
SLEEP DISORDERS IN PARKINSON DISEASE

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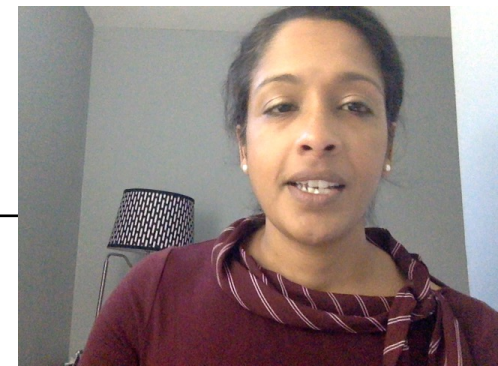
School of Medicine and Health Sciences

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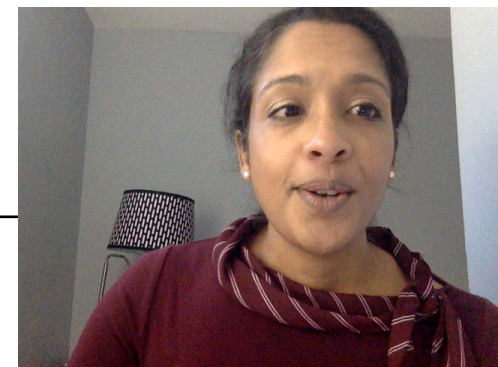
LEARNING OBJECTIVES

1. Identify basic sleep requirements to optimal functioning in people with Parkinson's disease
2. Describe behavioral strategies to manage insomnia
3. Recognize symptoms of REM-behavior disorder and obstructive sleep apnea



OUTLINE

1. Sleep physiology basics
2. Common sleep disorders in PD and their management



IMPORTANCE OF SLEEP

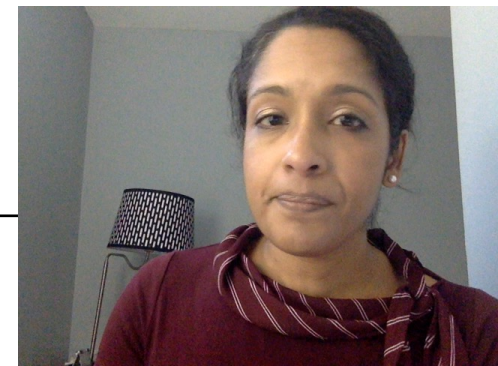


HOW MUCH SLEEP IS ENOUGH?

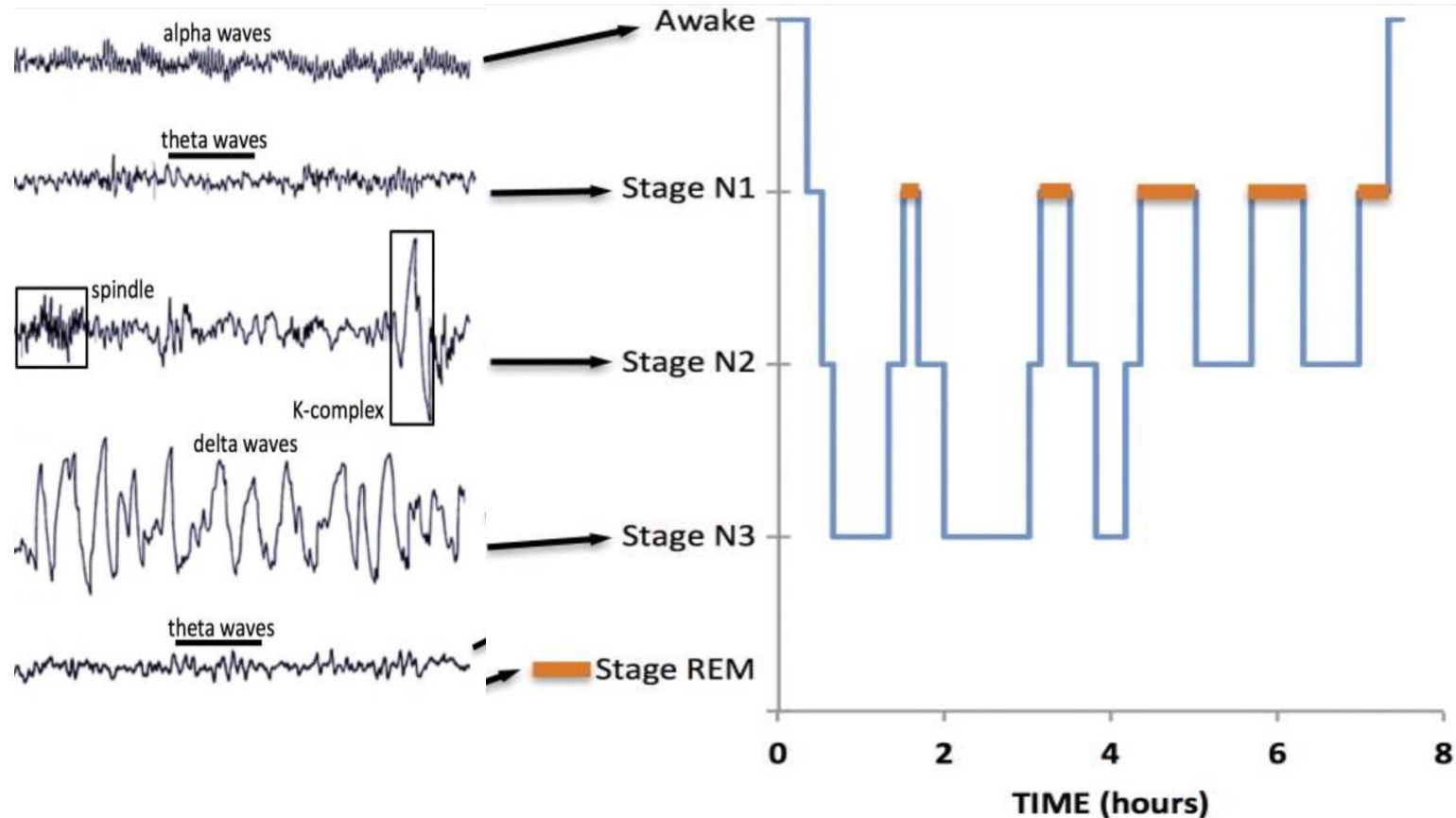
Ideally, about 7-8 hours of restful sleep

Restful sleep can impact

- Daytime energy
- Cognition (attention, concentration, memory)
- Motor function
- Mood



SLEEP BASICS



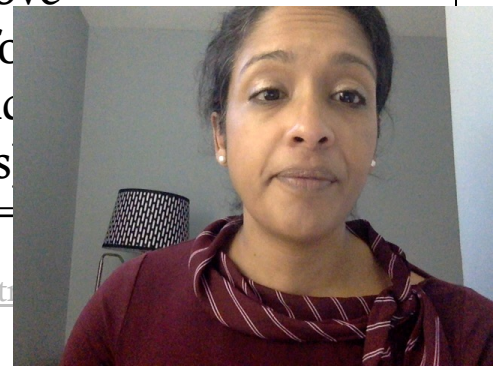
1. Wakefulness

2. Non-REM (NREM) sleep

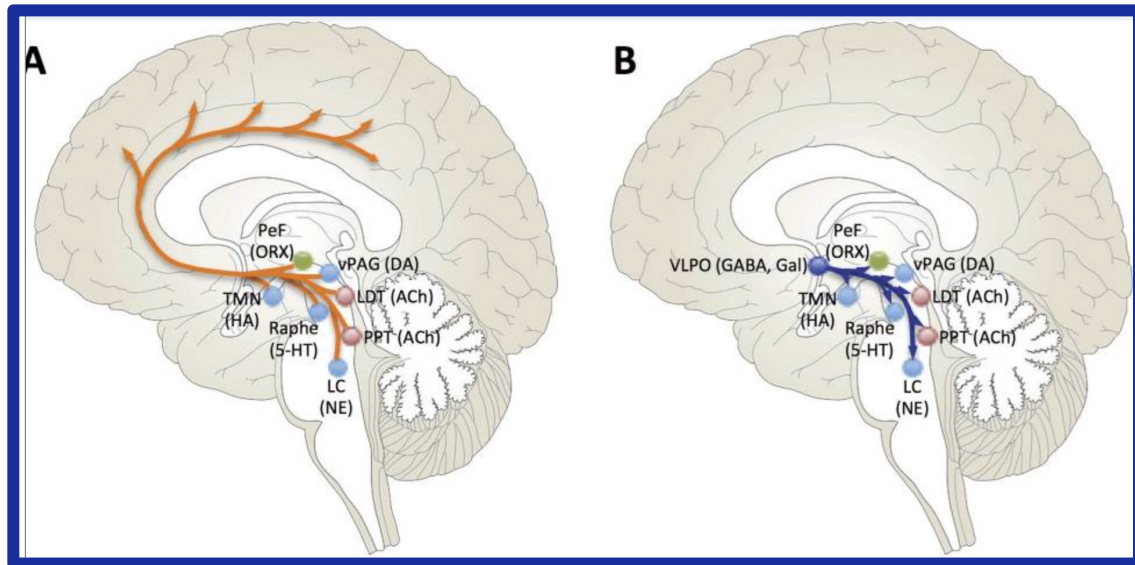
- N1
- N2
- N3 – “slow wave” sleep. May play a protective role in neurodegeneration

3. Rapid Eye Movement (REM) Sleep:

- Brain waves are very active, dreaming
- Normally, the body is paralyzed and eyes move
- Important for (pruning and homeostasis)



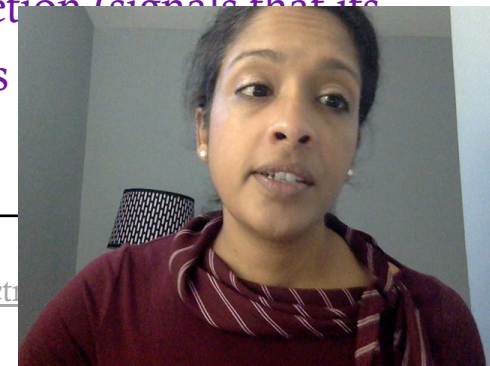
CIRCADIAN RHYTHM



- 24- hour cycle of wakefulness and sleep that regulates behavioral and physiological processes
- Coordinated by the “suprachiasmatic nucleus” (SCN)
 - Stimulation of the SCN causes a complex cascade of reactions among various structures in the brain – balancing the cycle between wakefulness and sleep
- SCN is stimulate by
 - Environmental triggers: natural light, physical activity, meals
 - Physiologic factors: melatonin secretion (signals that its night) and cortisol secretion (signals others

Breen et al, *JAMA Neurol.* 2014 May ; 71(5): 589–595

Carley DW and Farabi SS. Physiology of Sleep. *Diabetes Spectr*



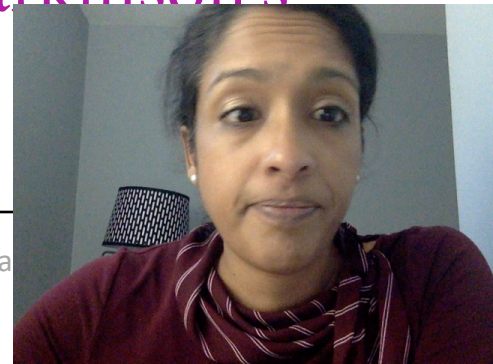


SLEEP CAN CHANGE WITH AGE

- Less Total Sleep Time
- Less Slow Wave Sleep (N3)
- Increased Wakefulness after Sleep Onset (waking up in the middle of the night)
- Increased Sleep Latency (time to fall asleep)

So how is it different in Parkinson's disease?

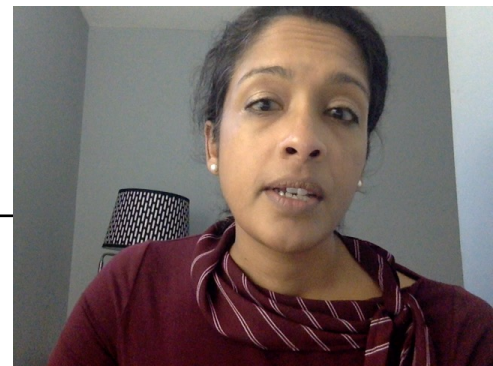
Zhang et al. Sleep in Parkinson's disease: A systematic review and meta findings. Sleep Medicine Reviews 51 (2020) 101281



SLEEP DISRUPTION IN PARKINSON'S DISEASE

Affects 80-90% of people with PD!

1. Insomnia
2. REM behavior Disorder
3. Obstructive Sleep Apnea
4. Excessive Daytime Sleepiness
5. Restless Leg syndrome



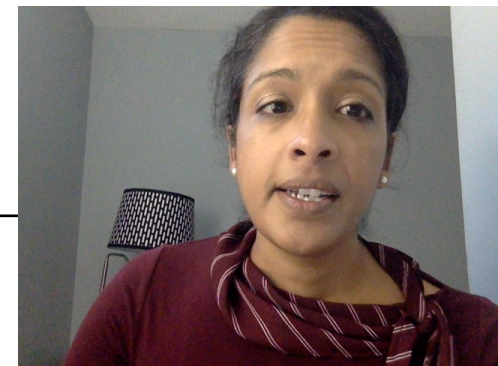
INSOMNIA

Difficulty with

- *initiating* sleep
- *maintaining* sleep or
- *awakening earlier* than desired

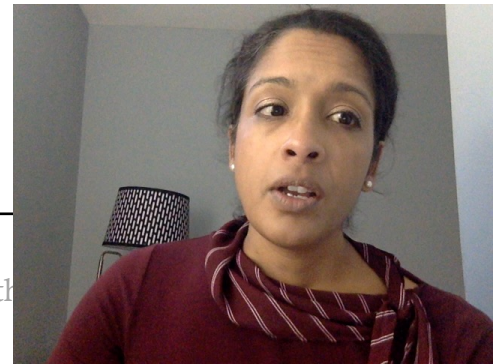
at least 3 days a week for 3 months

Occurs in 81% of people with PD



INSOMNIA - CAUSES

Zuzuarregui JR and During EH. Sleep issues in Parkinson's disease and their management. Neuroth



INSOMNIA - TREATMENT

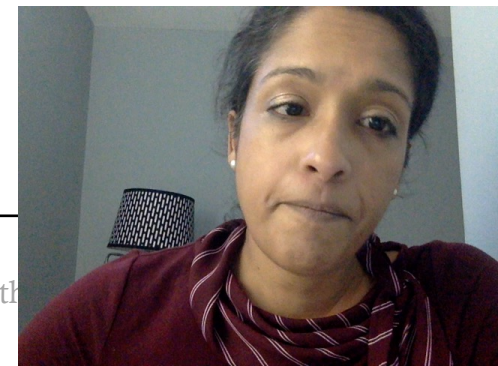
If the issue is motor symptoms at night...

Motor Symptoms

- Tremor
- Stiffness/slowness
- Difficulty turning in bed

Motor symptoms at night

- Long-acting forms of carbidopa/levodopa
- Extended-release dopamine agonists
 - Ropinirole (Requip) ER
 - Pramipexole (Mirapex) ER
 - Rotigine (Neupro) patch



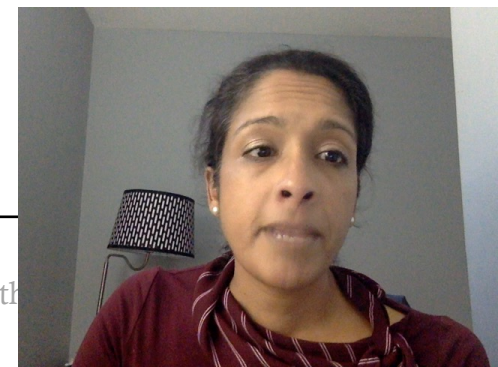
INSOMNIA - TREATMENT

If the issue is non-motor symptoms at night...

Non-motor symptoms

- Urinary frequency at night (nocturia)
- Mood (anxiety)
- Other sleep issues (RBD, restless leg)

- Urinary frequency at night (Nocturia):
 - Address other medical issues (ie. Prostate) if needed
 - Behavioral Strategies
 - decreased fluid intake at night
 - Adjust “water pills” (diuretics)
 - Medications if needed
 - Solifenacin (Vesicare)
 - Mirabegron (Myrbetriq)
 - Tropsiumb (Sanctura)



INSOMNIA - TREATMENT

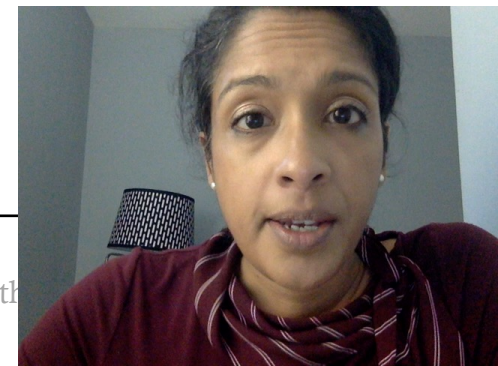
If the issue is non-motor symptoms at night...

Non-motor symptoms

- Urinary frequency at night (nocturia)
- Mood (anxiety)
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- **Mood Symptoms:**

- Non-medication treatments:
 - Sleep hygiene
 - Cognitive Behavioral Therapy
 - Bright Light Therapy
 - Exercise
- Medications for mood (SSRI, SNRIs)
- Medications for sleep
 - Short course of melatonin or benzodiazepine
 - Doxepin (<10mg) ?
 - Suvorexant (belsomra) ?
 - Trazodone ?



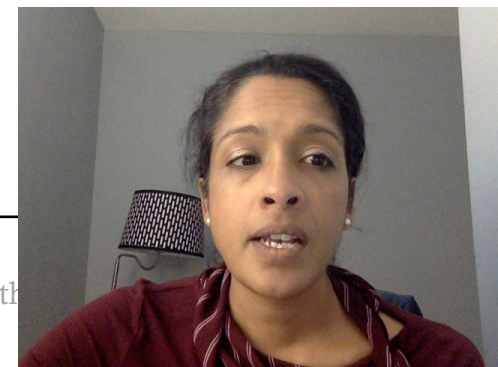
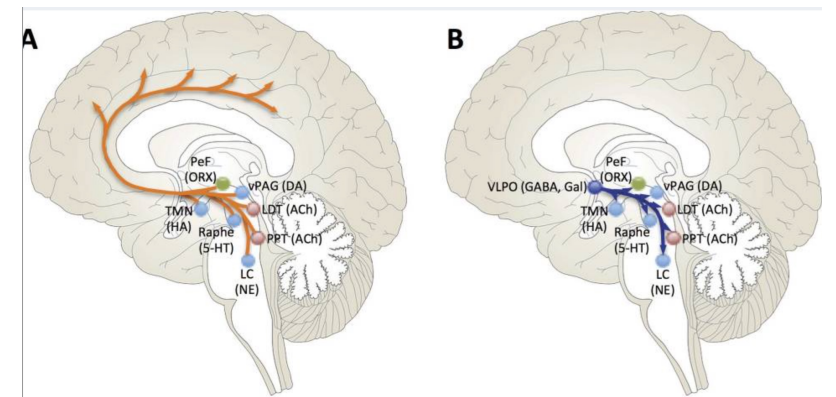
INSOMNIA - TREATMENT

If the issue is how the disease affects the function of sleep-wake centers at night...

Neurodegeneration

- Sleep-wake structures affected by PD

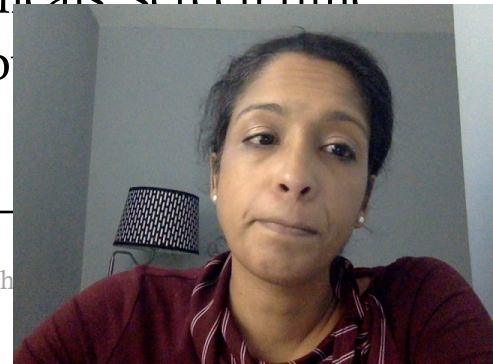
- Sleep Hygiene
- Cognitive behavioral therapy
- Bright Light Therapy
- Exercise
- Review of medications
- Melatonin 3-12mg at ~9pm



SLEEP HYGIENE – WHAT IS IT?



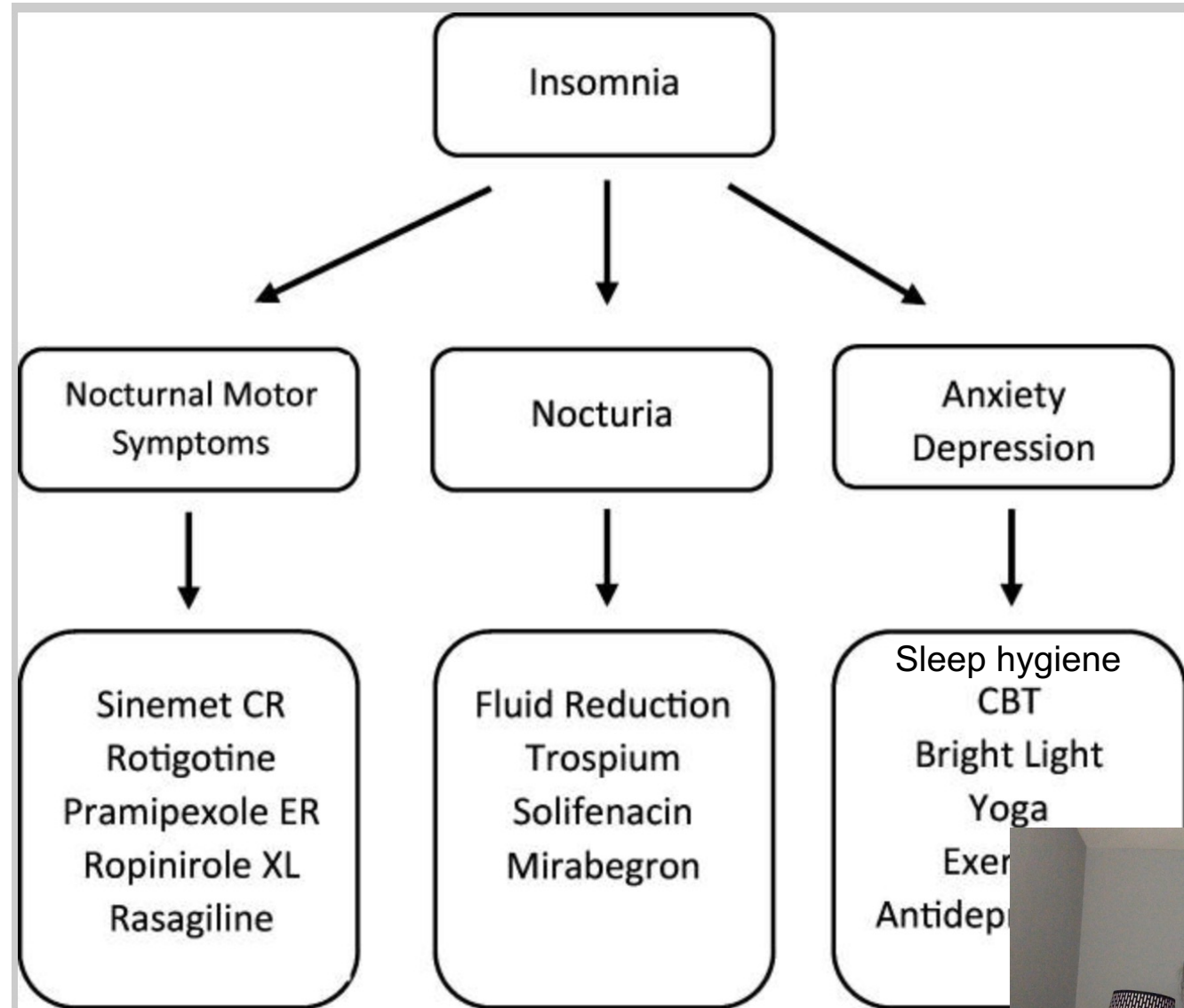
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- **Keep a regular sleep schedule** — go to bed at the same time and get up at the same time.
 - **Wind down and make a relaxing bedtime routine** — for example, bath, tooth-brushing, toileting
 - **Alert your body to daytime** - Spend time outdoors (get 30-90 minutes of light exposure), have regular meals and exercise everyday (in the morning if possible). Avoid exercise after 8pm
 - **Limit naps!** If you nap, try to do so at the same time (before 3pm) every day, for no more than an hour.
 - **Control environmental factors:** Keep bedroom dark and cool; reserve bedroom only for sleep and sex
 - **Avoid!** Caffeine, alcohol, heavy late-night meals, screen time close to bedtime, heavy exercise within 5 hours of bedtime, fluid-intake within 3 hours of bedtime



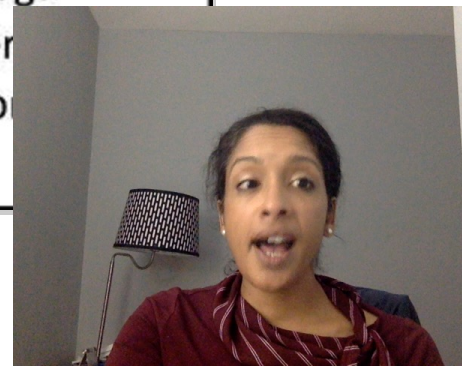
INSOMNIA

TREATMENT

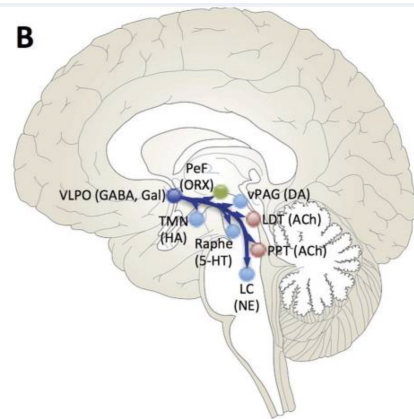
SUMMARY



Zuizarregui JR and During EH. Sleep issues in Parkinson's disease and their management. *Neurotherapeutics*. (2020) 17:1480-1494.



REM SLEEP BEHAVIOR DISORDER (RBD)

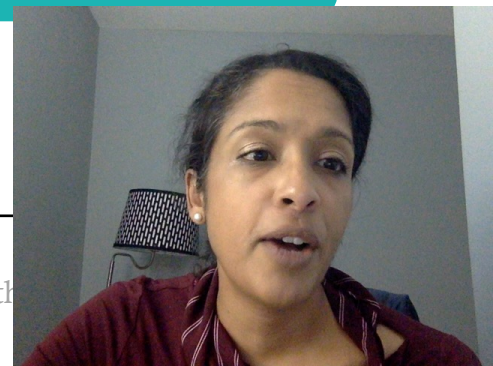


Loss of the normal paralysis during REM sleep, leading to dream-enactment behaviors

Could range from mild muscle twitches and vocalizations to violent, complex motor behaviors

Occurs in 50% of PD population

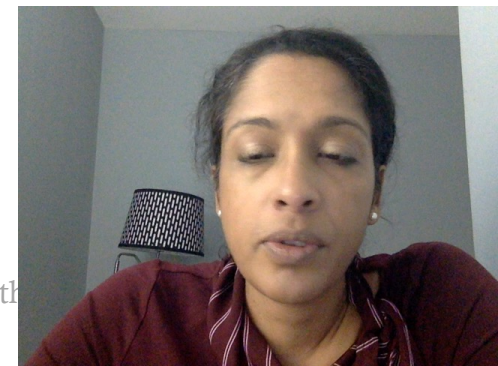
Due to an accumulation of abnormal protein (alpha-synuclein) in key sleep structures in the brain stem



REM SLEEP BEHAVIOR DISORDER (RBD)-

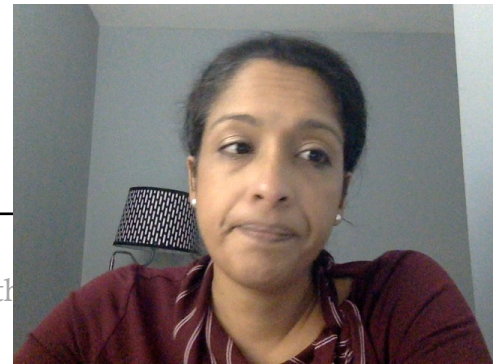
CONSERVATIVE MANAGEMENT

1. Safety measures
 - Bedrails, removal of objects near bedside
2. Review medications that may exacerbate this
 - Antidepressants (SSRI, SNRI, tricyclic antidepressant)
 - Barbituates
 - Anti-psychotics
 - Alcohol
 - Caffeine
3. Evaluation for “pseudo-RBD” – movements in sleep from untreated sleep apnea that mimic RBD

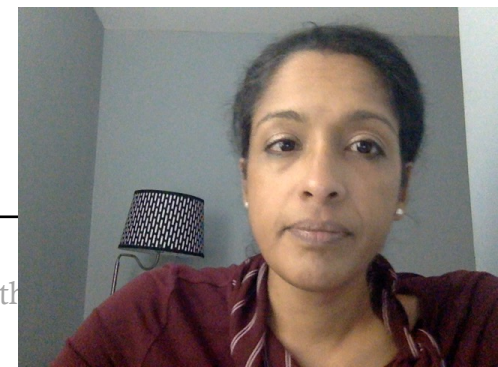
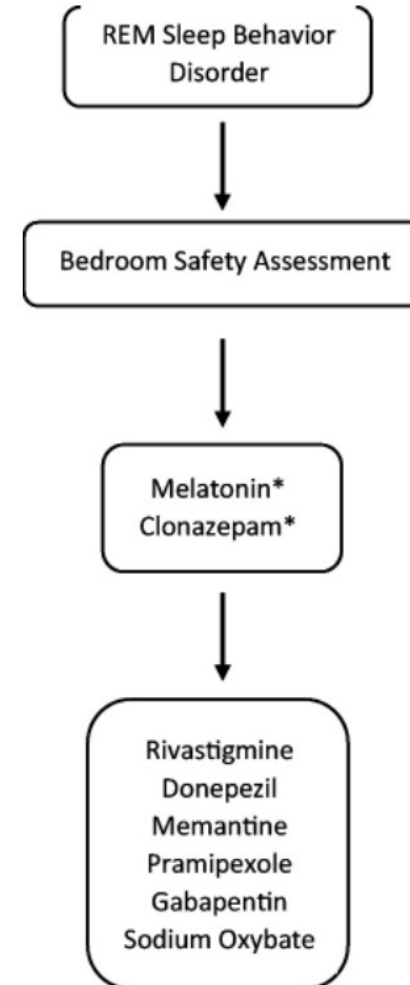


REM SLEEP BEHAVIOR DISORDER (RBD)- *MEDICATION TREATMENT*

1. Melatonin (3-12mg)
2. Clonazepam (0.5-1mg)
3. Rivastigmine? (Some small trials showed ↓ RBD episodes)
4. Pramipexole? (One small trial showed ↓ RBD episodes)
5. Gabapentin as adjunctive therapy to melatonin or clonazepam? (One case series showing this)
6. Sodium Oxybate? (Currently being studied)



REM SLEEP BEHAVIOR DISORDER (RBD)- *TREATMENT SUMMARY*



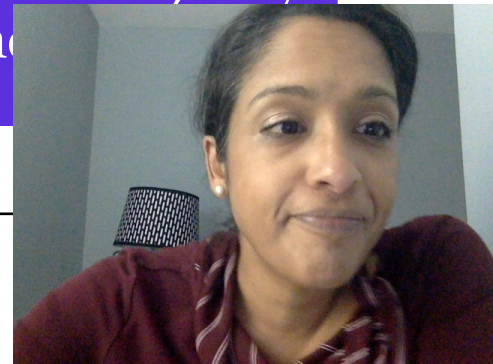
OBSTRUCTIVE SLEEP APNEA (OSA)

A common condition causing reduced airflow during the night due to a blockage of the airway, causing reduced oxygen intake

There is some evidence showing that prevalence (up to 30-45%) of OSA in people with PD

In PD, this is possibly due to motor impairment of the muscles of the larynx

Repeated events of reduced oxygen ("hypoxemia") may contribute to inflammation and injury in the



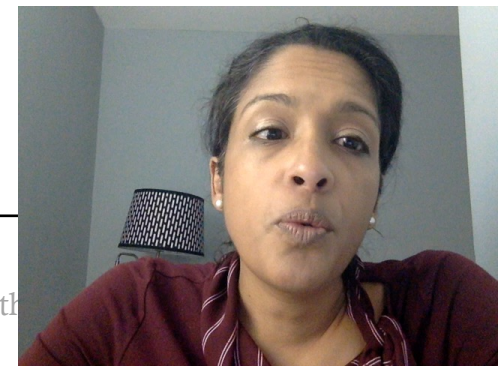
OBSTRUCTIVE SLEEP APNEA (OSA)

Signs/Symptoms

- Snoring at night
- Gasping for air at night
- Restless movements ("pseudo-REM behavior disorder)
- Excessive daytime sleepiness
- Morning headaches
- Poorer concentration/attention

Management

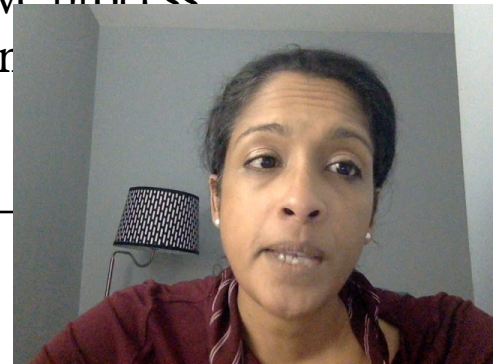
- Continuous positive airway pressure (CPAP) – gold standard
- Non-supine position
- Custom made mandibular advancement devices?



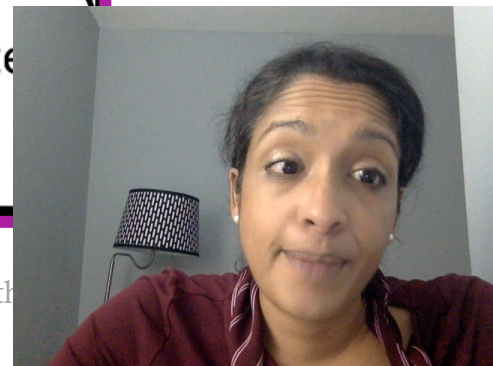
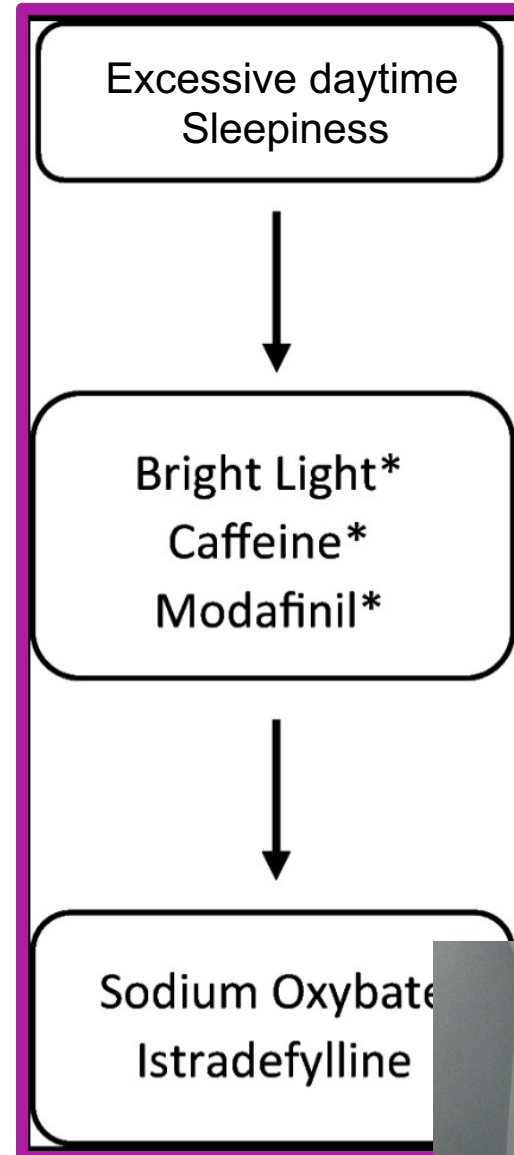


EXCESSIVE DAYTIME SLEEPINESS

- An overwhelming, persistent drowsiness during the day that may interfere with activities and quality of life
- Occurs in 15-45% of people with PD
- Causes:
 1. May be due to other sleep issues (OSA, RBD, insomnia)
 2. May be due to dopaminergic medications
 3. May be due to the neurodegenerative process affecting brain structures involved in cycle

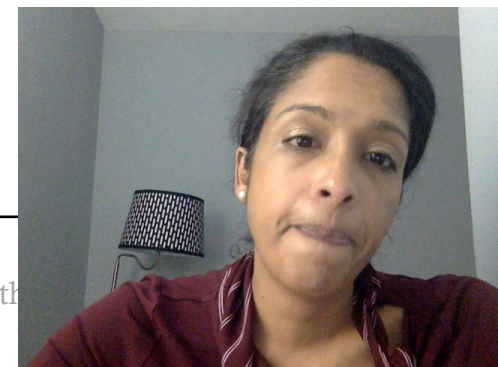


EXCESSIVE DAYTIME SLEEPINESS- *TREATMENT*



RESTLESS LEG SYNDROME

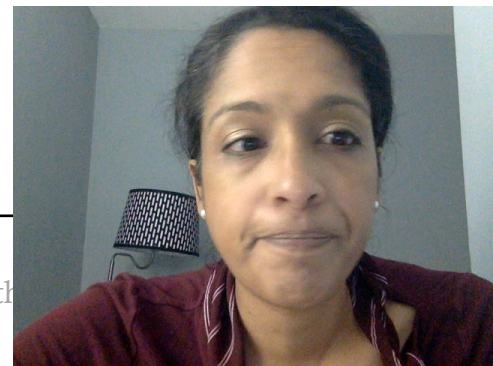
- Common sleep disorder characterized by
 - U**rge to move because of leg discomfort
 - R**est brings on the leg discomfort
 - G**etting up and moving makes it better
 - E**venings are when symptoms are worst.
- Occurs in 8-25% of people with PD
- Can be associated with low iron levels



RESTLESS LEG SYNDROME - *TREATMENT*

- **Behavioral Strategies:**

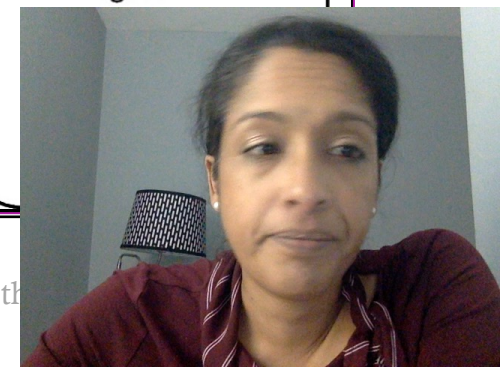
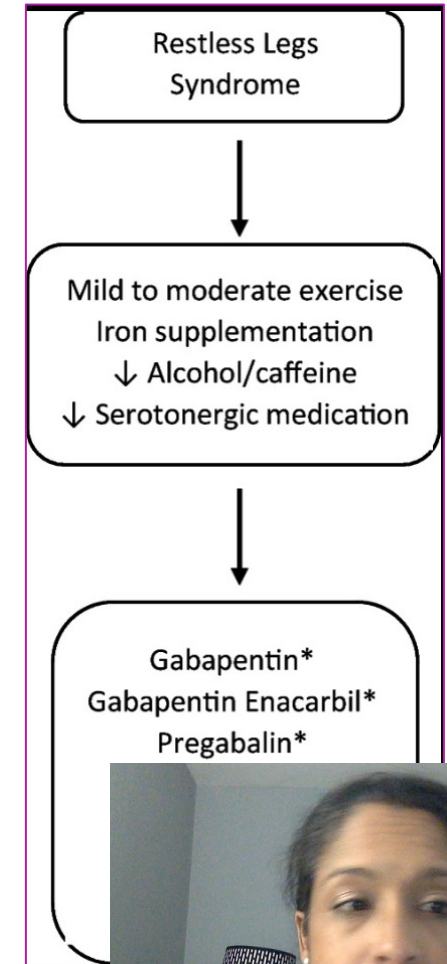
1. Avoid Alcohol
2. Avoid or reduce caffeine intake
3. Start mild to moderate exercise – at least 5 hours before bedtime
4. Stretching before bedtime
5. Review medications for medicines that worsen restless legs (SSRIs, allergy medications)
6. Other sleep hygiene strategies



RESTLESS LEG SYNDROME - *TREATMENT*

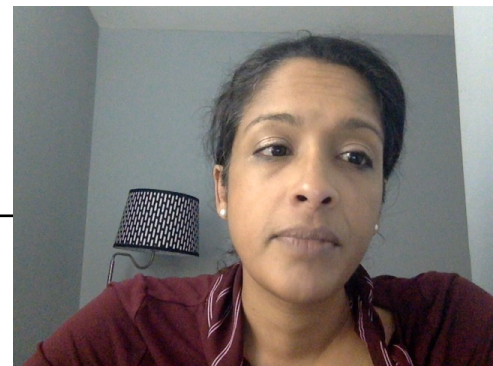
- **Medications/supplements:**

1. Iron (ferrous sulfate) 325mg with Vitamin C – *if iron levels are low*
2. Gabapentin, pregabalin or gabapentin encarbil
3. Dopamine agonists (pramipexole, ropinirole, rotigotine) – can “augment” symptoms earlier in the day
4. Carbidopa/Levodopa - can “augment” symptoms earlier in the day

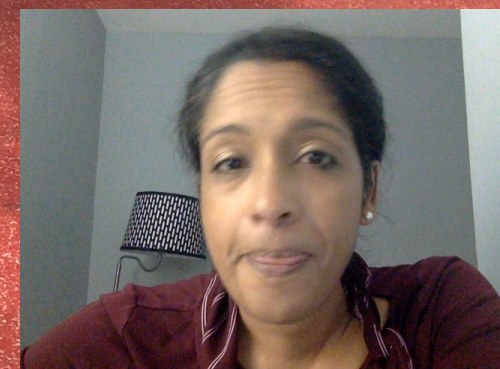


SUMMARY

- Sleep is an important process for our physical, cognitive and emotional health
- Sleep disruption is common in Parkinson's disease
- Treating sleep disruption in PD is dependent on identifying the cause of the disrupted sleep
- Talk with your doctor if you are experiencing unrestful sleep



THANK YOU!



CAUTION
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PISO PLAZADO