, signs of autonomic failure:

- Orthostatic hypotension
  - Sexual dysfunction
  - A decreased ability to sweat
  - Elevated blood pressure when lying down
  - Changes in gastrointestinal and urinary habits
  - Dystonia
  - Cognitive decline
- 

## When to seek help?

medical attention It is important to mention that in some instances where the disease activity is stable and patient symptoms are well managed, and they are not interfering with their daily living immediate medical attention in such cases is not advised. However, having regular follow ups to monitor disease progression is crucial to check for patient's adherence to medications and it also aids in early detection of red flags or abrupt worsening of disease.

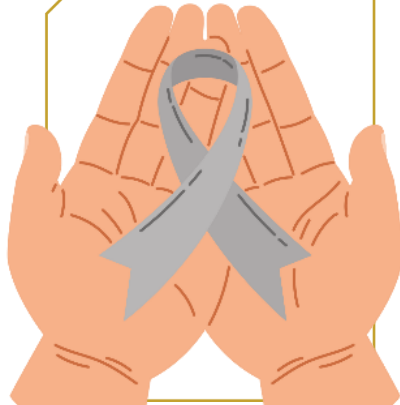




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# Support for Parkinson's Patients and their Caregivers



## What is the impact of Parkinson's disease on caregivers?

Parkinson's is a progressive neurodegenerative disease that leads to the loss of motor and non-motor symptoms, thus resulting in the loss of patient autonomy and the ability to perform day-to-day tasks. The patient may become more dependent on friends and family for support, negatively impacting the caregiver's physical, mental, and socioeconomic status. These impacts face the caregiver at all stages of Parkinson's disease:

- ❖ Depressive symptoms
- ❖ Lack of sleep
- ❖ The inability to work due to the physical dependency of the patient adds to caregiver stress.



## What is the impact of Parkinson's disease on caregivers?

The advancing neuropsychiatric symptoms seen in the patient (e.g., visual hallucinations, depression, and cognitive impairment) were proven to be predictors of caregiver burden. Caregivers may prioritize the patient's health over their own, neglecting themselves, especially since they are dealing with someone with more complex needs, this will contribute to caregiver burnout.

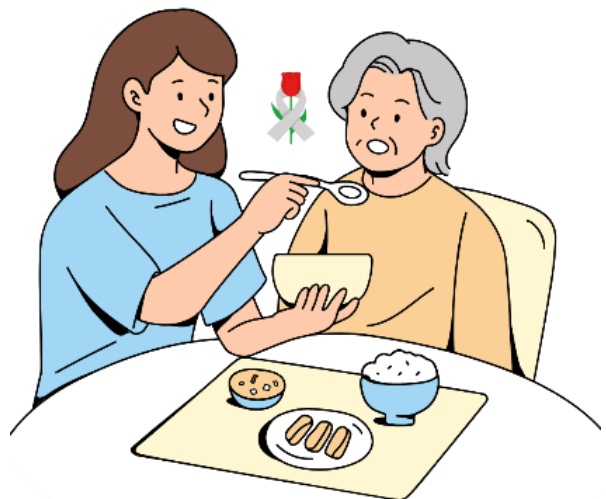




## What are the impacts on the caregiver and support of patients with Parkinson's disease?

It is essential to raise awareness of the caregiver's burden so that they seek treatment when needed, as it may improve their quality of life. To avoid caregiver burnout, it is important that:

- ❖ The caregiver takes time for themselves
- ❖ Has someone to talk to
- ❖ Sets realistic goals for them and their loved one
- ❖ Gets educated about Parkinson's disease



# What is the role of doctors and social workers in supporting patients with Parkinson's?

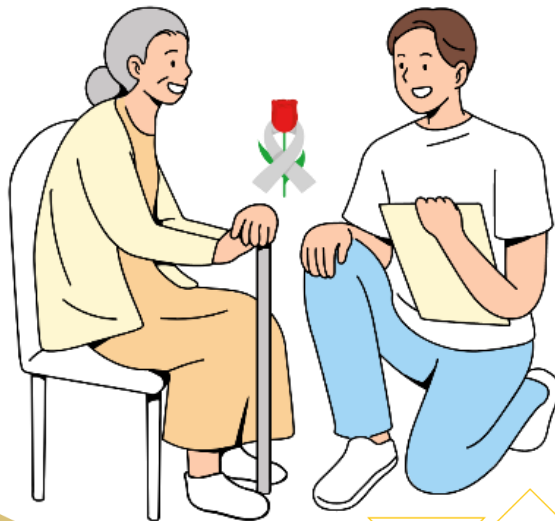
Social workers can help patients with:

- ❖ Practical life issues that may come up with the progression of the disease.
- ❖ Early intervention can help both the patient and the family cope with the disease.
- ❖ Discuss accommodation or future in home care needs.
- ❖ Educate the team on the disability or governmental programs available that support the patient's need.



# What is the role of doctors and social workers in supporting patients with Parkinson's?

- ❖ Good quality social care delivered at the appropriate time has been proven to positively impact the patient's overall well-being by preventing symptom deterioration and improving mental health.
- ❖ Proper social support helps the patient prepare for the challenges that may arise as the disease progresses
- ❖ It helps reduce stress for the patient and the medical team, allowing for a better transition.









## Sources and References:



All illustrations from Canva.com

## Review and Audit:

The content of this booklet was reviewed by neurology consultants at King Fahad Hospital the University.

**Neurology Department**

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**Health Awareness Unit**

**IAU-24-G02**



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