I’m so tired I can’t sleep: A systematic approach to the diagnosis and treatment of insomnia

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

Basic Sleep Overview

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS
Systems Generating Sleep

<table>
<thead>
<tr>
<th>Transmitter</th>
<th>Neurons</th>
</tr>
</thead>
<tbody>
<tr>
<td>GABA</td>
<td>VLPO, hypothalamus and basal forebrain</td>
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<tr>
<td>Adenosine</td>
<td>Basal forebrain</td>
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<tr>
<td>Glutamate</td>
<td>Spinal cord</td>
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<tr>
<td>Acetylcholine</td>
<td>PPT/LDT (pons) and basal forebrain</td>
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Systems Generating Wakefulness

<table>
<thead>
<tr>
<th>Transmitter</th>
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<tr>
<td>Glutamate</td>
<td>Ascending reticular formation</td>
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<tr>
<td>Dopamine</td>
<td>Substantia nigra</td>
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<tr>
<td>Hypocretin</td>
<td>Hypothalamus (perifornical)</td>
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<td>Histamine</td>
<td>Locus ceruleus</td>
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<tr>
<td>Serotonin</td>
<td>Raphe nuclei</td>
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<tr>
<td>Acetylcholine</td>
<td>Subnucleomammillary nucleus</td>
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<tr>
<td>Acetylcholine</td>
<td>Basal forebrain</td>
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Neurotransmitters of Sleep

<table>
<thead>
<tr>
<th>Transmitter</th>
<th>Wake/ EEG</th>
<th>NREM</th>
<th>REM</th>
<th>Neurons</th>
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<tbody>
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<td>GABA</td>
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<td>++</td>
<td>++</td>
<td>Dentate, EC, AT, thal., stria medullaris, p. reticularis</td>
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<tr>
<td>Adenosine</td>
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<td>++</td>
<td>++</td>
<td>Dentate, basal forebrain, thalamus, brain stem</td>
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<tr>
<td>Glutamate</td>
<td>+++ ++</td>
<td>++</td>
<td>+++</td>
<td>Dentate, thalamus, brain stem, hippocampus</td>
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<tr>
<td>Serotonin</td>
<td>+++</td>
<td>+</td>
<td>+++</td>
<td>LC, LC/DR, DR, DR, parietal, cingulate, retrosplenial</td>
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<tr>
<td>Acetylcholine</td>
<td>+++</td>
<td>+</td>
<td>++</td>
<td>LC/DR, DR, PPT</td>
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</tbody>
</table>

Key EEG features of NREM Sleep

- Alpha waves
- Slow waves
- Asynchronous activity
- Delta waves
- Theta waves
Why is sleep important?

Effects of sleep deprivation on cardiovascular system:
- Increased blood pressure and sympathetic nervous system activation
- Increased levels of C reactive protein
- Experimental sleep deprivation leads to changes in autonomic function, inflammation, and hormones that could contribute to cardiovascular disease

Laugsand LE et al., Eur Heart J, 2013

Effects of sleep loss on inflammation/immunity:
- Sleep loss alters immune responses
- Reduced natural killer cell activity
- Changes in circulating levels of leukocytes and cytokines
- Decreased antibody titers to influenza vaccinations
- Increased inflammatory markers (CRP)

J. Clin Sleep Med 2007;3(5):519-528
Why is sleep important?

Sleep deprivation and obesity:
- Children: Int J. Obes Relat Metab Disord 2002; 26:710-6
- Young Adults: Sleep 2004; 27: 616-6
- Older Adults: Int. J Obesity 2008; 32:1825-34


Why is sleep important?

Sleep deprivation and accidents:
- Sleep deprivation causes at least 10-15% of accidents:  Sleep 2004; 27:224
- Medical interns made significantly more serious medication and diagnostic errors when working shifts longer than 30 hours:  NEJM 2004; 351:1838-48

Why is sleep important?

Sleep Deprivation and Diabetes:
- Shorter sleep duration predicts diabetes risk: Diabetes Care 2006;29(3):657-661
- Slow wave sleep deprivation increases insulin resistance: PNAS USA 2008;105:1044-49

Physiologic effects of sleep loss
- Increased evening cortisol
- Increased sympathetic activation
- Decreased thyrotropin
- Decreased glucose tolerance
- Decreased leptin
- Increased ghrelin

These effects alter signaling of hunger and appetite and promote weight gain, obesity, and insulin resistance

Endocrin Dev 2010; 17:11-21

Pathways for sleep loss effects on obesity and diabetes

Ann NY Acad Sci 2008; 1129:287-304

Risk of Motor Vehicle Accidents increased after Extended Shifts

<table>
<thead>
<tr>
<th>Work shift</th>
<th>Work shift</th>
<th>Odds Ratio</th>
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<tr>
<td>24 hours</td>
<td>&lt;24 hours</td>
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<tr>
<td>Crashes</td>
<td>1.67</td>
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<tr>
<td>Near-misses</td>
<td>96.42</td>
<td>6.41</td>
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<tr>
<td># Commutes</td>
<td>54.12/1</td>
<td>160.288</td>
</tr>
</tbody>
</table>
Why is sleep important?
Sleep deprivation effects on learning and memory
Sleep is important both before learning (acquisition of information) and after learning (encoding and consolidation of information).
Effects of sleep loss may vary depending on the type of material being learned.
Performance lapses increase with sleep loss.

Arch. Ital Biol 2001; 139:253-67

Insomnia Overview

A 60-year-old woman presents to your office with a 5-year history of difficulty falling asleep. She admits that she has always been a light sleeper, just like her mother, but her sleep problems really began 5 years ago when her husband died suddenly. During the acute grief phase she had trouble going to sleep and found that she was afraid to be in the house alone. She started leaving most of the lights on in the house, including several table lamps in the bedroom. She moved the TV into the bedroom "to take my mind off of things." She started allowing her 80-lb. Labrador to sleep with her "to keep me company." She often has a highball at night to help her relax. She claims that she has been "getting by" but the past 6 months have seen further deterioration in her sleep and she is only sleeping 4-5 hours per night.

Which of the following are contributing to this patient's difficulty with sleep:
A. Co-morbid insomnia
B. Poor sleep hygiene
C. Insomnia caused by a CNS depressant
D. All of the above

Adapted from Kryger's Sleep Medicine Review
Insomnia
Pathophysiology
A hyperarousal disorder causing an inability to relax
Exaggerated reactions to environmental stressors
Bedtime anxiety - “Worried about sleep”
Increased Brain metabolic activity
Hypothalamic-pituitary-adrenal axis
Corticotropin-releasing hormone
Increased cortisol and ACTH in sleep
Decreased GABA levels based on MRS imaging

Diagnostic criteria: The 3 D’s
D (Difficulty initiating or maintaining sleep)
D (Despite adequate opportunity for sleep, resulting in)
D (Daytime impairment)

Acute/Short Term: Less than 3 months
Chronic: Lasts at least 1 month

Epidemiology and Risk Factors
Insomnia is the most common sleep disorder
One of the most prevalent mental health disorders
Challenge: Demarcate the border between insomnia complaints and clinical insomnia.

26% of people complain of difficulty sleeping at least a few nights per week
42% of people complain of difficulty staying asleep
13% of people complaining of insomnia seek professional treatment: typically based on severity and advanced age
A sleep complaint does not itself arise to the standard of clinical insomnia.

Demographics
30-50% of American adults experience insomnia during a one-year period
10-15% of general population may have chronic insomnia
More Prevalent In:
Females
Singles
Unemployed
Ethnicity
More common in African Americans than Whites
More common in Japanese population
Socioeconomics
Lower socioeconomic status

Types
Sleep onset
Sleep-maintenance
Early morning awakening
Combination
Primary or Comorbid with another medical condition
Insomnia
Core Symptoms
At least 1 sleep symptom and 1 wake symptom

Sleep Symptoms
- Difficulty initiating or maintaining sleep
- Early morning awakening
- Nonrestorative or non-refreshing sleep

Wake Symptoms
- Sleep-associated daytime impairment: sleepiness, fatigue, mood disturbance, cognitive difficulties, social impairment, occupational impairment

Etiology
Co-Morbid: 90%
Primary:
- Adjustment
- Psychophysiological (conditioned insomnia)
- Paradoxical (sleep-state misperception)
- Idiopathic (childhood onset)
- Poor sleep hygiene
- 30% of chronic insomniacs may develop alcohol abuse

Subtypes
Acute/Adjustment insomnia
- Precipitated by an identifiable stressor
- One year prevalence in general population is 15-20%
- More common in women and older adults
- Lasts no more than 3 months

Chronic Insomnias
Primary Insomnia
- Learned sleep-preventing associations
- Extreme concern with inability to sleep and consequences which follow
- Heightened state of arousal during the day (frequently unable to nap)
- Often sleep better away from home
- 1-2% of general population
Insomnia
Subtypes
Chronic insomnias
Paradoxical Insomnia: Sleep-state misperception
Daytime impairment much less severe than expected from the patient's report of extreme sleep deprivation
Mismatch between PSG or actigraphy and subjective sleep estimates
Increased risk and association of/with depression, anxiety, hypnotic use/abuse

Idiopathic Insomnia
Onset during childhood with lifelong sleep difficulty and often no identifiable precipitating event
Periods of sustained remission not reported

Inadequate sleep hygiene
Patients adopt living activities inconsistent with quality sleep
Varying bedtimes
Frequent napping, especially in the evening time
Abuse of substances interfering with sleep, especially close to bedtime (alcohol, caffeine, nicotine)
Engaging in stimulating activities close to bedtime
Sleep environment not conducive to sleep (noise, light, etc.)

Insomnias secondary to/comorbid with:
Medical conditions (pain, asthma, GERD)
Specific sleep related disorders (PLMS, OSA, SRBD)
Psychiatric disorders
Drug or alcohol abuse

Causes of Insomnia: Clues
Acute stressor:  Adjustment insomnia
Lifelong insomnia:  Idiopathic insomnia
Bad habits:  Inadequate sleep hygiene
Very minimal/no sleep for several days:  paradoxical insomnia
Rumination and intrusive thoughts:  Psychophysiologic insomnia
A 17-year-old high school senior presents for evaluation with his mother because of his "insomnia" and excessive daytime somnolence. He goes to bed at midnight, but he can't fall asleep until around 2 am and must get up at 6:30 am to make his first AP class at 7:45 am. He is very tired during the day and often inadvertently falls asleep in class. He admits that on weekends or during vacation, he stays up as late as he wants and then he doesn't seem to have trouble falling asleep. Because he can sleep as long as he wants (often 9 or 10 hours), he then doesn't feel tired during his wake period.

What is the most likely diagnosis?

A. Narcolepsy
B. Adjustment insomnia
C. Psychophysiologic insomnia
D. Delayed sleep phase disorder

Adapted from Kryger's Sleep Medicine Review

Defining insomnia is a complex task
Symptoms v. Disorder v. Both
Often evolves over time
Heterogeneous
Acute
less than 1 month
Intermittent
Chronic
6 or more months

Multitude of Trials and Review of Literature from the 1980s and 1990s
Research Diagnostic Criteria: Universal Definition for Insomnia Disorder
Patient must report difficulty initiating or maintaining sleep, waking up too early, or chronically nonrestorative or poor–quality sleep.
Sleep difficulty occurs despite adequate opportunity and circumstances for sleep.
Patient must report sleep–related daytime impairment involving one or more the following:
Fatigue or malaise
Attention, concentration, or memory problems
Social or vocational dysfunction or poor school performance
Mood disturbance or irritability
Daytime sleepiness
Reduced motivation, energy, or initiative
Proneness for errors or accidents at work or while driving
Tension headaches, and/or gastrointestinal symptoms in response to sleep loss
Concerns or worries about sleep

Evaluation
Self-Reporting:
Problematic
Retrospective
Biased
Recall errors

Prospective Sleep Diaries
Definition: Sleep diary data that collects information on sleep from the night just completed
2 weeks is recommended
Should record:
Sleep-onset latency
Wake time after sleep onset
Number of awakenings
Total sleep time
Helps elucidate sleep efficiency and type of insomnia (onset, maintenance, terminal).

Principles and Practice of Sleep Medicine 5th ed.
Insomnia

Principles and Practice of Sleep Medicine 5th ed.

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Insomnia

Evaluation

Actigraphy may be useful in some cases
PSG and MSLT not indicated in the routine evaluation of chronic insomnia unless suspect primary sleep disorder: RBD, PLMS, SRBD, Narcolepsy

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Insomnia

Prevalence

Depends on Definition and Subtype
Comorbid is most common
Primary is less common

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Insomnia

Comorbid insomnia

is a symptom secondary to another disorder. 2005 NIH State-of-the-Science Consensus panel recommended that the term comorbid insomnia replace the term secondary insomnia.
Felt to account for up to 90% of insomnia in the general population
20% of people with insomnia demonstrate clinically significant depression
19.3% of people with insomnia demonstrate clinically significant anxiety

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Insomnia

Comorbid insomnia

Most Common:
Psychiatric disorders 77%
Anxiety
Depression
Panic disorder
Adjustment disorder
Somatoform disorder
Personality disorders
Principles and Practice of Sleep Medicine 5th ed.

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Insomnia

Comorbid insomnia

Medical Disorders

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Heart Disease</td>
<td>22%</td>
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<tr>
<td>Cancer</td>
<td>9%</td>
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<tr>
<td>Hypertension</td>
<td>43%</td>
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<tr>
<td>Neurologic disease</td>
<td>7%</td>
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<tr>
<td>Breathing difficulty</td>
<td>25%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>20%</td>
</tr>
<tr>
<td>Chronic pain</td>
<td>50%</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>34%</td>
</tr>
</tbody>
</table>

Principles and Practice of Sleep Medicine 5th ed.
Insomnia

Three P Model

Predisposing Factors
- Light sleepers
- Anxiety
- Relationship Problems

Precipitating Factors
- Event/Stress which overwhelms coping mechanisms
- Bereavement
- Loss of job

Perpetuating Factors
- Maladaptive behaviors
- Misconceptions regarding sleep
- Persistent sleep hygiene issues, or learned sleep-preventing associations

Evaluation

Medication Precipitants
- Antidepressants (SNRIs)
- Beta-blockers - propranolol
- Bronchodilators
- Decongestants
- Corticosteroids
- Stimulants

Remember the 3 Ps
- Look for comorbid precipitants (90% of all causes of insomnia)
- Try and correct accordingly

Pharmacology and Sleep

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPS

A 62-year-old man with a history of RLS is referred to you because of a recent intensification of his symptoms. His symptoms typically begin around 6pm and can be so uncomfortable that he soaks in a hot tub for about an hour prior to bedtime. He recently started taking an antidepressant to help him cope with the death of a close relative.

Which of the following antidepressants is least likely to increase RLS and PLMS type symptoms?

A. Bupropion
B. Mirtazapine
C. Trazodone
D. Imipramine
E. Fluoxetine
F. Venlafaxine
Insomnia

Antidepressants

Sedation

Tricyclic: Amitriptyline, Doxepin

Mirtazapine

Trazodone

Paroxetine

Alerting

Fluoxetine

Sertraline

SNRIs: Venlafaxine

Somnambulism

Hypnotics: benzodiazepines and BzRAs especially zolpidem

Lithium

Major tranquilizers such as phenothiazines

GABA, sodium oxybate

Antihistamines

Stimulants

Anticholinergics

Montelukast

Alcohol

Nightmares

TCAs

SSRIs

SNRIs

Bupropion

Beta-Blockers, atenolol less likely

Alpha 2-agonists such as clonidine

Reserpine

Hypnotics

Barbiturates

Chloral hydrate

Stimulants

First Generation Antipsychotics

Erythromycin

Plaquenil

Quinolones

Zanamivir

Peramivir

Withdrawal of REM suppressing agents

Bupropion

Chantix

Amiodarone

Insomnia

Abnormal Dreams

BzRAs

Levodopa

Ropinirole

Pramipexole

Singulair

Donepezil

REM Behavior Disorder

SSRIs

SNRIs especially venlafaxine

Mirtazapine

MAOIs

TCAs

Stimulants: caffeine, amphetamines, cocaine

EtOH

* Bupropion is not associated with RBD

Insomnia

RLS/PLMS

Antidepressants

SSRIs

SNRIs

TCAs

Mirtazapine

Lithium

Dopamine antagonists - antiemetics, antipsychotics

Older sedating antihistamines

Calcium channel antagonists

Tramadol

Methylxanthines

Corticosteroids

Opioid withdrawal

Caffeine

Nicotine

Alcohol

* Bupropion does not cause RLS
Insomnia
Effects of Alcohol on Sleep

Biphasic effect on sleep and waking

Stimulating
At low doses and on the rising phase of alcohol levels
Visualize an animated person having fun at a bar

Sedating
At high doses and on the falling phase of alcohol levels
Visualize a drowsy person after drinking too much

Rapid Metabolism
Sedating effect wears off as adenosine levels decrease and this disrupts the normal sleep pattern leading to increased nocturnal awakenings and poor sleep efficiency

Acute Intoxication
Decreased sleep latency
During first half of night
Increased NREM
Decreased REM
Increased TST
During second half of night
Increased wakefulness due to rapid EtOH metabolism
REM rebound
Increased dreaming
Sympathetic arousal

Acute withdrawal in alcohol dependence
Insomnia
Decreased sleep continuity
Decreased TST
Decreased SWS
REM rebound
Nightmares
Insomnia Treatment Options

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

In conversation with our 60-year-old woman with multiple sleep complaints and risk factors (Co-morbid insomnia, poor sleep hygiene, alcohol use) we recommend which of the following treatment options to best try and help improve her quality of life?

A. Cognitive Behavioral Therapy for Insomnia (CBT-I), Sleep Hygiene, and Pharmacologic Therapy
B. CBT-I and Sleep Hygiene
C. Start with sleep hygiene alone
D. Start with CBT-I alone
E. Start with Pharmacologic Therapy alone

Cognitive-behavioral therapy for insomnia (CBT-I) strategies:
- Often performed under the guidance of a psychologist experienced in these strategies
- Short-term benefits are comparable to pharmacologic therapy
- Long-term benefits are more effective than pharmacotherapy

Pharmacological Therapies

Most effective CBT-I
- Stimulus-control therapy
  - Attempts to reassociate the bedroom environment with healthy sleep
  - Bedtime only when sleepy
  - Use the bed only for sleep and intimacy
  - Curtail wake time in bed
  - If unable to sleep within 15-20 minutes (estimate) of nocturnal wakening, relax or negative in quiet activity in another room and return to bed when sleepy.
  - Avoid clock watching - Remove or turn around

- Sleep-restriction therapy
  - Aim is to improve sleep onset through sleep deprivation
  - Being by reducing the time in bed according to the estimated time spent asleep (diary)
  - Establish a regular wake time and advance bedtime when 90% sleep efficiency is achieved
Insomnia

Other CBT-I

Progressive muscle relaxation (PMR)
Patient taught to systematically relax each part of the body

Biofeedback
Complex procedure that requires an experienced operator

Cognitive therapy
Re Educates patients faulty beliefs and attitudes to sleep
Correct irrational fears, unrealistic expectations, and excessive concern about the amount of sleep time needed for adequate daytime function.

Relaxation therapy
Aims to decrease anxiety and lower arousal threshold
Hot bath prior to bedtime helps relaxation and increases core temperature to promote sleep during its subsequent decline
Breathing exercises, meditation, modified yoga, guided imagery

Sleep hygiene education
Understanding and educating patients about the circadian rhythm
Adjusting bedroom environment, cool, quiet, absent TV, lower lighting
Establish a regular “wind down” routine - establish good habits
Avoiding stimulants or activities preventing sleep onset
Reduce or eliminate products that interfere with sleep (caffeine, nicotine, alcohol)
Avoid/eliminate napping, especially in the evenings
No exercising or large meals close to bedtime (3h.)
Summary of AASM insomnia guideline treatment flowchart

Principles and Practice of Sleep Medicine 5th ed.

A couple presents to your office seeking help with their 24-month-old daughter's sleep problem. The child has been a poor sleeper from birth and will not fall asleep when alone. The parents had her sleep in their bed from about 4 months of age, when nocturnal crying started to interfere with their own sleep. Attempts to let her fall asleep in her own room have been unsuccessful. She quickly will fall asleep in her parents bed. When in her crib alone she screams as if in fear. The child's examination is normal. The child does not demonstrate any evidence of daytime sleepiness. There is no family history of a sleep disorder.

What is the most likely diagnosis of this child's sleep problem?

A. Sleep terrors
B. Behavioral insomnia of childhood: limit-setting type
C. Behavioral insomnia of childhood: sleep-onset association type
D. Primary insomnia

Adapted from Kryger's Sleep Medicine Review

Childhood Sleep Brief

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

Developmental Milestones in Sleep Patterns
- 6 weeks: longest sleep period occurs at night
- 6-9 months: able to sleep through the night
- 3-6 years: cessation of daytime nap

Total sleep time by age in hours
- <1 month: 19
- <1 year: 15
- 1-3 years: 12
- 3-5 years: 10
- >5 years: 9

**Drugs Indicated for Insomnia**

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<thead>
<tr>
<th>Generic</th>
<th>Brand</th>
<th>Dose (mg)</th>
<th>Dose (mg)</th>
<th>Drug Class</th>
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<td>Alprazolam</td>
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<td>0.5-1.0</td>
<td>Benzodiazepine</td>
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<td>Trazodone</td>
<td>Trazodone</td>
<td>50-150</td>
<td>150-300</td>
<td>Tricyclic</td>
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<tr>
<td>Zolpidem</td>
<td>Ambien</td>
<td>5-10</td>
<td>10-20</td>
<td>Nonbenzodiazepine</td>
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<tr>
<td>Eszopiclone</td>
<td>Lunesta</td>
<td>1-3</td>
<td>3-6</td>
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<td>Zaleplon</td>
<td>Ambien CR</td>
<td>5-10</td>
<td>10-20</td>
<td>Nonbenzodiazepine</td>
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<td>Ramelteon</td>
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<td>1.5-3</td>
<td>3-6</td>
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<td>Zolpidem</td>
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<tr>
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<td>10-20</td>
<td>20-40</td>
<td>Nonbenzodiazepine</td>
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</table>
Insomnia
Childhood Sleep
Insomnia type symptoms in children
Behavioral insomnia: 10-30%
Difficulty falling asleep: 10%
Child night wakings for various reasons: 1-10%
Sleep onset association disorder
Limit setting disorder
Poor sleep hygiene
Overlap with delayed sleep phase: weekend sleep in or late day naps

Behavioral treatments of childhood insomnia
Place child to bed while drowsy but still awake: 2-4 months
Transition infant to final sleep environment: 3 months
Discontinuation of nighttime feedings: 6+ months
Sleep hygiene correction in older children same as in adults

Fatal Familial Insomnia
Prion disease
Hereditary form due to a GAC to AAC mutation at codon 178 of the prion PRNP gene at chromosome 20
Classification based on methionine polymorphism at codon 129
Methionine homozygous - short disease course; duration of survival <12 months
Methionine-valine heterozygous - longer disease course; duration of survival 1-6 years

Circadian Rhythm Sleep Disorders
Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

A 27-year-old nurse began working a rotating shift about 6 months ago. Her rotation schedule was days to evenings to nights. Her schedule is to work three 12-hour days per week and then rotate to the next later shift. Initially she had no trouble adapting to this rotation, however she did report sleepiness with the overnight shifts. After a few months she found it increasingly difficult to stay awake all night. A coworker found her asleep on the job recently, and now the patient is worried about losing her job.

What is the best recommendation for this patient’s shift work sleep disorder?
A. Discontinue night shifts and work regularly scheduled daytime and/or evening shifts if possible
B. Avoid morning light after working a night shift
C. Try armodafinil for daytime sleepiness
D. Hire an attorney to sue your manager and hospital administration for making such horrible rotating schedules in the first place

Adapted from Kryger’s Sleep Medicine Review

Circadian Rhythm Sleep Disorders
Caused by recurrent or persistent misalignment between the desired sleep schedule and the circadian sleep-wake rhythm
Can be associated with insomnia or sleepiness, or both
Sleep diaries and actigraphy may be helpful in diagnosing and monitoring these conditions
Polysomnogram not routinely indicated
Insomnia
Circadian Rhythm Sleep Disorders

Advanced Sleep Phase Syndrome
Morning lark
Early bedtime (6-9pm) and early wake time (2-5am)
Excessive sleepiness in the later afternoon or early evening
Morning awakening is earlier than desired
Onset common during middle age and older years
Therapy: Early evening bright light
Rule out depression

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Insomnia
Circadian Rhythm Sleep Disorders

Delayed Sleep Phase Syndrome
Night owl
Late bedtime (1-6am) and late wake time (10am-2pm)
Sleep onset insomnia when sleep is attempted earlier
Excessive sleepiness in the early morning
Onset often during adolescence
Therapy: Early morning light, evening melatonin

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Insomnia
Circadian Rhythm Sleep Disorders

Free-Running Circadian Disorder
Progressive daily delay in sleep and wake times
Result in periodically recurring problems of insomnia or EDS
Most affected persons are totally blind
Therapy: Evening melatonin, light therapy for persons with light perception, tasimelteon a melatonin receptor agonist.

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Insomnia
Circadian Rhythm Sleep Disorders

Irregular Sleep-Wake Rhythm
Variable, inconsistent and multiple sleep and wake periods over a 24-hour period
Most frequently seen in association with dementia or mental retardation
The "atrial fibrillation" of sleep disorders
Therapy: evening melatonin, phototherapy

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Insomnia
Circadian Rhythm Sleep Disorders
Jet Lag
Westward travel
Phase advanced relative to new time zone
Early evening sleepiness and early morning insomnia
Eastward travel
Phase delayed relative to new time zone
Sleep onset insomnia and morning sleepiness
Therapy: phototherapy, Melatonin, Stimulants, Hypnotics

Shift Work Disorder
Factors promoting SWSD
Age
Female gender
“Morningness” circadian rhythm preference
Backward (counterclockwise) shift rotation schedule
Therapy: Avoid overnight shifts if possible, bright light exposure in the workplace, planned napping, stimulants, hypnotics if having trouble sleeping, avoid morning light after working night shifts

Summary Slides
Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

Summary
Insomnia is common
Comorbid insomnia accounts for 90% of cases
Treatment typically requires CBT-I and Pharmacologic therapies
An understanding of the circadian rhythm and sleep hygiene principles are helpful for most individuals suffering from insomnia
Tools are readily available for the assessment and management of these patients

Summary of AASM Insomnia Guideline assessment flowchart
Principles and Practice of Sleep Medicine 5th ed.

Am Fam Physician. 2007 Aug 15;76(4):517-526
Questions?

Justin A. Malone MD, FAAN
Diplomate ABPN, ABEM, NBPAS

Link to slides:
https://docs.google.com/presentation/d/17o75PAm2iF_Ru0T1v_yf9hIC2x3iW6d4B22AC3Ox87?usp=sharing