

Sleep Disturbance in Patients with Parkinson's disease

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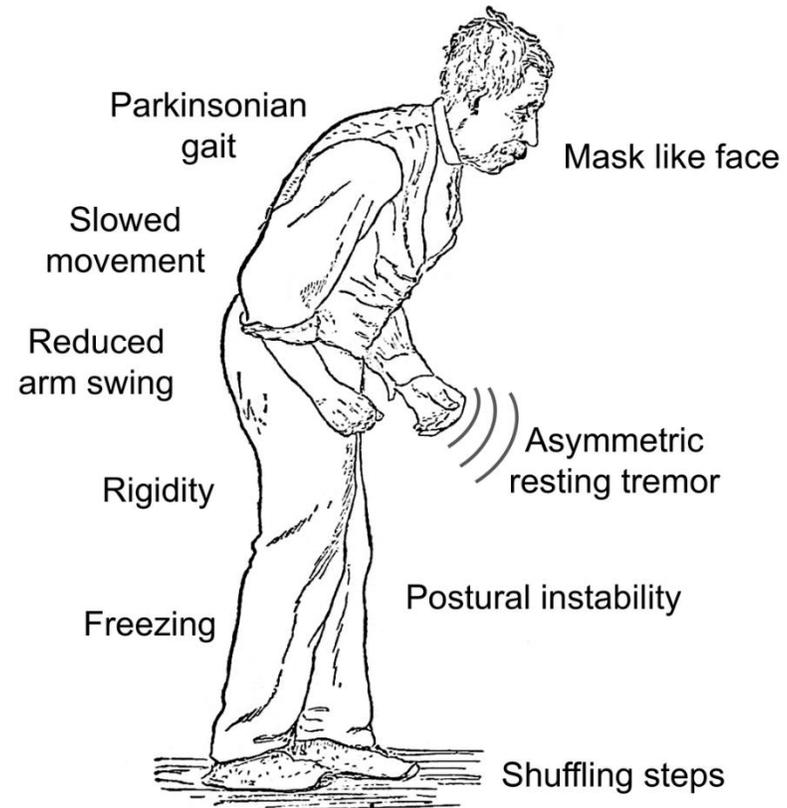
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Objectives

- 1. Parkinson's disease, a Movement Disorder
- 2. Non-motor features of PD
- 3. Describe the prevalence and variety of sleep disturbances in patients with Parkinson's disease.
- 4. Recognize the importance of sleep in neurodegeneration.
- 5. Communication with your health care providers.
- 6. What you can do for yourself to help with sleep disturbance.

Parkinson's disease

- Historically considered a Movement Disorder. James Parkinson described his observations of a PD patient and their motor dysfunction.
- Cardinal features of PD:
 - Bradykinesia (slowness of movement)
 - Rigidity (stiffness)
 - Rest Tremor (pill rolling tremor)
 - Postural Instability (near falls, unprovoked falls)



Parkinson's disease

- PD has evolved to have better understanding that the disease can also impact patients through manifestations of non-motor symptoms.
- Sleep disturbance
 - Insomnia
 - Sleep fragmentation
 - Nocturnal motor features
- Mood disturbance
 - Anxiety
 - Depression
 - Apathy
- Memory changes
 - Dementia
 - Hallucinations
- Urinary dysfunction
 - Urgency
 - Frequency
 - Nocturia
- Blood pressure fluctuations
 - nOH

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Non-Motor Symptoms in Parkinson's

Parkinson's has both motor and **non-motor** symptoms (NMS)

Recurrent national audits suggest we aren't very good at **looking for NMS**

NMS have a negative impact on quality of life for **84% of people** with Parkinson's

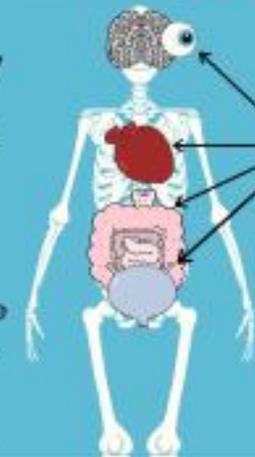
NMS are not limited to late-stage Parkinson's disease. Symptoms affecting smell, sleep, mood and autonomic function may **precede the diagnosis** by several years

α -synuclein is a key protein in the development of PD

Aggregates have also been found in **peripheral organs**

Neurotoxic forms of **α -synuclein** aggregate within the **brain**, for example in **Lewy Bodies**

This suggests significant involvement of the **peripheral nervous system**



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Sleep Disturbance: Background

- It is estimated that approximately 930,000 Americans live with Parkinson's disease and up to 98% of them experience SD. The prevalence will increase in an aging population.
- Sleep disturbance are defined as:

Excessive daytime sleepiness (EDS), insomnia/fragmentation, nocturnal motor features, dream enactment/REM sleep behavior symptoms, Restless Leg Syndrome, or sleep disorder breathing (obstructive sleep apnea).

Sleep and Brain Health

- Sleep enables the brain rest and regeneration of neurons and neurotransmitters.
- Sleep is a key role in the onset and progression of neurodegeneration.
 - It may be early sign of increased risk for future development of neurodegenerative disorders.
 - It can also be a result of damage to central nervous system.
- Increasing data to support that poor sleep leads to the acceleration in the progression of neurodegenerative diseases, and may be a role in pathogenesis.

Sleep in Prodromal PD

- Sleep related symptoms may be one of the earliest features of Parkinson's disease.
- REM Sleep Behavior Disorder convert to Parkinson's disease and other synucleinopathies such a dementia with Lewy Bodies and Multiple System Atrophy.
- Pheno-conversion risk:
 - 15 % – 35% in 2 – 5 years
 - 41 % – 90.9% in 12 – 25 yearsIt is the most specific clinical prodromal marker of PD.

Sleep Disturbance in PD

1. Types

- a. Insomnia (difficulty falling asleep)
- b. Sleep fragmentation (waking up multiple times during the night)
- c. Excessive daytime sleepiness (EDS)
- d. Vivid dreams
- e. Emotional dreams/nightmares
- f. RBD

REM Sleep Behavior Disorder

- As you sleep, your brain cycles through four stages:
- Stages 1 to 4 are non-rapid eye movement/quiet sleep
- Stage 5 is rapid eye movement (REM) sleep/active sleep
- The cycle repeats itself increasing in duration and depth

REM sleep behavior disorder is defined as dream enactment behaviors that emerge during loss of REM sleep.

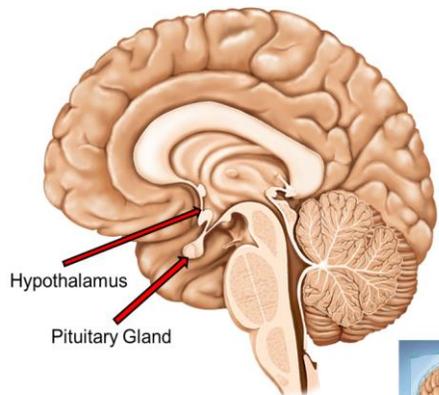
Male to female ratio: 9:1

Diagnosis: sleep polysomnography

Sleep partner report

Must rule out sleep apnea; can mimic RBD

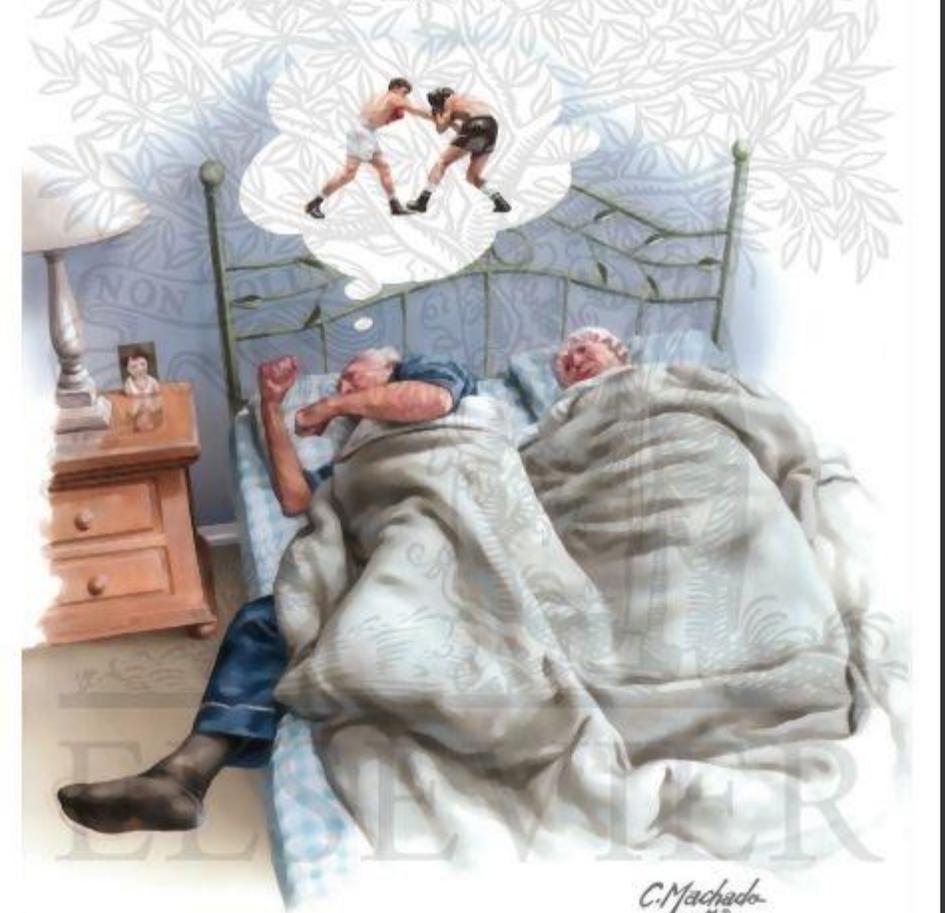
Treatment aimed for patient and bed partner safety



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Patients with REM sleep behavior disorder lack reticulospinal inhibition that normally induces paralysis during REM sleep. Patients act out their dreams without any recollection in the morning. The episodes are usually witnessed by the spouse.



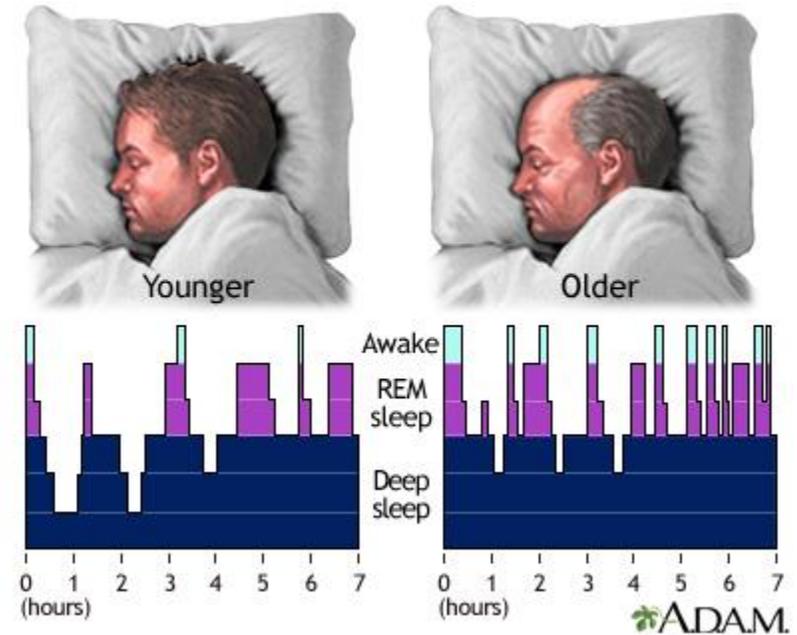
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Sleep-disordered Breathing

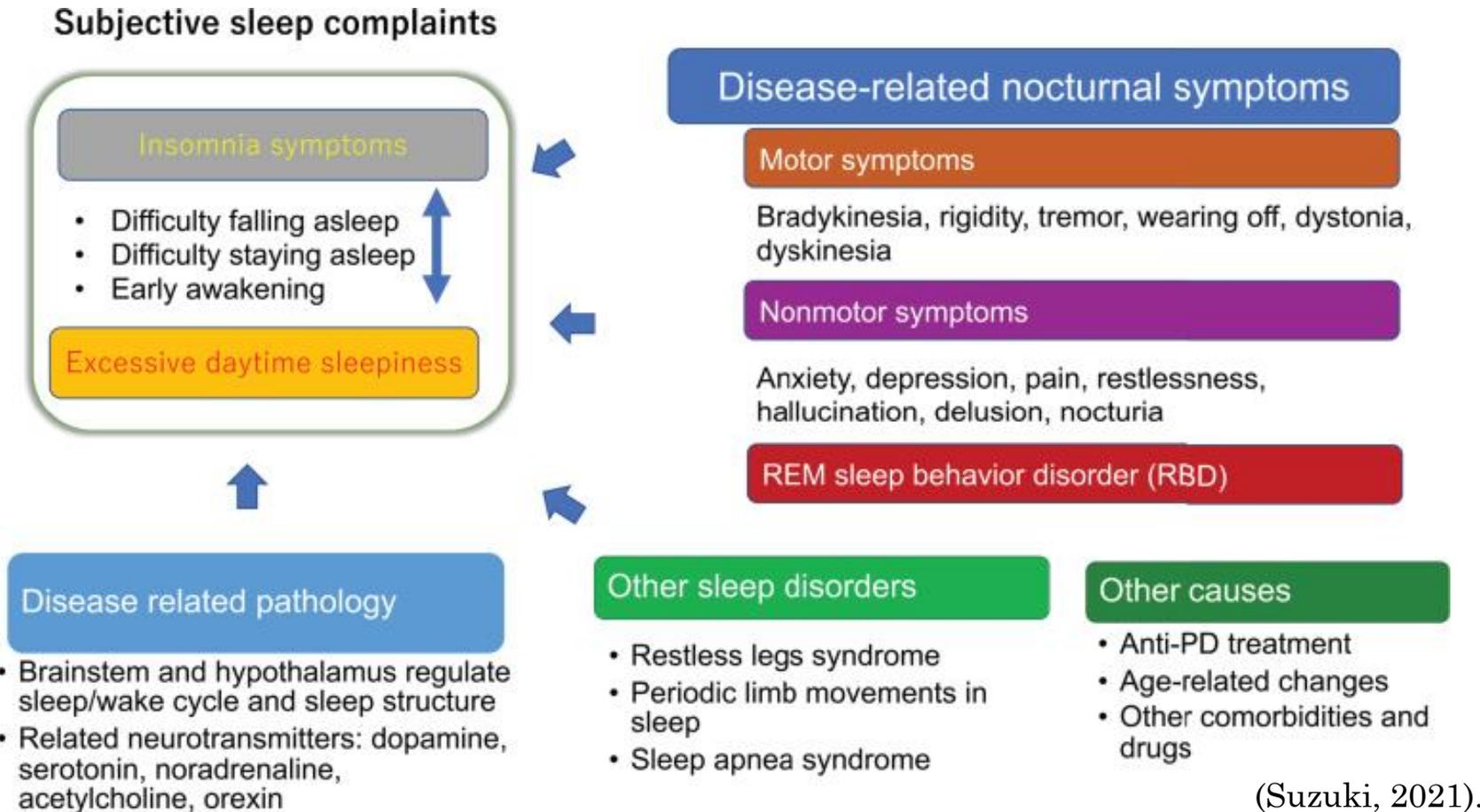
- Central Apnea– the brain fails to send a signal for muscle contraction, resulting in no movement of the rib cage and abdomen.
- Obstructive Apnea– majority of sleep apneas are obstructive. The result of a full collapse of the pharyngeal airway that blocks air from entering the lungs, leading out of phase movement.
- Gold standard for diagnosis: Polysomnography (PSG) is an overnight sleep study in a sleep lab. The results are interpreted by a sleep medicine physician. Treatment recommendations are generally made by the sleep medicine specialist.
- Sleep disordered breathing can also be a leading cause of sleep fragmentation, premature waking up, excessive daytime drowsiness.

Age-related Changes

- Sleep pattern changes is part of normal aging.
- Circadian system is the internal body's pacemaker: regulates physiological functions, including body temperature, heart rate, blood pressure, release of certain hormones, bone remodeling, sleep-wake rhythm, and rest-activity pattern.
- Becomes less robust with aging.
- Has difficulty with phase shifting.
- **Recommendations: Sleep at an earlier hour to achieve a full night's sleep requirement.**



Sleep Disturbance in Patients with Parkinson's disease



Current Trend in Practice

- Despite the prevalence of sleep disturbance in PD, it is often under recognized and under treated.
- No formal routine screening in general population.
 - May be due to patient/provider burden, instrument accessibility, and administrations.
- Majority of this patient population affected with Parkinson's disease > 60 years
- May interpret SD as a normal part of the aging process.
- In the COVID-19 infection-prevention procedures (social distancing, isolation) have also been found to contribute to sleep and mood disturbance.
- Failure to disclose

The Value in Screening

- Sleep dysfunctions were related to a worse quality of life and greater non-motor symptom burden.
- Symptoms such as depression, pain, fatigue, poorer cognition, and impulse control behaviors were increased in patients with PD who had sleep problems.
- Research suggested that early detection and management of sleep-related problems through screening in clinical practice may have a positive impact on the quality of life of patients with PD.

Treatment

- Change medication: assess current anti-PD medications that could be causing sleep issues, reducing the dose, or switching medicines.
- Prescribe new medication
- If patient has sleep apnea, recommend the appropriate appliance for treatment (CPAP, BIPAP).
- Lifestyle changes: setting regular sleep and wake times, reducing stimulus (electronic device, television, or options for safe sleeping environment).

Summary

- Sleep disturbance negatively affects quality of life.
- In patients with neurodegenerative syndrome, the brain develops difficulty regulating sleep/wake pattern.
- It is important to discuss with your health care providers sleep disturbance/quality of sleep.
- Don't snooze on your sleep concerns!

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