Gold Standards for Insomnia Management

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Learning Objectives

- Understand the basics of normal sleep and the symptoms and causes of insomnia.
- Review the effectiveness and side effects of sleeping pills to treat insomnia.
- Discuss the basis and techniques for cognitive behavioral therapy for insomnia (CBTI).
- Consider the resources available for support of people with insomnia.

What Is Insomnia?

- Difficulty falling or staying asleep or sleep that is not refreshing in the absence of another sleep disorder.
- The ICSD-3 recognizes 2 sub-types:
  - **Chronic**: occurs at least 3 times per week for >3 months
  - **Short-term**: unspecified frequency for <3 months

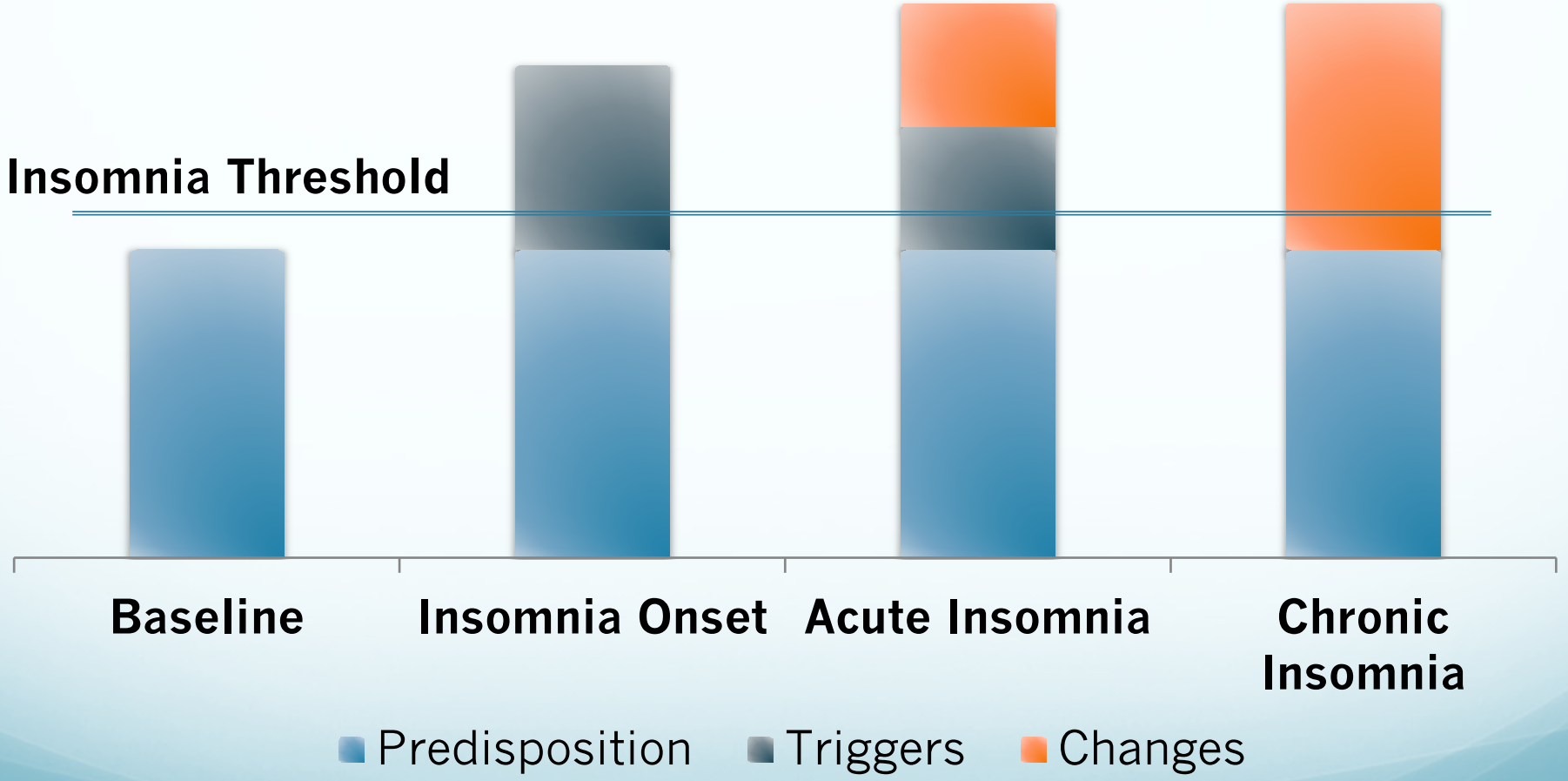
Common Symptoms Associated with Insomnia

- Fatigue > sleepiness
- Decreased energy
- Poor concentration
- Mood problems (anxiety or depression)
- Headache or pain complaints
- Malaise (feeling unwell)
- Dyspepsia (upset stomach)

How Common is Insomnia?

- Most common sleep disorder complaint encountered in the primary care setting.
- Prevalence estimated to be 10% of adults.

How Chronic Insomnia Develops



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What Causes Insomnia?

- Predisposition (genetics, arousal)
- Environmental
- Psychological or Psychosocial
- Circadian rhythm disorders
- Other sleep disorders:
  - Sleep-disordered breathing
  - Restless legs syndrome
  - Parasomnias
  - Narcolepsy
- Medical or psychiatric disorders
- Medication or substance use
- Poor sleep hygiene (conditioning)

Image source: https://www.eheandme.com/images/newsletters/sleepapnea.jpg

Consequences of Insomnia

- Insomnia is a known risk factor for:
  - Depression
  - Anxiety
  - Other psychiatric disorders (bipolar, ADHD, schizophrenia)
  - Alcohol or drug abuse
  - Suicide
  - Chronic pain
  - Social and occupational dysfunction

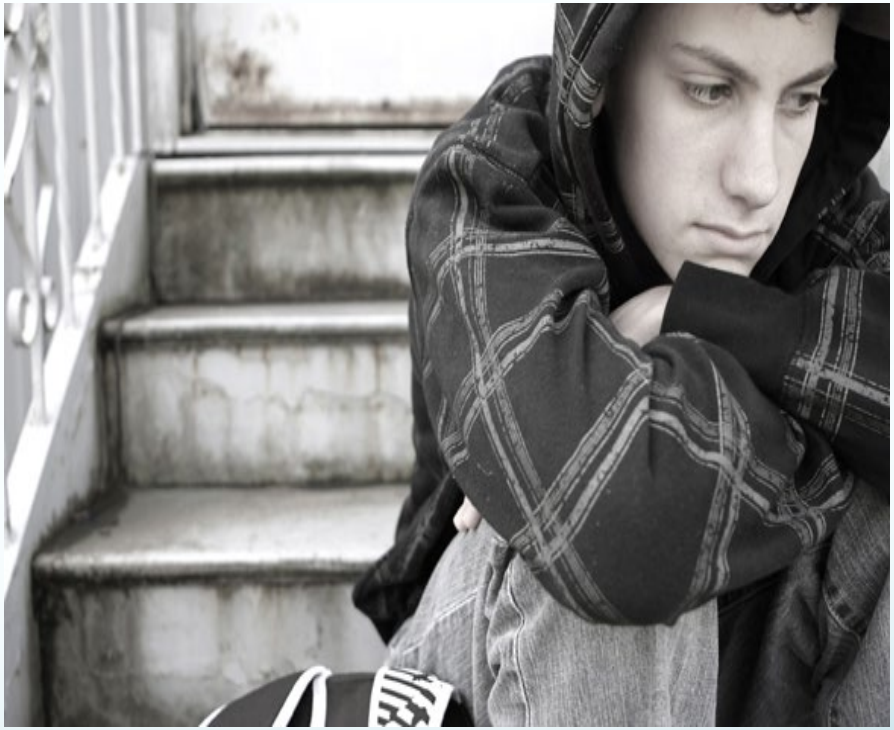


Image source: http://3.bp.blogspot.com/-lK7B8P-d2xg/TqxgM5Xi_lI/AAAAAAAAEII/iXVoYgORdY4/s1600/depression%2Bin%2BAspergers%2Bteens.jpg

How to Treat Insomnia

- Sleep Hygiene
- Sleeping Pills
- Cognitive Behavioral Therapy for Insomnia (CBTI)

National Guidelines

- "ACP recommends that all adult patients receive cognitive behavioral therapy for insomnia (CBT-I) as the **initial treatment** for chronic insomnia disorder."

-Annals of Internal Medicine (July 19, 2016)

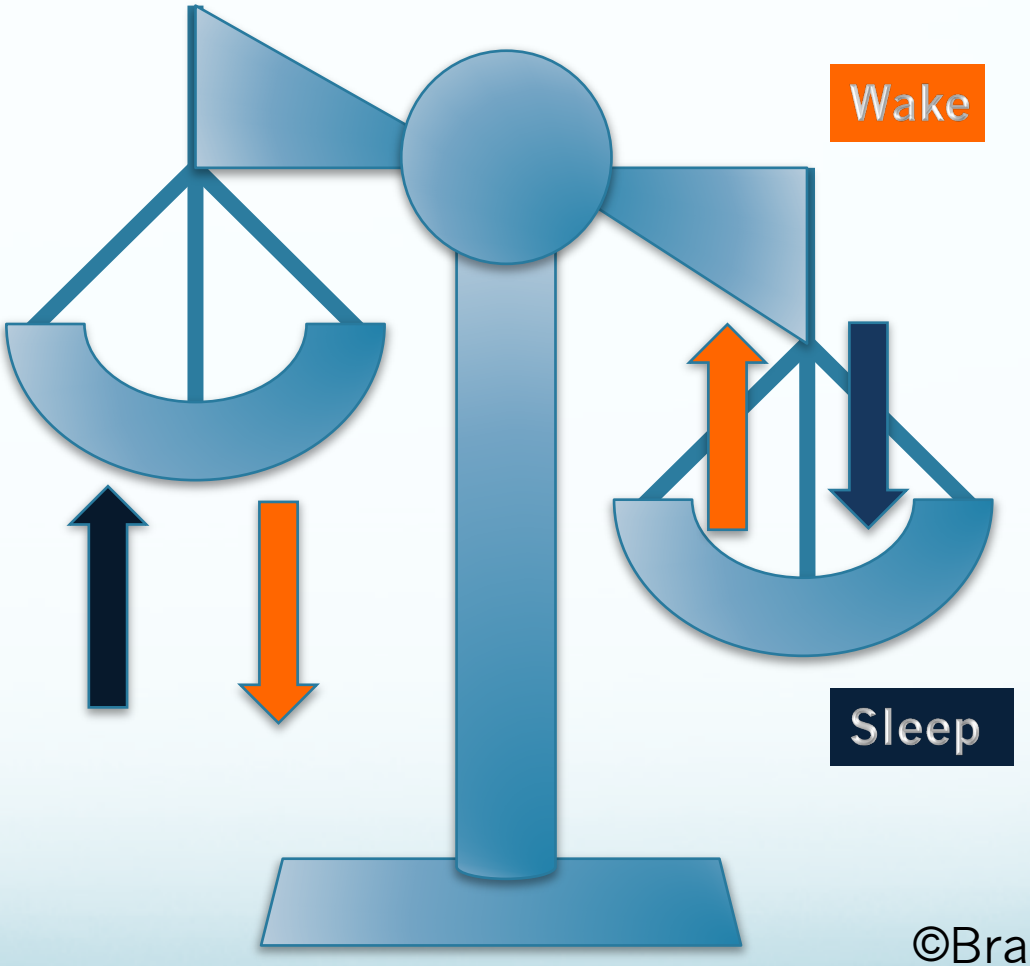
Prevalence of Sleeping Pill Use

- According to the CDC, between 2005 and 2010 about 4% of adults 20 and older had used a sleeping pill in the previous month.
- IMH Health tracks drug data and reports 59 million sleeping pills were prescribed in 2012, up from 56 million in 2008.
- Market research revealed a tripling in sleep aid prescriptions from 1998 to 2006 among young adults aged 18-24.

The Sleep-Wake Balance

Sleep

*Melatonin
*Galanin
*Gamma-aminobutyric acid (GABA)
*Adenosine
*Cytokines (IL-1β, IL-6, TNFα, etc.)



Wake

*Histamine
*Orexin/Hypocretin
*Norepine-phrine
*Acetylcho-line
*Serotonin
*Dopamine

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Overview of Sleeping Pills

- **Major classes:**
  - *Antihistamines* (Diphenhydramine, Doxylamine)
  - *Barbiturates* (Phenobarbital)
  - *Benzodiazepines* ("-pam" or "-lam" generics)
  - *Antidepressants* and *Antipsychotics* (Trazodone, Doxepin; Quetiapine)
  - *Non-benzodiazepines* or *benzodiazepine receptor agonists* (Zolpidem, Eszopiclone, Zaleplon)
  - *Melatonin Agonists* (Ramelteon, Tasimelteon)
  - *Orexin Antagonist* (Suvorexant)

Other Natural Remedies

- Melatonin
- Tryptophan
  - Converted into serotonin and then melatonin
- Serotonin
- GABA
  - Slows activity of neurons
- Valerian root
  - May help anxiety
- Kava kava
  - May interact with GABA, serotonin, and dopamine
  - Hepatotoxicity risk
- Chamomile
  - May help anxiety
- Marijuana
  - Affects cannabinoid receptors of the central nervous system
  - Smoked or ingested
  - Contains 100+ types of cannabinoids – delta-9 tetrahydrocannabinol (THC) and cannabidiol (CBD) occur in the largest amount
  - CBD seems to have greater impact on anxiety and sleep

Effectiveness of Sleeping Pills

	Average Reduction in Sleep Onset Latency	Average Reduction in Time Spent Awake at Night	Increase in Total Sleep Time
Zolpidem	5-12 minutes	25 minutes	29 minutes
Suvorexant	8 minutes	16-28 minutes	10 minutes
Diphenhydramine	8 minutes	--	12 minutes
Eszopiclone	14 minutes	10-14 minutes	28-57 minutes
Melatonin	9 minutes	--	--
Ramelteon	9 minutes	--	--
Zaleplon	10 minutes	--	--
Trazodone	10 minutes	8 minutes	--

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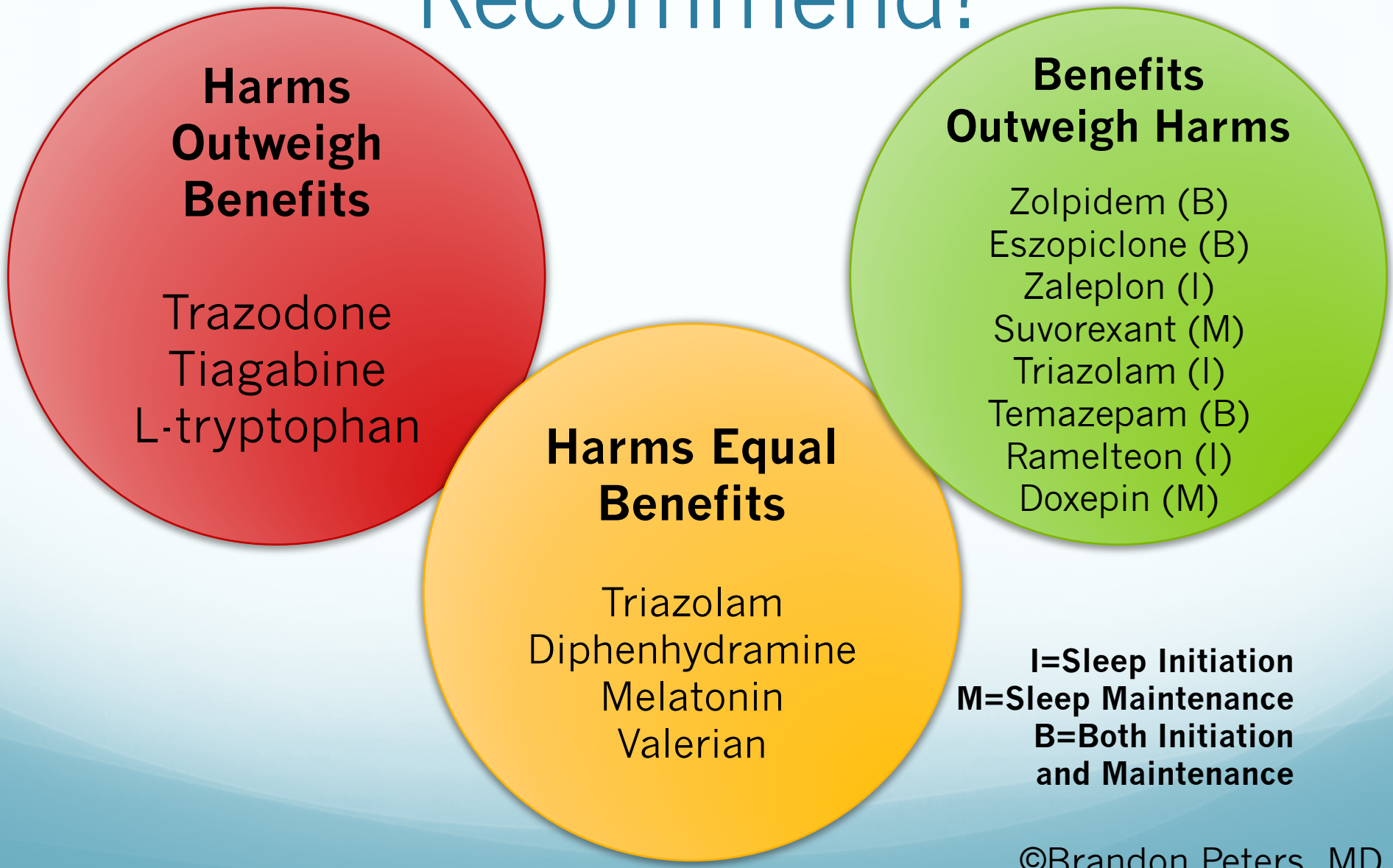
What Would the AASM Recommend?



I=Sleep Initiation
M=Sleep Maintenance
B=Both Initiation and Maintenance

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Problematic Sleeping Pills

- Amnesia: How Hypnotics Work
- Parasomnias
- Driving Impairment (FDA)
- Tolerance
- Dependence
- Rebound Insomnia

Image source: http://sleepdisorders.dolyan.com/wp-content/uploads/2011/10/05_sleeping-pills.jpg

The Dark Side of Sleeping Pills

- BMJ study from 2012 showed people taking sleeping pills were 5x as likely to die over 2 ½ years compared to those who did not.
- Increased risk of falls and hip fractures.
- An association has been noted between heavy use and a higher incidence of cancer.
- Overall increased mortality has been noted in multiple studies.
- Recent studies suggest the long-term use of antihistamines and benzodiazepines may lead to an increased risk of dementia.

Summarizing Sleeping Pills

- Don’t work very well
- May fail to treat the cause of the symptoms
- Have serious short-term side effects
- Have serious long-term side effects
- Are not recommended by national academies
- Can be avoided with insomnia therapy

Cognitive Behavioral Therapy for Insomnia (CBTI)

- Structured program to reinforce changes and defuse elements of psychophysiological insomnia.
- Address thoughts, emotions, and social pressures.
- Program lasts 4-6 weeks with long-term skills provided.
- Often taper sleeping pills.

Image source: https://expertbeacon.com/sites/default/files/avoid_the_cycle_of_chronic_insomnia_poor_sleep_and_exhaustion.jpg

Basic Elements of CBTI

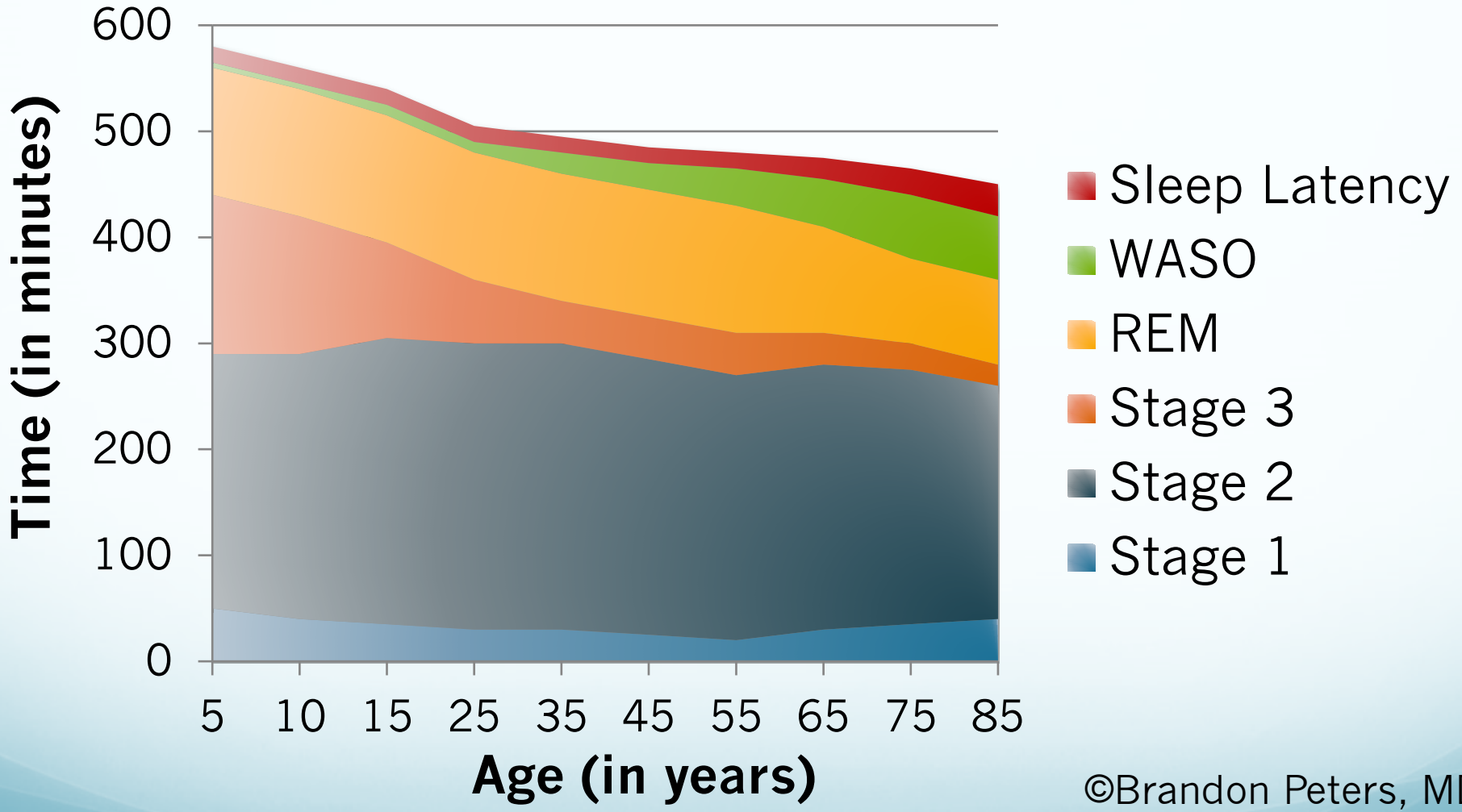
- Provides sleep education and targeted changes based on sleep logs that resolve insomnia and teach a skillset for long-term benefit.
  - Sleep Consolidation
  - Buffer Zone/Artificial Closure to the Day
    - Unwinding before bedtime
  - Stimulus Control
    - Breaking the association between wakefulness and the bed
  - Cognitive Restructuring
  - Scheduled Worry Time
    - "And where care lodges, sleep will never lie."

      -William Shakespeare
  - Relaxation Techniques
    - Breathing, progressive muscle relaxation, guided imagery, and mindfulness

Case 1

- 75 year old retired woman with trouble falling asleep and prolonged time awake at night
- She is a widow and has no bed partner
- Goes to bed at 9 PM and it takes 1 hour to fall asleep. Wakes 2-3 times at night and spends another 2 hours lying awake in bed. Gets up at 7 AM without an alarm.

Sleep Changes in Aging



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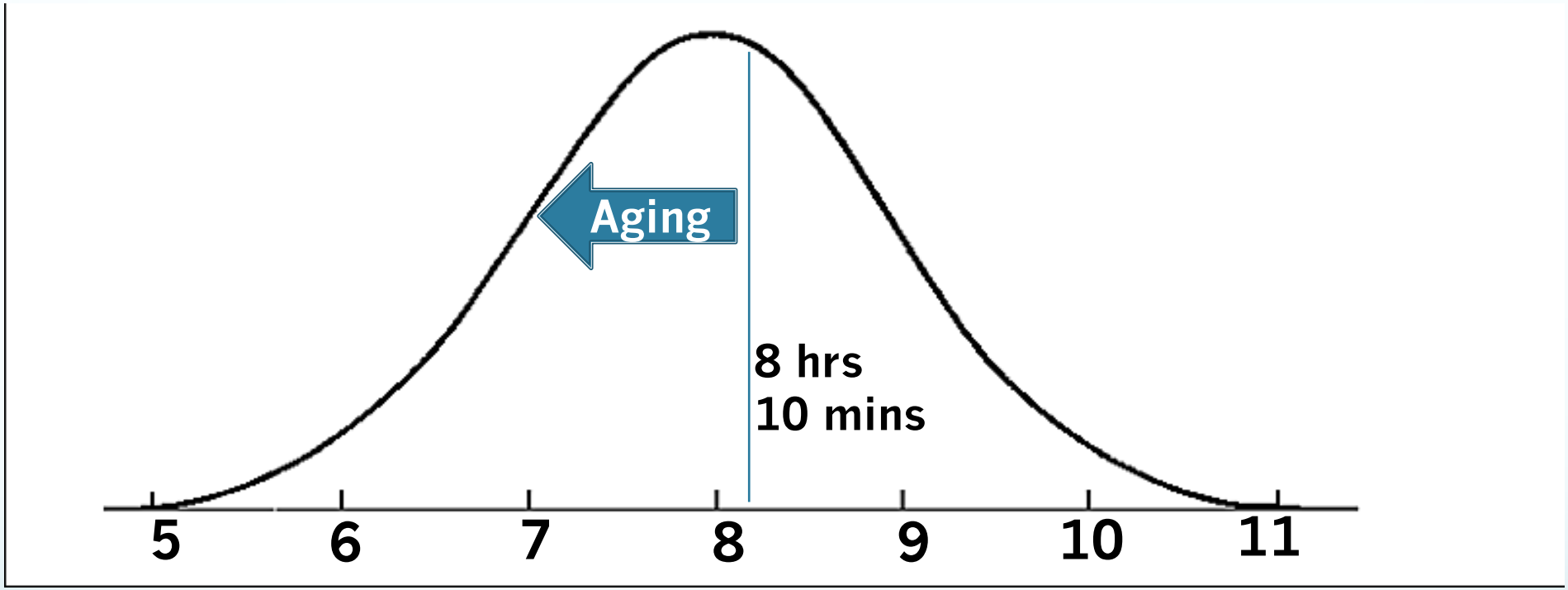
Average Sleep Needs



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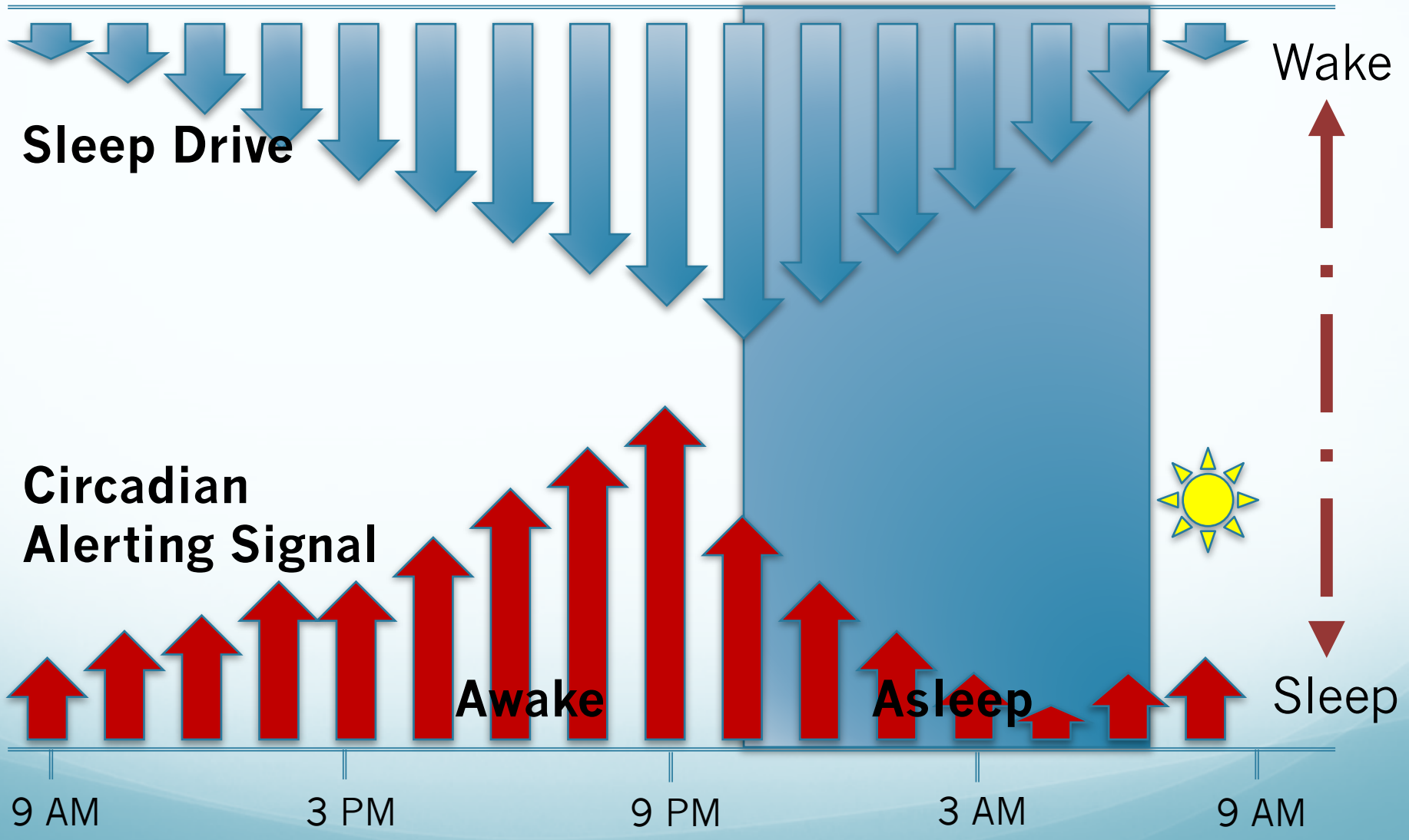
Optimizing Sleep Signals



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Sleep Log

CBTI Week #_____ Today's Date	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___	___/___/___
1. List any sleep aids you took (medication name, dose, time taken).							
2. What time did you get into bed?	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM
3. What time did you turn out the lights and try to go to sleep?	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM	___:___ PM/AM
4. How long did it take to fall asleep?	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)
5. How many times did you wake?	_____times	_____times	_____times	_____times	_____times	_____times	_____times
6. In total, how long spent awake?	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)
7. What time did you finally awaken?	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM
8. What time did you get out of bed?	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM	___:___ AM
9. In total, how long did you sleep?	_____hour(s)	_____hour(s)	_____hour(s)	_____hour(s)	_____hour(s)	_____hour(s)	_____hour(s)
10. What was the quality of your sleep (1=very poor … 5=very good)?							
11. How long did you nap yesterday?	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)	_____min(s)
12. Comments (if applicable):							

Sleep Consolidation

Time in Bed = 8 hours, Time asleep = 6 hours, Sleep efficiency = 75%

Time in Bed = 6 hours, Time asleep = 5.5 hours, Sleep efficiency = 92%

S = Sleep
W = Wake

And eventually…

Time in Bed = 7 ½ hours, Time asleep = 7 ¼ hours, Sleep efficiency = 98%

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Stimulus Control

- Simple Conditioning
- Pavlovian Response
- How to Apply:
  - If awake for more than 15-20 minutes, by estimate, get up.
  - Leave the bedroom.
  - Do something relaxing and return to bed when feeling sleepy.
- Further Builds Sleep Drive

Case 2

- 26 year old man with 6 months of difficulty sleeping after moving and starting a stressful new tech job.
- Often works late and doesn't have a lot of time to unwind before bed.
- Complains of mind racing in bed at night.
- Worries about how his sleep may impact his job performance.
- Acknowledges other generalized anxiety.

Stress Management

- Exercise/Yoga
- Go for a walk
- Spend time in nature
- Prayer/Meditation
- Mindfulness
- Self-hypnosis
- Deep breathing
- Progressive muscle relaxation
- Guided imagery
- Take a nap
- Music
- Journaling
- Friends/Family
- Sex
- Laughter
- Hobbies
- Pets
- Massage
- Aromatherapy
- Vacation

Buffer Zone

- 30-60 minutes to relax before bedtime
- Artificial closure to the day
- Engage in relaxing activities (reading, watching TV or a movie, listening to music, etc.)
- Minimize exposure to artificial screen light
- Night owls may require closer to 2 hours

Scheduled Worry Time

- Setting time to productively review sources of stress and worry
- Writing a list down and revisiting it daily
- Brainstorming ideas to resolve sources of stress
- Deferring any anxious thoughts at night
- Letting go what cannot be controlled

Cognitive Restructuring

- Challenging false beliefs with rational analysis
- Identify:
  - Thought
  - Associated mood
  - Pros/Cons
  - Alternate Thought
  - Reassess Mood
- Ex: “If I can’t sleep, I won’t be able to function tomorrow.”

Mindfulness

- Beginner's mind
- Non-striving
- Letting go
- Non-judging
- Acceptance
- Trust
- Patience

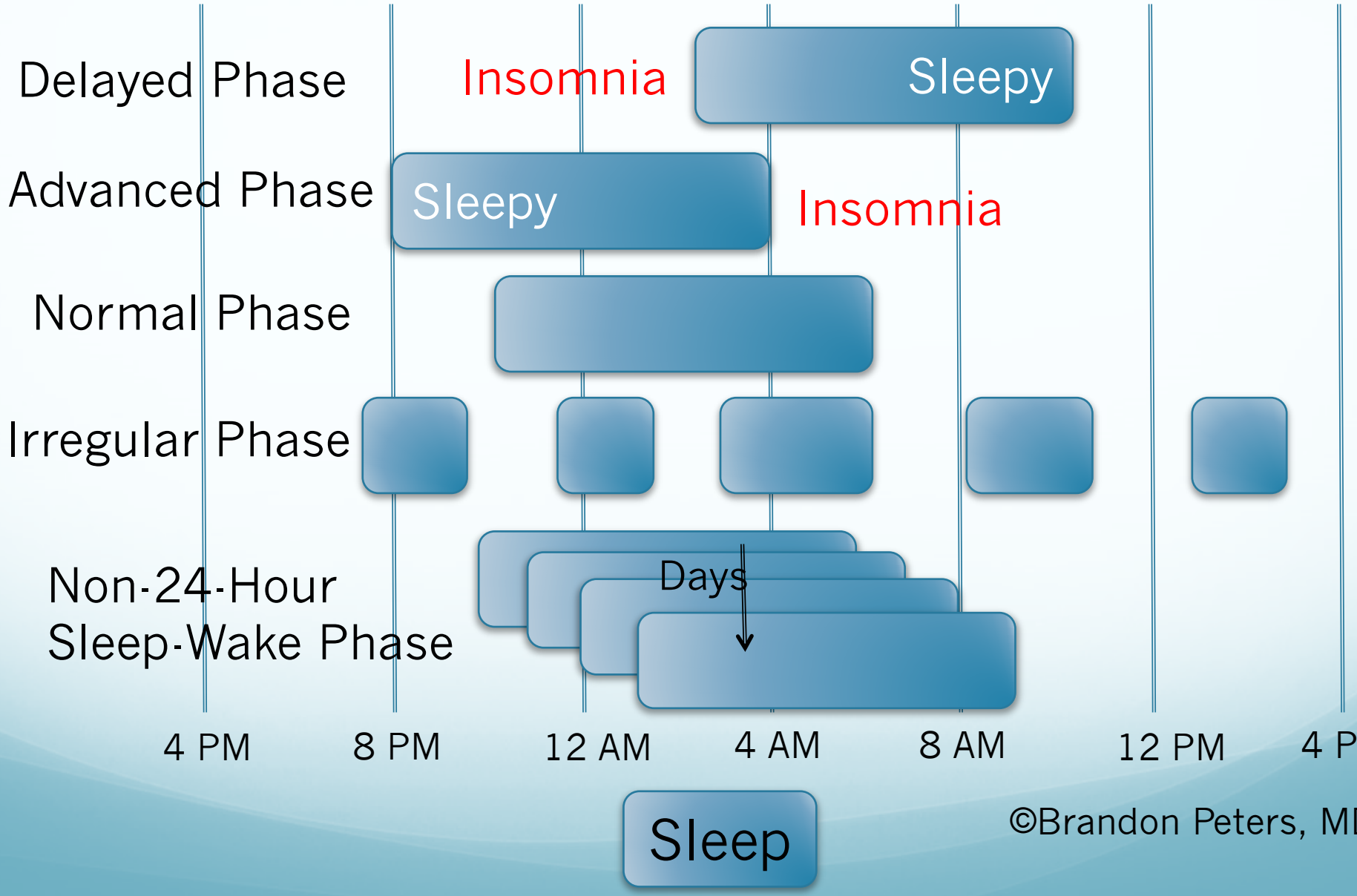
Relaxation Techniques

- Cognitive distraction can enhance the ability to fall asleep
- Breathing
  - Focus on movement of air and temperature variation with breathing
  - Start from tip of nose and work toward lungs
  - Divide breaths into equal thirds
- Muscle Relaxation
  - With a 5-3-1 second pattern, tighten up groups of muscles, from the toes to the face
- Guided Imagery
  - Recall a favorite vacation memory or relaxing experience and recreate it using the senses
  - Recall the details of a recent dream

Case 3

- 66 year old man with nearly 2 years of difficulty falling asleep after retiring at age 65
- Wife is upset that he stays up late watching TV until 2 AM and won't get up in the morning until after 10 AM without his alarm
- If he goes to bed with her, it can take hours to fall asleep and it is very difficult to wake in the morning earlier
- Occasionally taking naps
- He recalls having similar problems when he was a teenager

Circadian Rhythm Sleep Disorders



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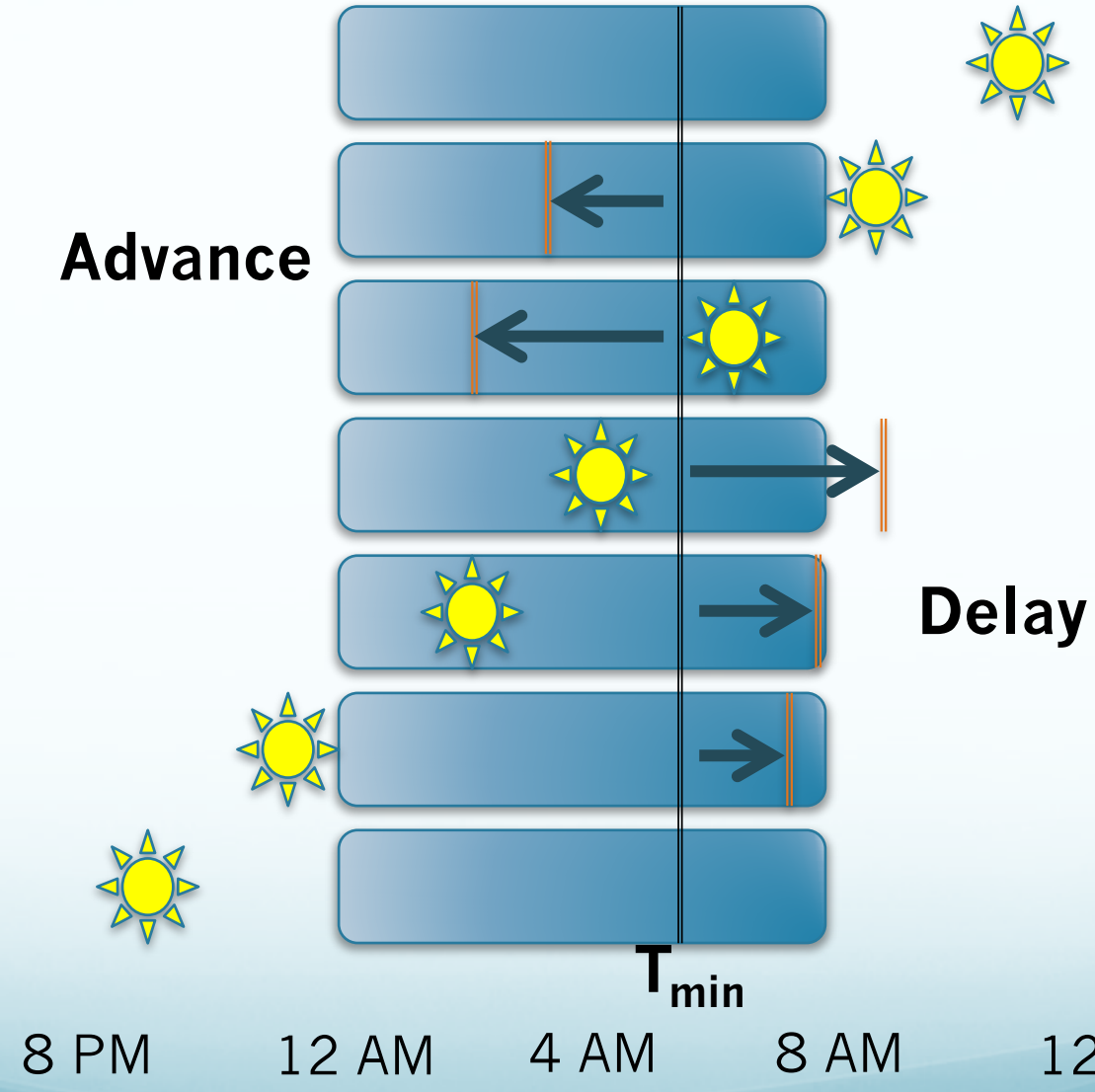
Circadian Rhythm Basics

- Coined by Franz Halberg in 1959, the term **circadian** (L. *circa*=about, *dies*=day) describes ~24-hour cycles
- Light is the primary synchronizer
- Master clock lies in the suprachiasmatic nucleus (SCN) of the hypothalamus
- Couples numerous body processes to the timing of light and darkness:
  - Sleep/Wakefulness
  - Metabolism
  - Core body temperature
  - Cortisol levels
  - Plasma melatonin levels
  - Other hormones

Circadian Rhythms in Humans

- Interplay between elegant internal clock machinery (known genetics since 1994) and external time cues.
- **Tau**
  - In constant conditions, the genetically determined period of biological rhythms is revealed.
  - It is typically >24 hours in length, but it may be shorter.
- **Zeitgebers** (German “time-givers”)
  - External signals that realign the innate rhythmicity to synchronize with the actual geologic patterns of light and darkness.
- Important implications for clinical treatment of circadian disorders, other disease, and medical therapies.

The Effects of Light Therapy



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Case 4

- 53 year old menopausal woman with increased difficulty sleeping through the night in the past year
- Improving night sweats, but wakes more often to urinate than before, often every 2-3 hours
- Bed partner observes intermittent snoring after weight gain
- Wears a mouth guard for bruxism
- Sleeping pills don't seem to relieve the awakenings

Who is at risk for sleep apnea?

Image source:
http://www.slate.com/content/dam/slate/articles/double_x/2013/06/130617_XX_Smiling.jpg.CROP.original-original.jpg

Sleep Apnea Symptoms/Signs

- Snoring
- Witnessed apnea
- Gasping/choking
- Dry mouth
- Unrefreshing sleep
- Excessive daytime sleepiness
- Naps/Dozing
- Sleep-maintenance insomnia
- Restless sleep
- Nocturia
- Bruxism
- Nocturnal heartburn
- Palpitations
- Night sweats
- Sleep-related behaviors
- Congestion/Post-nasal drip
- Morning headaches
- Cognitive complaints (short-term memory, concentration, attention)
- Mood complaints (anxiety, depression, irritability)
- Chronic pain
- Hypertension
- Insulin resistance/Diabetes

Signs of Obstructive Sleep Apnea

- Overweight/Obesity
- Neck size (>16” F, >17” M)
- Hypertension
- Nasal passage
  - Narrowness
  - Septum Deviation
  - Turbinate Hypertrophy

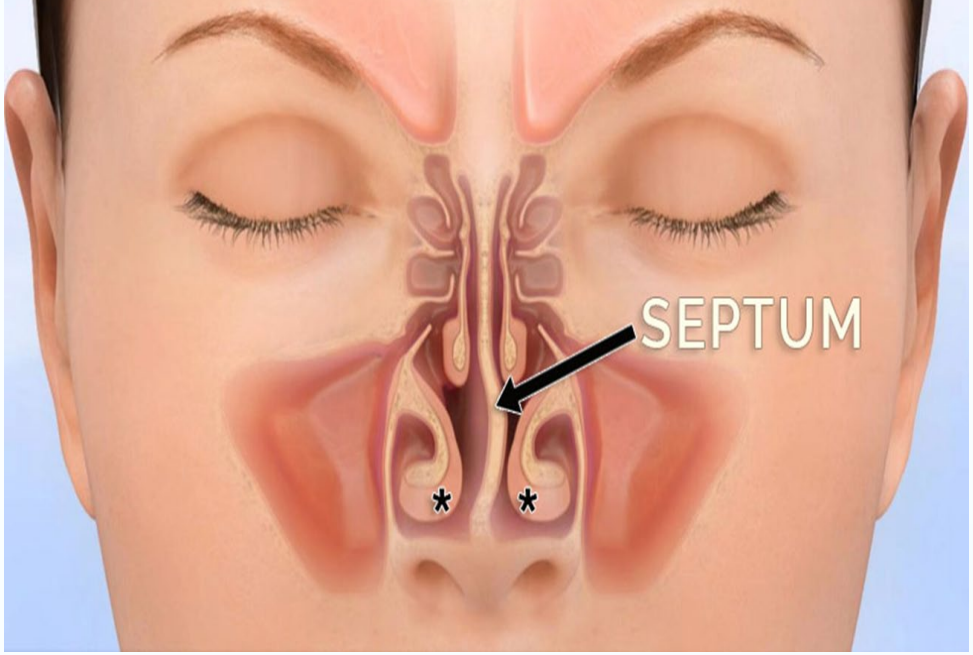
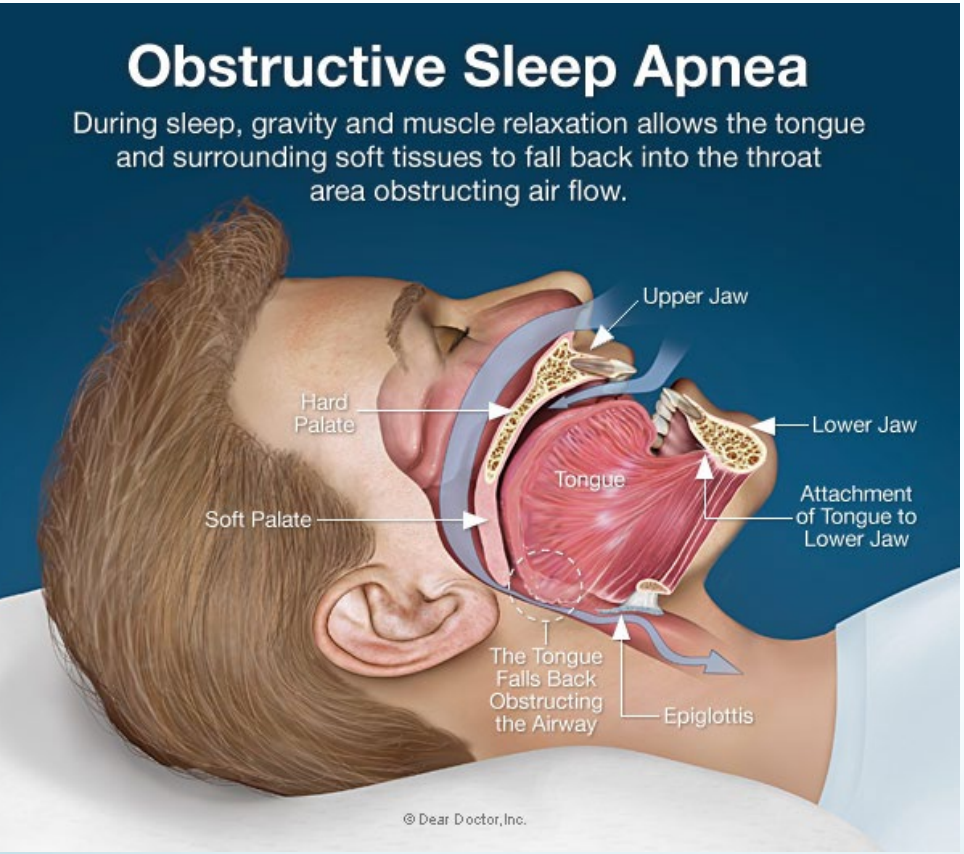


Image sources: http://www.perforatedseptum.com/wp-content/uploads/2013/04/perforated_septum_treatment.jpg
http://visagecenter.com/wp-content/uploads/2013/09/Valve-Collapse.jpg

Further Physical Examination



- Oropharynx (Soft Tissues)
  - Palate
  - Uvula
  - Tonsils
  - Crowding
  - Tongue Size
- Craniofacial (Bony Structures)
  - Jaw Structure
  - Bite
  - Teeth (Dentures, Wear)

Image source:
http://www.deardoctor.com/images/ddwc/features/sleep-disorders/obstructive-sleep-apnea.jpg

It's Anatomy Plus ...

- Risks
  - Baseline Anatomy
  - Aging (F: Menopause)
  - Sleep Position
  - **REM Sleep**
  - Alcohol and Rx
  - Allergies
  - Other Factors

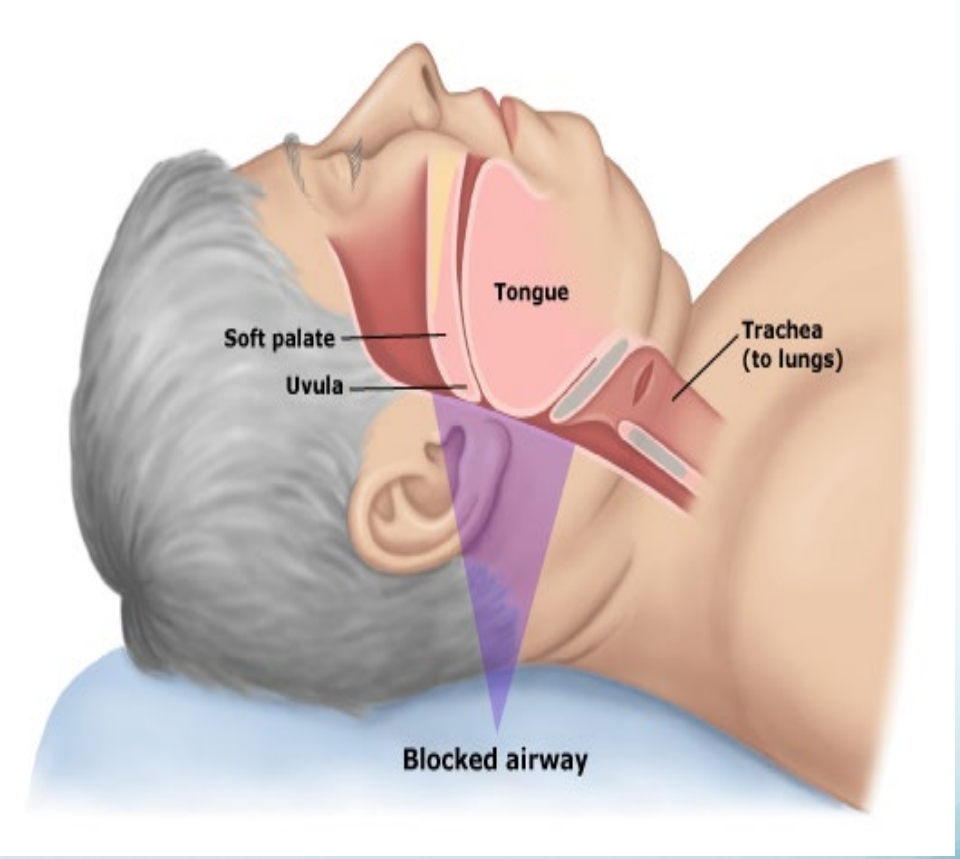


Image source:
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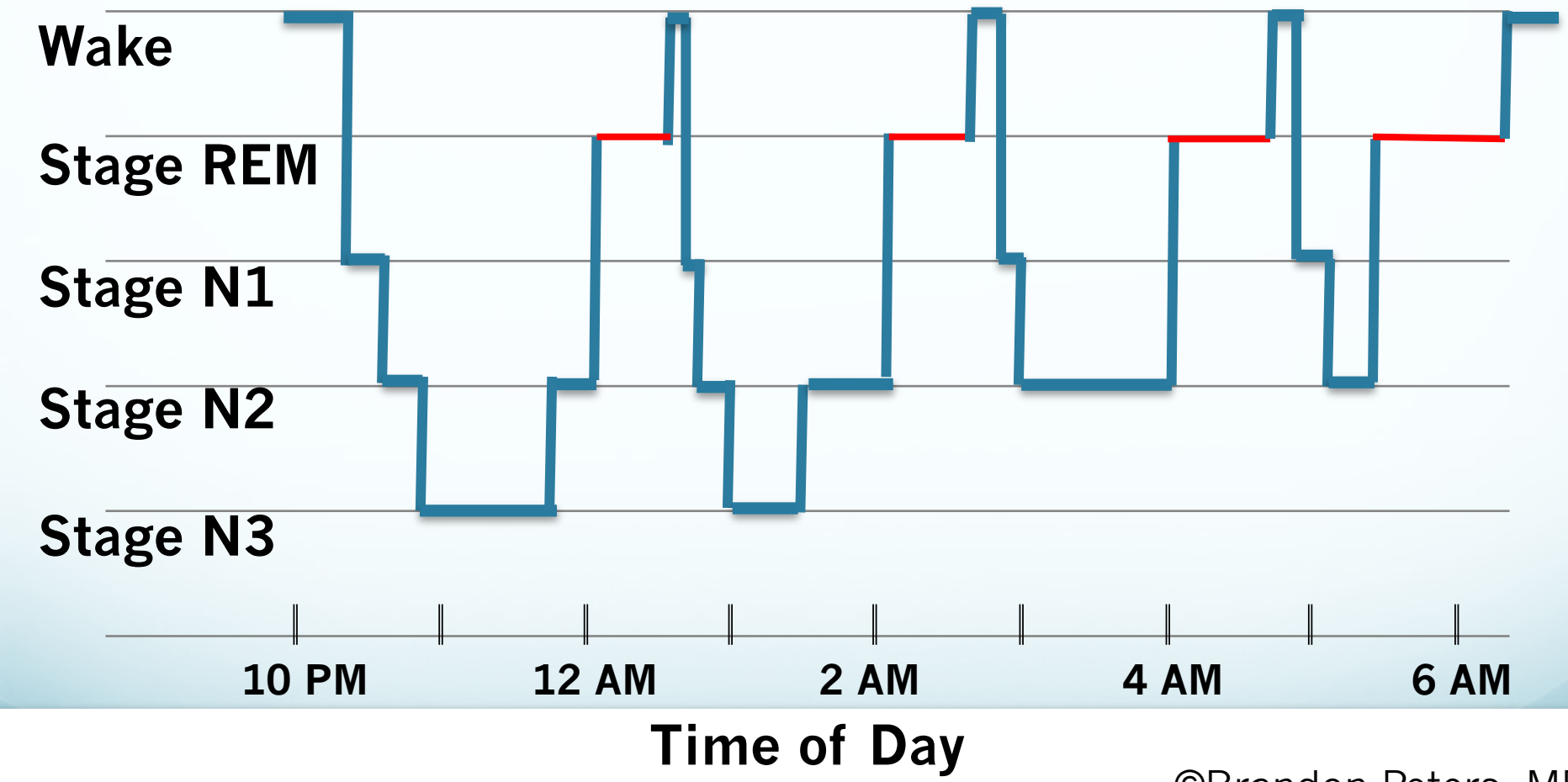
Idealized Sleep Pattern



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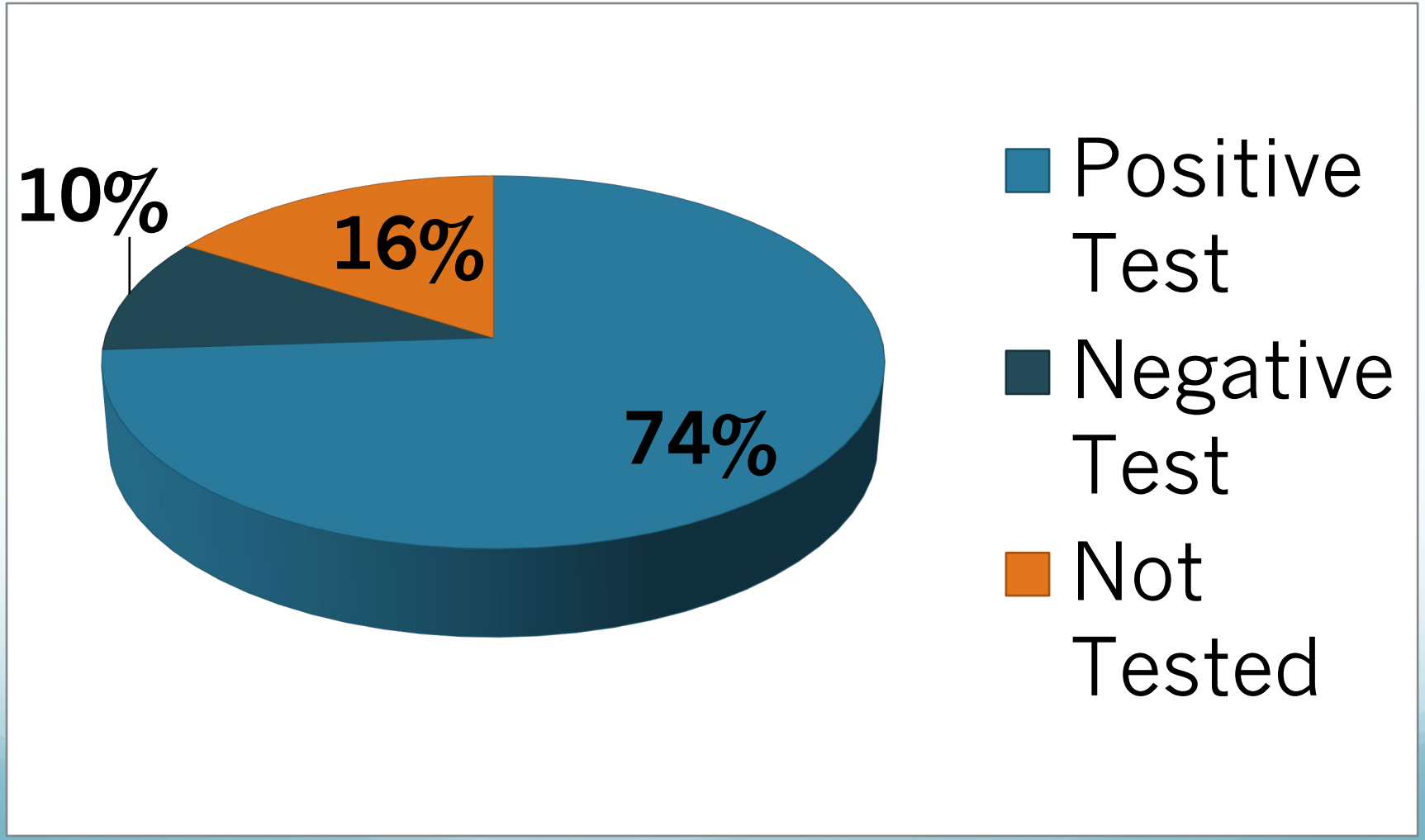
Sleep Apnea in Insomnia



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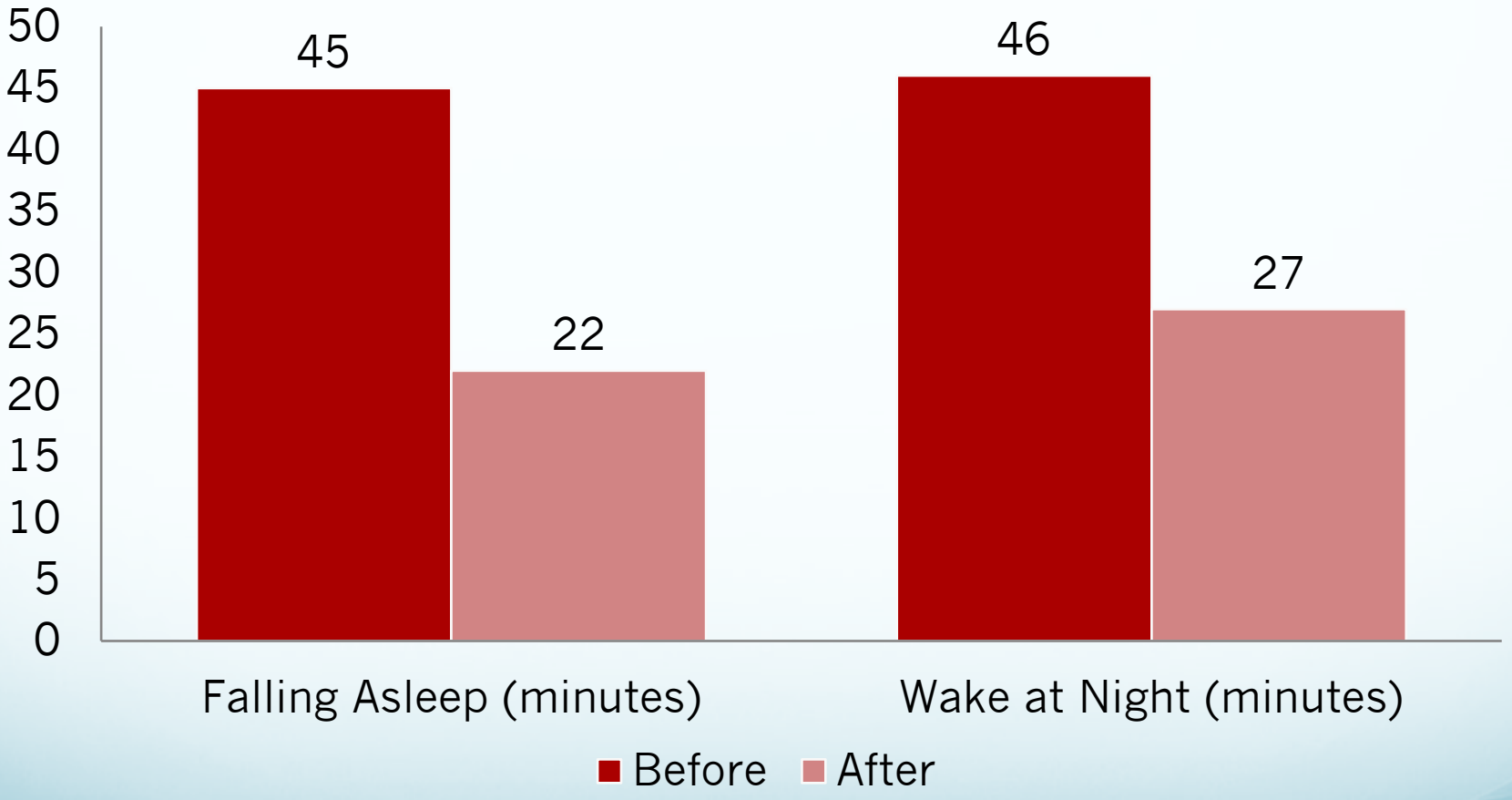
Access to Insomnia Therapy

- Personal sessions with a trained psychologist
  - Telemedicine
- Workshops
- Online courses
  - Insomnia Solved*
  - Sleepio
- Books
  - Say Good Night to Insomnia (Jacobs)
  - Cognitive Behavioral Treatment of Insomnia: A Session-by-Session Guide (Perlis)
  - Sleep Through Insomnia* (Peters)
  - The Sleep Solution (Winter)
- App (Adjunctive Tool)
  - CBT-i Coach (Veterans Administration)

*Author conflict

Response to CBTI



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Everyone with chronic insomnia on sleeping pills should be referred to a comprehensive sleep disorders center for further management.

Summary of Insomnia

- Chronic insomnia consists of difficulty initiating or maintaining sleep that lasts at least 3 months.
- Insomnia is due to a variety of causes, many disruptive of the sleep drive or circadian rhythm.
- Sleep apnea, circadian disorders, and poor sleep hygiene should be considered.
- The consequences of insomnia are quite serious and may significantly reduce quality of life.
- Sleeping pills are minimally effective with serious side effects and are no longer recommended as first-line therapy.
- Preferred treatment is CBTI and resources are readily accessible via referral to the sleep disorders center.

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Questions?

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