

**Sleeplessness in the Older Adult**

Ariel Cole, MD, FAAFP, CMD  
Alan Obringer, RPh, CPh, CGP



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**Objectives**

- Discuss normal sleep physiology
- Define and categorize insomnia
- Identify etiology of insomnia in this patient population
- Discuss non-pharmacological management of sleeplessness
- List medications to avoid
- Discuss pharmacological treatment options

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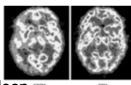
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**Review of Sleep Physiology**

**Sleep architecture** - basic structural organization of normal sleep



- Two types of sleep: non-rapid eye-movement (NREM) sleep and rapid eye-movement (REM) sleep
- NREM sleep is divided into four stages representing a continuum of relative depth
- Over the course of a period of sleep, NREM and REM sleep alternate cyclically
- Irregular cycling and/or absent sleep stages are associated with sleep disorders

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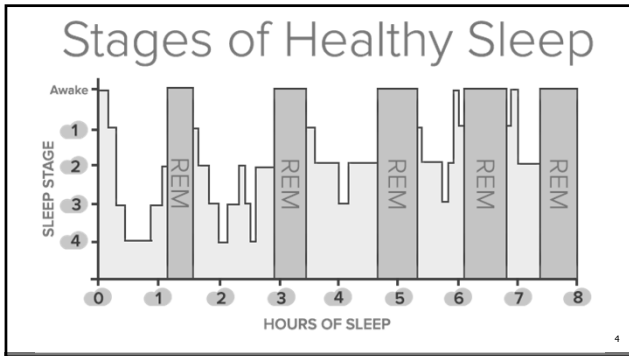
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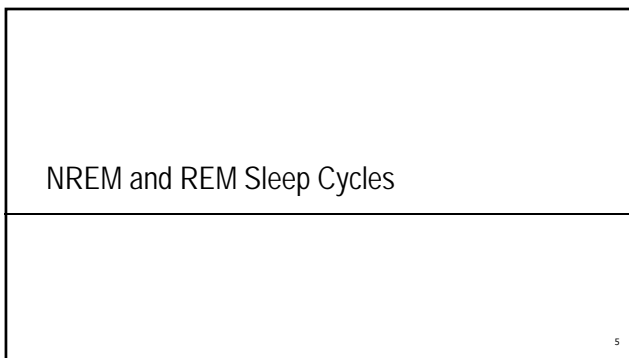
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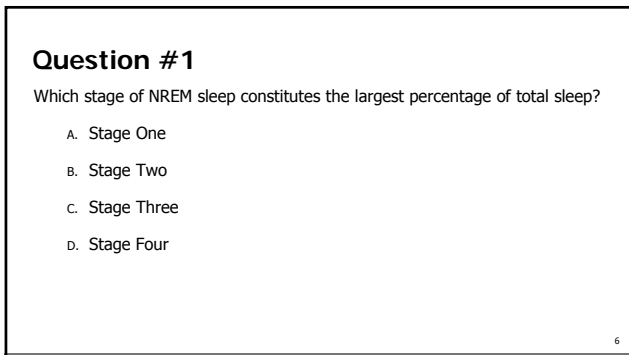
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### Four Stages of NREM Sleep

- Stage 1** 5%
  - Serves as transitioning role in sleep-stage cycling
  - Usually last 1 to 7 mins in initial cycling, constitutes 2 to 5% of total sleep
  - Easily interrupted by a disruptive noise
- Stage 2** 55%
  - Last approximately 10 to 25 mins in initial cycling and lengthens with each successive cycling, eventually constitutes 45 to 55% of total sleep
  - Requires more intense stimuli than in stage 1 to awaken
- Stage 3** 8%
  - Referred to as slow-wave sleep (SWS)
  - Last only a few minutes and constitutes 3 to 8% of sleep
- Stage 4** 15%
  - Referred to as slow-wave sleep (SWS)
  - Last approximately 20 to 40 mins in the first cycle and makes up about 10 to 15% of sleep

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### REM Sleep

- 5th phase of the sleep cycle
- Constitutes 20-25% of an average night of sleep
- First cycle typically begins 90 minutes after falling asleep

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### Sleep over the Lifespan

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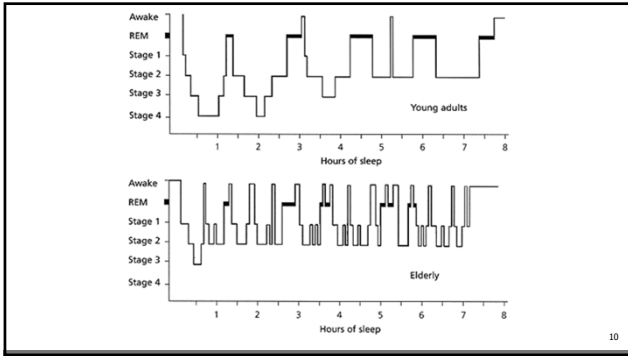
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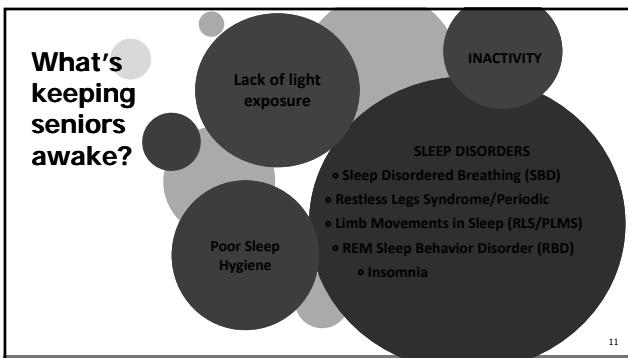
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### Epidemiology

- Insomnia is the most common sleep disorder
- Prevalence of sleep complaints rises with age
- ↑ comorbidities → ↑ sleep disorders
- More common in women, those with depression and chronic illness or chronic pain, older adults
- More than half of community dwelling elderly use OTC or Rx medications for sleep
- Chronic hypnotic use associated with increased dementia, mortality



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**Question #2**

Which of the following are consequences of poor sleep?

- A. Daytime sleepiness
- B. Fatigue and decreased energy levels
- C. Depression
- D. Falls
- E. All of the above

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**Consequences of Poor Sleep**



- Slower response times
- Difficulty sustaining attention
- Problems with memory on neuro-psychiatric tests
- Daytime sleepiness
- Fatigue and decreased energy levels
- Depression
- Falls

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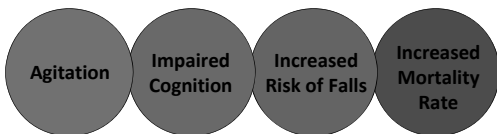
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**Sleeplessness in Nursing Homes in the US**

- Insomnia has been cited as a primary factor in caregivers' decisions to institutionalize an elder, with 20.4 - 52% of admissions to long-term care directly attributable to sleep disturbances

Sleeplessness can lead to:



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Sleep Disorders

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**DSM-5 Definition of Insomnia**

- Dissatisfaction with sleep quality or quantity and one or more of the following:
  - Difficulty initiating sleep (Sleep-onset insomnia)
  - Difficulty maintaining sleep (Sleep maintenance insomnia)
  - Early morning awakening (Late insomnia)
- Sleep disturbance persists despite sufficient opportunities for sleep
  - Sleep difficulty occurs 3 or more nights per week for 3 or more months
- Sleep disturbance causes significant daytime distress or impairment
  - Fatigue or low energy
  - Mood disturbance, behavioral problems, or cognitive impairment (attention, memory)
  - Impaired functioning (occupational or interpersonal)
  - Negative impact on family or caregiver

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**Sleep Disordered-Breathing**

- Ranges from benign snoring to obstructive apneas
- Affects 33-70% of elderly nursing home patients
  - Risk factors: increasing age, gender, and obesity
- Symptoms: snoring, excessive daytime sleepiness
- Treatment: CPAP is gold standard

**Range of Sleep Disordered Breathing**

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### Periodic Limb Movement Disorder in Sleep (PLMS)/Restless Legs Syndrome (RLS)

- Bursts of repetitive leg movements during sleep, often with nighttime awakening
- PLMS is estimated to affect 5-6% of adults, but up to 45% of those over the age of 65
- Unknown etiology
- Treatment: Dopamine agonists are preferred for PLMS and RLS in elderly
  - Ropinirole and pramipexole FDA approved for the treatment of RLS



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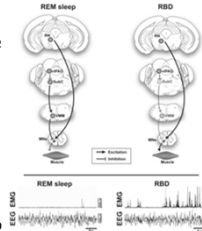
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### REM sleep-behavior disorder (RBD)

- RBD is characterized by the absence of normal skeletal atonia and excessive motor activity while dreaming
- Estimated prevalence in the elderly: 0.5%
- Withdrawal of REM suppressing agents (alcohol, tricyclic antidepressants, amphetamines) have been linked to the onset of acute RBD
- Treatment: Clonazepam is the treatment of choice for RBD
  - Patient education and sleep hygiene practices also important



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### Insomnia

- Difficulty initiating sleep (longer than 30 minutes to fall asleep), early morning awakening, decreased total sleep time, maintaining sleep, or obtaining restorative sleep which leads to daytime consequences
  - Affects many older adults with an annual incidence rate of 5% in adults over 65
- Classification and Potential Causes:
  - Transient (few days):
    - Acute stressors: travel, hospitalization
  - Short term (up to 1 month):
    - Severe stressors: surgery, divorce, loss of a loved one
  - Chronic (>1 month):
    - Untreated short term insomnia may progress to chronic insomnia
    - May be related to medical, respiratory, or psychiatric disorders

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**Insomnia**

- Primary insomnia (endogenous disorder):
  - Difficulty sleeping for at least one month
  - Affects functioning
  - Not caused by another condition, medication, or other substance
  - Generally light sleepers who are easily aroused by noise, temperature, or anxiety
- Secondary insomnia (comorbid):
  - Symptom or manifestation of another medical disorder
- Evaluation of patients with transient or short-term insomnia should focus on recent stressors:
  - e.g. death in family, job change, divorce

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**Etiologies of Insomnia**

Situational	Psychiatric
Work or financial stress, major life events, interpersonal conflicts	Mood disorders (depression, mania)
Jet lag or shift work	Anxiety disorders (generalized anxiety disorder, obsessive compulsive disorder)
Medical	Substance abuse (alcohol or sedative-hypnotic withdrawal)
Cardiovascular (angina, arrhythmias, heart failure)	Pharmacologically induced
Respiratory (asthma, sleep apnea)	Anticonvulsants
Chronic pain	Central adrenergic blockers
Endocrine disorders (diabetes, hyperthyroidism)	Diuretics
GI (gastroesophageal reflux disease, ulcers)	Selective serotonin reuptake inhibitors
Neurologic (delirium, epilepsy, Parkinson's disease)	Steroids
Pregnancy	Stimulants

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**Special Considerations**

- Diagnostic tests must include:
  - Routine laboratory tests
  - Physical and mental status examinations
  - Ruling out medication/substance-related cause
- Special consideration should be given to other sleep disorders with similar presentation:
  - E.g. restless legs syndrome (RLS), sleep apnea, and periodic limb movements of sleep (PLMS)

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### Question #3

What should be the first step to treating insomnia in an elderly patient?

- A. Drugs, drugs and more drugs
- B. Ignore it
- C. Non-pharmacological interventions like a consistent bedtime routine

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### Non-pharmacological interventions

- Cognitive-behavioral therapies (CBTs)
  - Most effective interventions for insomnia
- Identify cause of sleep problem and implement treatment if possible
- Adjust medications



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## GOOD SLEEP HYGIENE

 <b>Sleep Schedule</b> Sleep and wake up at the same time every day.	 <b>Eat Well</b> Avoid sleeping when hungry or stuffed. Avoid alcohol, caffeine, and nicotine before bed.	 <b>Exercise &amp; Daylight</b> 10 minutes of aerobic exercise, such as walking or cycling, can improve sleep quality. Avoid strenuous workouts before bed.
 <b>Relaxing Bedtime Routine</b> Regular nightly routine helps the body recognize it is bedtime. Avoid electronics and TV.	 <b>Manage Stress</b> Spend time before bed relaxing. When possible, avoid upsetting activities.	 <b>Limit Daytime Naps</b> Keep naps between 20 - 30 mins to improve mood, alertness, and performance.
		 <b>Sleep Environment</b> Keep bedroom clean and comfortable with cool temperatures.

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### Treatment approach

- Obtain a thorough sleep history
  - Symptoms
    - Duration, frequency, severity, course, aggravating or remitting factors
  - Usual sleep schedule
  - Daytime activities
  - Effects of sleep disturbance on daily functioning
  - Pre-sleep conditions
  - Sleep-wake patterns
  - Daytime consequences
- Identify and treat primary sleep disorders and other comorbid conditions

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### Medications that contribute to insomnia

- Antidepressants
- Antihypertensives
- Appetite suppressants
- Beta agonists
- Calcium channel blockers
- CNS stimulants
- Diuretics
- Glucocorticoids
- OTC allergy/cough/cold products
- Respiratory stimulants (theophylline)
- Sedatives/hypnotics

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### Medications to avoid

- National Institute of Health (NIH) has concluded that there is no systematic evidence for the effectiveness of the following for treatment of insomnia:
  - Antihistamines
  - Antidepressants
  - Antipsychotics
  - Anticonvulsants
- Anticholinergics like diphenhydramine have additional concerns for geriatric populations, including confusion and increased risk of falls

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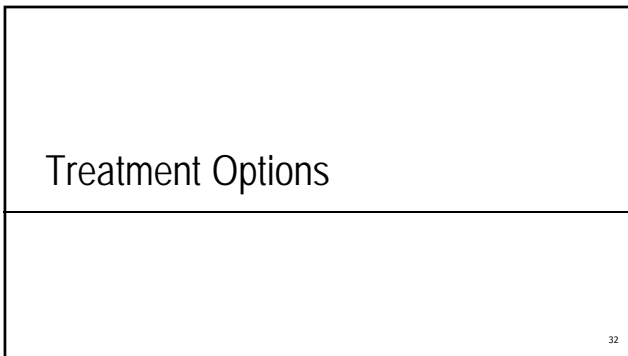
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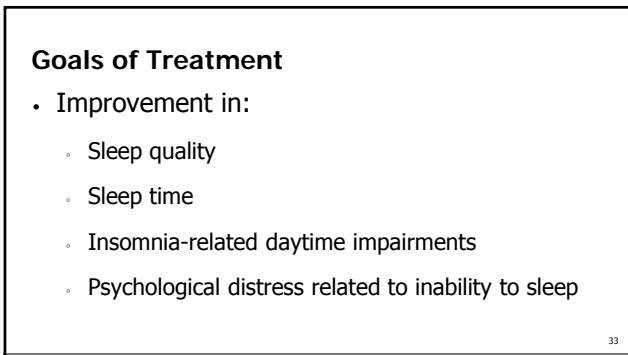
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### How do you choose an ideal treatment regimen?

- Consider:
  - Time course of insomnia
    - Is the insomnia related to sleep initiation, sleep maintenance, middle of the night awakening, or a combination?
  - Comorbidities
    - Depression
  - Potential for adverse effects
    - Underlying respiratory problems

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### Cognitive Behavior Therapy for Insomnia (CBT-I)

- Combination of cognitive therapy and behavioral treatments with or without relaxation therapy
- First-line therapy = monotherapy with CBT-I
- No advantage/disadvantage using CBT-I alone vs combined therapy
- Combined therapy (CBT-I + pharmacological therapy) directed by:
  - Symptoms
  - Goals of treatment
  - Past responses to treatment
  - Patient preference
  - Cost
  - Treatment availability
  - Comorbid conditions
  - Contraindications
  - Interactions with current medications
  - Medication side effects

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### Choosing Wisely

American Academy of Sleep Medicine/American Geriatrics Society

An initiative of the ABIM Foundation

- **Avoid use of hypnotics as primary therapy for chronic insomnia in adults; instead offer cognitive-behavioral therapy, and reserve medication for adjunctive treatment when necessary.**
  - In clinical trials, CBT is generally as effective as or more effective than hypnotics at improving sleep, and can be effective over an extended period of time without side-effects associated with hypnotics.
  - Some patients may benefit from a limited course of hypnotics while CBT for chronic insomnia is initiated.
  - Patients who have successfully used hypnotics for extended periods and are reluctant to discontinue their current treatment regimen may be reasonable candidates for continued pharmacologic treatment.

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### Cognitive Behavior Therapy for Insomnia (CBT-I)

- Cognitive Therapy
  - Change patient's beliefs and expectations about sleep using psychotherapeutic methods
  - Paradoxical Intention – eliminate patient's anxiety about sleep performance by training them to confront their fear of staying awake
  - Biofeedback therapy – reduce somatic arousal by training the patient to control physiologic variable using from visual and auditory mechanisms. feedback
- Behavior Treatments
  - Stimulus Control – extinguish negative association between bed and undesirable outcomes and establish stable sleep-wake pattern
  - Relaxation Training – lower somatic and cognitive arousal that interferes with a patient's ability to sleep
  - Sleep Restriction – improve continuity of sleep by restricting sleep which should enhance the sleep drive

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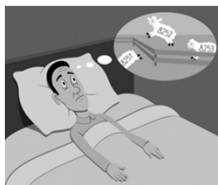
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### Treatment of Sleep Initiation insomnia

Class	Strengths available
<b>GABA Receptor Agonists</b>	
Zolpidem	5 mg, 10 mg
Zaleplon	5 mg, 10 mg
Eszopiclone	1 mg, 2 mg, 3 mg
<b>Melatonin Receptor Agonist</b>	
Ramelteon	8 mg
<b>Benzodiazepines</b>	
Temazepam	7.5 mg, 15 mg, 22.5 mg, 30 mg
Triazolam	0.125 mg, 0.25 mg



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### Patient Counseling Points

- Take at bedtime
- Stay in bed for the complete duration of action of the medication
- Make sure you are fully awake before engaging in activities
- Do not mix with other depressants, including alcohol
- Potential for rebound insomnia



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### Treatment of Sleep Maintenance Insomnia

Type of sleep disturbance	Medications indicated for treatment
Middle of the night awakening	Zolpidem SL
Sleep initiation and sleep maintenance insomnia	Eszopiclone, Suvorexant, Zolpidem ER, Temazepam
Sleep maintenance insomnia	Low-dose doxepin



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### Question #4

Per the BEERs list recommendations for insomnia, which medication(s) should be avoided if possible in the elderly?

- A. Triazolam (Halcion)
- B. Zolpidem (Ambien)
- C. Zaleplon (Sonata)
- D. All of the above

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### Zolpidem (Ambien®)

<b>Role in Therapy</b>	<ul style="list-style-type: none"> <li>FDA approved for short-term treatment of insomnia</li> <li>Short half-life (2.9 hrs in elderly) with no active metabolite or accumulation</li> </ul>
<b>BEERS Criteria</b>	Avoid combining with two or more CNS-active drugs
<b>Side Effects</b>	Dizziness, drowsiness Drug interactions: antidepressants, antipsychotics, Rifampin, Ketoconazole, anxiolytics
<b>Recommended dose for geriatric patients</b>	Elderly, women, hepatic impairment: 5 mg severe insomnia: 10 mg Take on an empty stomach
<b>Discontinuation strategy</b>	<ul style="list-style-type: none"> <li>Reduce by 25% every 2 weeks</li> <li>If dosage forms do not allow 25% reduction, consider 50% reduction initially using drug-free days during latter part of tapering</li> </ul>

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### Zaleplon (Sonata®)

<b>Role in Therapy</b>	<ul style="list-style-type: none"> <li>• Shortest acting of the "Z drugs"</li> <li>• Rapid onset of action (30 mins) and short duration of action (2 - 4 hrs)</li> <li>• Ideal for patients exhibiting problems with sleep latency</li> </ul>
<b>BEERS Criteria</b>	Avoid combining with two or more CNS-active drugs
<b>Side Effects</b>	Dizziness, headache, somnolence
<b>Recommended dose for geriatric patients</b>	Elderly: 5 mg at bedtime Adults: 10 mg at bedtime
<b>Discontinuation strategy</b>	<ul style="list-style-type: none"> <li>• Reduce by 25% every 2 weeks</li> <li>• If dosage forms do not allow 25% reduction, consider 50% reduction initially using drug-free days during latter part of tapering</li> </ul>

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### Eszopiclone (Lunesta®)

<b>Role in therapy</b>	<ul style="list-style-type: none"> <li>• Sleep initiation and sleep maintenance-related insomnia.</li> <li>• May be used for chronic insomnia.</li> </ul>
<b>BEERS Criteria</b>	Avoid combining with two or more CNS-active drugs
<b>Side Effects</b>	Metallic taste, dry mouth, drowsiness, daytime sleepiness Drug interactions: Alcohol, CYP3A4 inhibitors (-azole, ritonavir, clarithromycin)
<b>Recommended dose for geriatric patients</b>	Starting dose: 1 mg at bedtime Max daily dose: 3 mg May be taken nightly for up to 6 months
<b>Discontinuation strategy</b>	<ul style="list-style-type: none"> <li>• Reduce by 25% every 2 weeks</li> <li>• If dosage forms do not allow 25% reduction, consider 50% reduction initially using drug-free days during latter part of tapering</li> </ul>

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### Doxepin (Silenor®)

<b>Role in therapy</b>	Insomnia characterized by inability to maintain sleep
<b>BEERS Criteria</b>	<ul style="list-style-type: none"> <li>• Risk of orthostatic hypotension and syncope</li> <li>• Avoid combining with two or more CNS-active drugs</li> <li>• Avoid combining with other anticholinergic agents</li> </ul>
<b>Side Effects</b>	Anticholinergic effects (confusion, delirium, dry mouth, constipation), sedation, orthostatic hypotension
<b>Recommended dose for geriatric patients</b>	3 mg within 30 minutes of bedtime Max daily dose: 6 mg
<b>Discontinuation strategy</b>	Reduce by 10% each month

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### Suvorexant (Belsomra®)

<b>Role in therapy</b>	May be used for both sleep onset and sleep maintenance insomnia
<b>BEERS Criteria</b>	No criteria yet listed
<b>Side Effects</b>	Drowsiness, dizziness, headache, abnormal dreams, depression, suicidal ideation, behavioral changes
<b>Recommended dose for geriatric patients</b>	10 mg once daily within 30 minutes of bedtime; may increase to a maximum of 20 mg once daily Take on an empty stomach
<b>Discontinuation strategy</b>	Reduce by 10% each month

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### Temazepam (Restoril®)

<b>Role in Therapy</b>	Short-term, symptomatic relief of transient insomnia and chronic insomnia accompanied by anxiety
<b>BEERS Criteria</b>	<ul style="list-style-type: none"> <li>May be associated with increased risk of falling and cognitive impairment</li> <li>Avoid combining with two or more other CNS-active drugs (fall risk).</li> <li>Avoid alcohol</li> </ul>
<b>Side Effects</b>	Hypotension, somnolence Used with caution in patients with seizure disorders, respiratory depression, severe hepatic disease, or renal impairment Contraindicated in pregnancy, untreated sleep apnea, and substance abuse
<b>Recommended dose for geriatric patients</b>	15 mg
<b>Discontinuation</b>	<ul style="list-style-type: none"> <li>Use beyond 4-5 weeks not recommended</li> <li>Reduce by 10% per week when risks of therapy outweigh benefits</li> <li>Reduce by 10% every 2-4 weeks if function has not improved or patient has developed tolerance</li> </ul>

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### Triazolam (Halcion®)

<b>Role in Therapy</b>	Short-term, symptomatic relief of transient insomnia and chronic insomnia accompanied by anxiety
<b>BEERS Criteria</b>	<ul style="list-style-type: none"> <li>May be associated with increased risk of falling and cognitive impairment</li> <li>Avoid combining with two or more other CNS-active drugs (fall risk).</li> </ul>
<b>Side Effects</b>	Dizziness, somnolence, lightheadedness May cause respiratory depression abnormal thinking, severe anaphylactic reactions, worsening of insomnia, and daytime anxiety Drug-Drug Interactions with -azole antifungals, nefazodone, several HIV protease inhibitors, isoniazid, grapefruit juice, and ranitidine Contraindicated in pregnancy, untreated sleep apnea, and substance abuse
<b>Recommended dose for geriatric patients</b>	0.125 mg ; max 0.25 mg
<b>Discontinuation</b>	<ul style="list-style-type: none"> <li>Limit dose and therapy duration to minimum required time</li> <li>Gradual dosage taper schedule need for discontinuation</li> </ul>

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### Trazodone (Desyrel®)

<b>Role in therapy</b>	Increasingly prescribed off-label at subtherapeutic antidepressant doses of 50-100 mg for treatment of insomnia
<b>BEERS Criteria</b>	Low-dose trazodone preferred for treatment of insomnia
<b>Side Effects</b>	Nausea, Dry mouth, Daytime sleepiness
<b>Recommended dose for geriatric patients</b>	25-50 mg at bedtime
<b>Discontinuation strategy</b>	<ul style="list-style-type: none"> <li>Avoid abrupt discontinuation</li> <li>Reduce gradually over 4 weeks</li> </ul>

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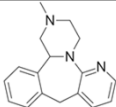
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### Mirtazapine (Remeron®)



<b>Role in therapy</b>	Patients with comorbid diagnosis of depression
<b>BEERS Criteria</b>	Concern for SIADH. Check sodium when starting or changing dose.
<b>Side Effects</b>	Weight gain/appetite increase, dry mouth
<b>Recommended dose for geriatric patients</b>	Doses of 7.5 mg to 15 mg generally effective for treatment of insomnia <ul style="list-style-type: none"> <li>No specific dose recommendations in geriatric patients</li> </ul>
<b>Discontinuation strategy</b>	If taken for >3 weeks, reduce by 10% every 4 weeks

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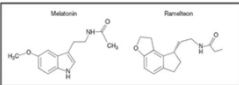
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### Ramelteon (Rozerem®)



<b>Role in therapy</b>	Effective for sleep-onset latency and increased total sleep time
<b>BEERS Criteria</b>	Recommended treatment option for insomnia
<b>Side Effects</b>	Minimal side effect profile Drug interactions: Abilify, Ambien, Clonazepam, Cymbalta, Gabapentin, Melatonin, Tramadol
<b>Recommended dose for geriatric patients</b>	8 mg within 30 minutes of bedtime
<b>Discontinuation strategy</b>	No need to taper dose

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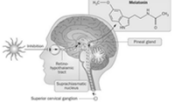
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### Melatonin



<b>Role in therapy</b>	Management of insomnia, resynchronization of circadian rhythms, inhibition of disease progression in neurodegenerative disorders
<b>Side Effects</b>	<ul style="list-style-type: none"> <li>Minimal side effect profile</li> <li>0.1-1% reported headache and somnolence</li> </ul>
<b>Recommended dose for geriatric patients</b>	Variable Typical range between 0.5mg-6mg
<b>Discontinuation strategy</b>	Tapering not required

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### Valerian Root

<b>Role in therapy</b>	Short term management of insomnia
<b>Side Effects</b>	<ul style="list-style-type: none"> <li>Minimal side effect profile</li> <li>Additive effect with other CNS depressants</li> </ul>
<b>Recommended dose for geriatric patients</b>	Variable Typical range between 300-600mg
<b>Discontinuation strategy</b>	Tapering not required

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### Beer's list for Medications for Insomnia

Avoid <small>with two or more other CNS-active drugs</small>	Recommended	Others
<ul style="list-style-type: none"> <li>Doxepin &gt; 6mg/d (Silenor)</li> <li>Temazepam (Restoril)</li> <li>Triazolam (Halcion)</li> <li>Zolpidem (Ambien)</li> <li>Zaleplon (Sonata)</li> <li>Eszopiclone (Lunesta)</li> <li>Paroxetine (Paxil)</li> </ul>	<ul style="list-style-type: none"> <li>Melatonin</li> <li>Ramelteon (Rozerem)</li> <li>Low-dose trazodone</li> </ul>	<ul style="list-style-type: none"> <li>Suvorexant (Belsomra)– Not listed</li> <li>Mirtazapine (Remeron)– Concerned for SIADH</li> </ul>

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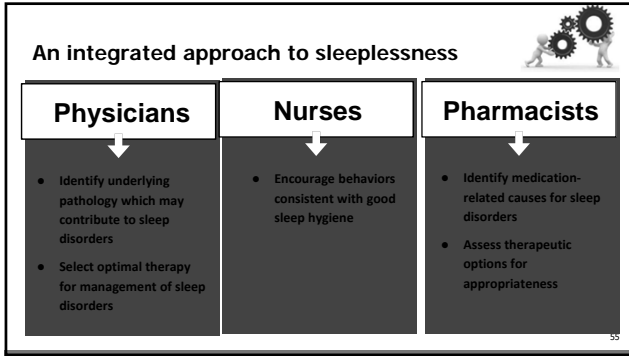
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### Patient Evaluation

- 1 week follow-up for patients with short-term or chronic insomnia
  - Assess drug efficacy, adverse effects, and adherence to non-pharmacologic recommendations
- In patients with chronic insomnia, rule out medical, psychiatric, and pharmacologic causes
- Educate patients on potential side effects, concepts of tolerance, withdrawal, and rebound insomnia

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### Conclusion

- Development of sleeplessness may be multifactorial
- Obtaining a thorough history and potential contributing factors is essential when treating insomnia
- Both pharmacological and non-pharmacological interventions should be considered
- A multi-disciplinary approach is ideal when treating sleeplessness in the nursing home

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**CONTACTS**

**Ariel Cole, MD, FAAFP, CMD**  
 Ariel.Cole.MD@AdventHealth.com

**Alan Obringer, RPh, CPh, CGP**  
 Alan.Obringer@guardianpharmacy.net

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