Learning Objectives

1. Review the prevalence of chronic insomnia in primary care settings, including the associations with chronic disease
2. Describe the types of insomnia and therapeutic challenges in different populations, such as the elderly and middle-aged women
3. Review the differential diagnosis of chronic insomnia
4. Discuss the value of non-pharmacologic approaches in the management of insomnia
5. Identify potential hypnotic treatments and related side effects when non-pharmacologic approaches fail

Multiple Theories of the Function(s) of Sleep

- **Restorative Function**
  - Anabolic effects of GH: tissue repair & protein synthesis

- **Energy Conservation**
  - Decreased BMR to optimally allocate limited energy resources

- **Ontogenetic Hypothesis**
  - Concept of significant amounts of active sleep in infancy-brain maturation

- **Memory Consolidation**
  - Role for SWS, REM, and lighter stages including same day learning post nap

- **Glymphatic Sleep System**

- **Immune Function Regulation**
  - Sleep as an adjuvant to enhance immunity

- **Synaptic Homeostasis**
  - Synaptic reset during sleep impact on brain plasticity

What Controls Sleep?

- **Sleep Drive**
  - (How long you've been awake)

- **Biological Clock**

Courtesy of Daniel J. Buysse, MD (University of Pittsburgh)
Sleep Requirements Decrease with Age

Acute/Adjustment Insomnia

- Difficulty in initiating or maintaining sleep that lasts for a few days or weeks
- Typically coincides with a stressful life event
  - Career problems, financial hardship, health problems, family/relationship conflicts and dealing with the death of a friend or family member
- Tends to subside when the stressful event is resolved but can evolve into chronic insomnia

Insomnia Disorder (DSM-5)

- A predominant complain of dissatisfaction with sleep quantity or quality:
  - Difficulty initiating sleep
  - Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings.
  - Early morning awakening with inability to return to sleep
- Significant distress or dysfunction in social, occupational, educational, academic, behavioral, or other important areas of functioning.
- The sleep difficulty occurs at least 3 nights per week
- The sleep difficulty is present for at least 3 months

Insomnia Disorder (DSM-5)

- The sleep difficulty occurs despite adequate opportunity for sleep
- The insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder
- The insomnia is not attributable to the direct physiological effects of a substance (e.g., a drug of abuse, a medication)
- Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia
Insomnia ≠ Sleep Deprivation

<table>
<thead>
<tr>
<th></th>
<th>Insomnia</th>
<th>Sleep Deprivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Opportunity</td>
<td>Adequate</td>
<td>Reduced</td>
</tr>
<tr>
<td>Sleep Ability</td>
<td>Reduced</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

Insomnia Is Under-recognized and Under-treated

- 14.7% Consulted a physician for insomnia
- 8.4% Received a drug prescription

% of Respondents With Insomnia in a US Survey


Impact of Insomnia

- Increased Absenteeism
- Increased Healthcare Costs
- Cognitive Impairment
- Psychiatric Disorders
- Medical Illnesses

Approach to Chronic Insomnia

1. Differential Diagnosis
2. Education, including good sleep practices
3. Nonpharmacologic and/or pharmacologic therapy
4. Referral to sleep specialist (in cases of treatment failure)

References:

Prevalence of Sleep-related Complaints in Elderly (≥ 65 years)

<table>
<thead>
<tr>
<th>Complaint</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any chronic complaint</td>
<td>27%</td>
</tr>
<tr>
<td>Waking not rested</td>
<td>13%</td>
</tr>
<tr>
<td>Waking too early</td>
<td>18%</td>
</tr>
<tr>
<td>Trouble falling asleep</td>
<td>19%</td>
</tr>
<tr>
<td>Daytime napping</td>
<td>25%</td>
</tr>
<tr>
<td>Insomnia</td>
<td>29%</td>
</tr>
<tr>
<td>Nocturnal awakening</td>
<td>30%</td>
</tr>
<tr>
<td>Initiation or maintenance</td>
<td>43%</td>
</tr>
</tbody>
</table>


Comorbid Conditions Commonly Producing Insomnia

<table>
<thead>
<tr>
<th>Category</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUROLOGIC</td>
<td>Stroke, Degenerative conditions, Dementia, Peripheral nerve damage, Restless leg syndrome, Central sleep apnea, Chronic pain</td>
</tr>
<tr>
<td>PULMONARY</td>
<td>COPD, Asthma, Obstructive sleep apnea</td>
</tr>
<tr>
<td>CARDIAC</td>
<td>Congestive heart failure, Hypertension, Menopause, Pregnancy</td>
</tr>
<tr>
<td>GASTROINTESTINAL</td>
<td>Gastroesophageal reflux disease</td>
</tr>
<tr>
<td>SUBSTANCES</td>
<td>Stimulants, Opioids, Caffeine, Alcohol, Or withdrawal from any of these Medications - decongestants, corticosteroids, and bronchodilators</td>
</tr>
</tbody>
</table>

Insomnia and Psychiatric Conditions

- **DEPRESSION**
  - As many as 40% of people with depression have insomnia

- **ANXIETY**
  - Generalized anxiety disorder, panic disorder, and anxiety disorders not otherwise specified
  - Predispose to insomnia

- **PTSD**
  - Vivid and terrifying nightmares
  - Checking behaviors

- **PSYCH MEDS**
  - Antidepressants may interfere sleep

Cognitive and Behavioral Issues Producing / Worsening Insomnia

- Inconsistent bedtimes and wake times
- “Dozing” in evening before bed
- Excessive time in bed
- Sleep-related anxiety (insomniaphobia)
- Unrealistic expectations of sleep
- Clock watching
- Use of electronics in bedroom
- Inappropriate attributions of daytime issues to sleep
Liz: 48-year-old Female

**Chief Complaint**
“Severe insomnia, I have had trouble sleeping for years”

**History of Present Illness**
Liz, a 48-year-old female with a history of hypertension, comes in with mild difficulties with falling asleep for many years, when she usually feels ‘wired before going to bed’, ‘worried and irritable about everything’, ‘can’t turn it off’.
► Usually takes ≥ 30 min to fall asleep
► For the past 6 months, Liz noticed that not only it has been taking longer to get to sleep, but also she has not been able to stay sleep, waking up on average 3 times per night, rarely >1 hour long
► Most nights she wakes at least once because of sweating

► More tired now and has some difficulty concentrating at work
► Never sought treatment because “it was not severe enough to affect her job or concentration the next day until recently”
► Denies feeling sad or anxious, although she doesn’t have much motivation for social activities
► Denies snoring, witnessed apneas, or gasping/choking arousals
► 2 cups of coffee/day, usually before 2PM

**Medical History**
- Hypertension
- Major Depressive Disorder (prior antidepressant treatment)

**Social History**
Lives at home with husband

**Physical Exam**
- BP: 138/84
- HR: 73
- Weight: 195 lbs
- Height: 5' 5"
- BMI: 32.4 kg/m²
  - Everything else within normal limits

**Laboratory Evaluation**
- FSH: 36 (4.7-21.5 mIU/mL for menstruating women)
- Estrogen: 180 pg/mL

**Based on Liz’s evaluation, which of the following is most likely responsible for her sleep problems?**
1. Major Depressive Disorder
2. Generalized Anxiety Disorder
3. Menopause-related insomnia
4. Obstructive sleep apnea
5. Restless legs syndrome
6. Caffeine
7. Diuretic use
Menopause and Sleep Disturbance

40-56% Midlife women transitioning menopause and post-menopause
31% Premenopausal women in the late-reproductive stage

Report Sleep Difficulties

- Sleep maintenance (waking up repeatedly) is the most common symptom
- Hot flashes and wakefulness
  - Not all hot flashes are linked with an awakening
  - # of awakenings and sleep stage transitions exceeds number of hot flashes
  - Approximately ¼ of wake time attributed to hot flashes

Primary insomnia complaint
- Characterization of Complaint(s):
  - Difficulty falling asleep
  - Awakenings
  - Poor or unrefreshing sleep
  - Onset
  - Duration
  - Frequency
  - Severity
  - Course
  - Perpetuating factors
  - Past and current treatments and responses

Pre-Sleep Conditions
- Characterization of Complaint(s):
  - Difficulty falling asleep
  - Awakenings
  - Poor or unrefreshing sleep

Onset

Duration

Frequency

Severity

Course

Perpetuating factors

Past and current treatments and responses

Amount of sleep obtained

Napping

Daytime Activities and Function
- Identify sleepiness versus fatigue
- Work
- Lifestyle
- Travel
- Daytime consequences
  - Quality of Life
  - Mood disturbance
  - Cognitive dysfunction
  - Exacerbation of comorbid conditions

Nocturnal Symptoms
- Respiratory
- Motor
- Other medical
- Behavioral and psychological

Sleep History

Sleep Wake Schedule (average, variability)

Bedtime:
- Time to fall asleep
- Factors prolonging sleep onset
- Factors shortening sleep
- Awakenings
  - number, characterization, duration
  - associated symptoms
  - associated behaviors
  - Amount of sleep obtained

Amount of sleep obtained

Napping

Sleep History (Continued)

Daytime Activities and Function
- Identify sleepiness versus fatigue
- Work
- Lifestyle
- Travel
- Daytime consequences
  - Quality of Life
  - Mood disturbance
  - Cognitive dysfunction
  - Exacerbation of comorbid conditions

Nocturnal Symptoms
- Respiratory
- Motor
- Other medical
- Behavioral and psychological

Insomnia Evaluation | Assessment Options

Self-reported
- Sleep diaries

Objective (to rule out other causes)
- Sleep lab
- Home sleep monitor

Wearable technology (e.g., Fitbit)
- Not validated in clinical practice

PRINTABLE SLEEP DIARY

Indications for Diagnostic Sleep Testing

- Suspicion of sleep apnea (loud snoring PLUS one of the following):
  - Daytime sleepiness
  - Witnessed apneas
  - Refractory hypertension

- Abnormal behaviors or movements during sleep

- Unexplained excessive daytime sleepiness

- Refractory sleep complaints, particularly repetitive brief awakenings

Wearable Sleep Trackers

- **Fitbit Charge HR**
  - Automatically can tell when you’re asleep based on movement and HR
  - Monitor how much time is spent tossing and turning

- **Misfit Shine**
  - Measures duration of sleep – light vs deep sleep
  - Alarm
  - Wakes up in light sleep stage → less groggy when aroused

- **Withings Pulse Ox**
  - Measures movement → light vs deep sleep
  - Monitors blood oxygen levels

- **Jawbone UP3**
  - Monitors HR, RR, body temperature, and movements
  - Duration of sleep
  - Tracks sleep stages
  - Smart alarm

- **Misfit Shine**
  - Measures duration of sleep – light vs deep sleep
  - Alarm
  - Wakes up in light sleep stage → less groggy when aroused

**Case**

**Liz: 48-year-old Female**

Based on Liz’s presentation, you confirm that she is peri-menopausal. What would you do next to address her sleep problems?

1. Educate her about good sleep hygiene
2. Advise her to maintain a regular sleep-wake cycle
3. Reduce caffeine intake
4. Resume regular exercise
5. Recommend cognitive behavioral therapy for insomnia (CBT-I)
6. Prescribe a benzodiazepine
7. Answers 1-5
8. All of the above
**Treatment Goals for Insomnia**

- Restore and improve sleep quality and duration
- Prevent progression from acute to chronic insomnia
- Reduce impact on comorbid condition
- Restore daytime function


---

**Nonpharmacologic Approaches**

- Patient Education
- Sleep Hygiene
- Aerobic exercise
- Cognitive behavior therapy for insomnia (CBT-I)

**Pharmacologic Approaches**

- FDA-approved medications
- Off-label prescription medications
- Over-the-counter medications
- Dietary supplements (unregulated)


---

**Tips for Good Sleep Hygiene**

**DO...**

- Enhance sleep environment: dark, quiet, cool temperature
- Increase exposure to bright light during the morning
- Practice relaxing routine
- Regular sleep/wake schedule
- Exercise regularly

**DON’T...**

- Use electronic devices (iPad; phone), unless used for relaxation
- “Watch the clock”
- Use stimulants in the evening (i.e., caffeine, nicotine near bedtime)
- Drink alcohol before bed


---

**ACP Recommends CBT-I as First-line Treatment**

**CBT-I Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Intended Effect</th>
<th>Specific Directions for Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep restriction</td>
<td><strong>Sleep drive and stabilize circadian rhythm</strong></td>
<td>▶ Reduce time in bed to perceived total sleep time (not &lt; 5-6hrs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Choose specific hours on the basis of personal preference and circadian timing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Time in bed gradually as sleep efficiency improves</td>
</tr>
<tr>
<td>Stimulus control</td>
<td><strong>Arousal in sleep environment promote the association of bed and sleep</strong></td>
<td>▶ Attempt to sleep when sleep is more consolidated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Get out of bed when awake and anxious at night</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Use the bed only for sleep or sexual activity</td>
</tr>
<tr>
<td>Cognitive therapy</td>
<td><strong>Restructure maladaptive beliefs regarding daytime and health consequences of insomnia</strong></td>
<td>▶ Maintain reasonable expectations about sleep</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Review previous insomnia experiences, challenging perceived catastrophic consequences</td>
</tr>
<tr>
<td>Relaxation therapy</td>
<td><strong>Physical and psychological arousal in sleep environment</strong></td>
<td>Practice progressive muscle relaxation, breathing exercises, or meditation</td>
</tr>
<tr>
<td>Sleep hygiene</td>
<td>Reduce behaviors that interfere with sleep drive or increase arousal</td>
<td>Limit caffeine and alcohol; keep bedroom dark/quiet; avoid daytime or evening napping; increase exercise; remove bedroom clock from sight</td>
</tr>
</tbody>
</table>

---

**Pharmacotherapy Versus Behavioral Therapy**

**Sleep latency (minutes)**

- Pre-treatment
- Post-treatment

**Wake after sleep onset (minutes)**

- Pre-treatment
- Post-treatment

* n = 8 pharmacotherapy studies; n = 14 behavioral therapy studies

---

**CBT-I | Overview**

- **Treatment of choice for most patients with insomnia**
  - Short-term efficacy comparable to hypnotics
  - Better durability of effectiveness following cessation of hypnotics Rx

- **Some patients may lack…**
  - Access to CBT-I
  - Response to CBT-I
  - Capacity of utilizing CBT-I

- **What to do when NO access to CBT-I?**

- **Short-term course of hypnotic medication + CBT-I may enhance outcome**

---

**Cognitive-behavioral Treatments for Insomnia**

**New Approaches**

- **Brief(er) Treatments**
  - Brief Behavioral Treatment for Insomnia
  - ≤ 4 sessions, single session treatments, classroom/lecture
  - Single-component treatments (stimulus control, sleep restriction)
  - Other types of therapists
  - Master’s-level therapist, nurse, social worker, peer specialist
  - Groups
  - Telephone, Video tele-health/Skype
  - Self-help approaches
  - Online treatments: Sleepio, Shuti, others
  - Mobile app-based: VA CBTI coach, iREST, others

---

5. Eisenberg, 2014; SLEEP 37(9):1305-1314.
At her follow-up visit, Liz reports that she...

- Increased her exercise (swimming) to 3 times per week
- Met with CBTi psychologist 4 times and has tried to adhere to recommendations
- Notes some improvement in her ability to fall asleep, but continues to wake up several times during the night and remains fatigued during the day
- Continues to take OTC medications to help her stay asleep a few times per week, but they produce a "hangover" effect

In addition to continuation of behavioral therapy, which of the following sleep aids might benefit Liz at this time?

1. Sedating antidepressant (e.g. trazodone or tricyclic antidepressant)
2. Selective serotonin reuptake inhibitor (SSRI)
3. Non-benzodiazepine benzodiazepine receptor agonist (e.g. zolpidem)
4. Benzodiazepine receptor agonist (e.g. temazepam)
5. Melatonin
6. Orexin antagonist (e.g. suvorexant)

Characteristics of Ideal Hypnotics

- No memory deficits
- No respiratory depression
- No interaction with ethanol
- No tolerance
- No physical dependence
- No rebound insomnia
- No residual effects
- No formation of active metabolites

Medications Commonly Used for Insomnia

- Benzodiazepines
- Z-drugs*
- Melatonin agonists
- Antidepressants
- Orexin receptor agonist
- Antihistamines
- Antipsychotics
- Anticonvulsants

*Non-benzodiazepine receptor agonists
Use during the the past month

55% of hypnotic users take ≥ 1 other sedating medication (e.g. opioids, BzA)

10% take ≥ 3 other sedating medications

19.2% said they took ≥ 1 ANY sleep medication (specifically asked)

N = 32,328 Age: ≥ 20 y/o

Medications Commonly Used for Insomnia (MCUFI)
NHANES, 1999-2010

Do BzRAs Work for Insomnia?

Do Z-drugs (Nonbenzodiazepine) Work for Insomnia?
### BzRA Risks

<table>
<thead>
<tr>
<th>Motor vehicle accidents in elderly</th>
<th>Hip fractures in elderly</th>
<th>Anterograde amnesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long T1/2 agents</td>
<td>Long T1/2 agents?</td>
<td>T1/2 dependent</td>
</tr>
</tbody>
</table>

### Abuse
- Rarely seen outside of drug abusers

### Tolerance
- No evidence from 12- and 26-week studies

### Rebound insomnia
- Depends upon dose, duration of use, and speed of taper

---

### Antidepressants

#### Advantages
- Little abuse liability
- Not scheduled substances

#### Disadvantages
- Probably not as effective as BzRAs
- Daytime sedation
- Weight gain
- Anticholinergic side effects
- Limited data on efficacy

---

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose (mg)</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline</td>
<td>25 - 150</td>
<td>Use only for insomnia with comorbid depression, fibromyalgia, and/or chronic neuropathic pain</td>
</tr>
<tr>
<td>Doxepin</td>
<td>3 – 6</td>
<td>Sleep maintenance</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>7.5 – 15</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>25 – 150</td>
<td>Use only for insomnia with comorbid depression, fibromyalgia, and/or chronic neuropathic pain</td>
</tr>
<tr>
<td>Trazadone</td>
<td>50 – 100</td>
<td>Not recommended</td>
</tr>
</tbody>
</table>

---

### Brain Activity in Wake-promoting Areas in Insomnia

- Hypothalamus
- Pons
- Thalamus
- LDT
- LC
- Raphe
- vPAG
- TMNBF
- OX
- PPT

- Hypothalamus
- Pons
- Thalamus
- LDT
- LC
- Raphe
- vPAG
- TMNBF
- OX
- PPT

---

### Orexin Receptor Antagonist | Suvorexant*

**Advantages**
- Little abuse liability
- Few side effects

**Disadvantages**
- Unknown efficacy vs BzRAs
- Occasional daytime sedation
- Prior authorization

---

### Melatonin Receptor Agonists

**Advantages**
- Little abuse liability
- Few side effects
- OTC widely available
- Potentially effective in circadian rhythm disorders

**Disadvantages**
- Modest efficacy for sleep-onset insomnia
- Potential systemic hormonal effects

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose (mg)</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melatonin CR</td>
<td>1</td>
<td>Sleep onset</td>
</tr>
<tr>
<td>Ramelteon</td>
<td>8</td>
<td>Sleep onset</td>
</tr>
</tbody>
</table>

---

### Orexin Receptor Antagonist | Suvorexant

**Dose (mg)** | **Recommended use**
--- | ---
5 to 20 | **Recommended starting dose:** 10 mg PO taken no more than once per night and within 30 minutes of going to bed, with at least 7 hours remaining before the planned time of awakening
- Use the lowest dose effective for the patient
- If 10 mg dose is well-tolerated but not effective, the dose can be increased

---

### Flip-flop Switch Model of Arousal and Sleep

- **Suvorexant**

---


Anticonvulsants | α-2 Δ Ligands

**Advantages**
- Little abuse liability
- Efficacy in insomnia related EtOH withdrawal

**Disadvantages**
- Less effective than BzRAs
- Cognitive impairment
- Daytime sedation
- Dizziness
- Weight gain

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose (mg)</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gabapentin</td>
<td>1</td>
<td>Use only for insomnia with comorbid seizure disorder, fibromyalgia, restless legs syndrome, or neuropathic pain.</td>
</tr>
<tr>
<td>Pregabalin</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Atypical Antipsychotics

**Advantages**
- Anxiolytic
- Little abuse liability

**Disadvantages**
- Unknown efficacy vs BzRAs
- Daytime sedation
- Weight gain
- Risks of extrapyramidal symptoms
- Glucose + lipid abnormalities

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose (mg)</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olanzapine</td>
<td>2.5 – 20</td>
<td>Use only for insomnia with comorbid schizophrenia or bipolar disorder</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>50 – 400</td>
<td></td>
</tr>
<tr>
<td>Risperidone</td>
<td>0.25 – 6</td>
<td></td>
</tr>
</tbody>
</table>

Other OTC Products | Antihistamines, Valerian Root

**Advantages**
- Available OTC

**Disadvantages**
- Limited data on efficacy (antihistamine)
- Negative data on efficacy (Valerian)
- Limited data on side effects

Issues with (Most) Non-BzRA Hypnotics in the Treatment of Insomnia (Antidepressants, Anticonvulsants, Antipsychotics)

- Paucity of short-term efficacy data
- Absence of long-term efficacy data
- Assumptions of lack of tolerance and rebound insomnia are unsubstantiated
- Anecdotally less effective than BzRAs
- May have deleterious side effects
Considerations in the Elderly

BzRAs
- Elderly are more sensitive to the adverse effects of these medications, which may include tolerance, withdrawal, over-sedation, cognitive impairment, and risk of falls
- Short-term use, low dosage, and preference for shorter half-life medications

Melatonin
- Decreases sleep latency, awakenings per night, and movements per night
- Use in patients with dementia may also improve sundowning behavior

Trazodone
- Generally better tolerated in the elderly population than some other treatment strategies (such as tricyclic antidepressants) given the lower risk of cardiac and anticholinergic side effects

Sedating Antidepressants
- Poor side-effect profile, including dry mouth, postural hypotension, cardiac arrhythmias, weight gain, and drowsiness

Suvorexant
- Generally improved sleep maintenance and onset
- Well-tolerated in elderly patients with insomnia
- No significant effects on next day memory or balance

Monitoring of Pharmacological Treatment of Insomnia

- Ongoing assessments of effectiveness and side effects
  - Every few weeks in the initial period of treatment
- Use lowest dose for shortest period of time
- Challenge patients to withdraw hypnotics (with CBT-I, ideally)
- Reassess comorbid conditions
- Manage patient expectations

Case

Liz: 48-year-old Female

After 2 weeks of treatment with suvorexant 10 mg, Liz reports measureable improvement in staying asleep during the night. She does occasionally feel a bit drowsy the following day.

You recommend that she continue with the medication and CBT-I, but consider ongoing causes for her daytime drowsiness.
When to Refer to a Specialist(s)?

- Non-response to usual first-line treatments
- Concern for comorbid sleep disorders
- Insomnia due to active psychiatric disorder not responsive to treatment by PCP

Insomnia Disorder | Summary

- Careful differential diagnosis of causes/contributors of insomnia
- Insomnia therapy needs to be individualized to meet patient’s expectations and needs
- CBT-I is considered first-line treatment
- Numerous medications are available, BUT…
  - Evaluate cost-benefit for each medication option -AND- for each patient

Reference Slides

Medications and Their Effects on Sleep

<table>
<thead>
<tr>
<th>Medication</th>
<th>Examples</th>
<th>Sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiarrhythmics</td>
<td>Propranolol, quinidine</td>
<td>Nighttime sleep difficulties, daytime fatigue</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Metoprolol, Lopressor</td>
<td>Insomnia, nighttime awakenings, nightmares</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Methadone, buprenorphine</td>
<td>Insomnia, nightmares</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>Prednisone, others</td>
<td>Daytime sleep, insomnia</td>
</tr>
<tr>
<td>Medications containing alcohol</td>
<td>Coricidin HBP, Nyquil</td>
<td>Suppressed REM sleep, disrupted nighttime sleep</td>
</tr>
<tr>
<td>Nicotine replacement products</td>
<td>Nicotine patches, gum</td>
<td>Insomnia, disturbing dreams</td>
</tr>
<tr>
<td>Selective serotonin reuptake inhibitors</td>
<td>Venlafaxine, bupropion</td>
<td>Decreased REM sleep, daytime fatigue</td>
</tr>
<tr>
<td>Bronchodilators</td>
<td>Theophylline (Bi-lo, others)</td>
<td>Insomnia, daytime fatigue</td>
</tr>
<tr>
<td>Thyroid hormone</td>
<td>Levothyroxine (Levoxyl, others)</td>
<td>Insomnia, daytime fatigue</td>
</tr>
</tbody>
</table>

*Note: The table includes examples of medications and their effects on sleep, focusing on insomnia and sleep disturbances.*