



# SLEEP ISSUES

Know and understand:

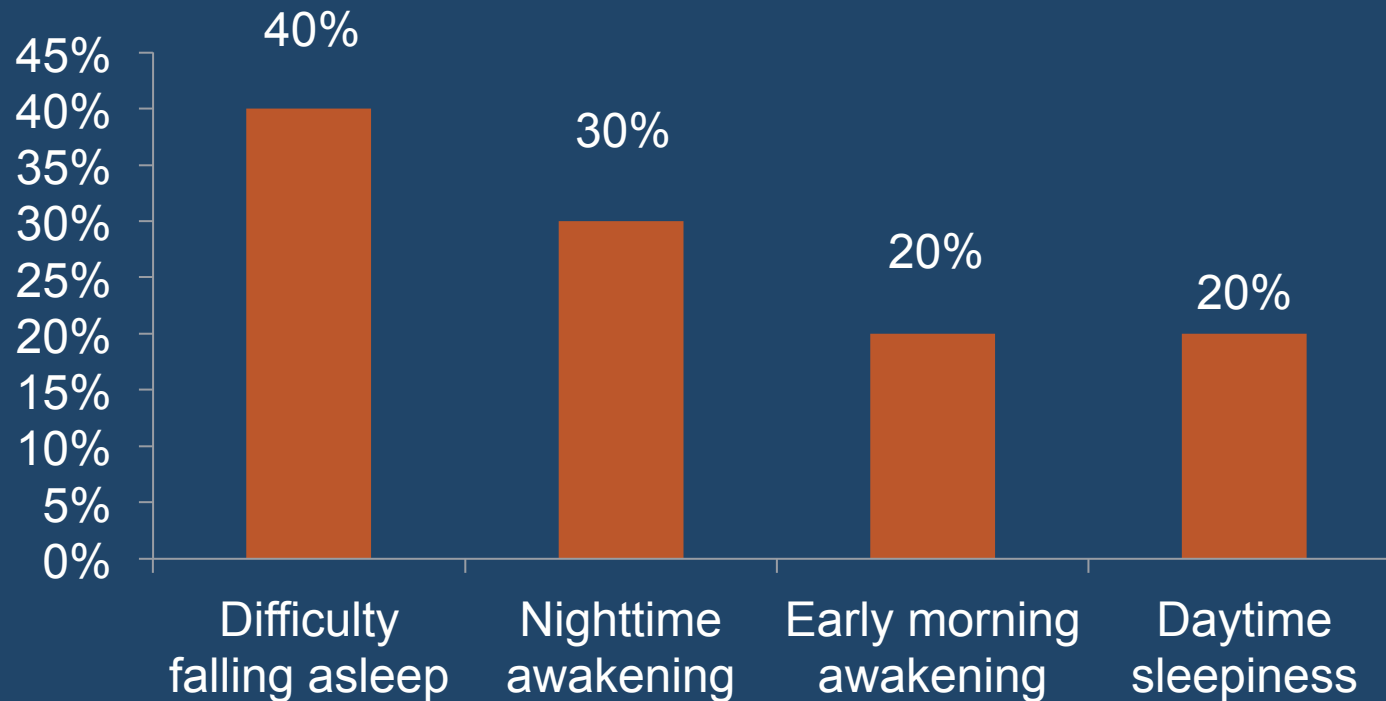
- Age-related changes in sleep
- The psychiatric, medical, and neurologic causes of sleep problems
- Office-based and objective methods of evaluating sleep
- Appropriate treatment of sleep problems

- Epidemiology of Sleep Problems
- Changes in Sleep with Aging
- Evaluation of Sleep
- Common Sleep Disorders
- Changes in Sleep with Dementia
- Sleep Disturbances in the Hospital
- Sleep in the Nursing Home
- Management of Insomnia

# EPIDEMIOLOGY OF SLEEP PROBLEMS IN OLDER PEOPLE (1 of 2)

- Sleep problems are common in older adults, particularly those with comorbid medical conditions and psychiatric illness
- At least one-half of community-dwelling older adults use an over-the-counter and/or a prescription sleeping medication
- Insomnia is more common in women than in men at all ages (SOE=A)

# EPIDEMIOLOGY OF SLEEP PROBLEMS IN OLDER PEOPLE (2 of 2)



# CHANGES IN SLEEP WITH AGING

- Decreased sleep efficiency (time spent asleep divided by total time in bed)
- Stable or decreased total sleep time
- Increased sleep latency (time to fall asleep)
- Earlier bedtime and earlier morning awakening
- More awakenings during the night
- More wakefulness during the night
- More daytime napping
- Decreases in deeper stages of sleep

# SCREENING QUESTIONS

- Is the person satisfied with his or her sleep?
- Does sleep or fatigue interfere with daytime activities?
- Does the bed partner or others complain of unusual behavior during sleep, such as snoring, interrupted breathing, or leg movements?

# OFFICE EVALUATION OF SLEEP

- Patient sleep log can be helpful
- Supplement with information from bed partner, others, and/or validated sleep questionnaire
- Focused physical exam — guided by evidence from the history
- Conduct mental status testing – with a focus on memory and mood problems, particularly depression
- Lab testing — guided by findings of the history and physical exam



- Polysomnography is indicated if primary sleep disorder is suspected:
  - Sleep apnea
  - Narcolepsy
  - Periodic limb movement disorder
  - Violent or other unusual behaviors during sleep
  - Other sleep symptoms that do not respond to treatment
- In-home portable monitoring — screens for sleep apnea
- Wrist-activity monitor — estimates sleep vs. wakefulness; may be useful in nursing home setting and to identify circadian rhythm sleep disorders

# COMMON SLEEP PROBLEMS: INSOMNIA (1 of 2)

- Insomnia disorder is defined by the *DSM-5* as:
  - Difficulty in initiating or maintaining sleep
  - Waking up too early
  - Associated with daytime impairment, such as:
    - ❖ Fatigue
    - ❖ Poor concentration
    - ❖ Daytime sleepiness
    - ❖ Concerns about sleep
  - Symptoms must occur at least 3 times per week
  - For chronic insomnia, symptoms must have been present for at least 3 months

# COMMON SLEEP PROBLEMS: INSOMNIA (2 of 2)

- Depression is the most common psychiatric illness that is associated with insomnia
- Chronic insomnia is a risk factor for development of major depressive disorder in older (and younger) adults
- Treatment of depression may improve the sleep abnormalities
- Caregiving and anxiety can also be associated with sleep difficulties

## Common medical problems/symptoms that can contribute to insomnia:

- Arthritis
- Lung Disease
- Stroke
- Neurodegenerative disorders (dementia, Parkinson's disease)
- Paresthesias
- Cough
- Dyspnea from cardiac or pulmonary illness
- Gastroesophageal reflux
- Nighttime urination

# MEDICATIONS ASSOCIATED WITH INSOMNIA

Medications/agents that can contribute to insomnia, particularly if taken near bedtime:

- Agents that increase urination (eg, diuretics)
- Stimulating agents (eg, caffeine, sympathomimetics, bronchodilators, activating psychiatric medications)
- Agents that can cause nightmares and impair sleep
  - Antidepressants
  - Antiparkinsonian agents
  - Antihypertensives (eg, propranolol)
  - Cholinesterase inhibitors

# MEDICATIONS ASSOCIATED WITH INSOMNIA

- Chronic use of sedatives may cause light, fragmented sleep
- Chronic use of sleep medications may lead to tolerance
- Rebound insomnia can occur when chronic use of hypnotics is suddenly stopped
- Alcohol abuse often leads to lighter sleep of shorter duration
- Sedatives and alcohol can worsen sleep apnea

- Respiratory effort is absent because of central nervous system or cardiac dysfunction
  - Cheynes-Stokes pattern of sleep apnea has a crescendo-decrescendo pattern, associated with heart failure
- Can be a primary disorder or associated with opioid use, stroke, heart failure, or other conditions
- Initial treatment should focus on management of heart failure, if present

- Characterized by an obstruction in the airway resulting in continued breathing effort but inadequate ventilation
- Diagnosis is made by in-laboratory polysomnography or portable home monitoring devices
- Examples of daytimes symptoms include excessive daytime sleepiness, morning headache, personality changes, poor memory, confusion, and irritability
- The patient may be unaware of their trouble breathing at night
- Bed partner report of loud snoring, cessation of breathing, or choking sounds during sleep is very suggestive



- High body mass index (BMI) and large neck circumference are important predictors
  - Less association in older age (ie, older patients with OSA may not be obese)
- Examples of other reported predictors:
  - Falling asleep at inappropriate times or napping
  - Male gender
- Consider the diagnosis in those with treatment-resistant hypertension
- Alcoholism is an important risk factor
- Some evidence of an association with dementia

- It is a treatable condition associated with:
  - Cardiovascular Disease
  - Motor Vehicle Accidents
  - Cognitive Impairment
  - All- Cause Mortality

- Refer to sleep laboratory for evaluation and, if indicated, treatment
- Main treatment = positive airway pressure (PAP)
  - Older adults likely to tolerate as well as younger adults
  - Reduces sleepiness and improves quality of life in those with moderate to severe OSA
  - Comfort-improving devices may improve compliance
  - Early adherence predicts long-term adherence
  - Oral appliances may be an option in mild cases
  - Reduces blood pressure in OSA patients with cardiovascular disease or multiple cardiovascular risk factors

# PERIODIC LIMB MOVEMENTS DURING SLEEP (PLMS)

- Repetitive, stereotypic leg movements that occur during non-REM sleep
  - Prevalence increases with age
- Usually associated with other conditions and do not require specific treatment
  - May present as difficulty maintaining sleep or excessive daytime sleepiness
- PLMS associated with sleep complaints not explained by another sleep disorder = periodic limb movement disorder (diagnosis requires polysomnography)

- Characterized by an uncontrollable urge to move the legs, usually with an unpleasant sensation in the legs, that worsens with inactivity, generally at night, and improves with movement
  - Diagnosis is made based on the patient's description of the symptoms
  - Symptoms occur while the person is awake
  - Symptoms can also involve the arms
- Prevalence increases with age

- Polysomnography not required for diagnosis
- Many patients with this condition also have PLMS
- RLS can be associated with low ferritin level
  - Check ferritin level in patients with RLS
  - If iron deficiency is present, treat the deficiency and identify the cause

- Examples of medications that can aggravate or induce RLS:
  - Antiemetics
  - Antipsychotics
  - SSRIs
  - Tricyclic Antidepressants
  - Diphenhydramine
- These medications should be addressed in patients with new or worsening RLS

# TREATMENT OF PLMD AND RESTLESS LEGS SYNDROME (1 of 2)

- Treat RLS if symptoms are severe or if quality of life is impacted
- A dopaminergic agent is generally the initial agent of choice for older patients
- Evening dose of a dopamine agonist (eg, pramipexole or ropinirole) is commonly used for patients with frequent (eg, nightly) symptoms of RLS or PLMD



# TREATMENT OF PLMD AND RESTLESS LEGS SYNDROME (2 of 2)

- Other agents (eg, gabapentin, used off label) can also be effective in patients who cannot tolerate dopamine agonists
- Benzodiazepines and opioids, both used off label, have been used to treat RLS, but are generally not recommended in older adults due to risk of adverse effects

# CIRCADIAN RHYTHM SLEEP DISORDERS

## (1 of 2)

- Disturbances in circadian rhythms of the sleep-wake cycle may be more common with advanced age
- **Advanced sleep phase** = fall asleep early, awaken early—particularly common in older people
- **Delayed sleep phase** = fall asleep late, awaken late
- **Irregular sleep-wake cycles** are common with dementia and in nursing home residents

- Sleep logs and wrist actigraphy can be helpful to establish the diagnosis
- Refer patients to a sleep specialist when symptoms do not respond to initial management, the diagnosis is unclear, or when another sleep disorder is suspected
- Treatment depends on the particular circadian rhythm disorder
  - Advanced sleep phase may respond to evening exposure to bright light
  - Delayed sleep phase may respond to morning exposure to bright light and/or evening melatonin

# REM SLEEP BEHAVIOR DISORDER

- Excessive motor activities during sleep and a pathologic absence of the normal muscle atonia during REM sleep
- Presenting symptoms are usually vigorous sleep behaviors associated with vivid dreams — may result in injury to the patient or bed partner
- Review patient medications
- Associated with neurodegenerative disorders, (eg, Parkinson's disease, Lewy body dementia)
- Polysomnography is needed to establish the diagnosis

# TREATMENT OF REM SLEEP BEHAVIOR DISORDER

- If drug-induced, remove the offending agent
- Clonazepam (off-label) — but adverse effects a concern in older patients
- Melatonin — some evidence for use in patients with coexisting neurodegenerative disorders (eg, Parkinson disease, dementia with Lewy bodies)
- Environmental safety interventions are indicated

- Older patients with dementia have:
  - More sleep disruption and arousals
  - Lower sleep efficiency
  - Less deep sleep
  - More sleep fragmentation
- Disturbances of the sleep-wake cycle are common with dementia
  - Excessive daytime sleeping
  - Nighttime wakefulness

# MANAGING SLEEP PROBLEMS IN PATIENTS WITH DEMENTIA

- Nighttime use of **cholinesterase inhibitors** may exacerbate insomnia and cause vivid dreams in some patients
- **Sedative-hypnotic agents** have not been adequately tested in patients with dementia
- In patients with both OSA and mild to moderate dementia, **PAP** can be well tolerated, improve sleep apnea, and have beneficial effects on cognition
- **Daytime bright-light exposure** has shown some beneficial effects on sleep and circadian rhythms, but the best timing and intensity of the light exposure is unclear

- **Factors contributing to insomnia in the hospital:**
  - Illness
  - Medications
  - Change from usual nighttime routines
  - Sleep-disruptive environment
- **Nonpharmacologic interventions can help:**
  - Daytime bright-light exposure
  - Change medication times to allow patients to sleep later in morning
  - Back rub, warm drink, relaxation tape at night



# MEDICATIONS FOR SLEEP DISTURBANCES IN THE HOSPITAL

- Benzodiazepine receptor agonists commonly used
- Sedating antihistamines (eg, diphenhydramine) should not be used
- Sleep-related breathing disorders may be common in hospitalized adults, particularly among those with cardiac illness or stroke, and may be unrecognized
- Opioids may exacerbate sleep-related breathing disorders in hospitalized patients
- Sleep apnea patients should continue their use of CPAP when hospitalized

- **Causes of sleep difficulties:**
  - Multiple physical illnesses
  - Use of psychoactive medications
  - Debility and inactivity
  - Large amounts of time spent in bed during the daytime
  - Increased prevalence of sleep disorders
  - Environmental factors such as nighttime noise, light, and disruptive nursing care
  - Lack of exposure to bright light during the day
- **Irregular sleep-wake cycle is common** (with dozing and waking off and on over 24 hours)

Nonpharmacologic interventions can help:

- Exposure to bright light
- Structured physical and social activities
- Nighttime interventions to decrease noise and light disruption

- Do not start an older patient with persistent sleep complaints on a sedative-hypnotic agent without careful clinical assessment to identify the cause of the complaints
- If the history and physical exam do not suggest a serious underlying cause, mild symptoms may respond to simple sleep hygiene
- Chronic insomnia generally does not respond to simple sleep hygiene, and requires another behavioral approach

# MEASURES TO IMPROVE SLEEP HYGIENE (1 of 2)

- Maintain a **regular rising time**
- Get adequate exposure to **bright light** during the day
- Maintain a **regular bedtime**, unless not sleepy, and **get up at the same time each morning**
- **Decrease or eliminate naps**, unless necessary
- **Exercise daily**, but not immediately before bedtime
- Do not use bed for reading or watching television
- **Relax mentally** before going to sleep

# MEASURES TO IMPROVE SLEEP HYGIENE (2 of 2)

- Limit or eliminate alcohol, caffeine, nicotine
- **Wind down** before bedtime, and **maintain** a routine period of preparation for bed
- **Control the nighttime environment** with comfortable cool temperature, quiet, and darkness
- Try a fan or other “white noise” machine
- Wear comfortable bed clothing
- If unable to fall asleep within 30 minutes, get out of bed and perform soothing activity (avoid bright light)

# NONPHARMACOLOGIC INTERVENTIONS FOR CHRONIC INSOMNIA (1 of 3)

Intervention	Goal	Description
Stimulus control	To recondition maladaptive sleep-related behaviors	Patient is told to go to bed only when sleepy, not use the bed for eating or watching TV, get out of bed if unable to fall asleep, return to bed only when sleepy, get up at the same time each morning, not take naps during the day
Sleep restriction	To improve sleep efficiency (time asleep divided by time in bed) by causing sleep deprivation	Patient first collects a 1- to 2-week sleep diary to determine average total daily sleep time, then stays in bed only that duration plus 15 minutes, gets up at same time each morning, takes no naps in the daytime, gradually increases time allowed in bed as sleep efficiency improves

# NONPHARMACOLOGIC INTERVENTIONS FOR CHRONIC INSOMNIA (2 of 3)

Intervention	Goal	Description
Cognitive interventions	To change misunderstandings and false beliefs regarding sleep	Identify patient's dysfunctional beliefs and attitudes about sleep; educate patient to change these false beliefs and attitudes, including normal changes in sleep with increased age and changes that are pathologic
Relaxation techniques	To recognize and relieve tension and anxiety	Teach patient to tense and relax each muscle group. Electromyographic biofeedback: give patient feedback regarding muscle tension and teach techniques to relieve it. Teach meditation or imagery techniques to relieve racing thoughts or anxiety.



# NONPHARMACOLOGIC INTERVENTIONS FOR CHRONIC INSOMNIA (3 of 3)

Intervention	Goal	Description
Bright light	To correct circadian rhythm causes of sleeping difficulty (ie, sleep-phase problems)	The patient is exposed to sunlight or a light box. Best evidence is from treatment of seasonal affective disorder (from 2500 lux for 2 hours/day to 10,000 lux for 30 minutes/day). For delayed sleep phase, 2 hours early morning light at 2500 lux. For advanced sleep phase, 2 hours evening light at 2500 lux. Shorter durations may be as effective. Routine eye examination is recommended before treatment; avoid light boxes with ultraviolet exposure.
Cognitive behavioral therapy for insomnia (CBT-I)	Combines approaches	Generally combines sleep restriction, stimulus control, and cognitive therapy, with or without relaxation techniques. Sleep hygiene often also included.

- **First-line treatment for chronic insomnia**
  - Effective in older adults, including those with comorbid conditions
- Combines sleep restriction, stimulus control, and cognitive therapy, with or without relaxation techniques. Sleep hygiene also often included.
- Provided by behavioral sleep medicine specialists (psychologists)
  - Also available in self-help materials, online, and using trained associated health personnel

- Most sleep medications increase the risk of falls in older adults
- Short-acting agents are used for problems initiating sleep
  - More rebound and withdrawal syndromes after discontinuation
- Intermediate-acting agents are used for problems with sleep maintenance
  - More daytime carryover
- Sedating antipsychotics should not be used in routine management of insomnia in older adults

# SLEEP MEDICATIONS (2 of 7)

Class, Drug	Starting dose	Usual dose	Half life, hr	Comments
Intermediate-acting benzodiazepine				
Temazepam	7.5 mg	7.5–30 mg	8.8	Psychomotor impairment, increases risk of falls
Short-acting non-benzodiazepines				
Eszopiclone	1 mg	1–2 mg	6	Reportedly effective for long-term use in selected individuals; may cause unpleasant taste, headache; avoid administration with high-fat meal

## SLEEP MEDICATIONS (3 of 7)

Class, Drug	Starting dose	Usual dose	Half life, hr	Comments
Short-acting non-benzodiazepines (continued)				
Zaleplon (pyrazolopyrimidine)	5 mg	5–10 mg	1*	Use lowest effective dose
Zolpidem (imidazopyridine)	5 mg	5–10 mg	1.5–4.5 <sup>†</sup>	Use lowest effective dose

\*Reportedly unchanged in older adults

<sup>†</sup>3 in older adults, 10 in hepatic cirrhosis

## SLEEP MEDICATIONS (4 of 7)

Class, Drug	Starting dose	Usual dose	Half life, hr	Comments
Sedating antidepressants				
Doxepin	3 mg	3–6 mg	15.3 doxepin; 31 metabolite	Somnolence/ sedation, nausea, upper respiratory tract infection reported; antagonizes central H1 receptors (antihistamine); active metabolite; should not be taken within 3 hours of a meal

## SLEEP MEDICATIONS (5 of 7)

Class, Drug	Starting dose	Usual dose	Half life, hr	Comments
Sedating antidepressants (continued)				
Mirtazapine (off-label)	7.5 mg	7.5–45 mg	31–39 in older adults; 13–34 in younger adults; mean = 21	Increased appetite, weight gain, headache, dizziness, daytime carryover; used for insomnia with depression

# SLEEP MEDICATIONS (6 of 7)

Class, Drug	Starting dose	Usual dose	Half life, hr	Comments
Sedating antidepressants (continued)				
Trazodone (off-label)	25–50 mg	25– 150 mg	Reportedly $6 \pm 2$ ; prolonged in older adults and obese people	Moderate ortho- static effects; used for insomnia with depression; administration after food minimizes sedation and postural hypotension



# SLEEP MEDICATIONS (7 of 7)

<b>Class, Drug</b>	<b>Starting dose</b>	<b>Usual dose</b>	<b>Half life, hr</b>	<b>Comments</b>
Melatonin receptor agonist				
Ramelteon	8 mg	8 mg	1.5 (2.6 in older adults)	Dizziness, myalgia, headache, other adverse events reported; no significant rebound insomnia or withdrawal with discontinuation

- **In studies of benzodiazepines:**
  - Prevalence of use increases with age
  - Chronic use increases morbidity and mortality
  - Chronic use may exacerbate sleep problems
- **To help patients eliminate use:**
  - Decrease dose by half for 2 weeks prior to full withdrawal; may need to taper more slowly
  - Refer for cognitive behavioral therapy for insomnia

- Used by nearly half of all older adults
- Melatonin: there is evidence for usefulness in circadian rhythm disturbances
- Not recommended:
  - **Sedating antihistamines** (anticholinergic side effects)
  - **Alcohol** (interferes with sleep later in night, other health concerns)
  - **Valerian** (herbal product, little effectiveness)
  - **Kava** (herbal product, significant adverse events including hepatotoxicity)

*Recommendations for **Sleep Issues**, based on the American Board of Internal Medicine Foundation's Choosing Wisely® Campaign:*

- Do not use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation, or delirium.

# SUMMARY

- In older people, insomnia generally occurs comorbidly with other psychiatric, medical, or neurologic illness
- Cognitive behavioral therapy is first-line treatment for chronic insomnia
- Polysomnography is indicated if a primary sleep disorder is suspected, or patient doesn't respond to treatment

A 67-year-old woman has had difficulty falling asleep most nights for the past 4 months.

- Previously, sleep-wake schedule was regular (bedtime at 10 PM, wake time at 5:30 AM).
- It now takes her about 2 hours to fall asleep, and she often wakes up briefly 2–3 times during the night.
- The lack of sleep is affecting her work performance and energy level during the day.
- The sleep problem began when she started treatment for high blood pressure.

Which one of the following is most likely to be associated with her insomnia symptoms?

- A. Atenolol
- B. Hydrochlorothiazide
- C. Olmesartan
- D. Lisinopril

Which one of the following is most likely to be associated with her insomnia symptoms?

- A. Atenolol
- B. Hydrochlorothiazide
- C. Olmesartan
- D. Lisinopril



- An 80-year-old woman has had difficulty falling asleep for the past year.
  - The difficulty now occurs nearly every night.
  - It takes her >1 hour to fall asleep.
- She has discomfort in her legs and sometimes arms in the late afternoon and early evening.
  - The discomfort makes it difficult for her to sit still or find a comfortable sleep position.
  - Sometimes she cannot get back to sleep because of the restlessness.
  - Rubbing and moving her legs seem to temporarily relieve the discomfort.
- Laboratory findings: blood count and general chemistry, ferritin and thyrotropin levels are within normal range.

Which one of the following is best supported by evidence as first-line treatment?

- A. Gabapentin
- B. Pramipexole
- C. Iron supplementation
- D. Vitamin D supplementation

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