Non-pharmacologic Treatment of Insomnia

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Objectives

The participant will have an understanding of:
- the natural history of insomnia in its development
- the diagnostic criteria for insomnia
- the associations and risk factors for insomnia

The participant will be able to identify:
- physiologic changes associated with altered sleep patterns
- general treatment principles for acute and chronic insomnia
Patient: KM

- 43 y/o Veteran
- Has complaints of difficulty sleeping
- Reports having OSA but is unable to wear his CPAP
Insomnia: Definition

Primary symptoms
- Difficulty falling asleep (75%)
- Frequent night awakenings
- Early morning awakening
  - Unable to return to sleep
- Non-restorative sleep
- Significant daytime fatigue

Categories
- Chronic, Short-term, Other
The interquartile range of prevalence of chronic insomnia varied from 8.5 to 24.3 percent – general populations and 27.8–43.0 percent – clinical populations. Only one study provided data on the natural history of chronic insomnia; the remission rate was 13.1 percent after a 4-month follow-up.
Changes in Diagnostic Standards

ICSD version 2
- 11 different diagnostic categories
- These were behaviorally based, due to medical/psych illnesses, or familial
- Most had subcategories based on acuity

ICSD version 3
- Marked departure from prior editions
- Insomnias were found to have substantial crossover in characteristics
- The major differentiation (in retrospect) was that of duration
- The prior subtypes had substantial overlap, however, they may still be helpful to the clinician in developing a therapeutic plan
Types of Insomnia

- secondary insomnia
- primary insomnia
- hypnotic-dependent insomnia

Figure 1—Prevalence of Types of Insomnia
Negative Impact of Poor Sleep

On daytime function
- Poor performance
- Memory difficulties
- Concentration problems
- Fatigue-related auto accidents (2x)
- Poor academic performance

- 27% reporting the occurrence in at least 2 d/wk

Morbidity & mortality
- Poor sleepers (35-59 y/o) are 2x more likely to develop CAD over the next six years
- Less than 6-7 hours of sleep is associated with an increase in mortality
- In elderly men, insomnia increases mortality risk 3x
PATHOPHYSIOLOGICAL BASIS OF INSOMNIA
(Patho) Physiological Influences

Circadian Rhythms and Sleep

![Diagram showing sleep homeostatic drive (Sleep Load), circadian alerting signal, wake, and alertness levels over time.]
“Natural History” Of Insomnia
Risk Factors (Predisposition)

- Psychiatric disorders:
  - Depression
    - Up to 80% of depressed patients report disturbed sleep:
      - Sleep phase advance often found
    - Anxiety disorders, PTSD, OCD
  - Poor sleep habits
  - Unstable childhood and/or social situation
  - Untreated or poorly controlled medical disorders
Insomnia: Perpetuating Factors

- Dysfunctional sleep-related behaviors
  - Excessive time in bed
  - Irregular sleep/wake schedule
  - Daytime Napping
  - Activities in bed

- Caffeine, alcohol, drugs

- Anxiety & persistent thought patterns
  - About daytime activities
  - Behavioral anxiety

- Night time activities and/or nightmares
(Patho) Physiological Influences

Circadian Physiology

Entrainment Effects
(Light, Food, Activity)
CHARACTERISTICS OF INSOMNIA
Diagnostic Criteria

- **Chronic insomnia disorder**
  - chronic sleep onset and/or sleep maintenance complaints with daytime impairment,
  - exceeds 3x/wk and >3 months
  - associated with clinically significant morbidity outcomes.

- **Short-term insomnia disorder**
  - Same basic complaints
  - Present <3 months
  - clinically significant sleep dissatisfaction or waking impairment.

- **Other insomnia disorders:**
  - rare cases that fail to meet the above criteria
  - have sufficient symptoms of insomnia to warrant clinical attention
  - may be used during the workup

- **Fatal Familial Insomnia**
# Sleep-related Differentials

## Chronic Insomnia
- delayed sleep-wake phase disorder
- Advanced sleep-wake phase disorder
- sleep-disruptive environmental circumstances
- chronic volitional sleep restriction (insufficient sleep syndrome)

## Short-term Insomnia
- circadian rhythm sleep-wake disorders
  - Jet lag
  - Shift work
Medical Differentials

**Medical Disease**
- Inadequately treated medical illnesses.
- Pain syndromes or disorders
  - Fibromyalgia
  - Arthritis
  - Neuropathies
  - Headache
- Drug or medication induced

**Specific disorders**
- PLMD, RLS
- Sleep apnea
- Menopause
- Respiratory dx
- Psychiatric illness
  - PTSD
  - Schizophrenia
  - Depression/anxiety
Special Considerations

General Population
- Psychiatric disease
- Sleep avoidance/PTSD
- Chronic pain
- Parkinson Disease
- Dementia
- End-of-life considerations

Women
- Pregnancy
- Secondary sleep disorders
- Menopause
Effect of Estrogen on Sleep

- Vasomotor symptoms are significantly reduced
  - Hot flashes
  - Night sweats

- Sleep was improved with HRT

- Other features were not affected in most individuals
  - Kantola Am J Ob Gyn 1998
Many patients use them
Not necessarily for insomnia

CAM & OTC AGENTS
OTC & CAM in insomnia

**OTC**
- H2 & other meds
- Herbs
- Exercise
- Passive body heating
- Low energy transmission therapy
- Alcohol
- Supplements

**CAM**
- Relaxation techniques
- Mind-body techniques
- Natural products
  - Melatonin/Valerian root
- Manipulative practices
- Homeopathy
- Acupuncture

Meoli - J Clin Sleep Med 2005
Bertisch – J Clin Sleep Med 2005
45.2% of adults with insomnia symptoms reported using ≥ 1 CAM therapy in the past year, compared with 30.9% of adults without insomnia (p < 0.0001)

<table>
<thead>
<tr>
<th>Therapy</th>
<th>With Insomnia Symptoms, (n = 4,415)</th>
<th>Without Insomnia Symptoms, (n = 18,943)</th>
<th>Chi-square p-value</th>
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<tbody>
<tr>
<td>Relaxation Techniques</td>
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<tr>
<td>Deep breathing exercises</td>
<td>997 (22.9)</td>
<td>2,082 (11.2)</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Progressive muscle relaxation</td>
<td>939 (21.5)</td>
<td>1,977 (10.6)</td>
<td>&lt; 0.0001</td>
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<td>Guided imagery</td>
<td>210 (5.2)</td>
<td>434 (2.4)</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Overall CAM</td>
<td>1,936 (45.2)</td>
<td>5,615 (30.9)</td>
<td>&lt; 0.001</td>
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<tr>
<td>Alternative Mind-Body Medicine</td>
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<td>Meditation</td>
<td>879 (20.7)</td>
<td>2,256 (12.0)</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Yoga</td>
<td>678 (16.0)</td>
<td>1,476 (7.8)</td>
<td>&lt; 0.0001</td>
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<td>Tai Chi</td>
<td>289 (6.9)</td>
<td>1,053 (5.8)</td>
<td>0.07</td>
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<tr>
<td>Natural Products*</td>
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<tr>
<td>Melatonin</td>
<td>60 (1.4)</td>
<td>207 (1.0)</td>
<td>0.056</td>
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<tr>
<td>Valerian</td>
<td>1,059 (24.4)</td>
<td>2,920 (16.2)</td>
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<td>Manipulative Practices</td>
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<tr>
<td>Chiropractic</td>
<td>766 (18.2)</td>
<td>2,374 (13.2)</td>
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<tr>
<td>Massage</td>
<td>464 (11.0)</td>
<td>1,389 (7.6)</td>
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<tr>
<td>Other CAM Practices</td>
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<tr>
<td>Homeopathy</td>
<td>270 (6.0)</td>
<td>620 (3.2)</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Acupuncture</td>
<td>121 (2.7)</td>
<td>174 (1.2)</td>
<td>&lt; 0.0001</td>
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</tbody>
</table>

Values are n (weighted populations%); CAM, Complementary and Alternative Medicine. *Natural products assessed within past three months. Not presented because overall prevalence < 1% or n < 50: Alexander Technique, Ayurveda, Biofeedback, Chelation, Energy Healing Therapy, Feldenkrais, Hypnosis, Naturopathy, Qigong, Stress Management Group, Curandero, Espiritista, Hierbero or Yerbera, Shaman, Native American Healer, Sobador.
Figure 2—Reasons for CAM use by insomnia symptom status

- With Insomnia Symptoms (n = 1,936)
- Without Insomnia (n = 5,615)

Prevalence (estimated %)

- General wellness/disease prevention: p = 0.45
- Improve or enhance energy: p = 0.18
- Treat specific medical condition: p < 0.001
- Friend, family, or co-worker recommend: p = 0.39
- Health care provider recommend: p < 0.001
- Improve or enhance immune function: p = 0.13
- Conventional treatments did not help: p < 0.001
- Conventional treatments too expensive: p < 0.001
Table 1 (continued)—Characteristics of adults by insomnia symptom status (n = 23,358)

<table>
<thead>
<tr>
<th></th>
<th>Without Insomnia (n = 18,943)</th>
<th>With Insomnia (n = 4,415)</th>
<th>Prevalence of Insomnia Symptoms %*</th>
<th>Chi-square p-value</th>
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</thead>
<tbody>
<tr>
<td>Alcohol Intake†</td>
<td></td>
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<tr>
<td>Abstainer</td>
<td>7,463 (38.7)</td>
<td>1,759 (38.7)</td>
<td>18.3</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Light</td>
<td>7,366 (41.6)</td>
<td>1,776 (42.7)</td>
<td>18.7</td>
<td></td>
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<tr>
<td>Moderate</td>
<td>2,491 (14.8)</td>
<td>498 (12.3)</td>
<td>15.7</td>
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<tr>
<td>Heavy</td>
<td>843 (4.9)</td>
<td>263 (6.2)</td>
<td>22.3</td>
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<tr>
<td>Physical Activity Level‡</td>
<td></td>
<td></td>
<td></td>
<td>&lt; 0.0001</td>
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<tr>
<td>Low</td>
<td>7,940 (39.9)</td>
<td>2,104 (47.0)</td>
<td>21.0</td>
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<tr>
<td>Moderate</td>
<td>2,879 (16.4)</td>
<td>692 (15.7)</td>
<td>17.6</td>
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<tr>
<td>High</td>
<td>7,755 (43.7)</td>
<td>1,562 (37.3)</td>
<td>16.0</td>
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<tr>
<td>Neuropsychiatric Symptoms</td>
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<tr>
<td>Mania/psychosis</td>
<td>65 (0.3)</td>
<td>91 (2.3)</td>
<td>64.0</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Frequently anxious</td>
<td>1,083 (5.7)</td>
<td>1,514 (34.1)</td>
<td>57.7</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Excessive daytime sleepiness</td>
<td>933 (4.9)</td>
<td>1,482 (34.2)</td>
<td>60.6</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Attention deficit disorder</td>
<td>339 (2.3)</td>
<td>217 (5.7)</td>
<td>35.9</td>
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<tr>
<td>Pain Syndromes</td>
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<tr>
<td>Dental pain/gum disease</td>
<td>2,077 (11.3)</td>
<td>1,172 (25.4)</td>
<td>33.3</td>
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<tr>
<td>Neck pain</td>
<td>1,784 (9.4)</td>
<td>1,319 (29.5)</td>
<td>41.1</td>
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<td>Jaw/ear pain</td>
<td>493 (2.7)</td>
<td>465 (10.2)</td>
<td>45.5</td>
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<td>Low back pain</td>
<td>3,858 (20.3)</td>
<td>2,205 (49.3)</td>
<td>35.0</td>
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<tr>
<td>Other Medical Conditions</td>
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<tr>
<td>Hypertension</td>
<td>4,894 (24.0)</td>
<td>1,942 (41.2)</td>
<td>27.6</td>
<td>&lt; 0.0001</td>
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<tr>
<td>Asthma</td>
<td>1,742 (9.3)</td>
<td>812 (18.5)</td>
<td>30.1</td>
<td>&lt; 0.0001</td>
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<td>Heartburn</td>
<td>3,244 (17.5)</td>
<td>1,798 (41.1)</td>
<td>34.3</td>
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<tr>
<td>Musculoskeletal strain</td>
<td>904 (5.1)</td>
<td>605 (14.7)</td>
<td>39.1</td>
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</tbody>
</table>

n = sample size; N = Population estimate. *NHIS complex sampling scheme allows for estimates of U.S. population. **%, estimate weighted to reflect population. †Alcohol intake: abstainer (< 12 drinks in lifetime), rare (< 1 drink/month in past year), light (≤ 3 drinks/week), moderate (> 3 and ≤ 7 drinks/ week for women, > 3 and ≤ 14 drinks/week for men), or heavy (> 7 drinks/week for women and > 14 drinks/week for men). ‡Physical activity levels: Vigorous = vigorous activity 2 times/week or moderate activity 4 times/week; moderate = vigorous activity 1 time/week or moderate activity 1–3 times/ week, sedentary = no vigorous or moderate activity/week.
Questionnaires
Actigraphy
Polysomnography

WORKUP & ROLE OF DIAGNOSTIC TESTING
Insomnia Treatment Paradigm

- Is insomnia present?
  - Acute or chronic?
- Could other sleep disorders explain the presentation?
- Are other medical disorders present that could cause the insomnia?
  - Are they co-morbid or causal?
- Are other concerns present that would impact therapy or the response to therapy?
Assessing SWSD

Sleep Logs & Pattern

<table>
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<tr>
<th>Date</th>
<th>YES</th>
<th>NO</th>
<th>9:00 PM</th>
<th>10:00 PM</th>
<th>11:00 PM</th>
<th>Midnight</th>
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</table>
Diagnostic Testing

Questionnaires

- Assessment of sleepiness
- Quality of life
- Depression
- Anxiety

Clinical Testing

- Actigraphy
- Polysomnography
- Multiple sleep latency testing

Problem: *The utility in patients with primary sleep disorders is not particularly good*

Problem: *The utility in patients with primary psych problems may cause difficulty in accurate diagnosis*
Primary
Secondary
NON-PHARMACOLOGIC TREATMENTS - CHANGES
Treatments - 1999

- Stimulus control (B)
  - Reassociate bedroom with sleep
- Progressive muscle relaxation (BC)
- Paradoxical intention (BC)
- Biofeedback (BC)
- Sleep restriction
  - Option in combined therapy
- Multimodal CBT (C)
Cognitive behavioral therapy (CBT):
- Primary treatment for chronic insomnia
- Effects last well beyond the end of treatment.
  - Other Delivery: Short term CBT, computer based CBT and telemental health CBT

Multi-modal CBT may include combinations of the following therapies:
- Relaxation training:
- Sleep hygiene training:
- Sleep restriction:
- Stimulus control:
CBT Basis

- CBT is based on two specific tasks:
  - cognitive restructuring, and
  - behavioral activation

- Is goal oriented and focuses on specific tasks

- Uses and educational paradigm
  - including Socratic questioning, role playing, imagery, guided discovery, and behavioral experiments.

- CBT is time limited. Typically, treatment with CBT lasts 14 to 16 weeks
Cognitive Behavioral Therapy

- In CBT, problems are broken down into five main areas:
  - situations
  - thoughts
  - emotions
  - physical feelings
  - actions

- CBT assumes these five areas are interconnected
CBT Variants

- Rational Emotive Therapy
- Dialetical Behavioral Therapy
- Acceptance and Commitment Therapy
- Stress Inoculation Therapy
- Mindfulness Based Stress Reduction
- Exposure Therapy **
**Table 1— Comparison of Properties of Hypnotics, CBT, and CBT+Hypnotics**

<table>
<thead>
<tr>
<th>Property</th>
<th>Hypnotics</th>
<th>CBT</th>
<th>Hypnotics +CBT</th>
<th>Non-Hypnotic Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence Base Supporting Efficacy and Safety in Insomnia Treatment</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>---</td>
</tr>
<tr>
<td>Speed of Response</td>
<td>+++</td>
<td>---</td>
<td>+++</td>
<td>?</td>
</tr>
<tr>
<td>Duration of Benefit in Responders</td>
<td>- (1)</td>
<td>+++</td>
<td>+++(2)</td>
<td>- (1)</td>
</tr>
<tr>
<td>Availability in Clinical Practice</td>
<td>+++</td>
<td>---</td>
<td>+++</td>
<td>+</td>
</tr>
<tr>
<td>Side-Effects</td>
<td>-- (3)</td>
<td>+++</td>
<td>-- (3)</td>
<td>---</td>
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<tr>
<td>Abuse Risk</td>
<td>- (5)</td>
<td>+++</td>
<td>- (5)</td>
<td>+++</td>
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<tr>
<td>Dependence</td>
<td>+ (6)</td>
<td>+++</td>
<td>+ (6)</td>
<td>?</td>
</tr>
<tr>
<td>Patient Responsibility to Change Behavior</td>
<td>+++</td>
<td>---</td>
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<td>+++</td>
</tr>
<tr>
<td>Evidence of Efficacy for Improving Total Sleep Time</td>
<td>+++</td>
<td>---</td>
<td>+++</td>
<td>---</td>
</tr>
<tr>
<td>Use in Drug Abuse Prone Individual</td>
<td>+++</td>
<td>---</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>Effective irrespective of the presence of behavioral targets</td>
<td>+++</td>
<td>---</td>
<td>+++</td>
<td>?</td>
</tr>
</tbody>
</table>

*The amount of time (mean +/- one standard deviation) available for analysis during the baseline portion of the evening was 137 +/- 42 minutes, and the amount of time available for analysis at the ‘optimal level of CPAP’ was 123 +/- 61 minutes.

1. Following discontinuation of medication, some studies suggest that insomnia returns although we have little data addressing this issue and lack data on when to optimally discontinue medications. We have little data on nightly long-term treatment of insomnia with medications. In one study, there is evidence of sustained efficacy up to 1 year.16

2. Where medications use is not contingent on sleep, there appears to be a sustained benefit following medication discontinuation,7,8 but not when taken on a contingent basis.12

3. Hypnotics are relatively side-effect free, however the most common side-effects include amnesia, sedation, motor impairment;

4. Vary by medication and frequently include sedation, weight gain, sexual side-effects, sometimes significant risks in overdose, but most importantly, because of lack of studies in insomnia patients, their safety and side-effects when used in this population are unknown.

5. Recent data suggest that in the FDA approved dosages abuse risk is low and abuse is limited to an drug-abuse prone subgroup of the population.
Management Principles
Combined approach

INSOMNIA INTERVENTIONS
Short-term Insomnia:
Management Principles

Non-pharmacologic Interventions
- Remove precipitating events
- Avoid development of behaviors
- Sleep hygiene

Pharmacologic Interventions
- Early treatment
  - often very effective and may decrease the likelihood of chronic insomnia developing
- Use lowest effective dosage
- <3 week duration
- Intermittent dosing may be effective
Chronic Insomnia:

Management Principles

Treat comorbid conditions

Treat other sleep disorders

- e.g., OSA, circadian rhythm disorders

Staged approach (insomnia)

- Basic measures (possibly with sCBT) directed at maintenance behaviors
  - Sleep Hygiene
  - Sleep restriction - Stimulus control
  - Cognitive-behavioral interventions
  - Relaxation techniques

- Multi-modal CBT
Sleep Hygiene

- Maintain regular sleep times
  - Go to bed when tired
  - Arouse at the same time each day
- Avoid caffeine
- Avoid going to sleep intoxicated
- Exercise regularly but not within 3 hours of going to bed
- Do not sleep late to make up for lost sleep
- Maintain a comfortable sleeping environment
- Sleep enough to feel rested & refreshed
- Upon awakening increase the ambient light
- Avoid daytime napping
  - If you nap, keep the nap duration <30 min
Bright Light Therapy

**Evening light**
Prior to bedtime will delay sleep onset

**Morning light**
First thing in the a.m. moves sleep to an earlier time
Summary & Patient Status
Additional References

- AASM sleep recs
- Treatment guidelines - AASM
- Epidemiology of insomnia
- End of Life care (EPEC ™)
- CBT by non-specialists