Optimal Treatment for Anxiety & Mental Health

Introduction to Cognitive Behavioral Therapy for Insomnia (CBT-I)

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Outline

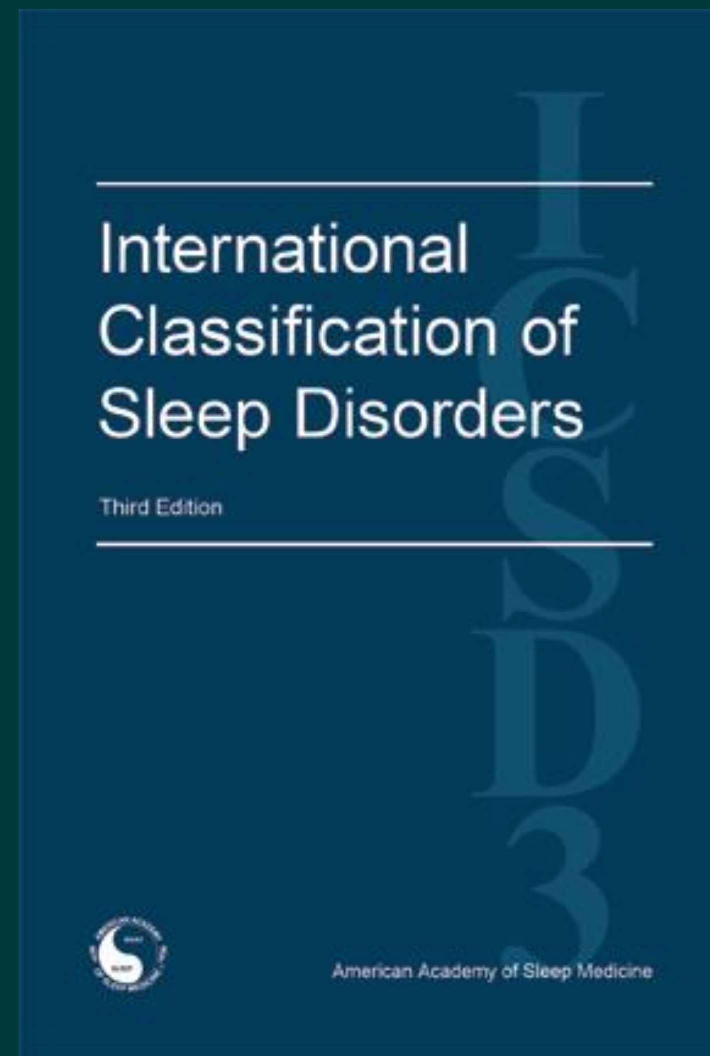
- Sleep disorders other than insomnia
- Insomnia: definition, assessment
- CBT-I: effectiveness, appropriateness, delivery options, session-by-session review

Why Bother Screening for Other Sleep Disorders?

- **Another sleep disorder might cause/worsen insomnia symptoms**
- **Insomnia might worsen another sleep disorder**
- **For differential diagnosis (e.g., sleep onset insomnia might actually be delayed sleep phase syndrome)**
- **The "standard" approach to CBT-I is contraindicated for those with certain untreated sleep disorders**

American Academy of Sleep Medicine. International classification of sleep disorders, 3rd ed.
Spielman et al. Sleep Restriction Therapy in Perlis et al. Behavioral Treatments for Sleep Disorders. 2011, 21-30.

Sleep Disorders

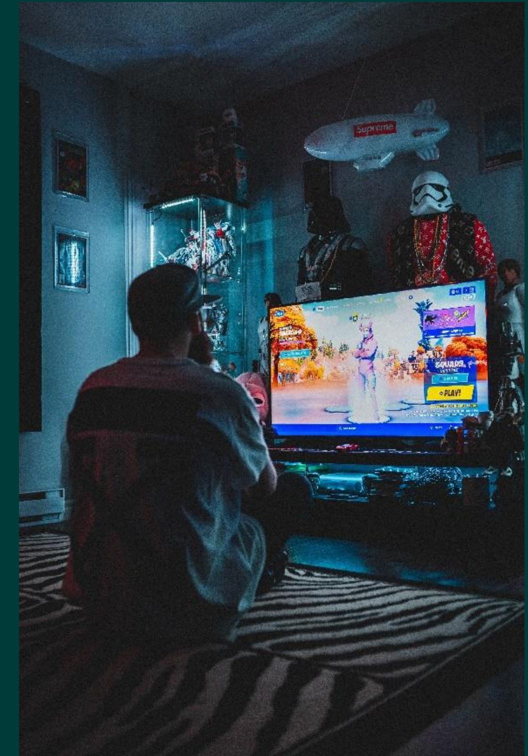


Sleep Disorders

- **Insufficient Sleep Syndrome**
- **Sleep Apnea**
- **Restless Legs Syndrome/Periodic Limb Movement Disorder**
- **Circadian Rhythm Sleep-Wake Disorders**
- **Parasomnias**
- **Narcolepsy**

Insufficient Sleep Syndrome

- **Being sleepy or falling asleep during the day**
- **Amount of sleep is shorter than expected for age**
- **The patient curtails sleep time by, for example, staying up late despite being able to fall asleep earlier or setting an alarm clock in the morning, and generally sleeps longer when such measures/behaviors are eliminated, such as on weekends or vacations**
- **Getting more sleep resolves the daytime sleepiness**



*** daytime sleepiness of insomnia can look like daytime sleepiness of ISS**

How Much Sleep Is Enough?

- **Determined by an expert panel of 18 leading scientists and researchers**
    - **Reviewed 300+ current scientific publications**
    - **Voted on how much sleep is appropriate throughout the lifespan**
- **NSF warns that research cannot pinpoint an exact amount of sleep needed but instead recommends a range of sleep that represents the "rule-of-thumb" amounts experts agree upon**

recommended

may be appropriate

Hours of Sleep (0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22)

Age group	may be appropriate	recommended	may be appropriate
NEWBORN 0-3 MOS	*18-19*	**14-17**	*11-13*
INFANT 4-11 MOS	*16-18*	**12-15**	*10-11*
TODDLER 1-2 YRS	*15-16*	**11-14**	*9-10*
PRE-SCHOOL 3-5 YRS	*14*	**10-13**	*8-9*
SCHOOL AGE 6-13 YRS	*12*	**9-11**	*7-8*
TEEN 14-17 YRS	*11*	**8-10**	*7*
YOUNG ADULT 18-25 YRS	*10-11*	**7-9**	*6*
ADULT 26-64 YRS	*10*	**7-9**	*6*
OLDER ADULT 65+ YRS	*9*	**7-8**	*5-6*

Sleep Apnea

Prevalence

- Low estimates: 3% in men, 2% in women
- High estimates: 24% in men, 9% in women
- Higher risk in:
  - Men
  - ↓SES
  - Racial minorities – maybe?
    - Differences sometimes disappear after controlling for variables such as obesity, comorbidities, and SES

Sleep Apnea

The Bad News

- Cardiovascular problems (heart disease, stroke)
- Sleepiness
- Increased risk for accidents

The Good News

- Easily recognized
- Treatable

Obstructive Sleep Apnea

- **OSA occurs when the tissue in the back of the throat collapses and blocks the airway, which is sometimes related to brief awakenings**

- **Snoring happens when tissue in the back of the throat partially blocks the airway and vibrates during breathing.**

Sleep Apnea: Signs & Symptoms

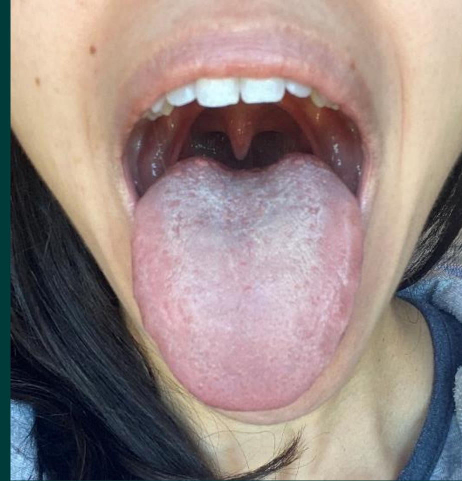
- **Excessive daytime sleepiness**
- **Snoring**
- **Apneas (holding breath)**
- **Morning headaches**
- **Morning dry mouth**
- **Obesity**
- **Narrow airway (↑Mallampati score)**

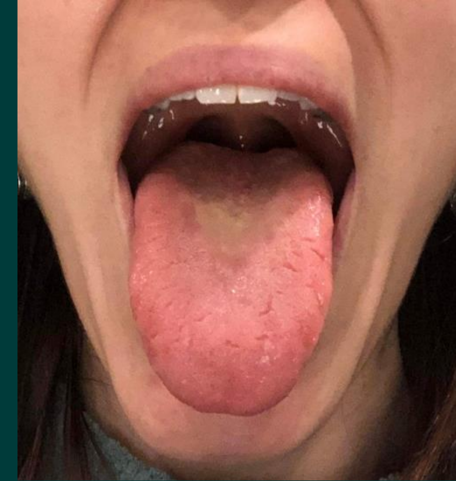
Sleep Apnea: Mallampati Score

1985: used to identify patients at risk for difficult intubation

Those with Mallampati scores of 3 or 4 often considered to be at increased risk of OSA

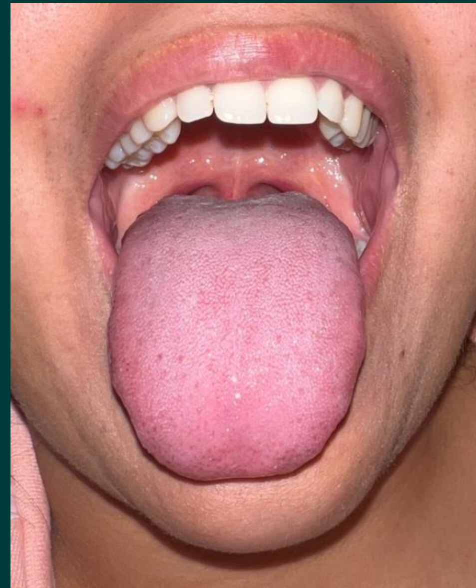
Class I

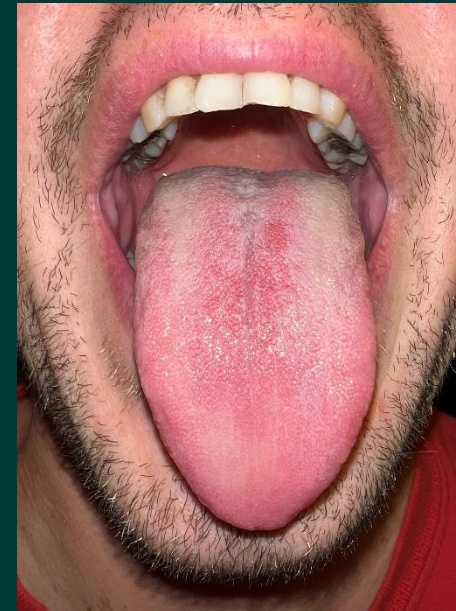




Class II

Class III





Class IV

Sleep Apnea: Signs & Symptoms

- **Excessive daytime sleepiness**
- **Snoring**
- **Apneas (holding breath)**
- **Morning headaches**
- **Morning dry mouth**
- **Obesity**
- **Narrow airway (↑Mallampati score)**
- **Retrognathia**

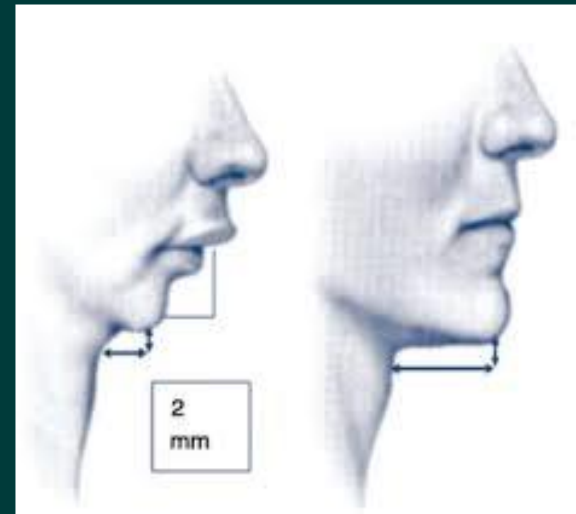


Image source: in the journal article “Obstructive sleep apnea and primary snoring: diagnosis” by Zancanella (2014) in Brazilian Journal of Otorhinolaryngology, 80(1S1), S1-S16.

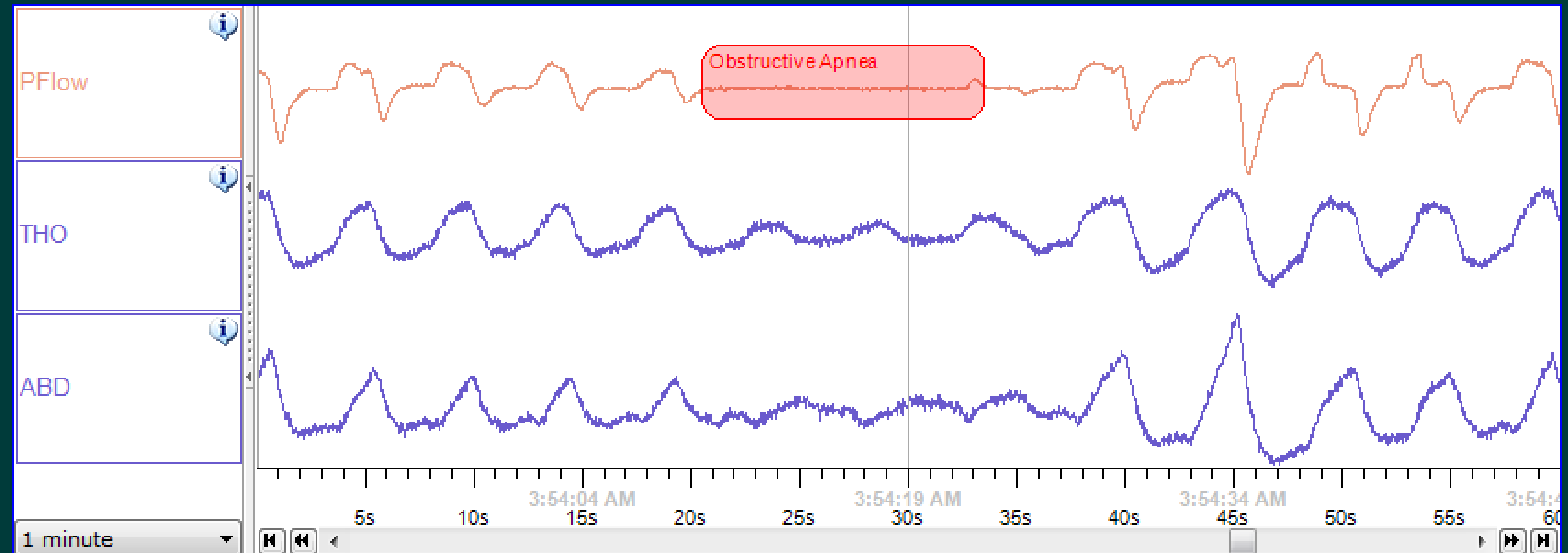
*** Problems with staying asleep can be associated with sleep apnea**

*** Part of CBT-I – sleep restriction – is contraindicated in patients with untreated sleep apnea**

Sleep Apnea

The only way to diagnosis sleep apnea is by a sleep study, called polysomnogram (PSG), which monitors several body functions during sleep including:

- **Brain activity**
- **Oxygen levels**
- **Respiratory airflow**
- **Limb movements**
- **… and more**



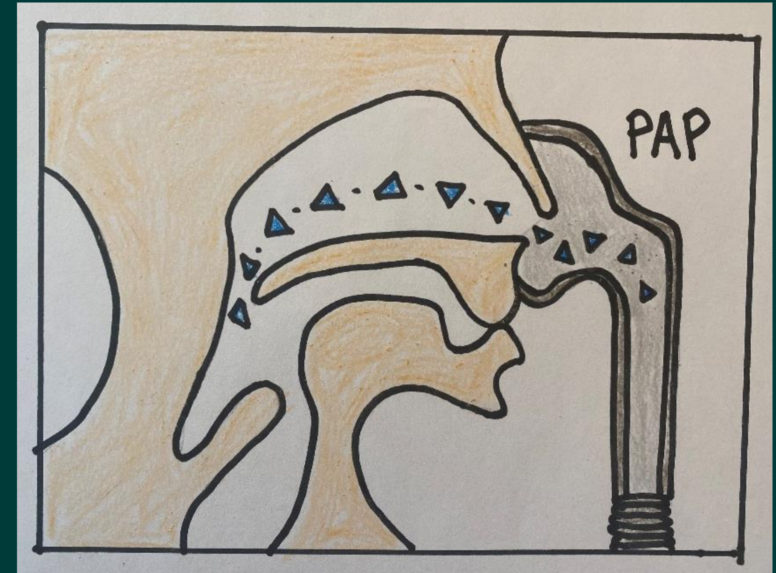
(Image Source: "ObstructiveApnea" by NascarEd is licensed under CC BY-SA 3.0)

Sleep Apnea

PSG are conducted in a sleep lab or, in some cases, in the home ("home sleep testing", HST)

Sleep Apnea Treatment Options

- **Continuous Positive Airway Pressure (CPAP), BiPAP, AutoPAP**
- **Oral appliances**
- **Surgery**
- **Inspire stimulator**
- **Positional therapy**
- **Weight loss**



Restless Legs Syndrome

An urge to move the legs, usually accompanied by or thought to be caused by uncomfortable and unpleasant sensations of the legs that:

- **Begin or worsen during inactivity (e.g., lying down)**
- **Are improved by movement (e.g., walking, stretching)**
- **Occur only or mostly in the evening or night vs. during daytime**
- **Prevalence: 5-10%**

*** problems falling and staying asleep are associated with RLS**

Periodic Limb Movement Disorder

Periodic episodes of repetitive, highly stereotyped limb movements (PLMS) that occur during sleep, in conjunction with clinical sleep disturbance or fatigue.

- Diagnosed by sleep study
- PLMS most frequently occur in the lower extremities, typically involving extension of the big toe and often in combination with partial flexion of the ankle, knee, and sometimes hip
- PLMS can cause awakenings
- PLMD: >15/hr in adults (>5/hr in children)
- PLMS are common but PLMD is thought to be rare (note: PLMS + RLS is not considered PLMD)
- Prevalence: exact prevalence unknown

* problems falling asleep, staying asleep, or unrefreshing sleep may be attributable to PLMS

RLS vs. PLMS

RLS

Sensations in legs felt during WAKE

PLMS

Limb movements during SLEEP

RLS Treatment Options

- Medications (dopamine agonists, benzodiazepines, opiates, etc.)
- Iron supplement
- Avoid alcohol, caffeine, nicotine
- Before bedtime, try stretching, hot or cold bath, hot or cold pack, massage limb, relaxation
- Ivory soap?

Aurora et al., The Treatment of RLS and PLMD in Adults – An Update for 2012, SLEEP 2012, 35(8), 1039-1062.

PLMD Treatment Options

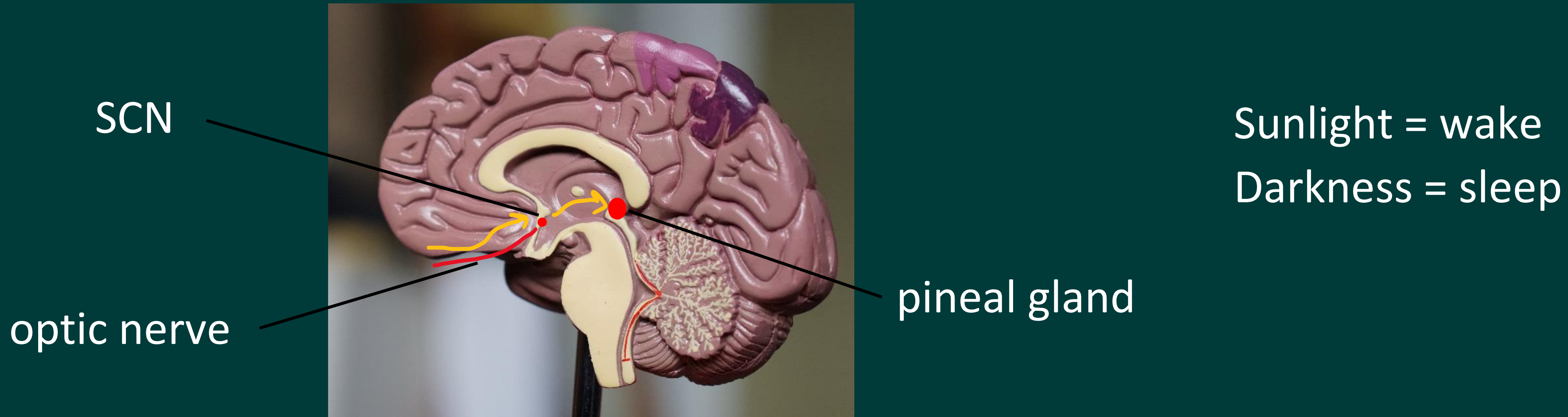
"There is insufficient evidence at present to comment on the use of pharmacological therapy in patients diagnosed with PLMD alone.

- **Existing data in RLS therapy does, in some cases, support some medical interventions in both RLS and PLMD."**

Aurora et al., The Treatment of RLS and PLMD in Adults – An Update for 2012, SLEEP 2012, 35(8), 1039-1062.

Circadian Rhythms

- **Circadian rhythms are endogenous, ~24-hour biological rhythms**
- **Our rhythm is entrained or synchronized to the 24-hour light-dark cycle**

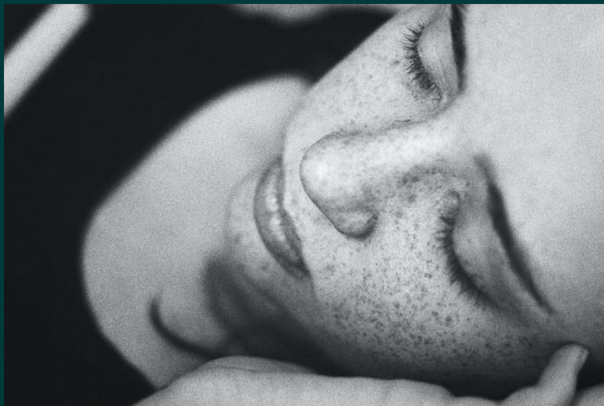


- **Light triggers the suprachiasmatic nucleus (SCN) in the hypothalamus to decrease melatonin from the pineal gland and increase it when dark**

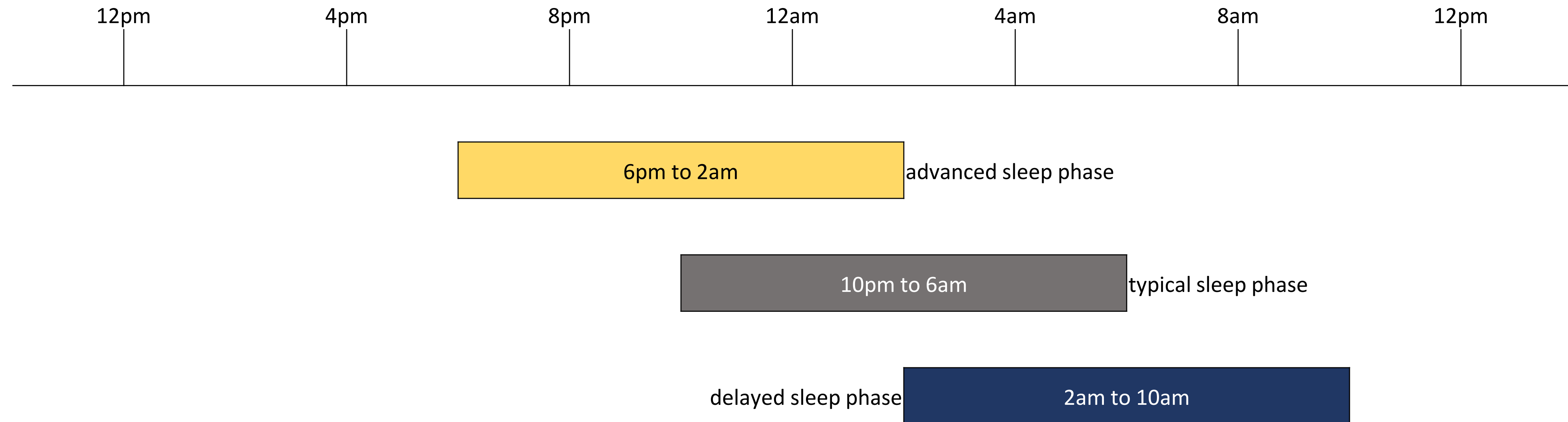
Circadian Rhythms

Circadian Rhythm Sleep-Wake Disorders result when there is:

- **a disruption of the internal circadian timing system, or**
- **a misalignment between the timing of the person's internal "clock" and the social/physical environment**



Delayed & Advanced Sleep Phases



*** problems falling asleep can be due to a delayed sleep phase**

*** problems waking up too early can be due to an advanced sleep phase**

Circadian Rhythm Sleep-Wake Disorders

- **Delayed Sleep-Wake Phase Disorder**
- **Advanced Sleep-Wake Phase Disorder**
- **Shift Work Disorder**
- **Jet Lag Disorder**
- **Irregular Sleep-Wake Rhythm Disorder**
- **Non-24-Hour Sleep-Wake Rhythm Disorder**
- **Circadian Sleep-Wake Disorder NOS**

CRSWD Treatment Options

- **Light Therapy**
- **Melatonin**
- **Sleep Scheduling (e.g., chronotherapy)**
- **Hypnotic and Stimulant Medications (for treating symptoms)**

Auger et al. Clinical practice guideline for the treatment of intrinsic CRSWD. J Clin Sleep Med 2015, 11(10), 1199-1236

Morgenthaler et al. Practice parameters for the clinical evaluation and treatment of CRSD. SLEEP 2007, 30(11), 1445-1459.

Circadian Rhythms and Light

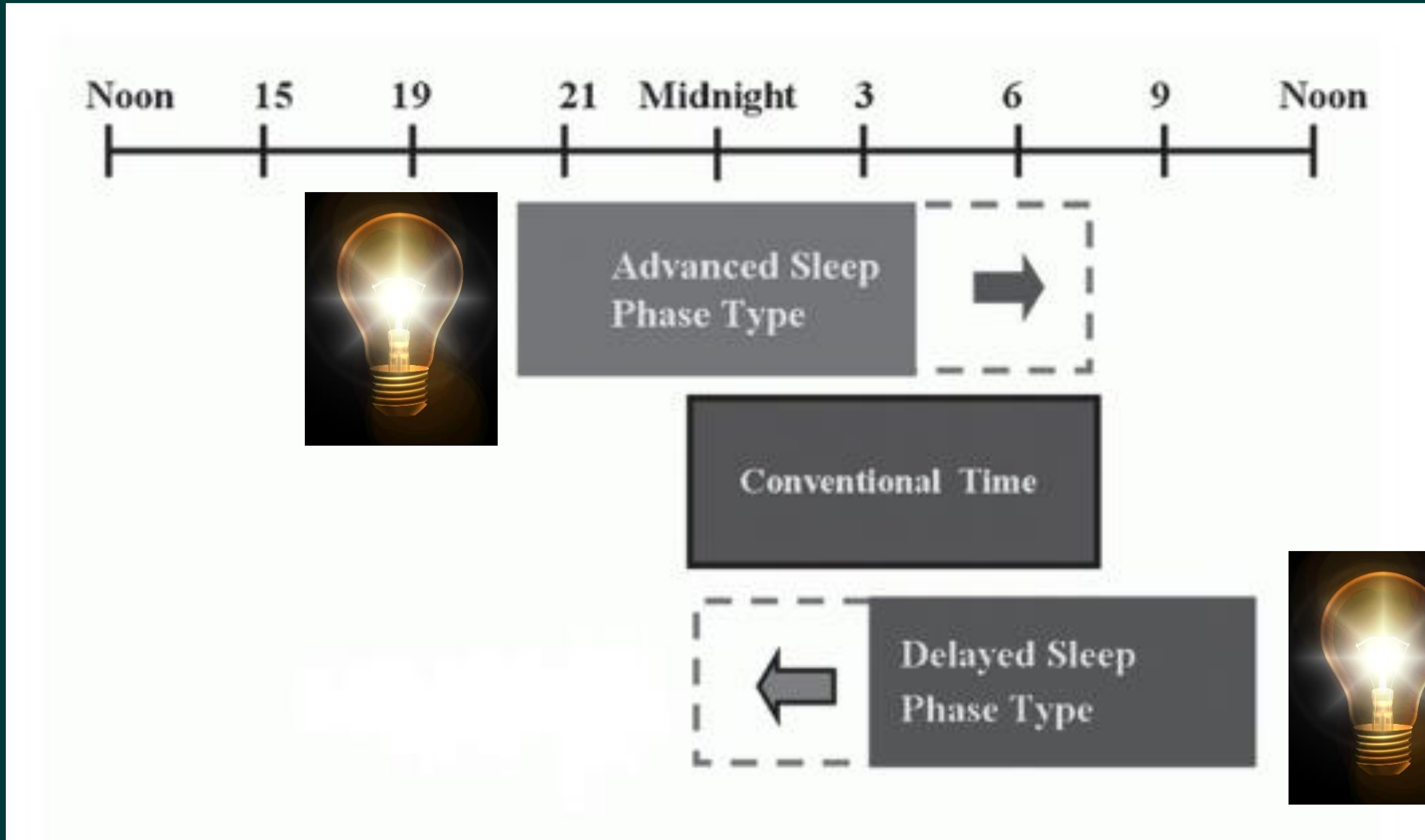


Figure adapted from Circadian Rhythm Sleep Disorders, Neupsy Key, (KJ Reid, C Goldstein, & PC Zee)

Light Therapy

Natural Sunlight

Turn on the lights!

Light Boxes

The Sunbox Company
Northern Light Technologies
Philips GoLITE BLU

Specialized Light Bulbs

The Up Light
GoodDay
(Healthe/Lighting Science)

Light Visors

Luminette

Re-Timer

Circadian Rhythms and Light

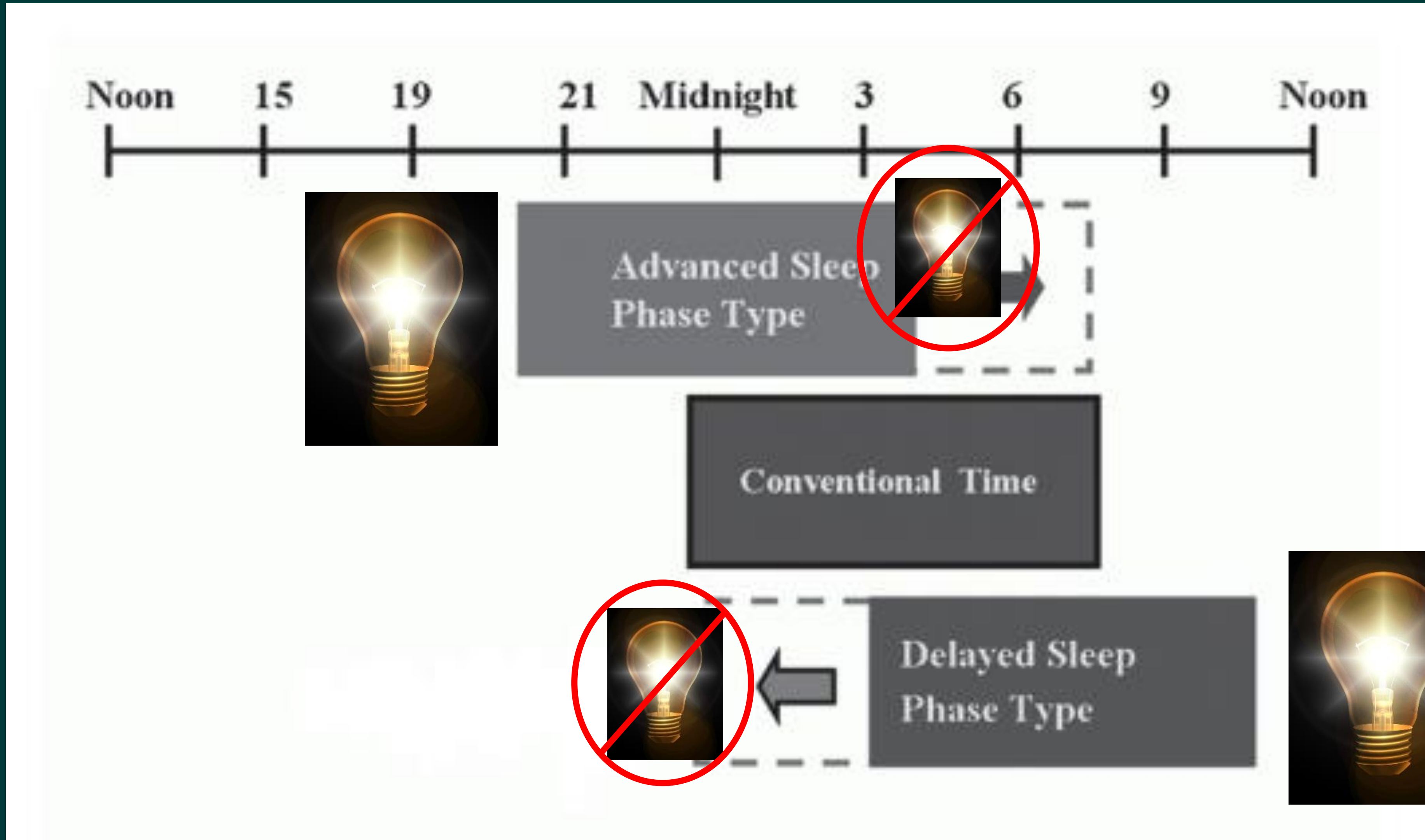


Figure adapted from Circadian Rhythm Sleep Disorders, Neupsy Key, (KJ Reid, C Goldstein, & PC Zee)

Blocking Light

Turn off the lights or use the minimum necessary brightness of light

Specialized Light Bulbs

The Up Light
GoodNight
(Healthe/Lighting Science)

Software

Night Shift setting (iPhone, iPad)
f.lux (computers)

Blue Blocking Glasses

Uvex Skyper (orange tinted)
*Consumer Report pick

Cyxus (clear lenses)

many options available for adults and children

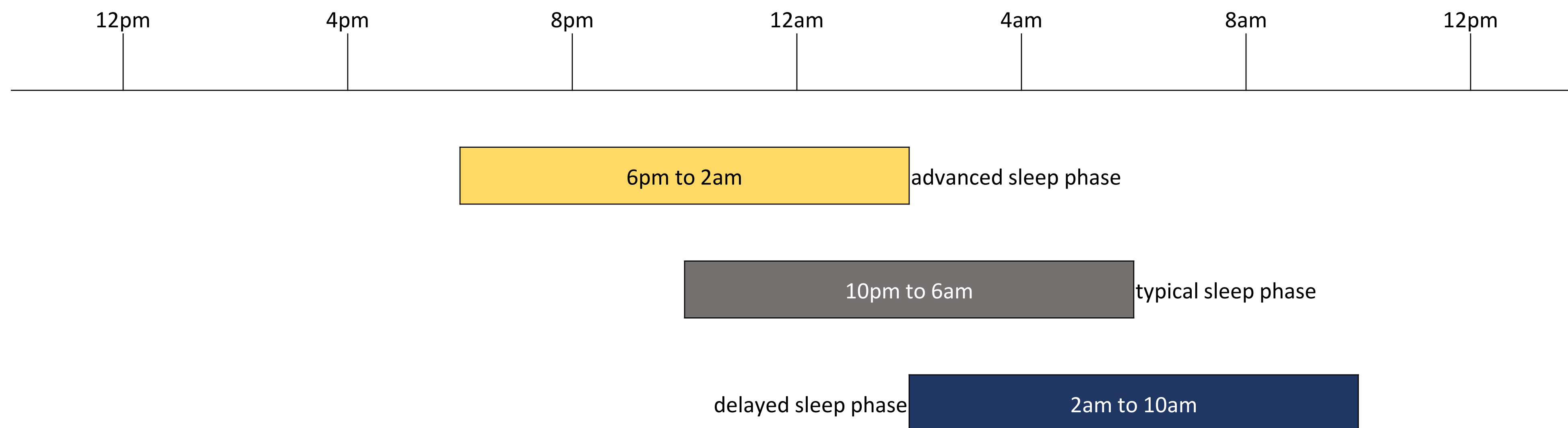
CRSWD Treatment Options

- **Light Therapy**
- **Melatonin**
- **Sleep Scheduling (e.g., chronotherapy)**
- **Hypnotic and Stimulant Medications (for treating symptoms)**

Sacks et al. Circadian rhythm sleep disorders: Part I, basic principles, shift work and jet lag disorders. SLEEP 2007, 30(11), 1460-83.

Sacks et al. Circadian rhythm sleep disorders: Part II, advanced sleep phase disorder, delayed sleep phase disorder, free-running disorder, and irregular sleep-wake rhythm. SLEEP 2007, 30(11), 1484-1501.

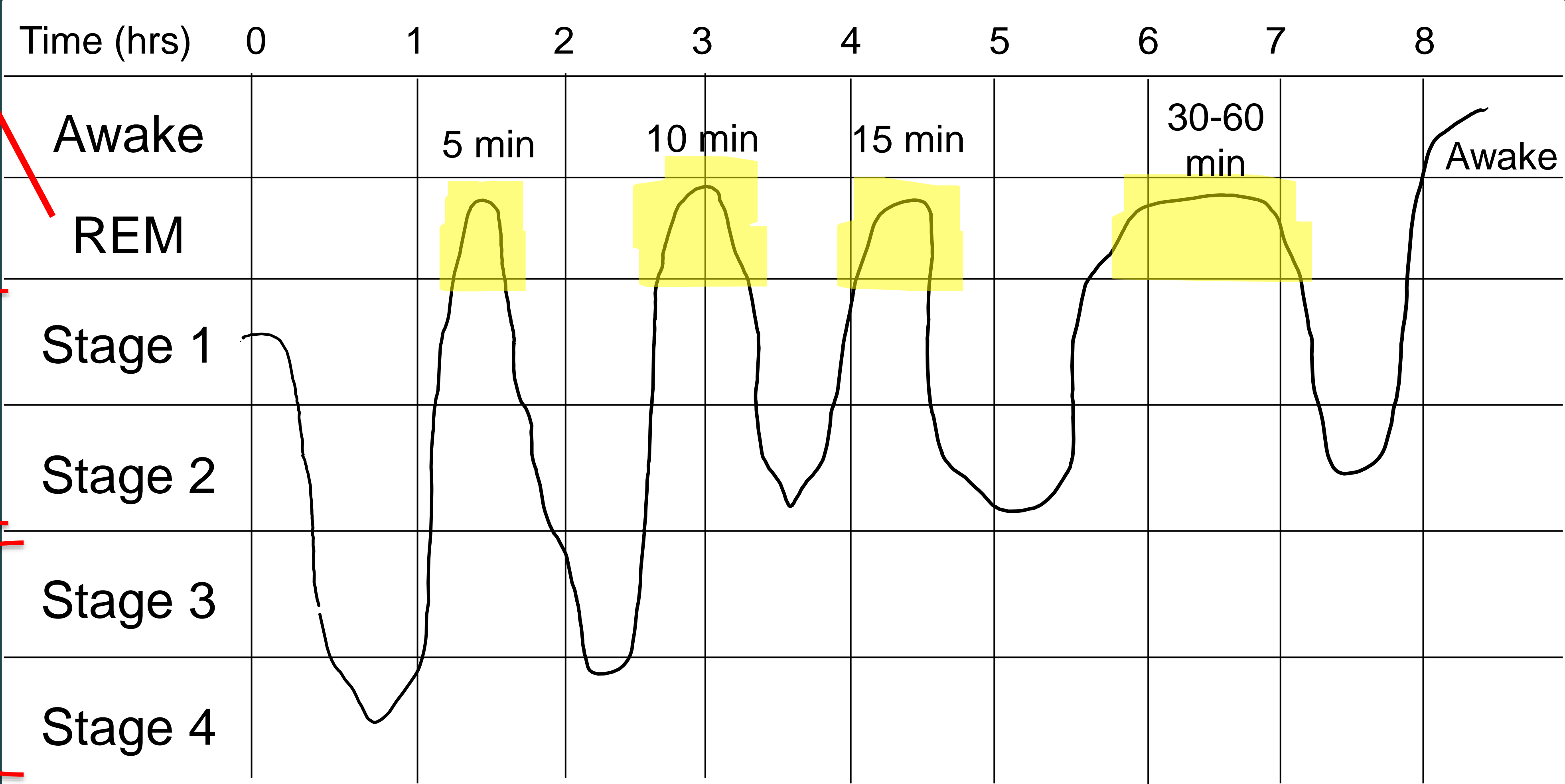
Delayed & Advanced Sleep Phases



Sleep Stages: Hypnogram

Dreaming

Light Sleep

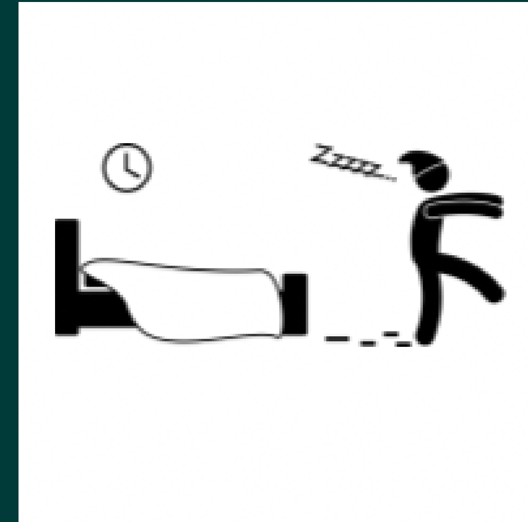


Deep Sleep (delta, slow wave sleep or SWS) = rested feeling

Parasomnias

NREM-Related

- **Disorders of Arousals (from NREM sleep): incomplete awakenings from sleep with partial or complete amnesia for the episode**
  - **Sleepwalking**
  - **Sleep Terrors**
  - **Confusional Arousals**



- **Sleep Related Eating Disorder: recurrent episodes of involuntary eating and drinking during arousals from sleep, associated with diminished levels of consciousness and subsequent recall, with problematic consequences**

Parasomnias

Some factors can increase frequency of NREM-related parasomnias, including:

- **Sleep deprivation**
- **Alcohol**
- **Stress**

*** sleep deprivation of insomnia can increase likelihood of parasomnias**

Pressman, MR. Factors that predispose, prime and precipitate NREM parasomnias in adults: Clinical and forensic implications. Sleep Med Rev. 2007, 11(4), 327-9.

Parasomnias

REM-Related

- REM Sleep Behavior Disorder
- Recurrent Isolated Sleep Paralysis
- Nightmare Disorder

Other

- Exploding Head Syndrome
- Sleep Related Hallucinations
- Sleep Enuresis
- Parasomnia Due to Medical Disorder, Medication/Substance, or Unspecified

* sleep deprivation of insomnia has been identified as a predisposing factor to sleep paralysis
* sleep onset insomnia and perceived insufficient sleep are associated with hallucinations
* anxiety and difficulty returning to sleep is associated with nightmare disorder

Parasomnia Treatment Options

- **Of all the parasomnias, the American Academy of Sleep Medicine (AASM) has only published guidelines for two: nightmare disorder and REM sleep behavior disorder (RBD)**
- **Nightmare disorder: the 2010 practice guidelines were updated but the AASM in 2018 published a position paper (vs. practice guidelines) due to limited direct evidence for many of the available treatment options**
- **RBD: no update since the 2010 practice guidelines**

Morgenthaler et al. Position paper for the treatment of nightmare disorder in adults . J Clin Sleep Med 2018, 14(6), 1041-1055.
Aurora et al. Best practice guide for the treatment of REM sleep behavior disorder (RBD). J Clin Sleep Med 2010, 6(1), 85-95.

Nightmare Disorder Treatment Options

PTSD-associated nightmares and nightmare disorder

- Recommended: image rehearsal therapy
- May be used: CBT, CBT-I, EMDR, Exposure, Relaxation, & Rescripting Therapy (ERRT), medications

Nightmare disorder

- May be used: CBT, ERRT, hypnosis, lucid dreaming therapy, PMR, sleep dynamic therapy, self-exposure therapy, systematic desensitization, testimony method, medications

Morgenthaler et al. Position paper for the treatment of nightmare disorder in adults . J Clin Sleep Med 2018, 14(6), 1041-1055.

REM Sleep Behavior Disorder Treatment Options

Level A

- **Creating a safe sleep environment, like removing breakable objects**

Level B

- **clonazepam**
- **melatonin**

Aurora et al. Best practice guide for the treatment of REM sleep behavior disorder (RBD). J Clin Sleep Med 2010, 6(1), 85-95.

Parasomnia Treatment Options

In practice, often also try:

- **Improving sleep hygiene and sleep quality**
- **Stress management**
- **Safety precautions (e.g., bell on door for sleepwalking)**

Narcolepsy

- **Daily episodes of an uncontrollable need to sleep or lapses into sleep**
- **Excessive daytime sleepiness**
  - **Multiple Sleep Latency Test (MSLT) is objective testing, with mean sleep latency ≤ 8 mins and 2+ sleep onset REM periods required criteria**
- **With or without cataplexy**
  - **Cataplexy: a generally brief (< 2 mins), usually bilaterally symmetrical sudden loss of muscle tone with retained consciousness precipitated by strong emotions (usually positive, laughter)**

*** sleep disruption with frequent awakenings may be present**

Narcolepsy Treatment Options

STRONG

- **Modafinil, pitolisant, sodium oxybate, and solriamfetol**

CONDITIONAL

- **Armodafinil, dextroamphetamine, and methylphenidate**

(note: these are the adult, not pediatric, practice guidelines for narcolepsy)

Maski et al. Treatment of central disorders of hypersomnolence: An AASM clinical practice guideline. J Clin Sleep Med. 2021, 17(9), 1881-1938.

Defining Insomnia

Diagnosis of insomnia made by self-report

No overnight sleep study required to diagnose insomnia

However, sleep studies might be conducted to rule-out other sleep disorders that might cause or coexist with the insomnia

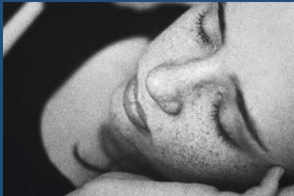
Schutte-Rodin et al. Clinical guideline for the evaluation and management of chronic insomnia in adults. J of Clin Sleep Med 2008, 4(5), 487-504.

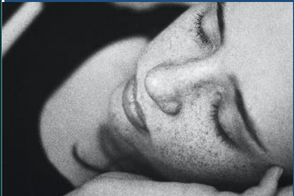
Insomnia Definition

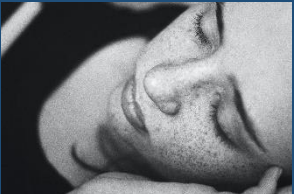
problems falling asleep

and/or

waking up at night

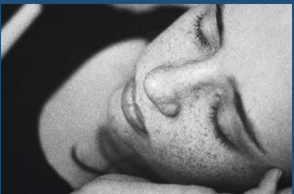






and/or

waking up too early



Insomnia Definition

The complaint of sleep quantity or quality must also cause some type of daytime problem, for example:

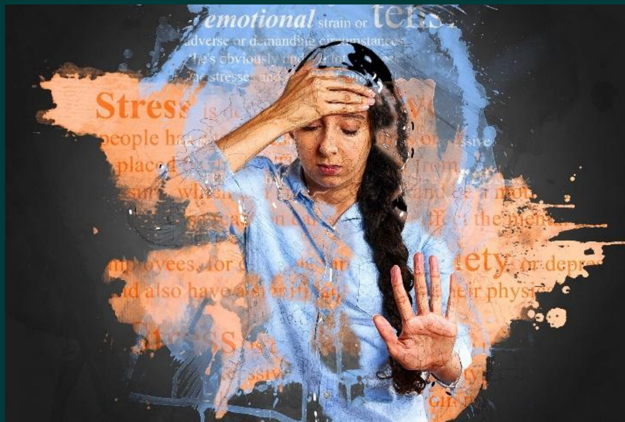
- Sleepiness, falling asleep at inappropriate times
- Concentration/focus problems
- ↓ productivity
- Fatigue, feeling tired
- Irritability, problems with others
- Worrying about sleep

Insomnia Definition

To be classified as “Insomnia Disorder”, the sleep problem occurs at least 3 nights/week and has been going on for at least 3 months

Insomnia Definition

- The sleep problem occurs despite adequate opportunity for sleep (in other words, insomnia is NOT insufficient sleep syndrome)
- The insomnia is not caused by something else, like a coexisting mental disorder or medical condition. But it’s hard to determine cause & effect so guidelines are to treat both the insomnia and the “primary” disorder



anxiety

insomnia

Prevalence

- **Insomnia disorder is the most prevalent of all sleep disorders**
- **Insomnia disorder occurs in about 10% of the population**
- **Transient insomnia symptoms occur in 30-35% of the population**
- **Insomnia is more common in:**
  - women (ratio of 1.58:1, F:M)
  - those with medical, psychiatric, substance disorders
  - those with lower socioeconomic status
  - older adults (age-related deterioration in sleep + increase in medical problems, medications)

Consequences of Insomnia

- As noted in the definition of insomnia, the sleep problem can cause distress and/or some sort of problem at work, with others, etc.
- Increased absenteeism, reduced productivity at work
- Reduced quality of life
- Increased economic burden (prolonged use of prescription or over-the-counter sleep aids)
- Persistent insomnia is associated with long-term health consequences:
  - Increased risk of major depressive disorder
  - Increased risk of hypertension and heart attack

Assessment/Measures

- Ask questions!

- Sleep study if appropriate (i.e., to rule out sleep apnea, PLMs)

- Insomnia Severity Index (copyrighted, need permission to use but it should be free)
  - 0-7: none
  - 8-14: mild
  - *15-21: moderate
  - 22-28: severe

*15 is often used as a cut-off

Insomnia Severity Index

1. Please rate the current (i.e., last 2 weeks) **SEVERITY** of your insomnia problem(s).

	None	Mild	Moderate	Severe	Very Severe
Difficulty falling asleep:	0	1	2	3	4
Difficulty staying asleep:	0	1	2	3	4
Problem waking up too early:	0	1	2	3	4

2. How **SATISFIED**/dissatisfied are you with your current sleep pattern?

Very Satisfied				Very Dissatisfied
0	1	2	3	4

3. To what extent do you consider your sleep problem to **INTERFERE** with your daily functioning (e.g. daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc.)?

Not at all Interfering	A Little	Somewhat	Much	Very Much Interfering
0	1	2	3	4

4. How **NOTICEABLE** to others do you think your sleeping problem is in terms of impairing the quality of your life?

Not at all Noticeable	Barely	Somewhat	Much	Very Much Noticeable
0	1	2	3	4

5. How **WORRIED**/distressed are you about your current sleep problem?

Not at all	A Little	Somewhat	Much	Very Much
0	1	2	3	4

STOP-BANG Sleep Apnea Questionnaire

Chung F et al Anesthesiology 2008 and BJA 2012

STOP		
Do you **S**NORE loudly (louder than talking or loud enough to be heard through closed doors)?	Yes	No
Do you often feel **T**IRED, fatigued, or sleepy during daytime?	Yes	No
Has anyone **O**BSERVED you stop breathing during your sleep?	Yes	No
Do you have or are you being treated for high blood **P**RESSURE?	Yes	No

BANG		
BMI more than 35kg/m2?	Yes	No
AGE over 50 years old?	Yes	No
NECK circumference > 16 inches (40cm)?	Yes	No
GENDER: Male?	Yes	No

TOTAL SCORE		

High risk of OSA: Yes 5 - 8

Intermediate risk of OSA: Yes 3 - 4

Low risk of OSA: Yes 0 - 2

In the last year, have you experienced any of the following?

Symptom	Yes/No	If yes, how often?
Difficulty falling asleep		
Difficulty staying asleep		
Shallow and unrefreshing sleep		
Falling asleep at inappropriate times/places		
Loud snoring		
Awakening with a choking sensation		
Awakening gasping for breath		
Holding breath while asleep		
Waking up in the morning with headaches		
Waking up with pain/discomfort in jaw		
Grinding your teeth while asleep		
An urge to move legs during periods of rest or inactivity		
Uncomfortable and unpleasant sensations in legs at night		
Muscle cramping during the night		
Bed partner notices that your feet/legs twitch while you sleep		

Symptom	Yes/No	If yes, how often?
Muscle weakness when having strong emotions		
Muscle weakness when laughing		
Upon awakening, feeling like you can't move as if paralyzed		
Seeing "visions" or hearing sounds that aren't really there as you FALL ASLEEP		
Seeing "visions" or hearing sounds that aren't really there as you WAKE UP		
Nightmares		
Frequent travel across time zones		
Wake up screaming		
Frequent night-time urination (more than 2 times per night)		
Heartburn interfering with sleep		
Sleep walking		
Sleep talking		
Acting out your dreams while asleep (e.g., punching, flailing your arms in the air, making running movements)		
Other sleep-related problem		

Cognitive Behavioral Therapy for Insomnia (CBT-I)

Short-term treatment (~4-8 weeks) that includes:

- Stimulus Control
- Sleep Restriction
- Cognitive Restructuring
- Relaxation Training
- Sleep Hygiene

CBT-I: The Recommended First-Line Treatment

2005 **NIH Consensus**

(NIH Consens and State Sci Statements, 2005, 22(2), 1-30)

2008 **American Academy of Sleep Medicine**

(Schutte-Rodin et al., 2008, J of Clin Sleep Med, 4(5), 487-504)

2016 **American College of Physicians**

(Qaseem et al., 2016, Ann Intern Med, 165 (2), 125-133)

2017 **European Sleep Research Society**

(Riemann et al., 2017, J Sleep Res, 26(6), 675-700)

2017 **Australasian Sleep Association**

(Ree et al., 2017, Sleep Med, 36 Suppl 1, S43-S47)

2019 **British Association of Psychopharmacology**

(Wilson et al., 2019, J Psychopharmacol, 33(8), 923-947)

American College of Physicians: Clinical Practice Guidelines for Chronic Insomnia Disorder

Recommendation 1: ACP recommends that all adult patients receive cognitive behavioral therapy for insomnia (CBT-I) as the initial treatment for chronic insomnia disorder. (Grade: strong recommendation, moderate-quality evidence).

Recommendation 2: ACP recommends that clinicians use a shared decision-making approach, including a discussion of the benefits, harms, and costs of short-term use of medications, to decide whether to add pharmacological therapy in adults with chronic insomnia disorder in whom cognitive behavioral therapy for insomnia (CBT-I) alone was unsuccessful. (Grade: weak recommendation, low-quality evidence).

Qaseem et al., 2016, Ann Intern Med, 165(2), 125-133.

Is CBT-I Appropriate?

Sleep Assessment

- Is this insomnia or something else (e.g., insufficient sleep syndrome)?
- Even if comorbid conditions present (e.g., depression, pain), CBT-I can be beneficial*
- Even if the patient is on sleep aids or wants to start taking sleep aids, this can be done in combination with CBT-I

Patient Characteristics

- Is the patient motivated to try CBT-I? Do they just want a pill?
- Is the timing good for starting CBT-I?
- Does the patient have sufficient intellect to benefit from CBT-I?
- CBT-I is intended for adult patients
- A major component of CBT-I (sleep restriction) is contraindicated for those with bipolar disorder, untreated sleep apnea, and seizure disorder, so CBT-I should be modified in these cases
  - A sleep study should be conducted in cases of suspected sleep apnea before sleep restriction started

* McCrae & Lichstein. Secondary insomnia: Diagnostic challenges and intervention opportunities. Sleep Med Rev 2001, 5(1), 47-61.

CBT-I Outcomes by Demographics

Race

- Unknown – usually studies haven't been sufficiently powered
- One study (Cheng et al., 2018) of internet-based, 6-session CBT-I found no racial differences in treatment outcome or attrition

Sex

- Unknown – no dedicated line of research to examine this

Age

- More research here and it generally shows that CBT-I is effective across the life span, perhaps better for middle-aged adults vs. older adults in terms of increasing total amount of sleep in particular

Muench et al. (2022). We know CBT-I works, now what? Faculty Reviews, 11 (4).

CBT-I Delivery Options

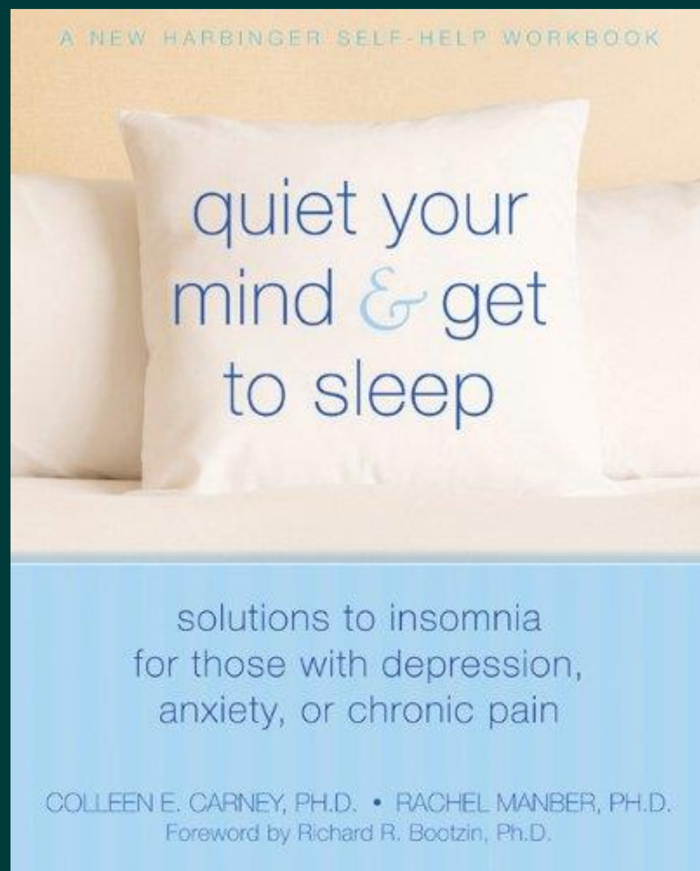
- Treatment with a CBT-I specialist
- Self-Help CBT-I

Finding a CBT-I Provider

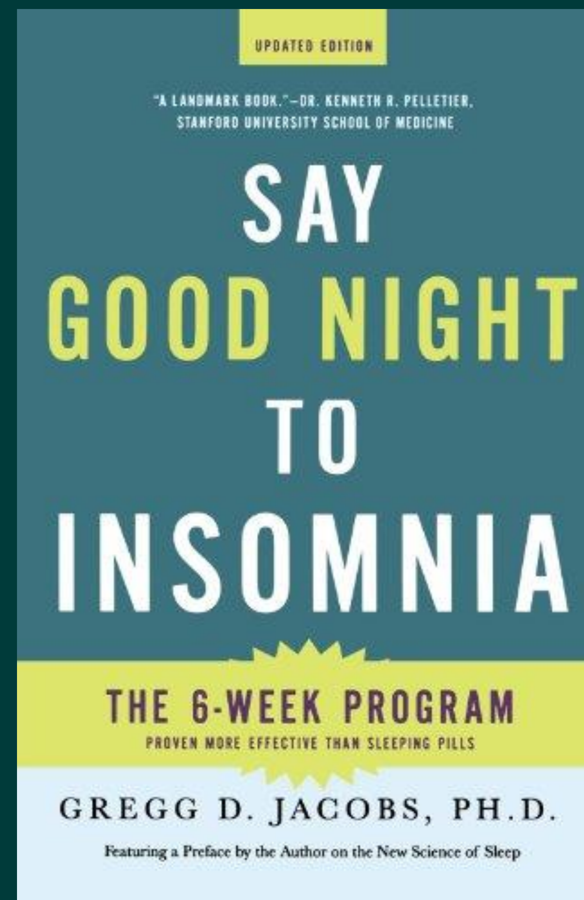
Treatment with a CBT-I specialist, who is likely a psychologist

- Board-certified in Behavioral Sleep Medicine (“CBSM”, “DBSM”) ideal, but very few providers with this certification, approx. only 200 in the US
    - http://www.absm.org/bsmspecialists.aspx
    - https://www.bsmcredential.org/index.php/bsm-diplomates
- Other directories (may or not be board-certified)
    - https://www.behavioralsleep.org/index.php/society-of-behavioral-sleep-medicine-providers/member-providers
    - https://www.pennsleep.directory/
    - http://insomnia.onair.cc/category/find-a-therapist/
- Individual CBT-I or Group CBT-I

CBT-I Self-Help Options: Books



Quiet Your Mind and Get to Sleep
by Carney & Manber



Say Good Night to Insomnia
by Jacobs

CBT-I Self-Help Options: Internet

- Path to Better Sleep: free, VA
- Go! To Sleep: Cleveland Clinic
- Sleepio
- SHUTi: UVA, clinical trial vs. direct to consumer
- Sleepstation: integrated human support

CBT-I Self-Help Options: Apps

- Insomnia Coach (free)
- Night Owl – Sleep Coach ($9.99)
- Somryst (app version of SHUTi): might be available now although it might be prescription only

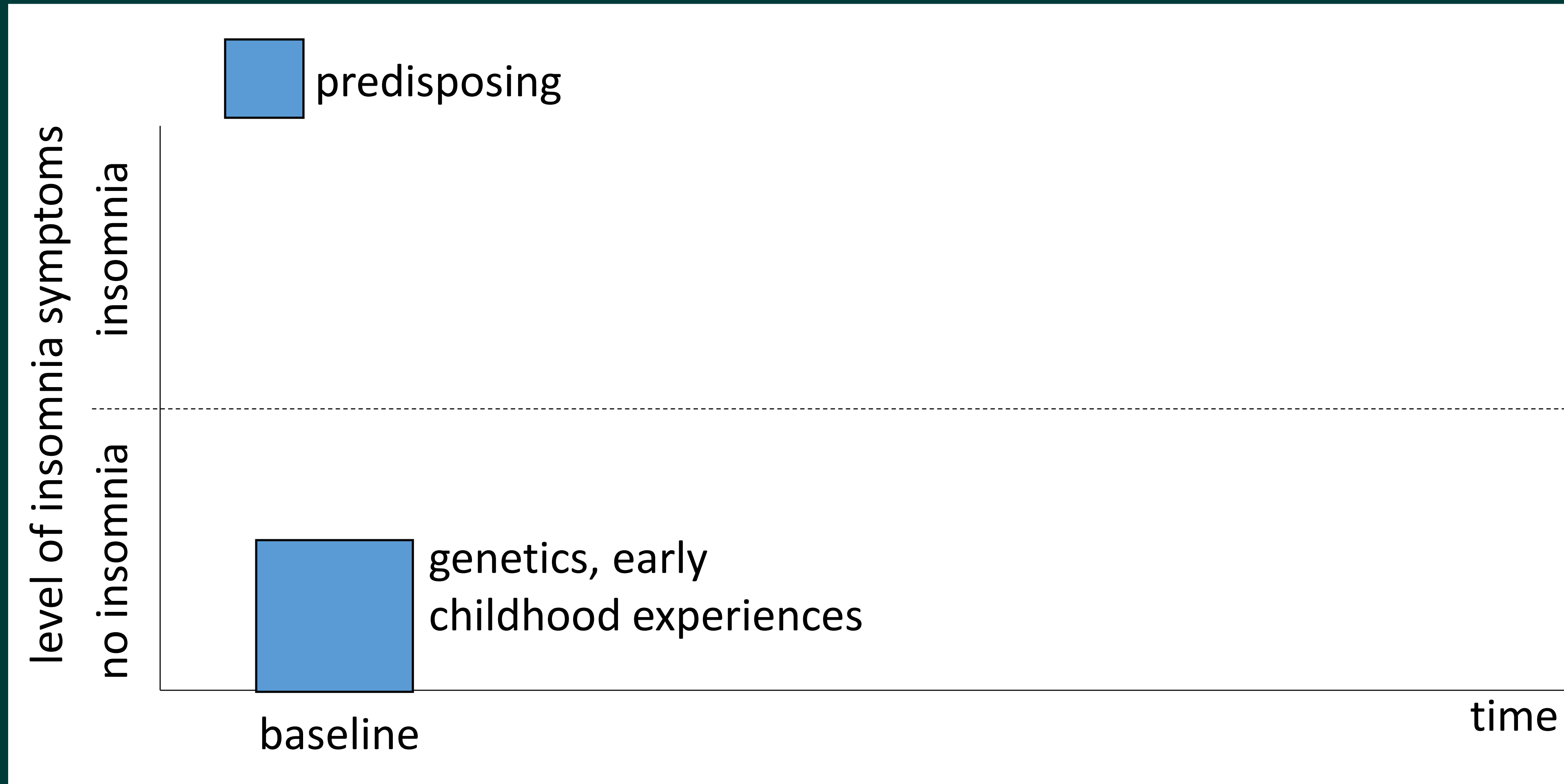
Cognitive Behavioral Therapy for Insomnia (CBT-I)

Short-term treatment (~4-8 weeks) that includes:

- Stimulus Control
- Sleep Restriction
- Cognitive Restructuring
- Relaxation Training
- Sleep Hygiene

What Causes Insomnia?

Spielman's 3 Factor Model of Insomnia



Spielman et al. A behavioral perspective on insomnia treatment. Psychiatr Clin of North Am 1987, 10(4), 541-553.

What Causes Insomnia?

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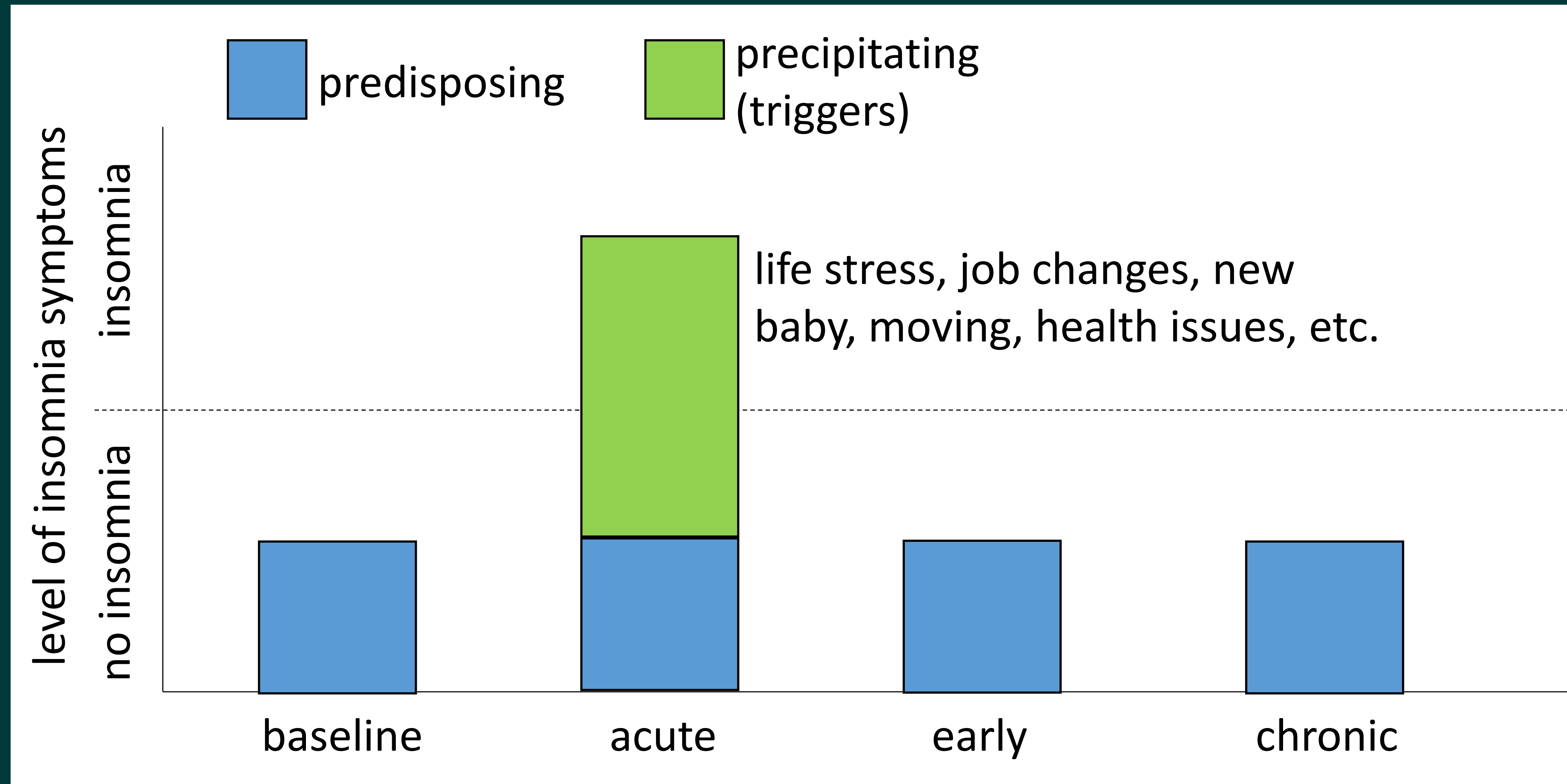

Spielman et al. A behavioral perspective on insomnia treatment. Psychiatr Clin of North Am 1987, 10(4), 541-553.

What Causes Insomnia?

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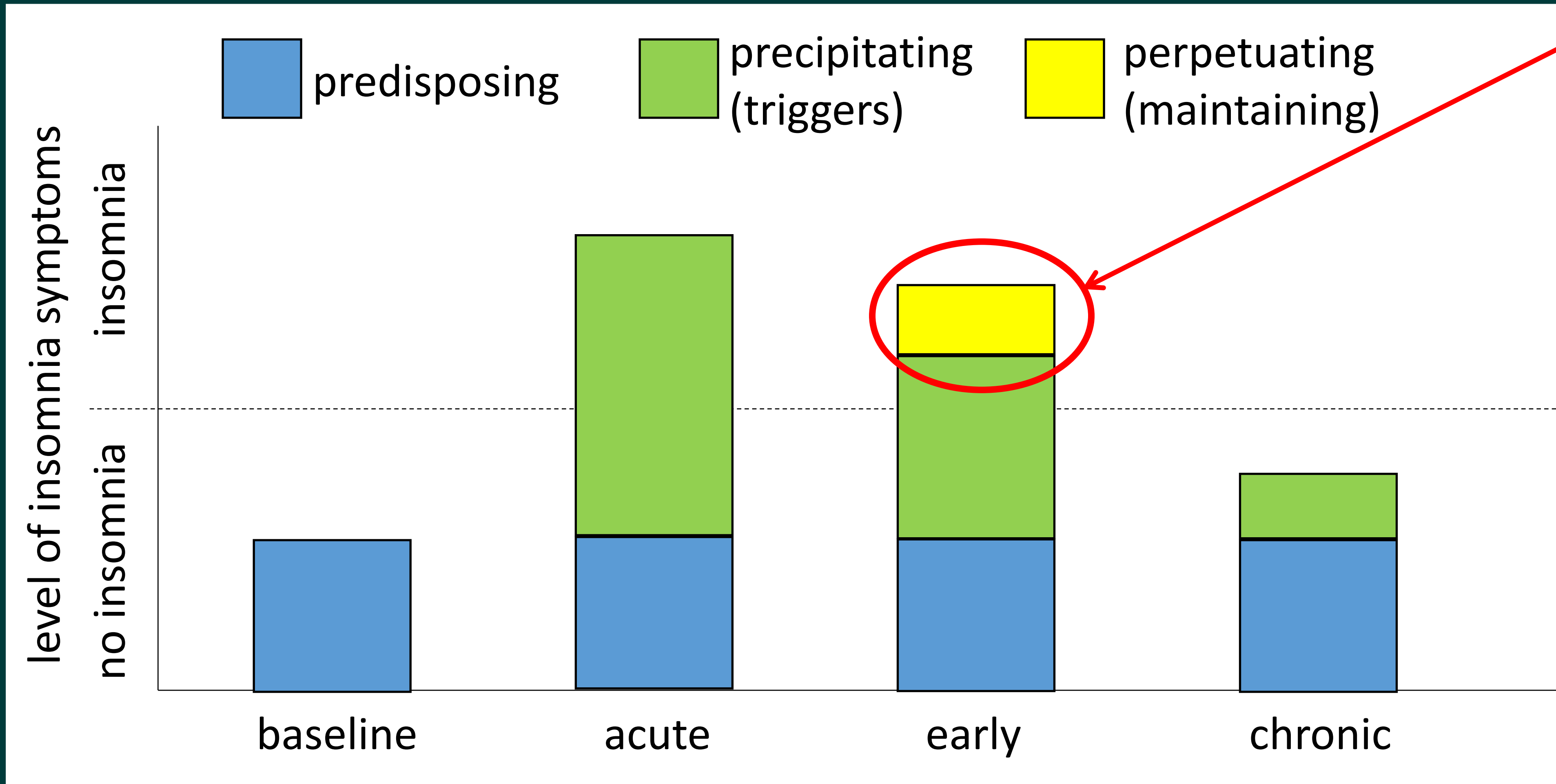
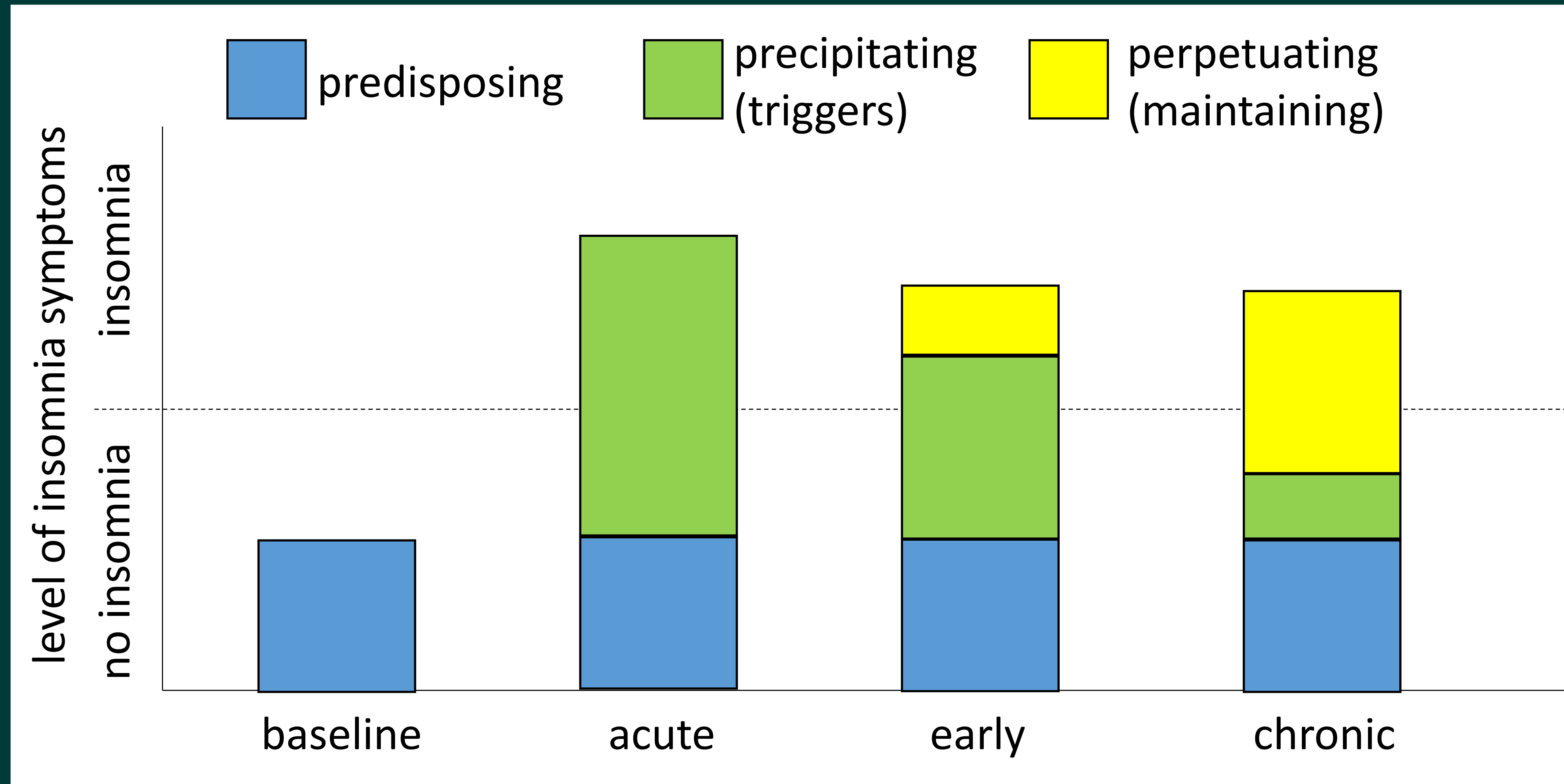


Perpetuating Factors: napping, oversleeping, spending too much time in bed, sleep-related stress, stress over deciding whether to take sleeping pills, belief that sleeping pills are the only solution, conditioned arousal

Spielman et al. A behavioral perspective on insomnia treatment. Psychiatr Clin of North Am 1987, 10(4), 541-553.

What Causes Insomnia?

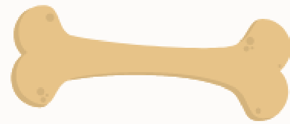
Spielman's 3 Factor Model of Insomnia



Spielman et al. A behavioral perspective on insomnia treatment. Psychiatr Clin of North Am 1987, 10(4), 541-553.

Classical Conditioning

Learning of association between two previously unrelated stimuli to change behaviour.



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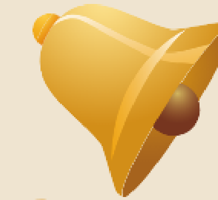

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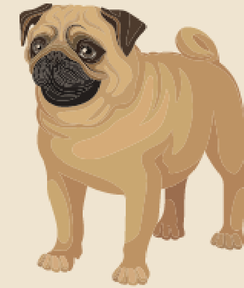

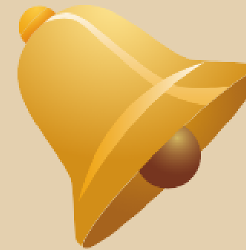

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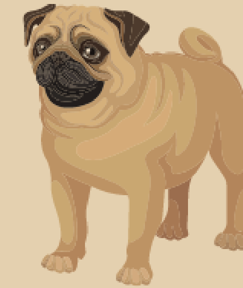
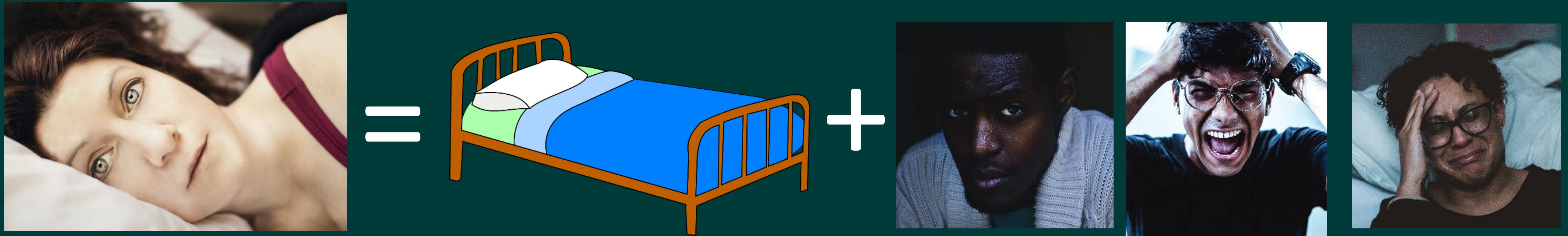
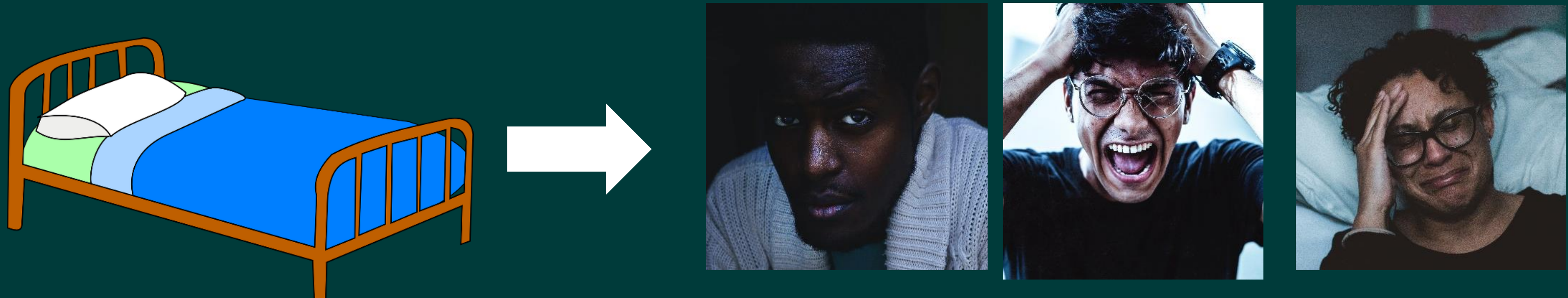


Conditioned Arousal



Over
time …



Stimulus Control

Stimulus control attempts to:

- ↓ conditioned arousal:
break the pairing of bed with wake

≠

- ↑ conditioned sleepiness:
strengthen the pairing of bed with sleep and falling asleep quickly (…and this may take time)

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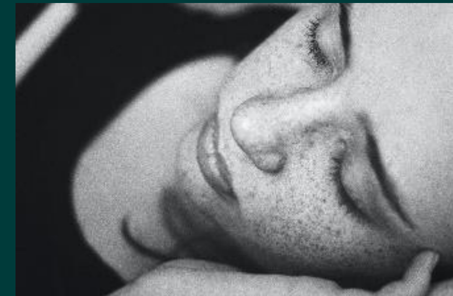


Bootzin & Perlis. Stimulus Control Therapy in Perlis et al. Behavioral Treatments for Sleep Disorders. 2011, 21-30.

Stimulus Control Instructions

1. Do not use your bed for anything except sleep; that is, do not read, watch TV, eat, or worry in bed. Sexual activity is the only exception to this rule. On such occasions, the instructions are to be followed afterward when you intend to go to sleep.

2. If you find yourself unable to fall asleep within about 15-20 minutes, get up and go into another room. Since I do not want you to watch the clock, just estimate how long you have been lying awake. Remember, the goal is to associate your bed with falling asleep *quickly*! Return to bed intending to go to sleep only when you are very sleepy, or after a predetermined amount of time (___________).

3. While out of bed during the night, you can engage in quiet, sedentary activities (e.g., reading, TV viewing, etc. – but make sure content of such is not too engaging or activating). Do not exercise, eat, smoke, or take warm showers or baths. Try not to fall asleep when not in bed.

4. If you return to bed but still cannot fall asleep within 15-20 minutes, repeat step 2. Do this as often as necessary throughout the night.

Instructions slightly modified from Bootzin & Perlis. Stimulus Control Therapy in Perlis et al. Behavioral Treatments for Sleep Disorders. 2011, 21-30.

Cognitive Behavioral Therapy for Insomnia (CBT-I)

Short-term treatment (~4-8 weeks) that includes:

- Stimulus Control
- Sleep Restriction
- Cognitive Restructuring
- Relaxation Training
- Sleep Hygiene

Sleep Logs

• DC Psychology and Sleep Services •
Virginia Runko, PhD, CBSM, DBSM
www.dcpsychandsleep.com

Name: ______________________________

Energy Rating Scale:	0 *no energy*	1	2	3	4	5	6	7	8	9	10 *high/good energy*
Sleep Quality Rating Scale:	0 *extremely poor sleep quality (shallow, unrefreshing)*	1	2	3	4	5	6	7	8	9	10 *excellent sleep quality (deep, refreshing)*

Please complete the shaded areas prior to going to bed. ***Complete the rest of the diary immediately upon waking up the next day.***

Date	Medication(s) taken at bedtime (med name, dose, & time)	Naps (time & duration)	Energy Rating (0-10) for the day	Bedtime (time went into bed)	Lights out (time tried to go to sleep)	Mins it took you to fall asleep initially	# of awaken-ings	Mins awake in the middle of the night/early morning*	Wake-up time (time of final awakening)	Time you wanted to wake-up	Time you physically got out of bed	Sleep Quality Rating (0-10)
ex	Ambien 5mg -9pm	6pm - 30 min	6	9:15pm	10:30pm	60	3	45	5:00am	5:00am	5:05am	2

* Amount of time awake in the middle of the night/early morning: this is the total, cumulative time you spent awake between when you first fell asleep and when you woke up for the last time. It does not include the time it took you to fall asleep initially. Add up the amount of time you were awake for each of your awakenings.

Sleep Logs

	Week 1	day 1	day 2	day 3	day 4	day 5	day 6	day 7	AVERAGE	
	Date	10/7/2014	10/8/2014	10/9/2014	10/10/2014	10/11/2014	10/12/2014	10/13/2014		
complete before bedtime	**Medication(s) taken at bedtime** (med name, dose, & time)	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish	mel 3.75 - 10pm, klon .0625 - 12am	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish	mel 3.75 - 10pm, klon .0625 - 12am, .0625 - 3am'ish		
	Naps (time & duration)	13:00 - 60 min	0	0	0	0	15:15 - 25 min	1:30 - 20 min		
	Fatigue Rating (0-10) for the day	9.0	8.0	7.0	7.0	5.0	5.0	4.0	6.4	Fatigue Rating
	Bedtime (time went into bed)	21:00	23:00	23:00	23:30	23:30	23:30	0:00	23:04	Bedtime
	"Lights out" (time tried to go to sleep)	1:30	1:30	1:30	1:30	1:30	1:30	1:00	1:25	Lights out
complete right after waking up	**Mins to fall asleep intially**	60	20	30	60	80	60	60	52.9	Mins to fall asleep
	# of awakenings	2	2	1	0	2	1	2	1.4	# of awakenings
	Mins awake in middle of night/early morning (how long awakenings lasted)	120	60	45	0	60	30	15	47.1	Mins awake after sleep onset
	Wake time (time of final awakening)	8:00	7:00	7:30	6:30	8:30	7:30	8:00	7:34	Wake time
	If final wake-up time earlier than desired, mins awake too early	0	0	0	60	0	0	0	8.6	Mins wake too early
	Time physically got out of bed	8:00	7:00	7:30	6:30	8:30	7:30	8:00	7:34	Out of bed
	Sleep Quality Rating (0-10)	2.0	5.0	6.0	6.0	7.0	8.0	7.0	5.9	Sleep Quality
	Time in Bed (TIB)	6.50	5.50	6.00	5.00	7.00	6.00	7.00	6.14	Time in Bed
	Total Sleep Time (TST)	3.50	4.17	4.75	4.00	4.67	4.50	5.75	4.48	Total Sleep Time
	Sleep Efficiency (SE)	53.85%	75.76%	79.17%	80.00%	66.67%	75.00%	82.14%	72.87%	Sleep Efficiency

Sleep Regulation: Internal Mechanisms

Process S
(homeostatic
sleep drive)

"sleep gate"

Process C
(circadian rhythm)

sleep

wake up

sleep

7am

11pm

7am

11pm

7am

Borbély, AA. A two process model of sleep regulation. Hum. Neurobiol. 1982, 1 (3): 195–204.

Sleep Restriction

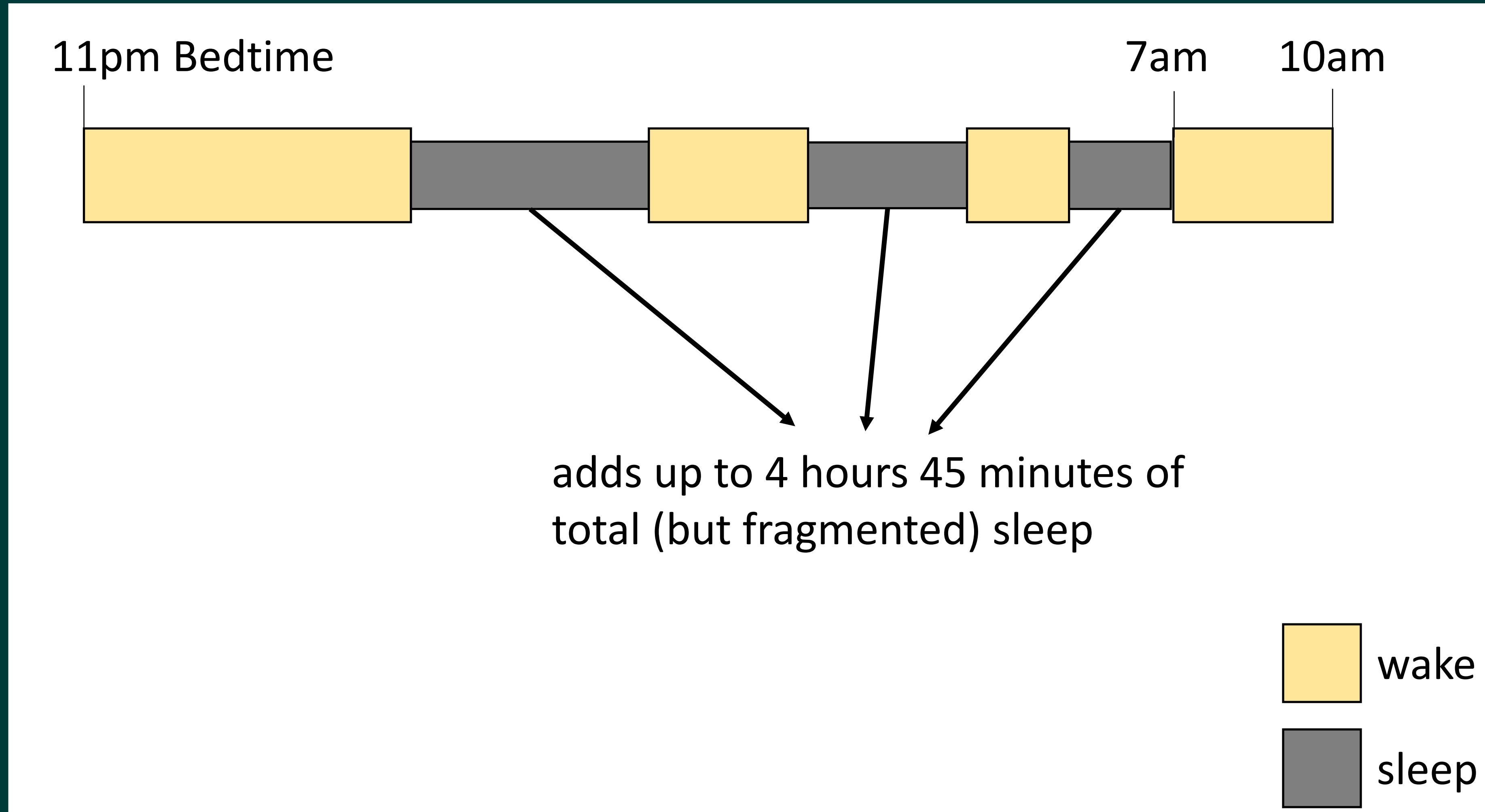


Figure adapted from Perlis et al. Cognitive Behavioral Treatment of Insomnia: A Session-by-Session Guide. 2005

Sleep Restriction

11pm Bedtime

7am

10am

2am Bedtime

7am

1:45am Bedtime

7am

wake

sleep

Figure adapted from Perlis et al. Cognitive Behavioral Treatment of Insomnia: A Session-by-Session Guide. 2005

Sleep Restriction Instructions

1. Your earliest bedtime is _________________.

2. Set your alarm and get up at the same time every morning, regardless of how much sleep you got during the night. Your wake time is _______.

3. Do not nap during the day.*

* In cases where sleepiness might cause harm to self or others, go ahead and nap, go to bed earlier, sleep in, etc. In elderly, scheduling a nap might be beneficial, but try to limit to 30 minutes (and track this!).

Titration Rules

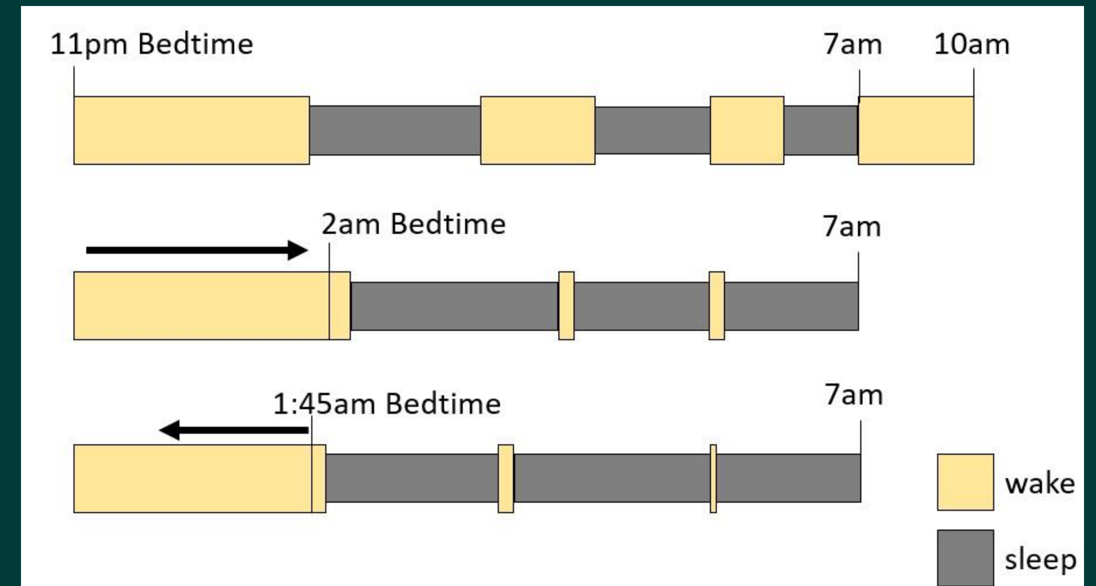
Sleep Efficiency = total sleep time / time in bed

Sleep Efficiency ≥ 90%: increase TIB by 15-30 mins

SE between 85-89%: stay the same

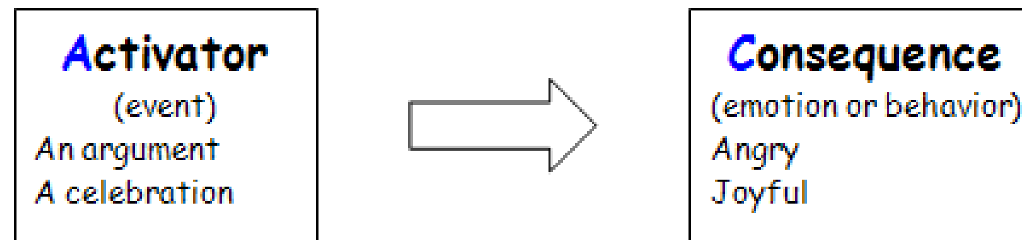
SE < 85%: decrease by 15-30 mins

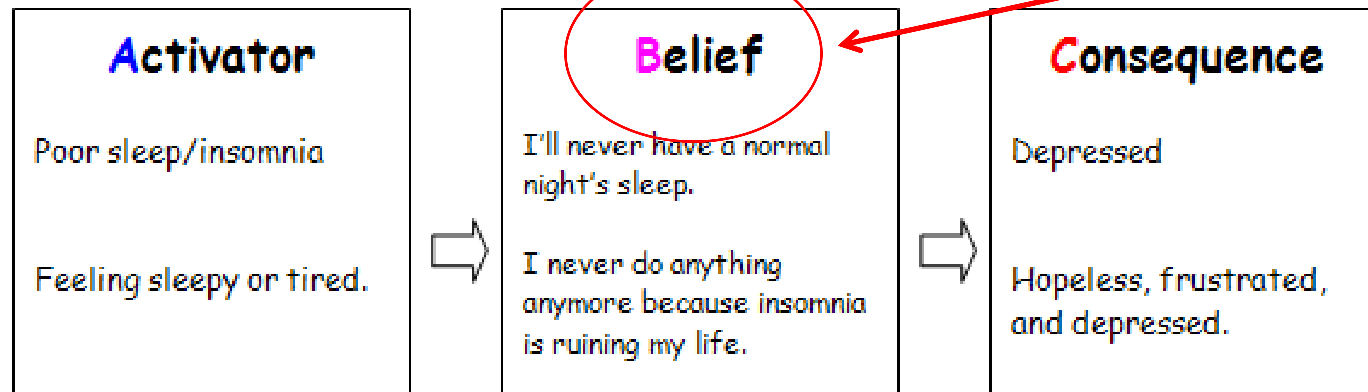
*** In older adults, lower threshold**



Spielman et al. Sleep Restriction Therapy in Perlis et al. Behavioral Treatments for Sleep Disorders. 2011, 21-30.

Cognitive Therapy



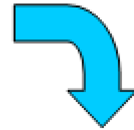


Albert Ellis' ABC Model

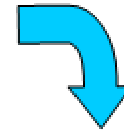
Cognitive Therapy II

Adding "D" to the ABC model:

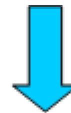
Activators (events)



Beliefs (thoughts)



Consequences (emotions or behaviors)



Dispute negative thoughts

Albert Ellis' ABC Model

Cognitive Therapy II

Example:

Disputing beliefs about negative consequences of sleep by examining the evidence

“I won’t be able to do well at work if I don’t sleep well tonight.”

Compare estimated # of poor nights of sleep with # of days where you actually didn’t do well at work (or record this prospectively)

Insomnia for 5 years, 3x/week = 780 “bad” nights

Days of poor work performance in the past 5 years = 100?

100/780 = <u>***13%***</u> chance of doing poorly at work due to sleep

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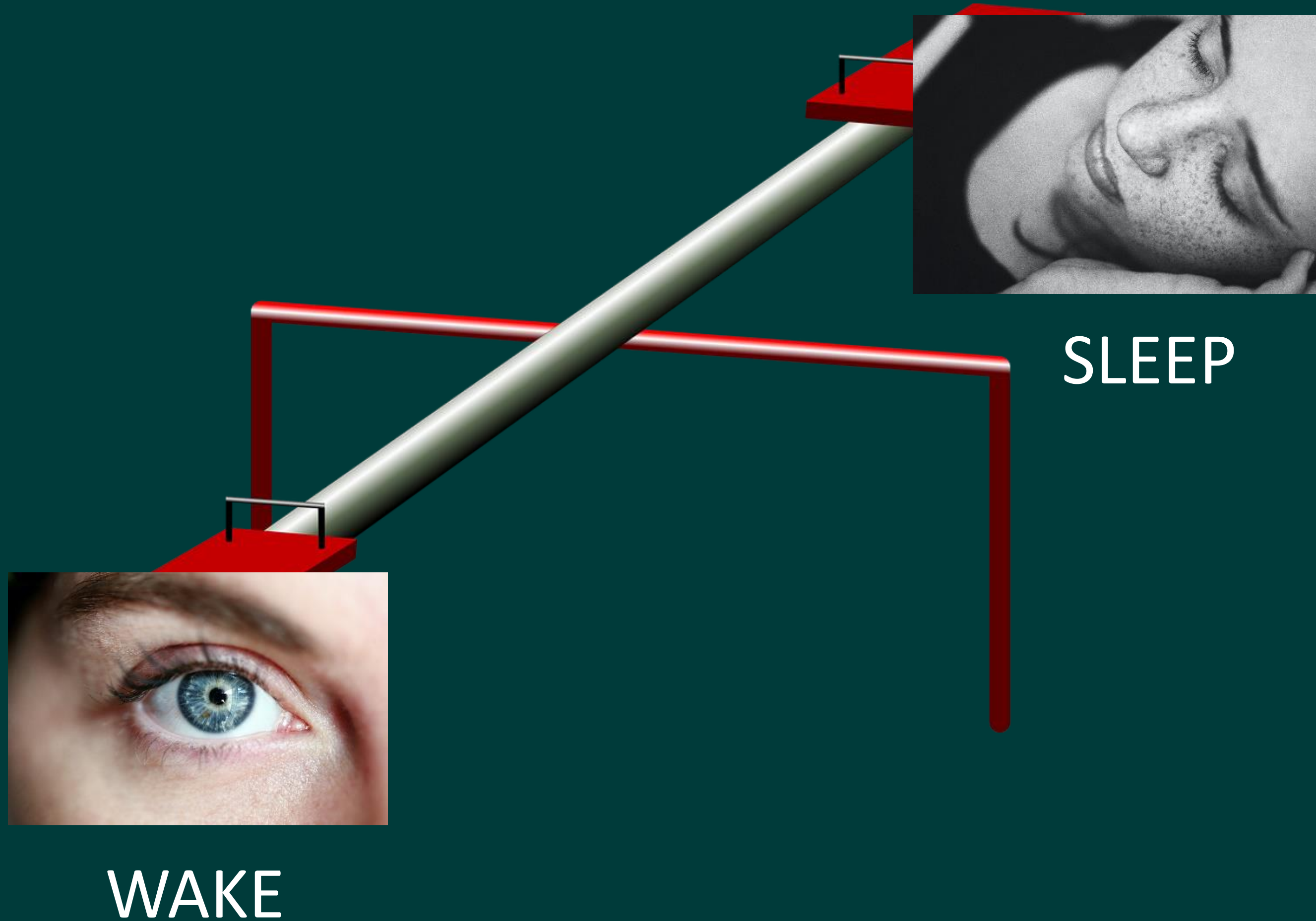
"Seesaw" of Sleep-Wake

Wake-Promoting Factors:

- Anxiety/Stress (sleep-related or otherwise)
- Noise
- Pain/Body Discomfort
- Exercise?*
- Circadian Rhythm
- Conditioned Arousal
- Certain Neurotransmitters & Modulators (NE, serotonin, ACh, histamine, hypocretin/orexin)



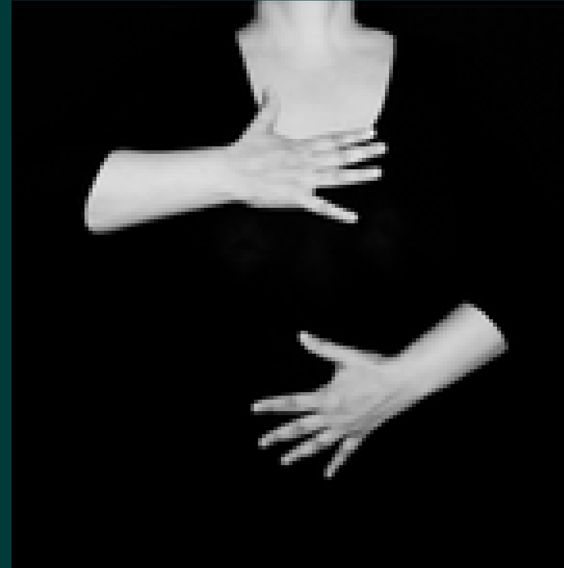
Sleep-Promoting Factors:

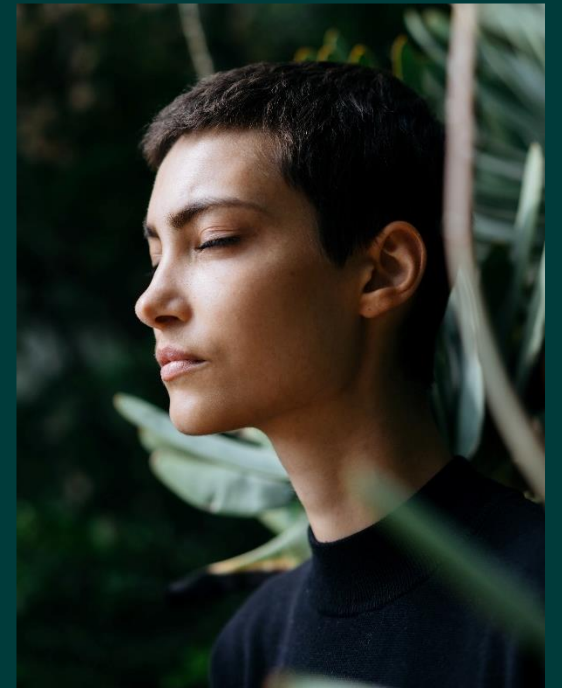
- ↑ Sleep Drive
- Exercise?*
- Circadian Rhythm
- Conditioned Sleepiness
- Certain Neurotransmitters & Modulators (adenosine, GABA, galanin, melatonin)

* Esteves et al. Sleep patterns and acute physical exercise: the effects of gender, sleep disturbances, type and time of physical exercise. J Sports Med Phys Fitness 2014, 54(6), 809-815.

Relaxation Training

- Diaphragmatic Breathing
- Progressive Muscle Relaxation
- Imagery
- Many Others!





Manzoni et al. Relaxation training for anxiety: a ten-years systematic review with meta-analysis. BMC Psychiatry 2008, 8, 41.

Sleep Hygiene

- Cut down on caffeine
- Don’t go to bed hungry
- Avoid moderate to heavy alcohol use in the late evening
- Avoid excessive liquids in the evening
- Avoid smoking before bed or during the night
- Exercise regularly
- Make sure bedroom is quiet (except perhaps for some white noise), very dark, and comfortable in terms of mattress, pillow, and temperature
- Electronic devices? Blue light?

Posner & Gehrman. Sleep Hygiene in Perlis et al. Behavioral Treatments for Sleep Disorders. 2011, 31-43.

Additional Resources

For information on sleep, sleep disorders, & treatments for sleep disorders:

- http://yoursleep.aasmnet.org/
- http://www.sleepeducation.com/
- http://sleepfoundation.org/
- http://www.behavioralsleep.org/

To locate an AASM-accredited sleep center:

- http://www.sleepeducation.com/find-a-center

For a list of Behavioral Sleep Medicine specialists:

- http://www.absm.org/bsmspecialists.aspx
- https://www.bsmcredential.org/index.php/bsm-diplomates
- https://www.behavioralsleep.org/index.php/society-of-behavioral-sleep-medicine-providers/member-providers
- https://www.pennsleep.directory/
- http://insomnia.onair.cc/category/find-a-therapist/

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Licensed Psychologist

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