

# Sleep Problems in Older Adults

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# Topics

- Age-related changes in sleep
- Case-based review of common sleep problems in older adults
- Sleep in special situations:
  - Major neurocognitive disorder
  - Long-term care settings

# Age-related changes in sleep

↓ Total nighttime sleep

↓ Slow wave sleep

↓ Sleep efficiency\*

↑ Nighttime awakenings

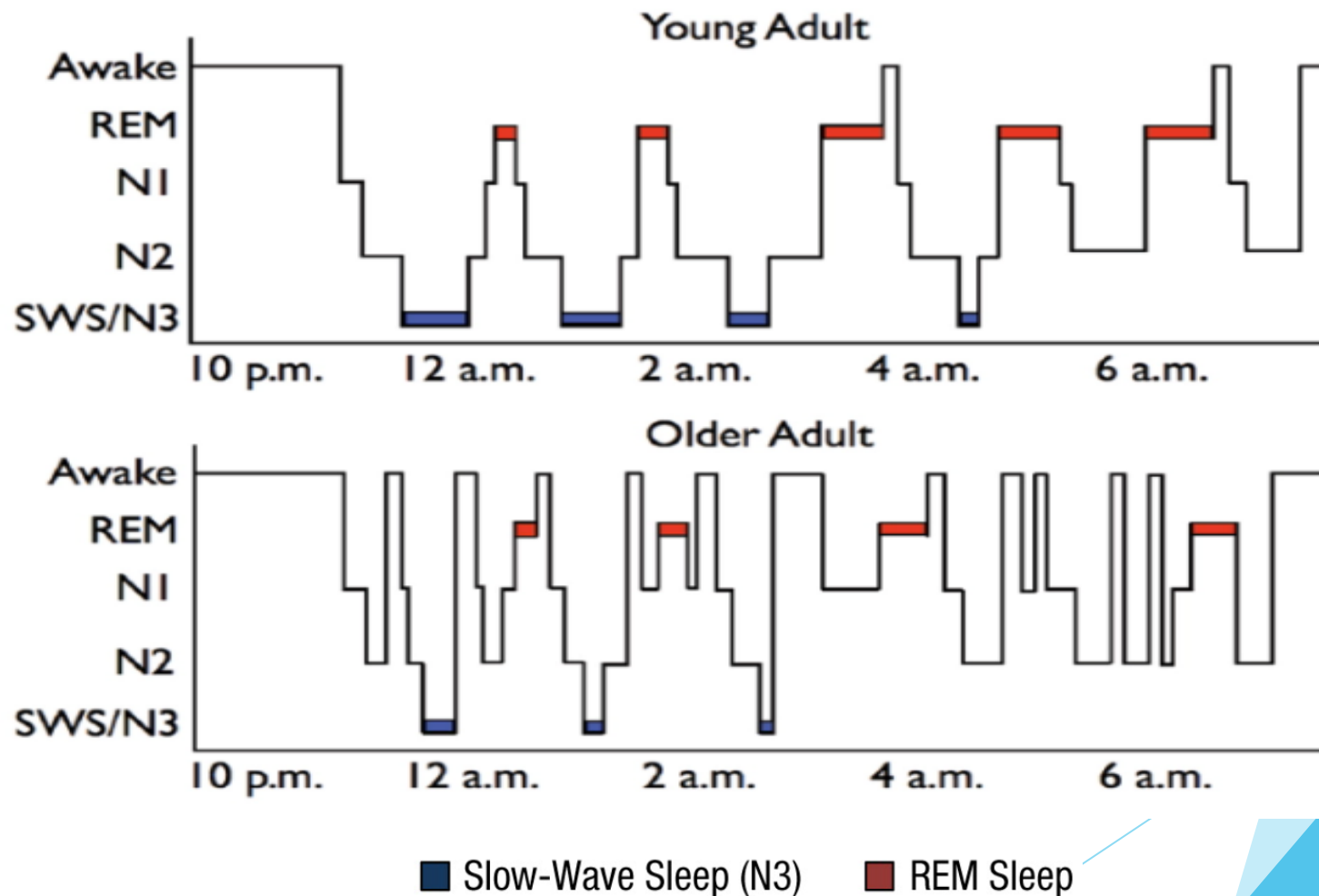
↑ Sleep latency

↑ Insomnia complaints

↑ Daytime napping

*\*Most age-related changes in sleep plateau by age 60 (except sleep efficiency, which continues to decline with age)*

# Age-related changes on a sleep hypnogram



# A sleep diary can assist in diagnosis



WEEK 1 Start date: \_\_\_/\_\_\_/\_\_\_

COMPLETE WHEN YOU WAKE UP							
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
I went to bed at: (Enter the time and circle am or pm)							
am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm
When I went to bed, I fell asleep: (Circle one) 1 = With difficulty, 2 = After some time, 3 = Easily							
1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
I woke up during my sleep: (Enter # of times and # of minutes)							
# times	# times	# times	# times	# times	# times	# times	# times
# mins	# mins	# mins	# mins	# mins	# mins	# mins	# mins
I got out of bed at: (Enter the time and circle am or pm)							
am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm
I slept a total of: (Enter approximate hours/minutes)							
My sleep was disturbed by: (List any factors that made it hard to sleep including noise, lights, pets, allergies, temperature, pain, stress, medication, etc.)							
When I woke up, I felt: (Circle one) 1 = Still tired, 2 = Somewhat awake, 3 = Wide awake							
1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

COMPLETE AT BED TIME							
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
I exercised at least 30 minutes at: (Circle all that apply) ☀ = Morning, ☔ = Afternoon, ☾ = Evening							
☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾
Medications I used today:							
I took a nap today (Circle YES or NO. If YES, enter how long you napped).							
YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
How likely was I to doze off while doing daily activities today: (Circle one) 1 = Not at all likely, 2 = Not very likely, 3 = Somewhat likely, 4 = Very likely							
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
My mood today was: (Circle one) ☺ = Bad, ☹ = Okay, 😊 = Good							
☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊	☺ ☹ 😊
Approximately 2-3 hours before going to bed I drank/ate: (Circle all that apply) 🍷 = Alcohol, 🍴 = Heavy meal, ☕ = Caffeine							
🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕	🍷 🍴 ☕
I drank/ate something with caffeine at: (Circle all that apply) ☀ = Morning, ☔ = Afternoon, ☾ = Evening							
☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾	☀ ☔ ☾
In the hour before going to sleep, my bedtime routine included: (e.g. read book, used electronics, took bath, did relaxation exercises, etc.)							

## Sleep Diary

Use this sleep diary to record the quality and quantity of your sleep, your use of medicines, alcohol and caffeinated drinks, and how sleepy you feel during the day. Bring the diary with you to review the information with your doctor.

Fill out before going to bed		June 13*							
Today's date:	June 13*								
Number of caffeinated drinks (coffee, tea, cola) and time when I had them today:	1 drink, 8 p.m.								
Number of alcoholic drinks (beer, wine, liquor) and time when I had them today:	2 drinks, 9 p.m.								
Nap times and lengths today:	3:30 p.m., 45 minutes								
Exercise times and lengths today:	None								
How sleepy did I feel during the day today? 1—So sleepy I had to struggle to stay awake during much of the day 2—Somewhat tired 3—Fairly alert 4—Alert	1								
Fill out in the morning		June 14*							
Today's date:	June 14*								
• Time I went to bed last night:	11 p.m.								
• Time I got out of bed this morning:	7 a.m.								
• Hours spent in bed last night:	8								
Number of awakenings and total time awake last night:	5 times, 2 hours								
How long I took to fall asleep last night:	30 minutes								
Medicines taken last night:	None								
How alert did I feel when I got up this morning? 1—Alert 2—Alert but a little tired 3—Sleepy	2								



\* This column shows example diary entries—use as a model for your own diary notes.

## TWO WEEK SLEEP DIARY

SleepEducation.org

AASIM American Academy of SLEEP MEDICINE™

### INSTRUCTIONS:

(1) Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation. (2) Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise. (3) Put a vertical line (|) to show when you go to bed. Shade in the box that shows when you think you fell asleep. (4) Shade in all the boxes that show when you are asleep at night or when you take a nap during the day. (5) Leave boxes unshaded to show when you wake up at night and when you are awake during the day.

SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't get back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7 AM.

Date	Day of the week	Type of Day (Work, School, Day Off, Vacation)	Noon	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Midnight	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM
sample	Mon.	Work							A																	

week 1  
week 2

## **Case:**

A 75 year-old woman reports trouble sleeping at night and daytime fatigue.

On further questioning, she reports that she dozes off in a chair after dinner, then awakens at 8:30 pm and goes to bed. Once in bed, she takes an hour to fall asleep. She awakens 2 – 3 times per night and takes an hour to fall back asleep. She gets up for the day at 6 am.

She's had these symptoms several nights per week for many years.

# Diagnostic criteria for insomnia in adults

(Basic components of ICSD3 and DSM-5 criteria)

- Difficulty initiating sleep, difficulty maintaining sleep, and/or waking up earlier than desired
- Associated with one or more daytime consequences
- Symptoms occur  $\geq 3$  times per week
- Symptoms present  $\geq 3$  months
- Not better explained by another sleep disorder

*ICSD3 = International Classification of Sleep Disorders, 3<sup>rd</sup> Edition (2014)*

*ICSD3 also includes: Not explained purely by inadequate opportunity or inadequate circumstances for sleep*

*DSM-5 = Diagnostic and Statistical Manual, 5<sup>th</sup> Edition (2013)*

*DSM-5 also includes: Not attributable to a substance, or coexisting mental or medical disorder (if present, these should be specified)*

# Example sleep diary: Insomnia

Today's date	Day of the week	Type of day (work, school, vacation)	Noon	1 PM	2	3	4	5	6 PM	7	8	9	10	11	Midnight	1 AM	2	3	4	5	6 AM	7	8	9	10	11 AM
Sample	Mon.	Work		E					A	█			↓		█	█	█	█	█	█	↑	C	M			
Week 1											↓			█	█	█	█	█	█	█	█		↑			
						█	█				↓	█	█	█	█	█	█	█	█	█	█		↑			
											↓			█	█	█	█	█	█	█	█			↑		
					█	█								↓	█	█	█	█	█	█	█	█			↑	
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												↓		█	█	█	█	█	█	█	█	█			↑	
												↓		█	█	█	█	█	█	█	█	█			↑	
Week 2															↓	█	█	█	█	█	█				↑	
							█				↓				█	█	█	█	█	█	█	█			↑	
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														↓	█	█	█	█	█	█	█	█			↑	
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																↓	█	█	█	█	█	█			↑	

Adapted with permission from: The American Academy of Sleep Medicine. Form available at: <http://sleepeducation.org/docs/default-document-library/sleep-diary.pdf>.

# American College of Physicians (ACP) Practice Guideline for the Management of Chronic Insomnia Disorder in Adults

*(Qaseem et al. Ann Intern Med. 165:125-133, 2016)*

- **Recommendation 1:** All adult patients should receive cognitive behavioral therapy for insomnia (CBT-I) as initial treatment for chronic insomnia  
*(Grade: strong recommendation, moderate-quality evidence)*
- **Recommendation 2:** Use shared decision-making (with discussion of benefits, harms, and costs of short-term use of medications), to decide whether to add pharmacological therapy if CBT-I alone was unsuccessful.  
*(Grade: weak recommendation, low-quality evidence)*

# What is cognitive behavioral therapy for insomnia (CBTI)?

- Key components:
  - Stimulus-control therapy
  - Sleep restriction therapy
  - Cognitive therapy
  - May include sleep hygiene and/or relaxation  
(but sleep hygiene alone is not effective for chronic insomnia)
- Evidence of effectiveness of CBTI is strong  
(*Edinger et al. J Clin Sleep Medicine, 2021*)
- Can be provided by:
  - Psychologists, other mental health professionals, other clinicians (e.g., nurses)
  - Non-clinical sleep coaches (supervised by a specialist)
  - Self-help formats, online, phone apps

# American Geriatrics Society (AGS) recommendations regarding sedative-hypnotics

- Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation, or delirium. *(AGS Choosing Wisely Workgroup; J Am Geriatr Soc, 2013)*
- **Avoid** benzodiazepines and nonbenzodiazepine benzodiazepine receptor agonist hypnotics *(Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. J Am Geriatr Soc, 2023)*
  - Benzodiazepines:
    - Older adults have increased sensitivity, decreased metabolism of long-acting agents, physical dependence
    - Increase risk of cognitive impairment, delirium, falls, fractures and motor vehicle accidents
    - May be appropriate for specific conditions (e.g., seizure disorder, ethanol withdrawal, procedural anesthesia)
  - Nonbenzodiazepine benzodiazepine receptor agonists (“Z-drugs”):
    - Adverse events similar to benzodiazepines in older adults (e.g., delirium, falls, fractures, emergency room visits, motor vehicle crashes) with minimal improvement in sleep latency and duration

# Examples of FDA approved medications for sleep

- Benzodiazepine receptor agonists (BZRAs)
  - Benzodiazepines
    - Estazolam (ProSom®, generic available)
    - Temazepam (Restoril®, generic available)
  - Non-benzodiazepine BZRAs
    - Eszopiclone (Lunesta®, generic available)
    - Zaleplon (Sonata®, generic available)
    - Zolpidem (Ambien®, Ambien CR®, Edluar® SL, Intermezzo® SL, Zolpimist® spray; generic zolpidem available)
- Melatonin receptor agonist
  - Ramelteon (Rozerem®, generic available)\*
- Sedating antidepressant
  - Doxepin (Silenor®)\*
- Dual orexin receptor antagonists
  - Daridorexant (Quviviq®)\*
  - Lemborexant (Dayvigo®)\*
  - Suvorexant (Belsomra®)\*

\* Some evidence suggests few adverse effects in adults aged  $\geq 65$  years

## Case:

During a routine office visit, a 75-year-old woman asks for “something to help my sleep”.

She has a history of hypertension and osteoporosis. Her medications include lisinopril, alendronate, calcium, and vitamin D. She does not drink alcohol.

Her vital signs are stable. Physical examination is unremarkable. PHQ-2 is 0 and Mini-Cog is 5/5.

On further questioning, she reports falling asleep around 7 pm each night, and awakening in the early morning, with difficulty falling back asleep. She’s had these symptoms for “many years.”

# **Diagnostic criteria for advanced sleep-wake phase disorder** *(Key components of ICSD3 criteria)*

1. Advanced (early timing) phase of major sleep episode, with difficulty staying awake until required/desired bedtime and inability to remain asleep until required/desired time for awakening
2. Symptoms present  $\geq$  3 months
3. Sleep quality and duration are improved when allowed to sleep consistent with their internal biologic clock
4. Documented by 7 – 14 day sleep log (and actigraphy if possible)
5. Not better explained by another sleep disorder

*ICSD3 = International Classification of Sleep Disorders, 3<sup>rd</sup> Edition (2014)*

# Example sleep diary: Advanced sleep phase

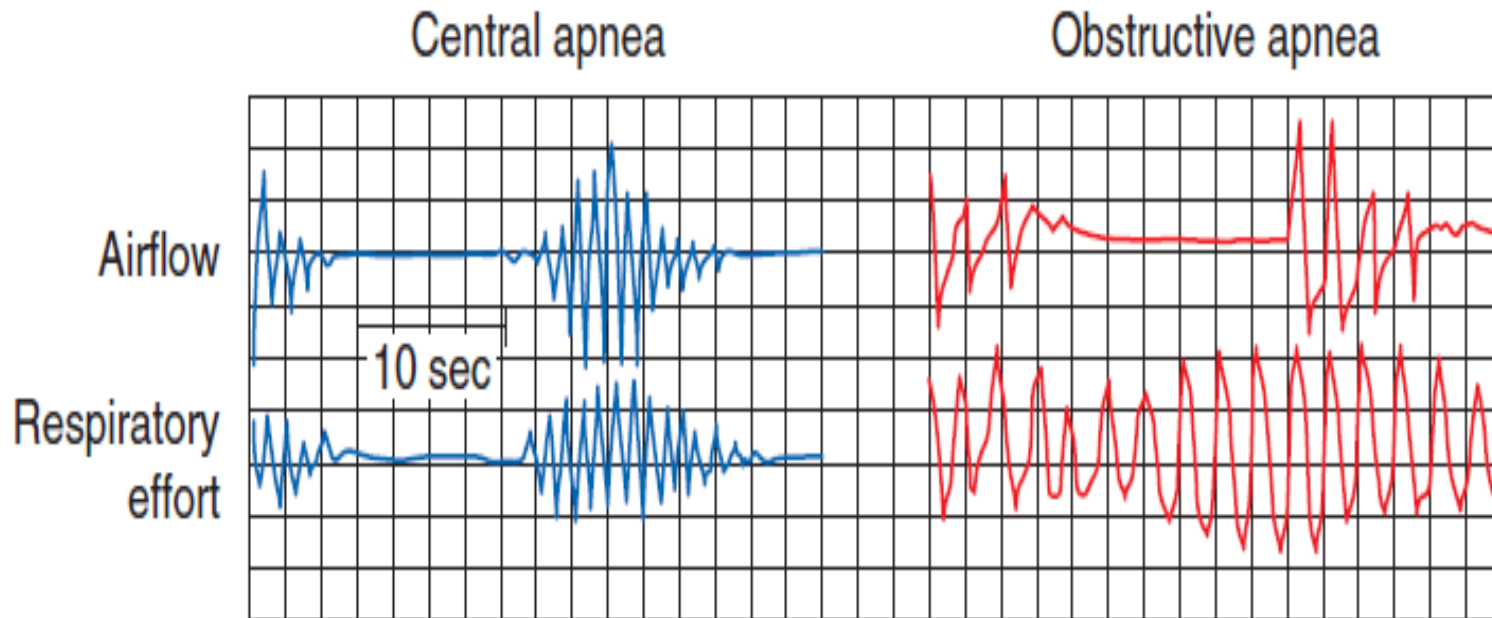
	Noon	PM										Midnight	AM											
		Afternoon					Evening						Morning											
Day	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
SAT								↓											↑					
SUN									↓										↑					
MON								↓											↑					
TUE																		↑						
WED								↓											↑					
THU								↓											↑					
FRI								↓												↑				

## **Case:**

A 75-year-old man reports poor sleep at night and daytime sleepiness. He has a history of atrial fibrillation and hypertension that has been difficult to control. Medications include metoprolol, lisinopril, hydrochlorothiazide, amlodipine and apixiban.

On further questioning, he reports that he dozes off frequently during the daytime. He lives alone and does not know if he snores.

# Schematic of central versus obstructive sleep apnea



Krieger MH, Roth T, Dement WC, eds. *Principles and Practices of Sleep Medicine*, 5th ed; 2011

# Obstructive sleep apnea (OSA): Diagnosis and common features

- Typical patient = “obese, sleepy, snorer with hypertension”
  - Obesity, large neck circumference, big tongue, crowded oropharynx
  - High prevalence in treatment-resistant hypertension, atrial fibrillation, type 2 diabetes and stroke
- OSA in older adults:
  - Prevalence increases with age
  - Less likely to be obese; little or no relationship with neck circumference
- Common signs/symptoms:
  - Excessive daytime sleepiness
  - Loud snoring, nocturnal gasping or choking
  - Nocturia, chronic morning headache

# Positive airway pressure (PAP) therapy for OSA

- PAP is first-line treatment for OSA:
  - Recommended in adults with excessive sleepiness (*strong evidence*)
  - Recommended in adults with impaired sleep-related quality of life or comorbid hypertension (*conditional evidence*)
- Improving adherence with PAP:
  - Early adherence with PAP (e.g., first week) predicts long-term adherence
  - Recommended:
    - Educational and behavioral interventions are recommended prior to starting PAP (*strong*), or during the initial period of PAP (*conditional*)
    - Telemonitoring-guided interventions during initial PAP use (*conditional*)

# When to consider repeat sleep testing in a patient with previously diagnosed OSA

- ▶ Recurrent or persistent symptoms despite good PAP adherence
- ▶ To assess response to treatment with non-PAP interventions
- ▶ Clinically significant weight gain or loss
- ▶ Reassessment of sleep-related hypoxemia and/or sleep-related hypoventilation following initiation of treatment for OSA
- ▶ Patient develops or has a change in cardiovascular disease
- ▶ Unexplained PAP device-generated data

# Central sleep apnea (CSA): Diagnosis and common features

- Diagnostic criteria for specific types of CSA:
  - International Classification of Sleep Disorders (ICSD-3)
- Common underlying conditions
  - Heart failure
  - CVA
  - Chronic opioid use
- Common signs/symptoms:
  - Daytime sleepiness
  - Self-reported poor sleep quality
  - Paroxysmal nocturnal dyspnea
  - Cheyne-Stokes breathing pattern may be present
- More common in men and in older adults

# Treatment of central sleep apnea (CSA)

- Treat underlying condition (e.g., heart failure management, taper opioids)
- Consider positive airway pressure (PAP) therapy
  - Continuous (CPAP) is first-line
  - Bilevel (BiPAP)
  - Adaptive servo-ventilation (ASV), especially for CSA with Cheyne-Stokes respiration
    - Adaptive servo-ventilation (ASV) is contra-indicated in patients with CSA and ejection fraction  $\leq 45$
- Consider low flow supplemental oxygen (if hypoxic)

# Sleep apnea and cognitive decline

- Strong epidemiological evidence that sleep apnea is associated with cognitive impairment in older adults.

*(Gosselin et al, Amer J Resp Crit Care Med 2019; Mubashir et al, BMC Neurology 2019)*

- There is evidence that positive airway pressure (PAP) therapy for OSA has a protective effect on the incidence and progression of mild cognitive impairment and Alzheimer's disease.

*(Bubu et al. Sleep Medicine Reviews, 2020; Shieu et al, Neurology 2022)*

## **Case:**

An 85-year-old woman with diabetes and peripheral vascular disease reports difficulty falling asleep due to an uncomfortable urge to move her legs at night. The symptoms occur at rest and improve with walking.

# Restless legs syndrome (RLS) (Willis-Ekbom disease)

- An urge to move the legs, may be associated with an uncomfortable/unpleasant sensation of the legs
- Other key features:
  - Begins or worsens with rest
  - Partially or totally relieved while moving
  - Occurs predominantly in the evening or night
- Risk of RLS:
  - Women > men
  - Increases with age, up to 60 – 70 years
  - Family history of RLS (especially early onset RLS)
- May have periodic limb movements on polysomnography
- Diagnosis: History and physical exam

# Treatment of restless legs syndrome

- Iron replacement if low ferritin level ( $\leq 75$ )
- Behavioral approaches (e.g., exercise, avoid caffeine)
- If pharmacological treatment is warranted:
  - Alpha-2-delta ( $\alpha 2\delta$ ) ligands (“gabapentinoids”)
    - Gabapentin (off-label)
    - Pregabalin (off-label)
    - Gabapentin enacarbil (Horizant®)
  - Dopamine agonists\*
    - Pramipexole (Mirapex®)
    - Ropinirole (Requip®)
    - Rotigotine transdermal (Neupro®) (*augmentation at high dose*)
  - Carbidopa/levodopa immediate release (off-label, for infrequent symptoms)\*

**\* Increase risk of augmentation**

*Garcia-Borreguero et al, Sleep Medicine 2016; Allen et al, Sleep Medicine 2018; Gossard et al, Neurotherapeutics 2021*

## Case:

A 72-year-old man with Parkinson's disease reports vivid dreams at night. His wife reports they no longer share a bed because he shouts during sleep and "thrashes about at night," and has struck her while he was asleep.

# Rapid eye movement (REM) sleep behavior disorder

- Major features:
  - Vigorous motor behaviors, vivid dreams (dream enactment behavior)
  - Lack of the muscle atonia during REM
  - **May result in injury**
- Etiology:
  - Acute: drug-induced (e.g., SSRIs, TCAs) and drug withdrawal
  - Chronic: idiopathic, **synucleinopathies (e.g., Parkinson's disease, Lewy body dementia, multi-system atrophy)**, psychiatric illness
  - "Pseudo-RBD" (e.g., obstructive sleep apnea)
- Diagnosis: Polysomnography

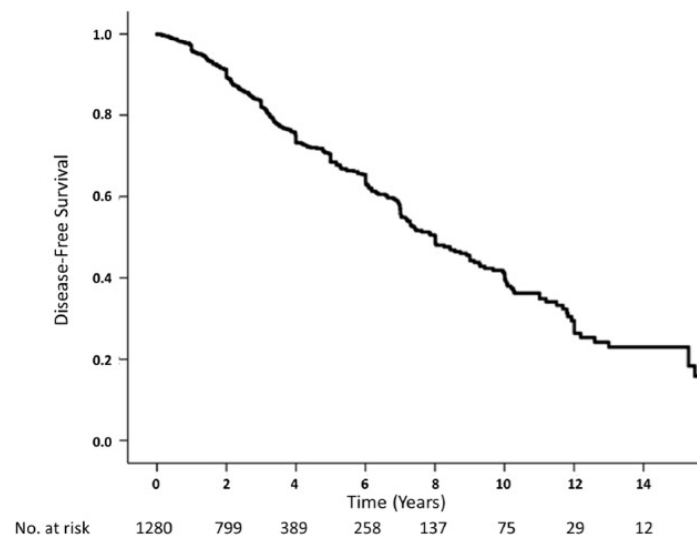
# Treatment of REM sleep behavior disorder

- Environmental safety
- Remove offending drug/agent
- Treat other sleep disorders (e.g., sleep apnea)
- Pharmacological treatment
  - Melatonin
    - First line treatment in older adults with neurodegenerative disorders, and/or patients with comorbid sleep apnea or polypharmacy
    - Start at 3 mg, taper up (often requires 6 – 18 mg)
  - Clonazepam
    - Caution recommended if dementia, gait disorder, sleep apnea

# High risk of future dementia and parkinsonism in idiopathic REM sleep behavior disorder (RBD)

(Postuma et al. Brain 2019)

- Prospective experience of 24 centers
  - N = 1280 patients with idiopathic RBD (confirmed by polysomnography)
  - No parkinsonism or dementia at baseline
- Phenoconversion to parkinsonism (bradykinesia + rigidity or rest tremor, or dementia):
  - **6.25% per year**
  - 31.3% after 5 years
  - 60.2% after 10 years
  - **72.5% after 12 years**



# Sleep disturbance is common in dementia

- Common changes in sleep with dementia:
  - ↑ sleep latency, nighttime awakenings, circadian rhythm abnormalities
  - ↓ sleep efficiency, total sleep time and N3 sleep
  - Nighttime wandering, “sundowning”

*(Lim et al, Neurodegener Dis Manag 2015; Zhang et al, Translat Psychiatry 2022)*
- Sleep disturbance is common in adult caregivers and predicts worse mood and other important outcomes among caregivers

*(Gao et al, JAMA Network 2019; Osakwe et al, Front Aging Neurosci 2022)*
- Restless legs syndrome may present as agitation/wandering behavior in patients with dementia

*(Richards et al, Sleep 2015; Richards et al, J Amer Med Dir Assoc 2021)*

# **Diagnostic criteria for irregular sleep-wake rhythm disorder** *(Key components of ICSD3 criteria)*

1. Patient or caregiver reports chronic or recurrent irregular sleep and wake throughout the 24 hour period with insomnia (usually at night), and/or excessive sleepiness (usually during the day)
2. Symptoms present  $\geq$  3 months
3. Documented by 7 - 14-day sleep log (and actigraphy if possible) with no major sleep period and  $\geq$  3 irregular sleep bouts over 24-hour period
4. Not better explained by another sleep or other disorder

*ICSD3 = International Classification of Sleep Disorders, 3<sup>rd</sup> Edition (2014)*

# Example sleep diary: Irregular sleep wake rhythm disorder

Sleep Log for Irregular Sleep Wake Rhythm Disorder

\*dark areas indicate sleep

Today's Date	Noon	1	2	3	4	5	6	7	8	9	10	11 P M	Midnight	1	2	3	4	5	6	7	8	9	10	11 A M
Day1			■	■	■				■	■	■							■	■	■				
2				■	■	■		■	■	■	■									■	■	■		
3					■	■	■						■	■	■	■	■					■	■	
4		■	■	■				■	■	■	■							■	■					
5	■	■	■	■	■				■	■						■	■							
6			■	■	■	■	■	■	■	■	■										■	■	■	■
7			■	■					■	■	■		■	■	■				■	■				
8						■	■	■					■	■	■	■					■	■		
9		■	■	■			■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	
10								■	■	■	■		■	■	■	■	■				■	■		
11			■	■	■				■	■	■			■	■	■	■							
12						■	■	■					■	■	■	■	■	■	■	■	■	■	■	
13			■	■	■				■	■	■							■	■	■	■	■		
14						■	■	■					■	■	■	■	■	■	■	■	■	■	■	

# Pharmacotherapies for sleep disturbances in dementia *(Cochrane Review 2020)*

- Evidence is limited
- Some beneficial effects on sleep outcomes in small trials:
  - Trazodone in moderate to severe Alzheimer's disease (AD):
    - Low certainty evidence that trazodone 50 mg for 2 weeks improved total nighttime sleep and sleep efficiency (but not wake after sleep onset or nighttime awakenings)
    - No serious adverse effects reported
  - Orexin antagonists (suvorexant and lemborexant) in mild to moderate AD:
    - Moderate certainty evidence that orexin antagonist increases total nighttime sleep time and decreases time awake after sleep onset (but not number of awakenings)
    - Adverse events were probably no more common than placebo
- No beneficial effects of melatonin (up to 10 mg) or a melatonin receptor agonist (ramelteon)
- No randomized controlled trials for many widely prescribed drugs.

# Examples of factors contributing to sleep disturbance in long-term care residents

- Medical illness, dementia, depression
- Medications
- Inactivity, excessive time in bed, daytime napping
- Primary sleep disorders (e.g., sleep apnea)
- Lack of bright light exposure
- Disruptive nighttime environment
- Poor sleep hygiene
- Lack of social interaction

*Webster et al, Sleep 2019; Kim and Yoon, Inter J Environ Res Pub Health 2020; Wilfling et al, BMC Nursing 2020; Snow et al, BMC Geriatr 2021*

**Questions?**