

The Regulation of Sleep and How it Can Go Wrong: 2 Common Sleep Disorders and Their Treatments

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APA Required Statement

- *"Materials that are included in this course may include interventions and modalities that are beyond the authorized practice of mental health professionals. As a licensed professional, you are responsible for reviewing the scope of practice, including activities that are defined in law as beyond the boundaries of practice in accordance with and in compliance with your professions standards."*



The following presenter has relevant financial disclosures to make:

- Sleep Advisor for Fitbit, Inc.

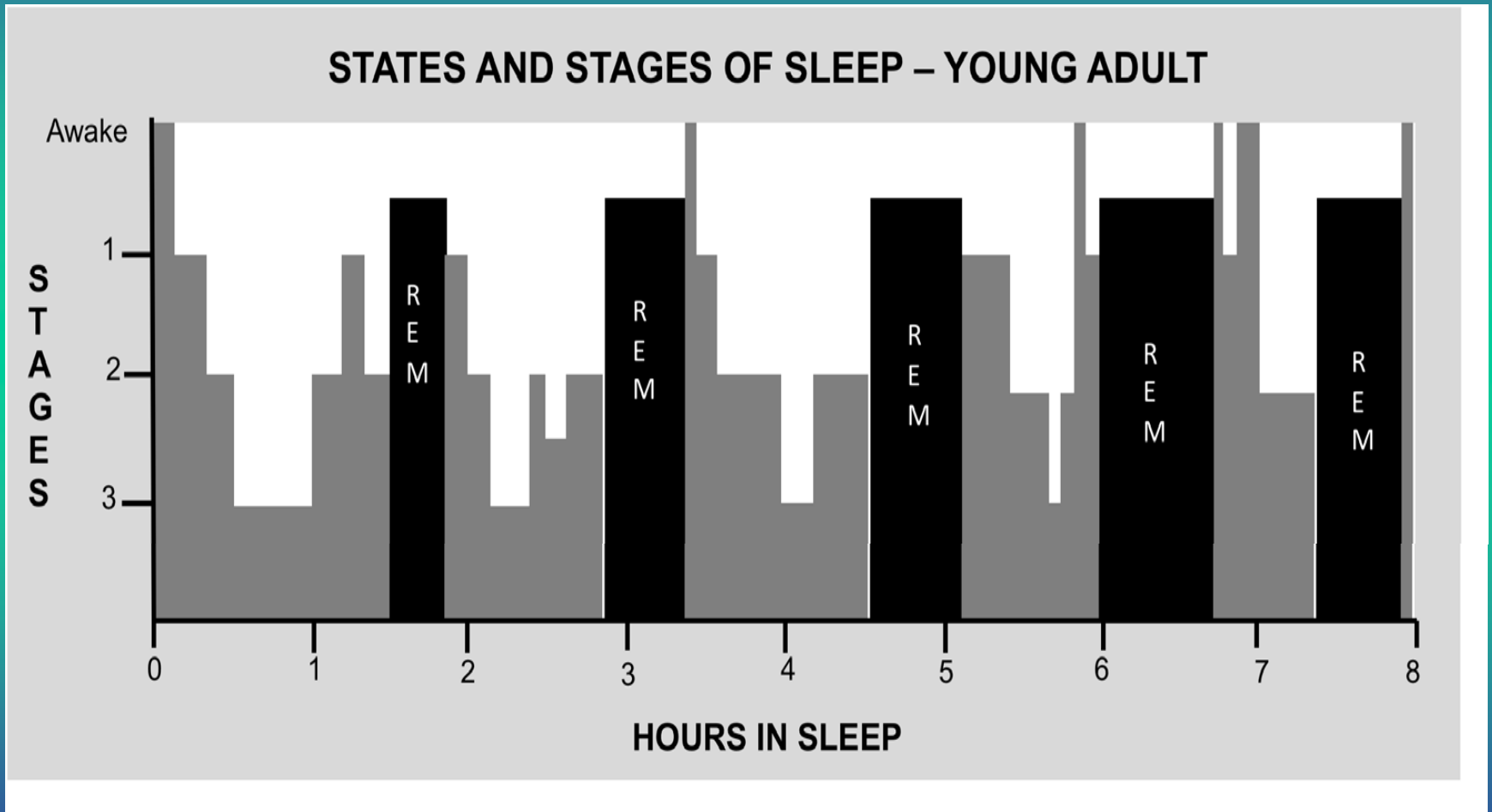
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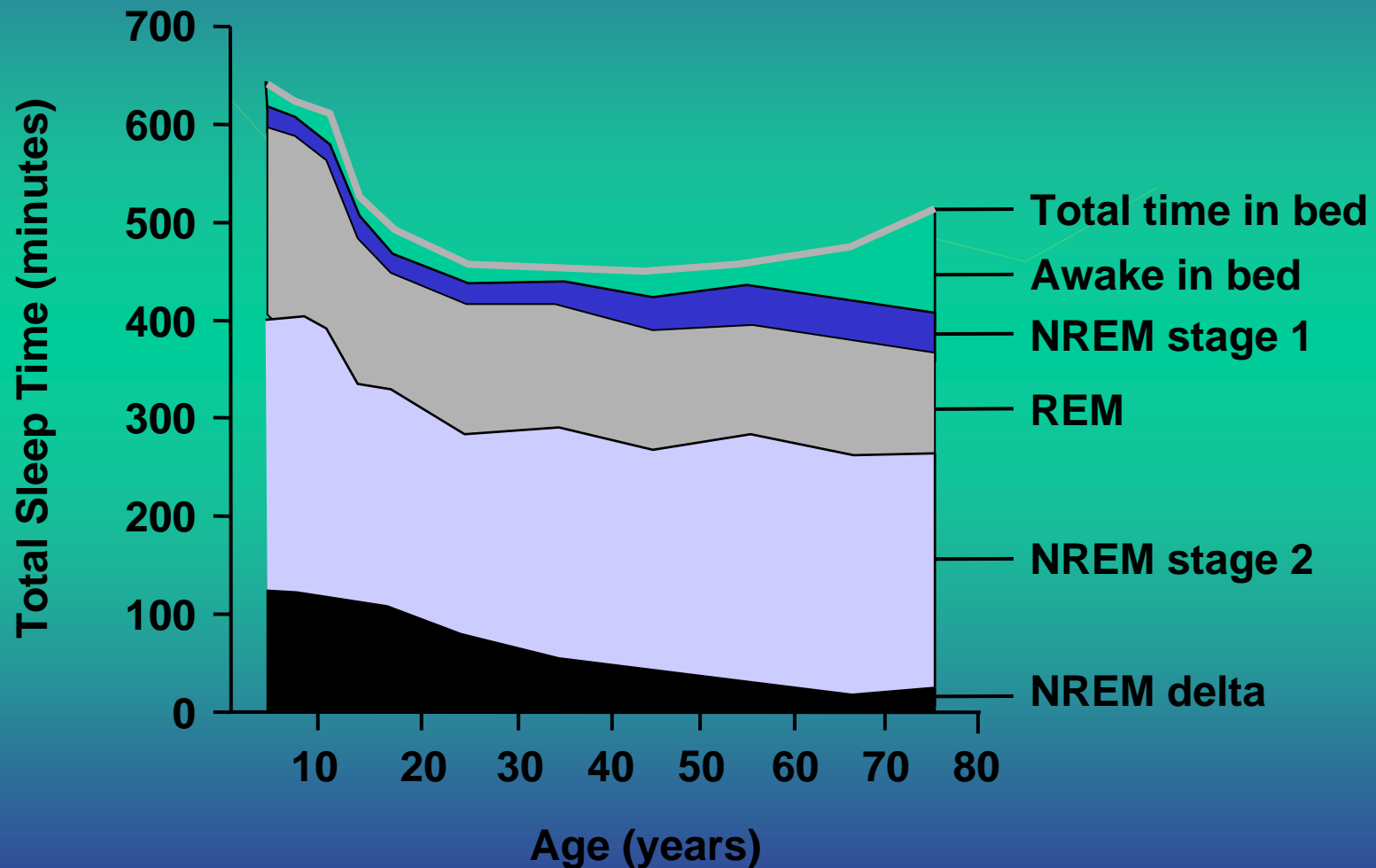
Overview of Part I

- Insomnia disorder
- The regulation of sleep
- Behavioral treatment components
- Cognitive treatment component

Hypnogram



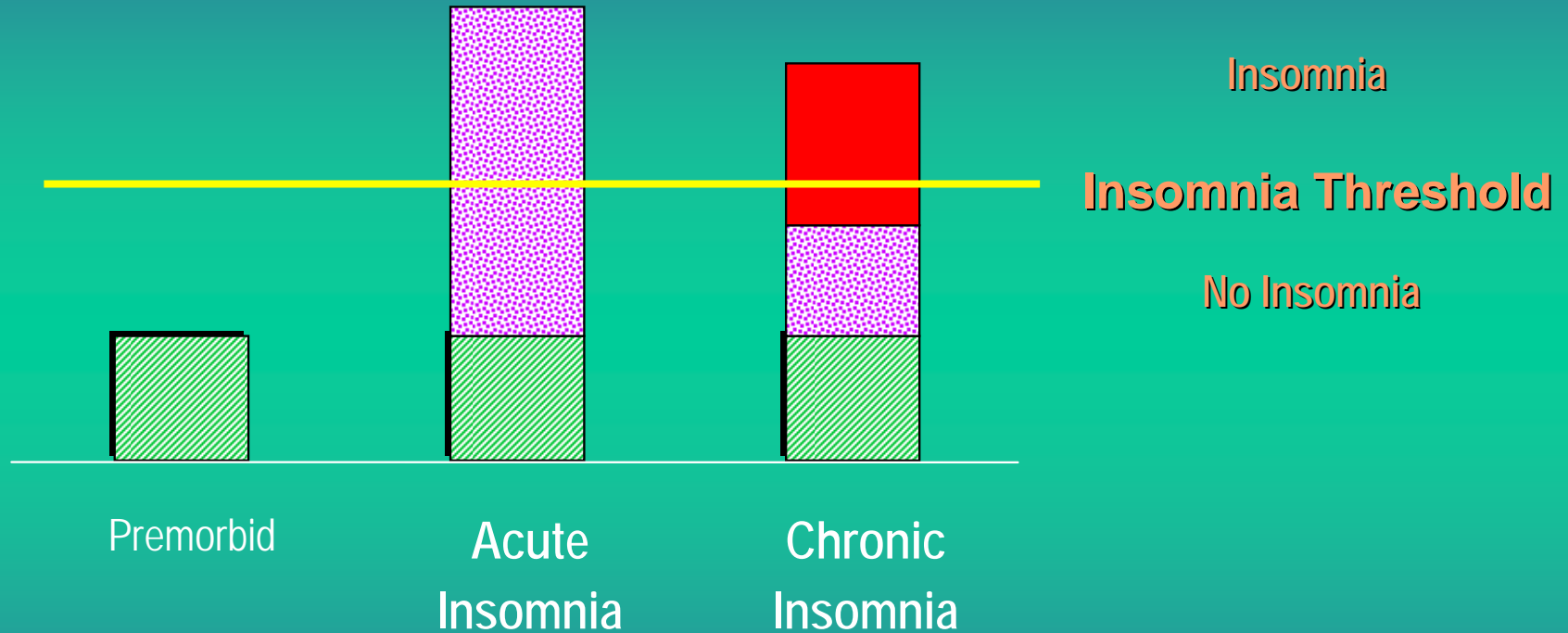
Sleep Across the Life Span



Diagnostic Criteria for Insomnia Disorder

- A. A predominant complaint of dissatisfaction with sleep quantity or quality, associated with difficulty initiating or maintaining sleep (frequent awakening or problem returning to sleep), or early morning awakening with inability to return to sleep
- B. The sleep disturbance is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- C. Sleep difficulty occurs at least 3 nights per week.
- D. The sleep difficulty is present for at least 3 months.
- E. The sleep difficulty occurs despite adequate opportunity for sleep.
- F. The insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder
- G. The insomnia is not attributable to the physiological effects of substances
- H. Coexisting mental or medical conditions do not adequately explain the predominant complaint of insomnia

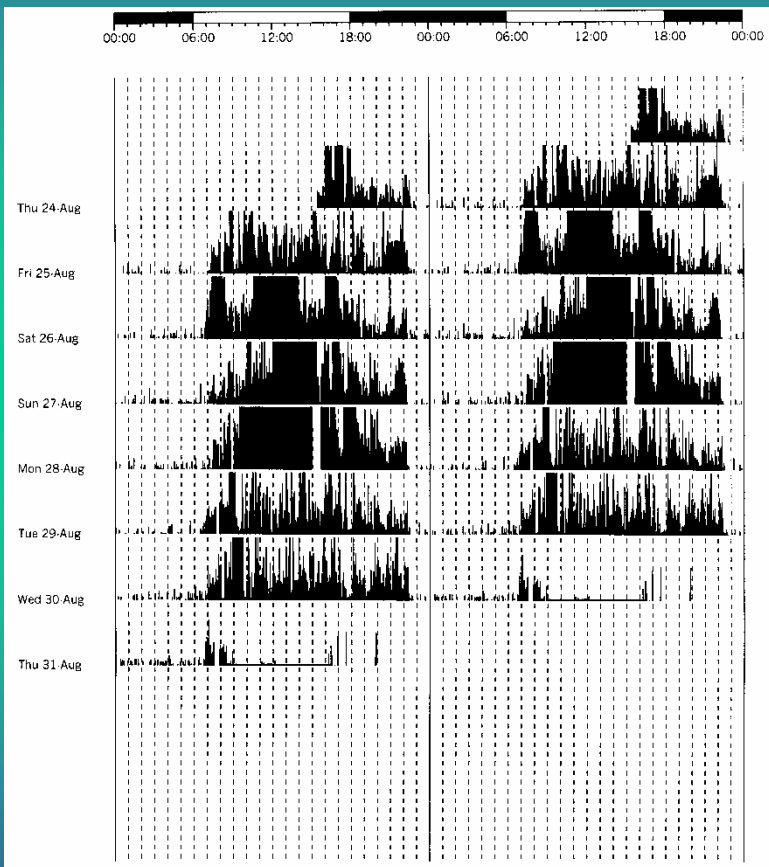
The Evolution of Insomnia



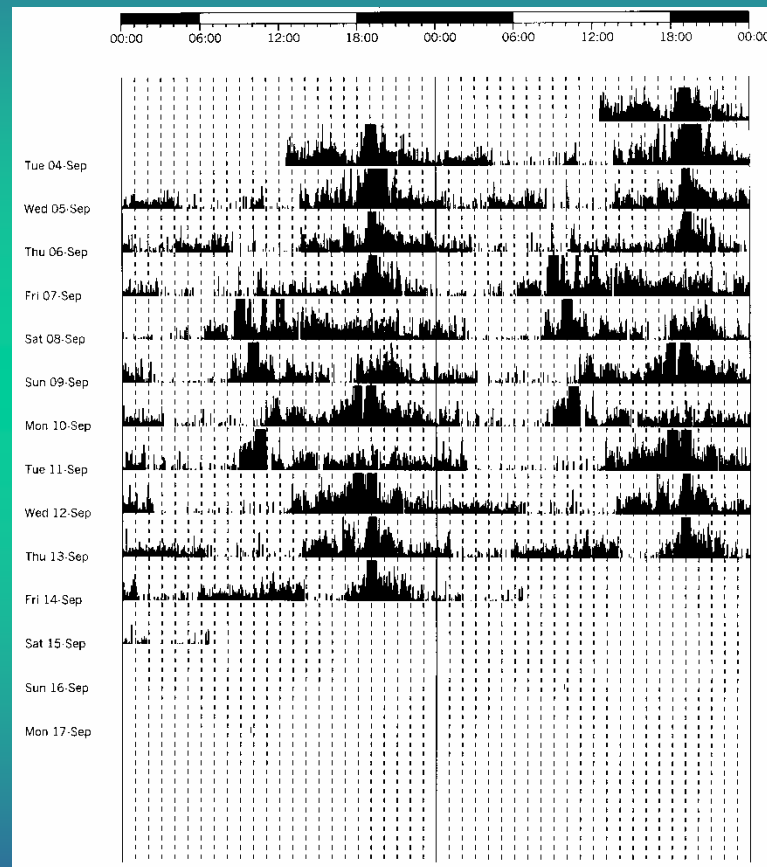
-  Predisposing Factors
-  Precipitating Factors
-  Perpetuating Factors

Adapted from Spielman et al., 2000

Actigraph



Control



Insomnia

Indications for Polysomnography

- **Suspect other sleep disorder**
- **Poor treatment response**
- **Atypical clinical presentation**



Not routinely indicated for the evaluation of insomnia

Today's date	4/1/10						
In total, how long did you nap or doze yesterday?	1:30-2:45 PM						
1. What time did you get into bed?	11:00 PM						
2. What time did you try to go to sleep?	11:30 PM						
3. How long did it take you to fall asleep?	40 Min.						
4. How many times did you wake up, not counting your final awakening?	2 Times						
5. In total, how long did these awakenings last?	1 hour 5 min.						
6a. What time was your final awakening?	6:30 AM						
6b. Did you wake up earlier than you planned/desired?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
6c. If yes, how many minutes earlier?	30 min						
7. What time did you get out of bed for the day?	7:15 AM						
8. How would you rate the quality of your sleep?	Poor						
9. Comments (if applicable)	I have a cold						

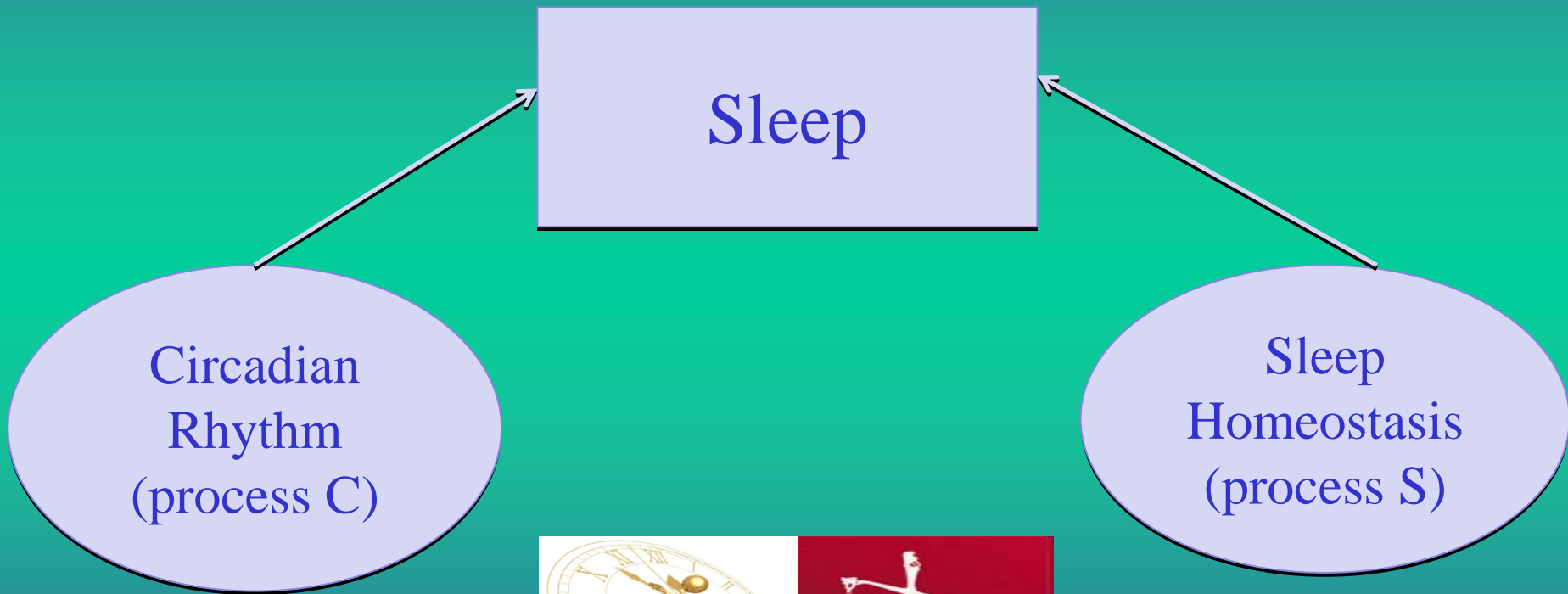
Sleep Regulation

Sleep



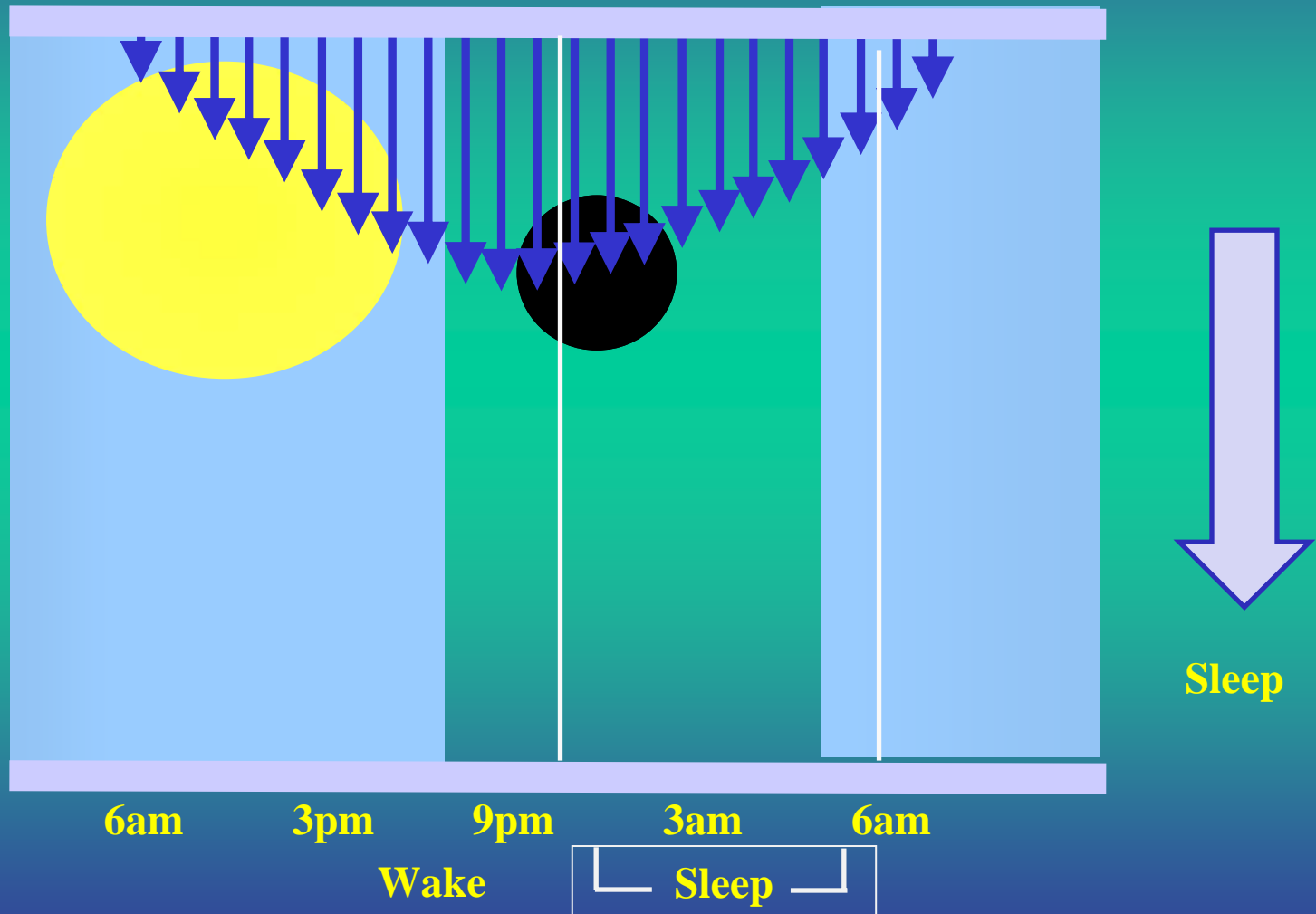
Wake

Sleep Regulation



Sleep/Wake Regulation

Process S: The Sleep Drive



Sleep/Wake Regulation

Process S: The Sleep Drive

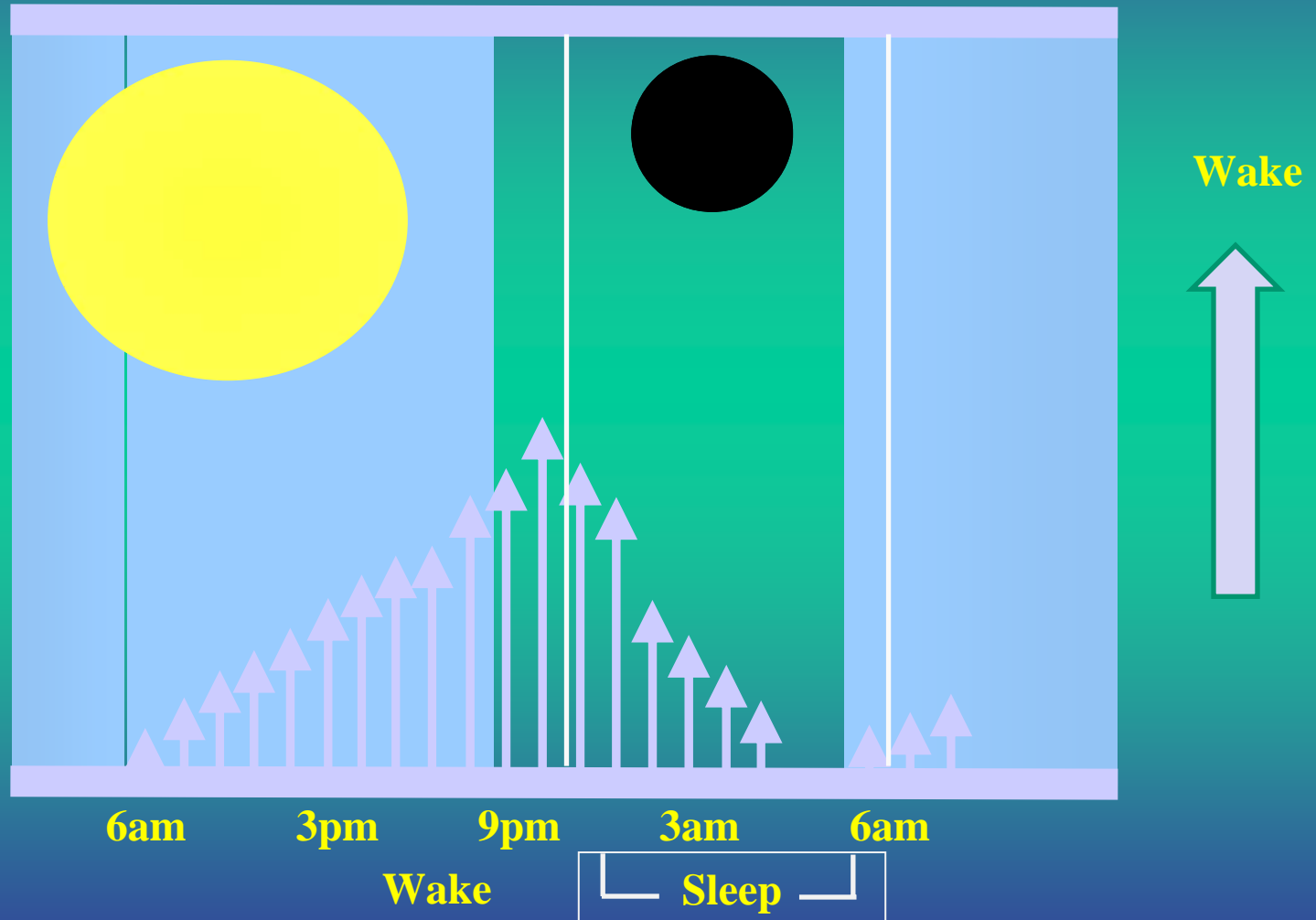
- Sleep drive increases during the day as more time elapses after waking
 - Adenosine accumulates in brain during waking hours
This increases sleep drive and causes sleepiness
- Sleep drive decreases during the night, as sleep progresses across the night
 - Adenosine stores in brain diminish. This decreases sleep drive and leads to alertness

Factors that Weaken the Sleep Drive

- Excess time in bed
- Napping
- Dozing (particularly close to bedtime)

Sleep/Wake Regulation

Process C: The Circadian Clock



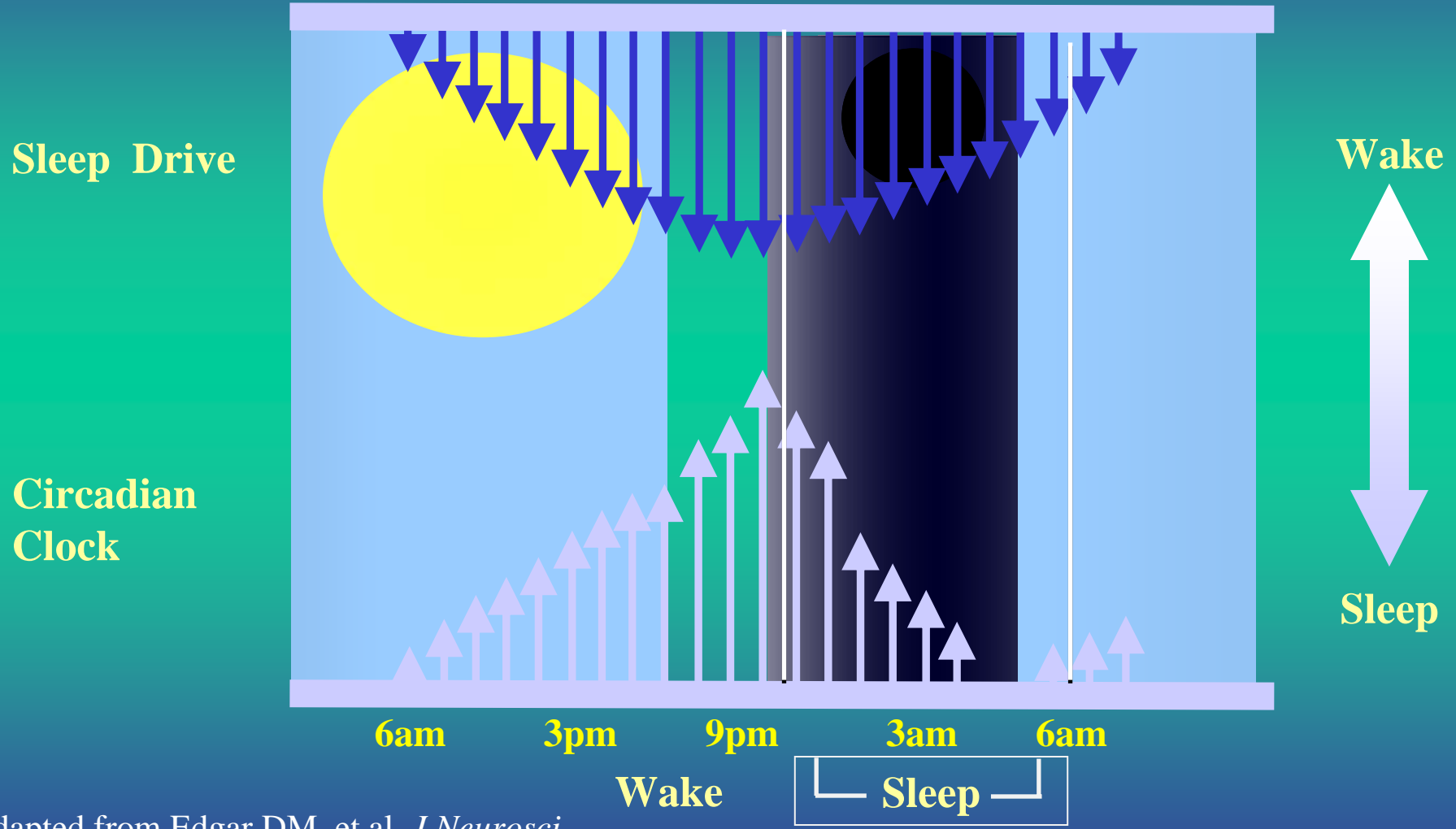
Sleep/Wake Regulation

Process C: The Circadian Clock*

- The circadian clock regulates sleep/wake by sending alerting signals of varying strength across the 24-hour day
 - Alerting signals increase across the day starting at wake time
 - Alerting signals decrease across the night until the early morning

* Circadian = Circa (about) + diem (day)

Sleep Drive (S) & Circadian Clock (C) Work Together to Regulate Sleep



Adapted from Edgar DM, et al. *J Neurosci*
Courtesy of Phyllis Zee

Sleep/Wake Regulation

Process W: The Arousal System



- Arousal system can over-ride sleep-promoting system
 - In order to allow us to respond to danger

- BUT -- over-active arousal system can interfere with the two processes regulating sleep (Sleep Drive and Circadian Clock)

Misalignment of Circadian Clock with Society's Schedule



Typical Sleep Phase
 $T_{min} \downarrow$

Delayed Phase
 "Owls"



Advanced Phase
 "Larks"

Strong sleep drive



Correct circadian placement



Low arousal



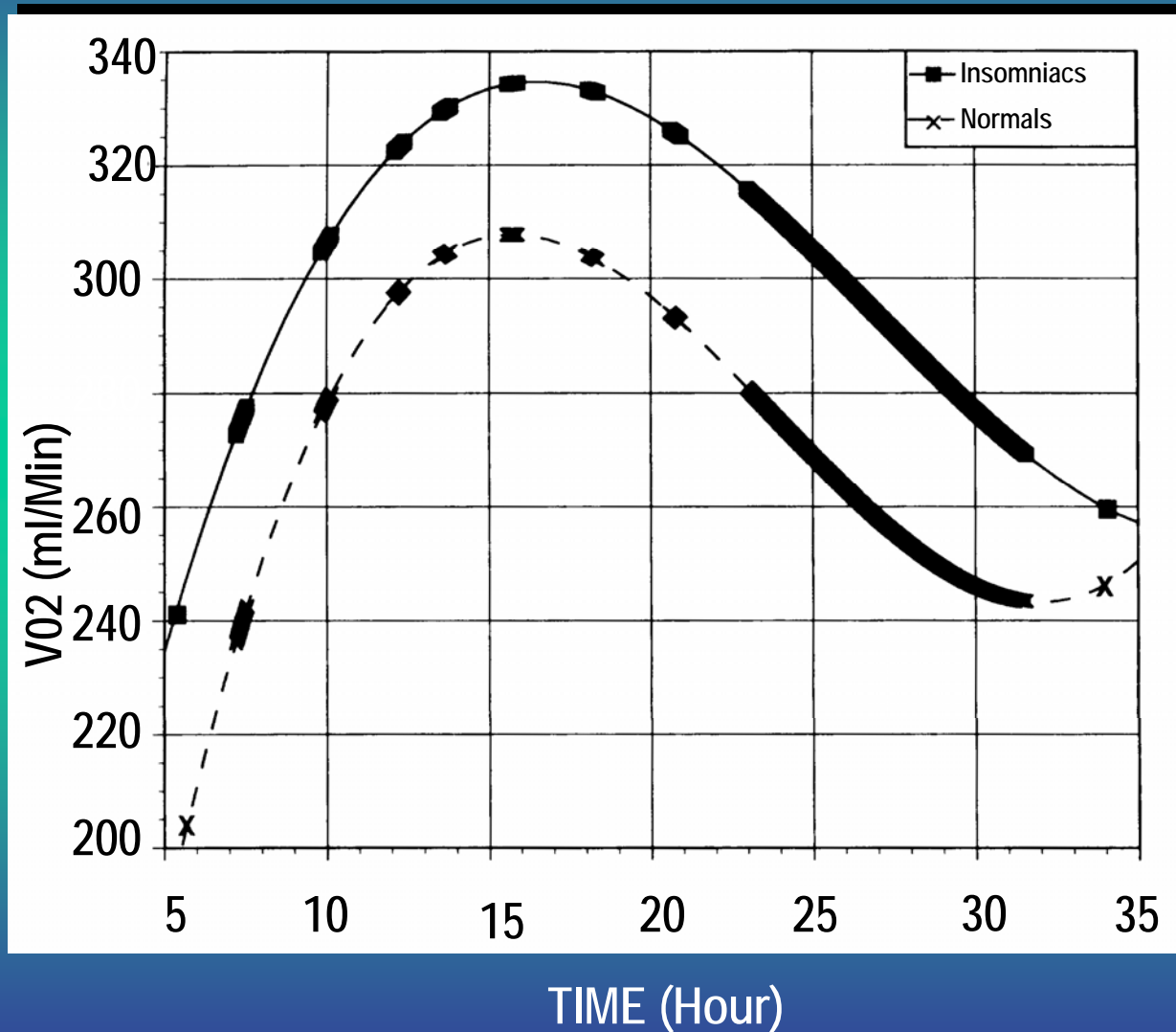
Good sleep

Increased Physiological Arousal in Insomnia

- Metabolic rate
- Sympathetic activation
- Hypothalamic-Pituitary-Adrenal Axis (stress system)
- Cortical arousal measured by
 - Electroencephalogram (EEG)
 - Brain metabolism (PET, fMRI)

Metabolic Rate

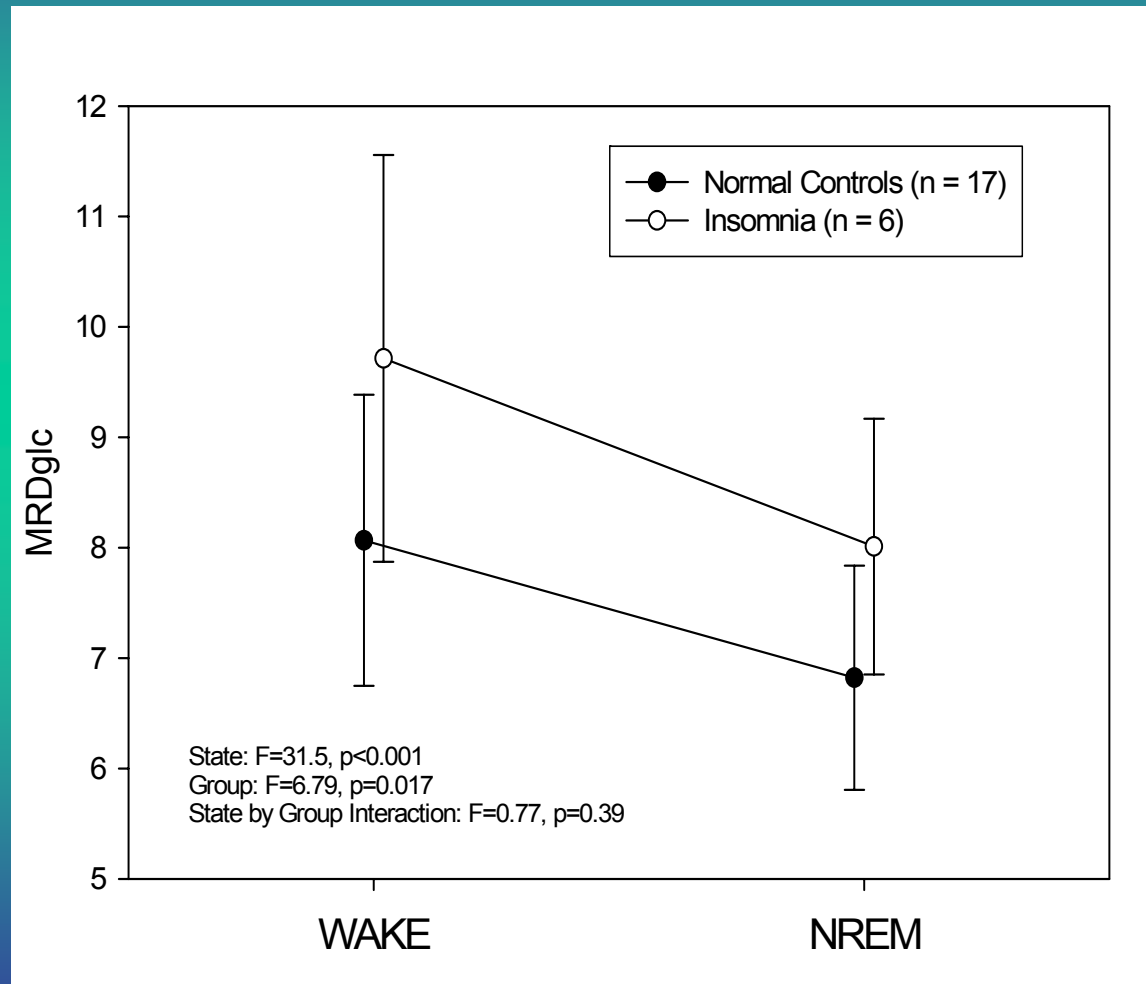
VO₂ max is the maximum capacity to transport and utilize oxygen during incremental exercise.



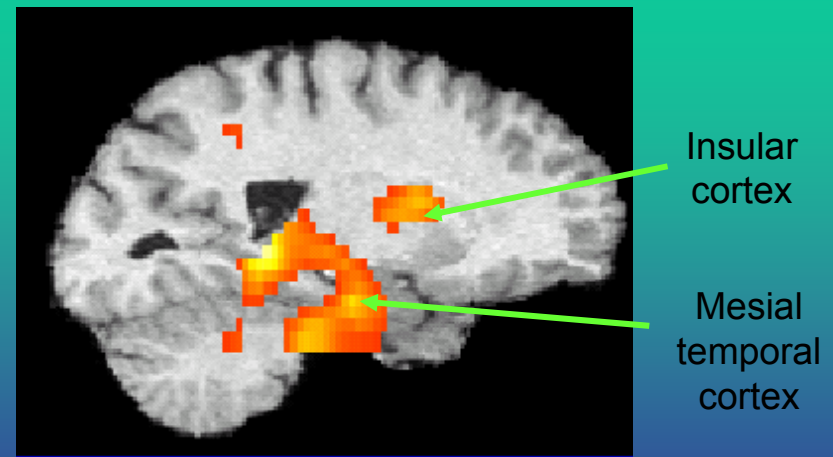
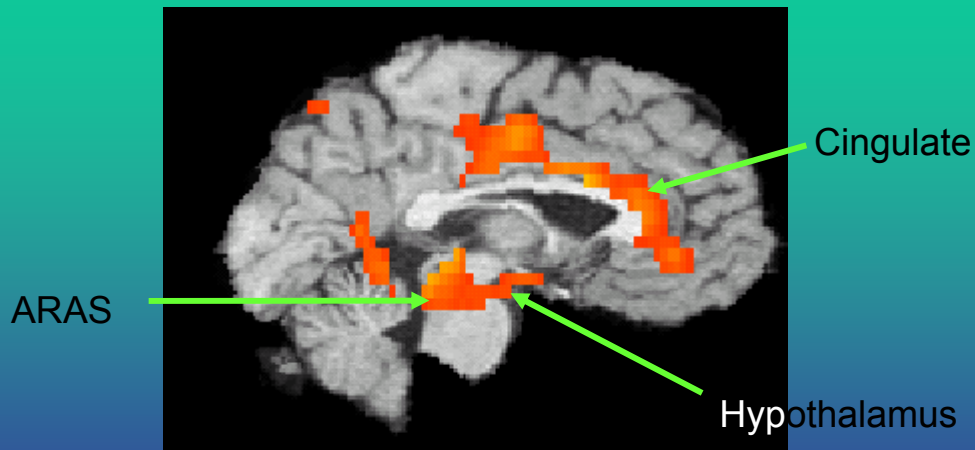
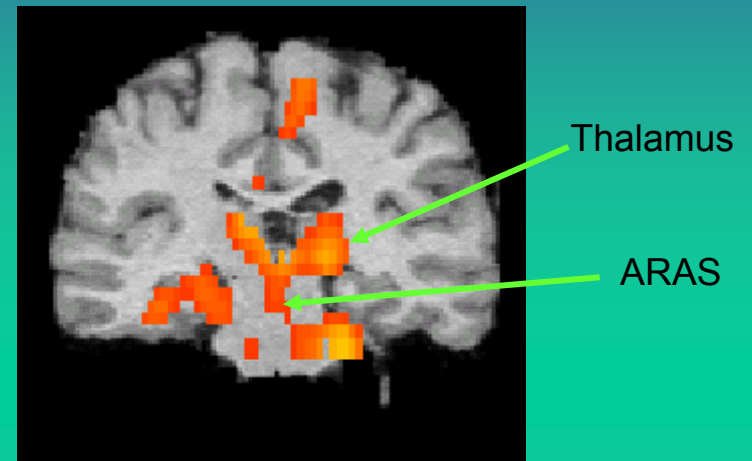
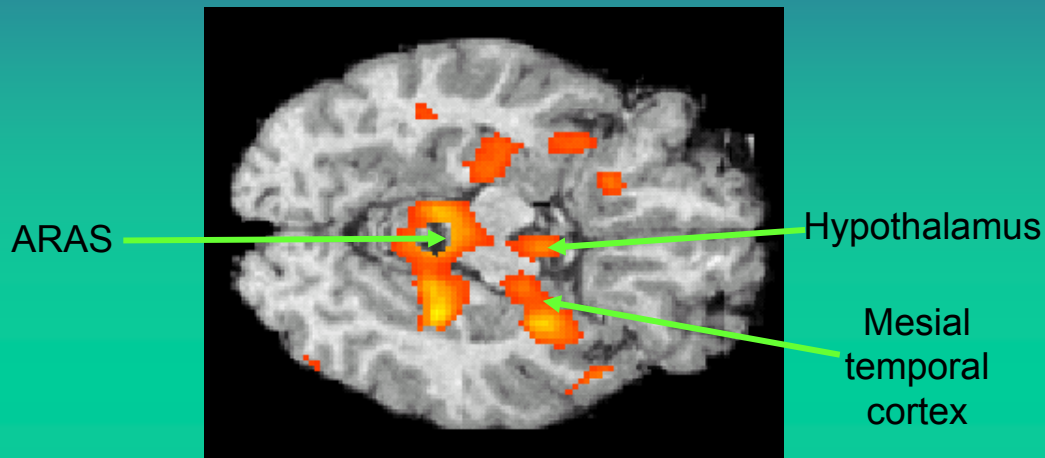
Bonnet M et al.
SLEEP 1995;18.

Hypermetabolism in Insomnia

Whole brain
metabolism



Areas that do not deactivate from waking to sleep: insomnia vs. controls



Limitation of Hyper-Arousal Evidence

Cognitive and somatic arousal might be an epiphenomenon of nighttime wakefulness

Metabolism

- Relative to good sleepers, insomnia is associated with higher 24-hour metabolic rate, viewed as a “higher arousal set point”

(Bonnet & Arand, 1995)

Diminished Ability to Nap

Insomnia vs. Good Sleep

Minutes to fall asleep

- People with insomnia ↑
- Caffeine induced insomnia in normals ↑
- Simulated insomnia in normals ↓
- Sleep-deprived people with insomnia ↓

Multiple Sleep Latency Test (MSLT): Average minutes to fall asleep at multiple opportunities

Diminished napping ability in insomnia = hyperarousal
“Tired but wired”

Cognitive Arousal

- Pre-sleep anticipatory anxiety
- Negative emotions about sleep
- Intrusive thoughts in bed
- Catastrophizing at night about potential negative consequences of poor sleep
- Rigid sleep-related rules
 - Critical sleep window

Cognitive Arousal

- Avoidance behaviors
 - To prevent poor sleep
 - Following poor sleep
- Arousal producing cognitions
 - Attributing poor daytime function, negative mood, and “ill-being” to poor sleep
- Hyper-attention to “threats” to sleep
 - Clock monitoring

Attention



Original Stimulus, OS



Sleep-Related Changed Stimulus, CS-S
(one of a pair of slippers removed)








Neutral Changed Stimulus, CS-N
(one of a pair of gloves removed)

Figure 1. Gray-scale versions of the full color stimuli used: original stimulus (OS) and the two changed stimuli for each of the two levels of the nature of change factor—sleep-related change (CS-S) and neutral change (CS-N).

(Jones et al. 2005)

CBTI Components

Technique	Aims
Stimulus Control 	Strengthen bed & bedroom as <u>sleep cues</u>
Sleep Restriction 	Restrict time in bed to increase <u>sleep drive</u> and consolidate sleep
Biofeedback, Relaxation, buffer, worry time	<u>Arousal reduction</u>
Cognitive Restructuring 	Address <u>thoughts and beliefs</u> that interfere with sleep & adherence
Sleep Hygiene 	Address substances, exercise, eating, environment
Circadian Rhythm Entrainment 	Shift or strengthen the <u>circadian</u> sleep/wake rhythm

Conditioned Insomnia

With repeated pairing of bed with wakefulness
(high arousal)



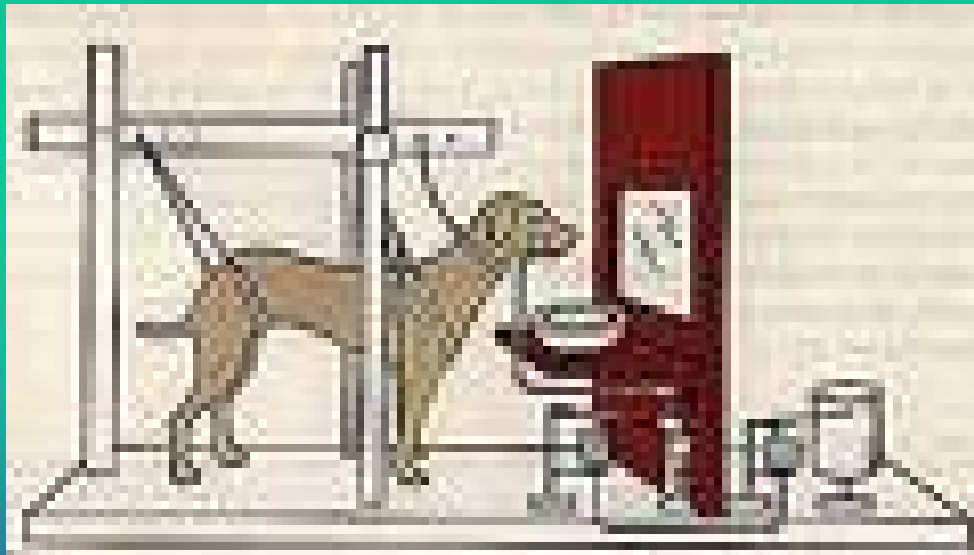
The bed becomes a cue for hyperarousal, rather
than sleep

Examples of classical conditioning can help patients understand
this idea (e.g., Pavlov's dog)

Classical Conditioning

Bell

Meat powder



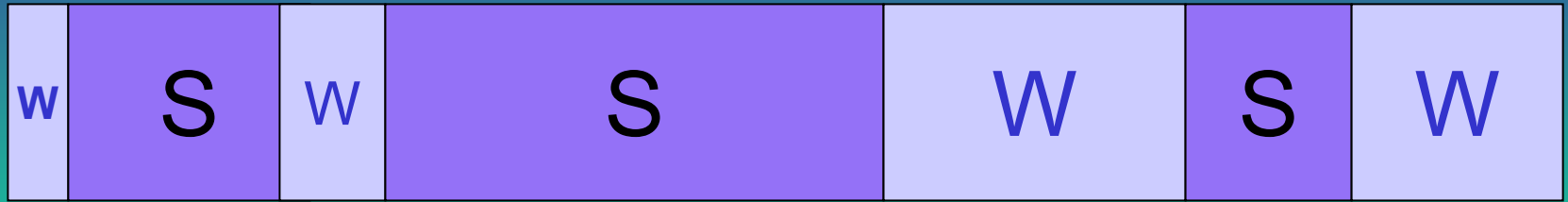
Drooling

Conditioned Insomnia



Also known as conditioned arousal

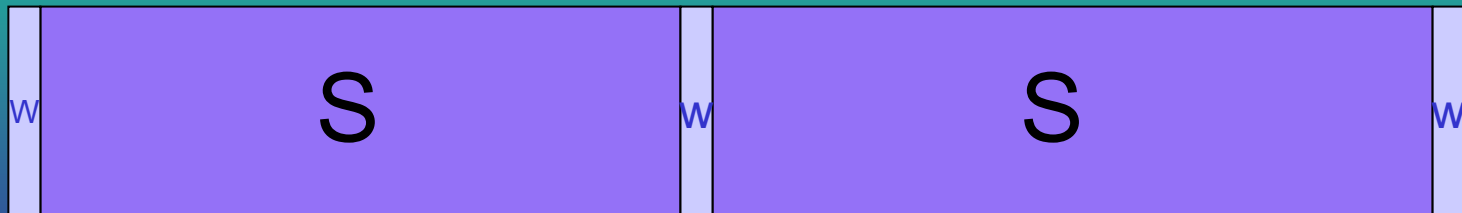
SRT: How It Works



Step 1: Restrict TIB



Step 2: Expand TIB when indicated



How Does SRT Increase Sleep Drive?

- Patients with insomnia overestimate time awake at night and underestimate how long they slept
- Setting TIB = TST based on self report (log) will likely result in less TST during the following week
- Sleep deprivation appears to alter this perception bias

SRT Step 2: Changing TIB

Extend TIB if sleep quality (defined by sleep efficiency) high and sleep need not met

- Sleep efficiency (SE) = $(TST/TIB) * 100$

Reduce TIB if sleep still of poor quality

- But not if concerned about daytime safety

Otherwise do not change TIB

SRT Step 1: Case 2 (Paula)

68 year old married female, Vietnam surgical nurse, with sleep maintenance problem (wakes several times during the night and wakes too early for the day)

Paula

Stressor: husband with prostate cancer; socially isolated

History: insomnia during periods of anxiety, increased with menopause

Dozes off and on all evening long on the sofa

BT: 7:00 PM watches TV SOL < 30 minutes

WASO 3-4 times a night, up 20-40 minutes each time

WT = 3 AM Out-of-Bed = 4:30 AM

Daytime effects: Tired, does not drive, tries to nap during the day

Problems: Arthritis, anxiety, Restless Leg Syndrome

Medications: Motrin, Mirapex, Calcium

Coffee and a glass of wine with dinner at 4:30 PM

Goal: sleep at least 7 hours and not worry about it

SRT: Paula's Sleep Diary

Today's date	7/1	7/2	7/3	7/4	7/5	7/6	7/7
In total, how long did you nap or doze yesterday?	30	60	45	60	60	40	50
1. What time did you get into bed?	7:00	7:15	7:00	7:00	7:30	6:30	8:00
2. What time did you try to go to sleep?	7:00	8:00	7:15	8:00	8:00	7:00	8:00
3. How long did it take you to fall asleep?	15	5	10	10	10	15	10
4. How many times did you wake up, not counting your final awakening?	3	2	4	3	3	4	3
5. In total, how long did these awakenings last?	110 min	120 min	150 min	120 min	120 min	190 min	60 min
6a. What time was your final awakening?	3:00	4:00	4:30	4:20	4:10	4:50	4:10
6b. Did you wake up earlier than you desired?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6c. If yes how many minutes earlier?	90	60	70	60	20	40	60
7. What time did you get out of bed for the day?	4:30	4:50	5:00	5:00	5:00	5:30	5:30
8. How would you rate the quality of your sleep?	<input checked="" type="checkbox"/> Very poor	<input checked="" type="checkbox"/> Poor	<input checked="" type="checkbox"/> Poor	<input checked="" type="checkbox"/> Fair	<input checked="" type="checkbox"/> Very poor	<input checked="" type="checkbox"/> Poor	<input checked="" type="checkbox"/> Poor
9. Comments (if applicable)							

Averages: TIB = 9 hrs 26 min; TST = 6 hrs 23 min

Assessment Considerations for Older Adults

- Particularly important to assess comorbid conditions and medications
- Pay attention to lifestyle patterns
 - Napping
 - Are there sufficient stimulating/meaningful daytime activities?
 - Social isolation
 - Hypnotic use
- Note concerns
 - Some older adults are more concerned about possible consequences of insomnia on memory and health than about sleep problem itself

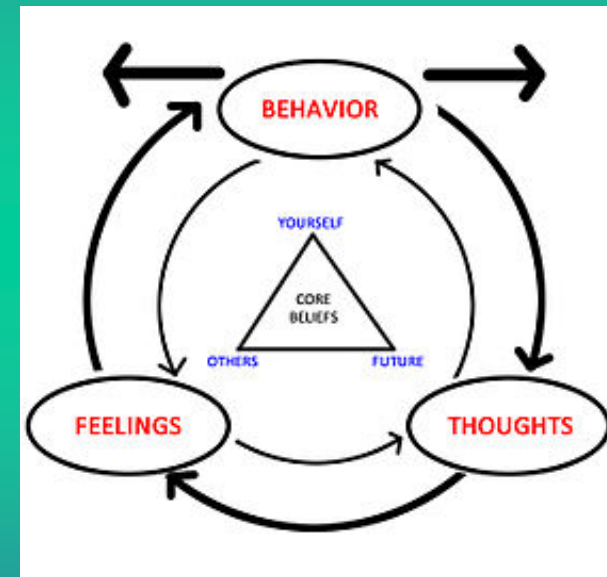
Cognitive Therapy

Addressing Beliefs and Cognitions
That Interfere with Sleep and
Adherence to Behavioral Guidelines

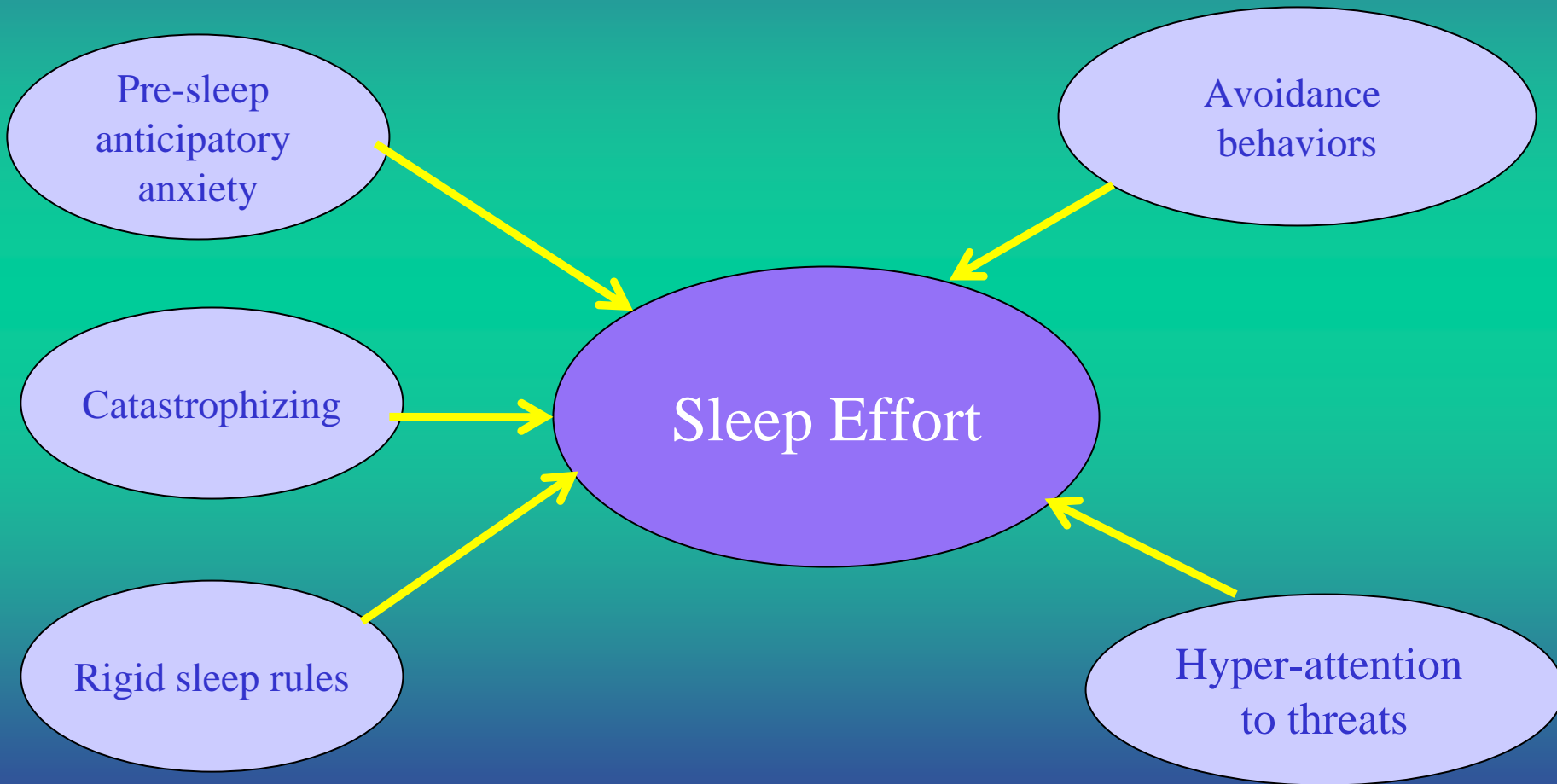
Cognitive Therapy

What is it?

- Based on the theory that our emotional experiences are impacted by our beliefs, thoughts, and interpretation of situations
- Aims to change beliefs and thoughts that may interfere with sleep and/or adherence



Sleep Effort




Addressing Arousal

- Biofeedback
- Progressive muscle relaxation
- Diaphragmatic breathing
- Meditation
- Guided imagery



New area of treatment
emerging:

‘Electroceuticals’

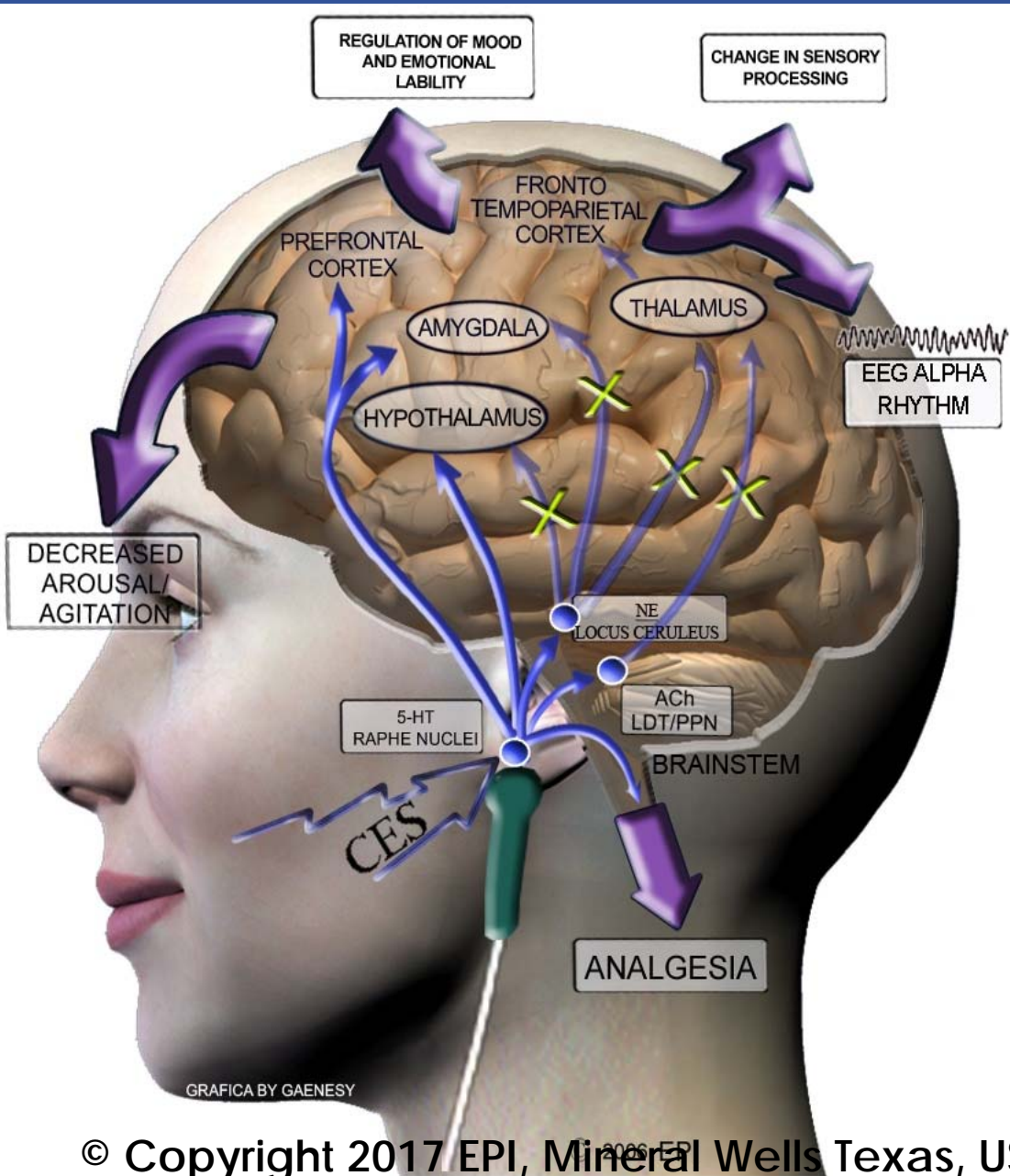


The Management of Anxiety, Insomnia, Depression and Pain with Cranial Electrotherapy Stimulation (CES) and Microcurrent Electrical Therapy (MET): Theory and Practice

es courtesy of Jeff Marksberry, MD, FAIS, CCRP, Vice President, Science and Education EPI

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Putative Mechanism of CES



CES engages the serotonergic (5-HT) raphe nuclei of the brainstem. 5-HT inhibits brainstem cholinergic (ACh) and noradrenergic (NE) systems that project supratentorially. This suppresses thalamo-cortical activity, arousal, agitation, alters sensory processing and induces EEG alpha rhythm. 5-HT can also act directly to modulate pain sensation in the dorsal horn of the spinal cord, alter pain perception, cognition and emotionality within the limbic forebrain.

Legend:

Blue arrows: inhibitory interactions

Purple arrows: excitatory interactions

X: suppressed pathways/interactions

Ach actetylcholine

LDT laterodorsal tegmental nucleus of the brainstem

PPN pediculo-pontine nucleus of the brainstem

NE norepinephrine;

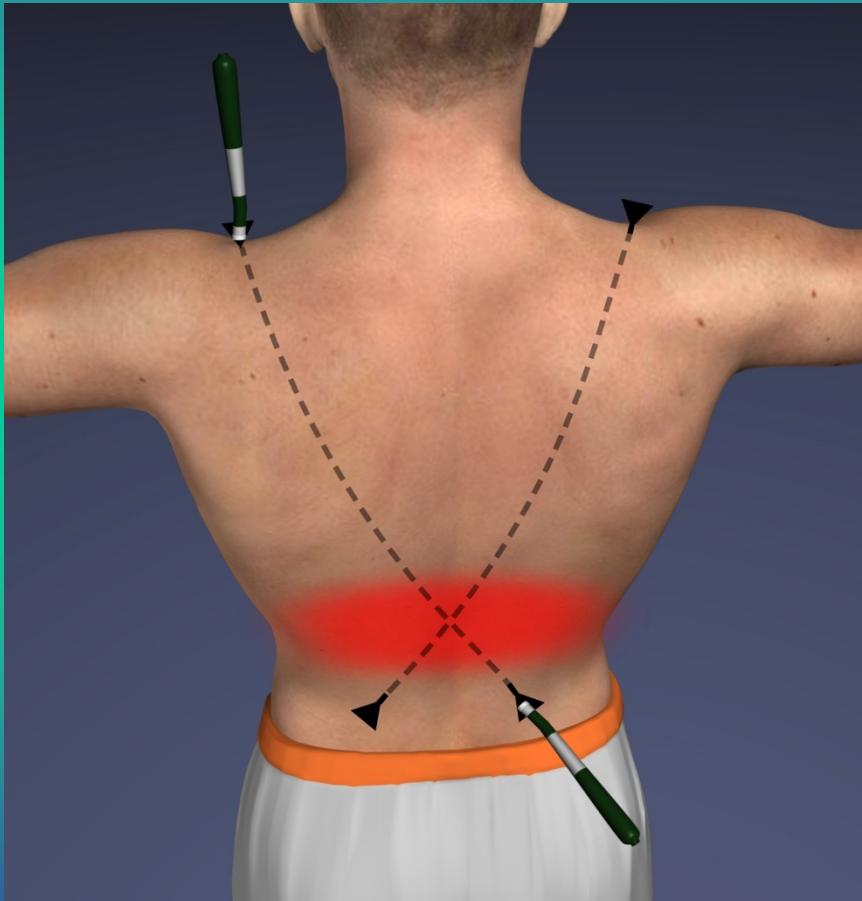
LC locus ceruleus,

5-HT serotonin

Giordano, James. Illustrating how CES works. Insert in Kirsch, Daniel L. Cranial electro-therapy stimulation for the treatment of anxiety, depression, insomnia and other conditions. *Natural Medicine*,

23:118-120, 2006

Example 2: Back Pain



Sleep Hygiene

Healthy Sleep Practices

1. Clock watching
2. Environment: lighting, comfort & safety
3. Sleep and eating
4. Exercise
5. Substances



Part II

- What is Delayed Sleep Phase Syndrome (DSPS)
- Influences that can further impact DSPS
- Adolescent and adult case examples with treatment recommendations

Circadian Rhythm Disorder Delayed Sleep Phase

- General Criteria – (ICSD 3 – DSM V)
 - 1) Persistent or recurrent sleep disturbance due to alteration in circadian timing or misalignment between endogenous circadian rhythms and external factors that affect timing of sleep; AND
 - 2) Distress/impairment in areas of functioning
 - 3) Sleep log, if possible actigraphy data

When the Biological Clock is Out of Sync with Society

- “Night Owls” (approximately 10% or less of the adult population)
 - a delayed circadian clock relative to most others.
 - Sleep better with a later bedtime
 - Have difficulty waking up in the morning.
- “Larks”
 - an advanced circadian clock
 - early rise time
 - Early bed time

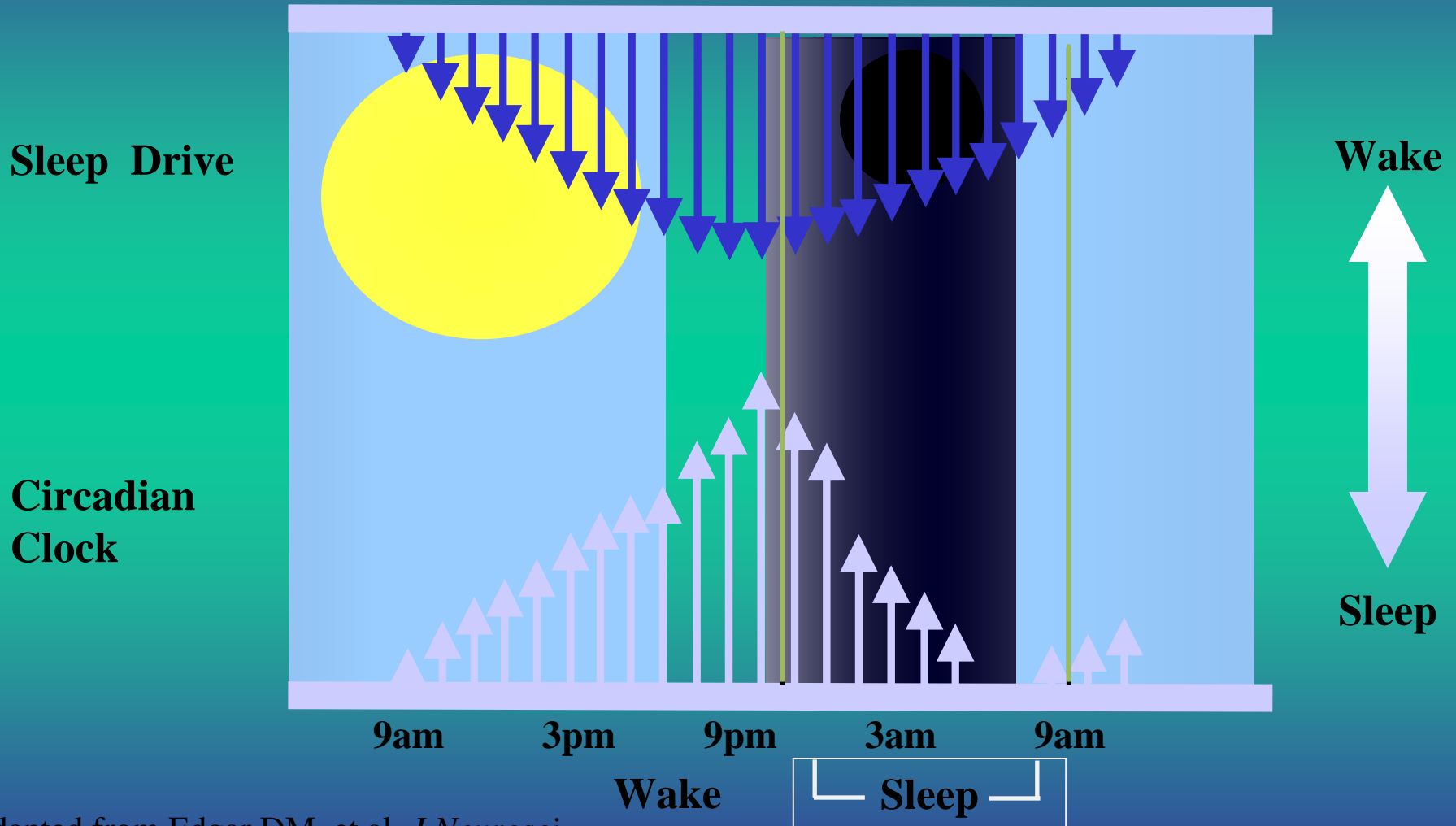
School-Aged Children (6-12 yrs)

- 10-11 hrs
- Complaints of EDS should be taken seriously and evaluated by primary care provider
- Electronic sandman – associated w/ difficulties falling asleep, may increase nightmares, 30-60 minute reduction in TST
- Avoid caffeine

Adolescents

- 9-9 1/2 hrs needed
- 7 hrs
- Puberty onset 2-hour physiologically based phase delay. Hormonal influence on circadian sleep-wake cycles and melatonin secretion
- Chronically sleep deprived

Sleep Drive & Circadian Clock Work Together to Regulate Sleep



Adapted from Edgar DM, et al. *J Neurosci*
Courtesy of Phyllis Zee

Misalignment of Circadian Clock with Society's Schedule



Typical Sleep Phase
 $T_{min} \downarrow$

Delayed Phase
"Owls"



Advanced Phase
"Larks"

Circadian/ Biological Rhythm Markers

- CTmin: Core Temperature Minimum
 - Usually occurs 2-4 hours before the end of the sleep period
- DLMO: Dim Light Melatonin Onset
 - Time when melatonin levels start to rise, normally occurring 2-3 hours before bedtime
 - Can be measured in saliva using serial sampling

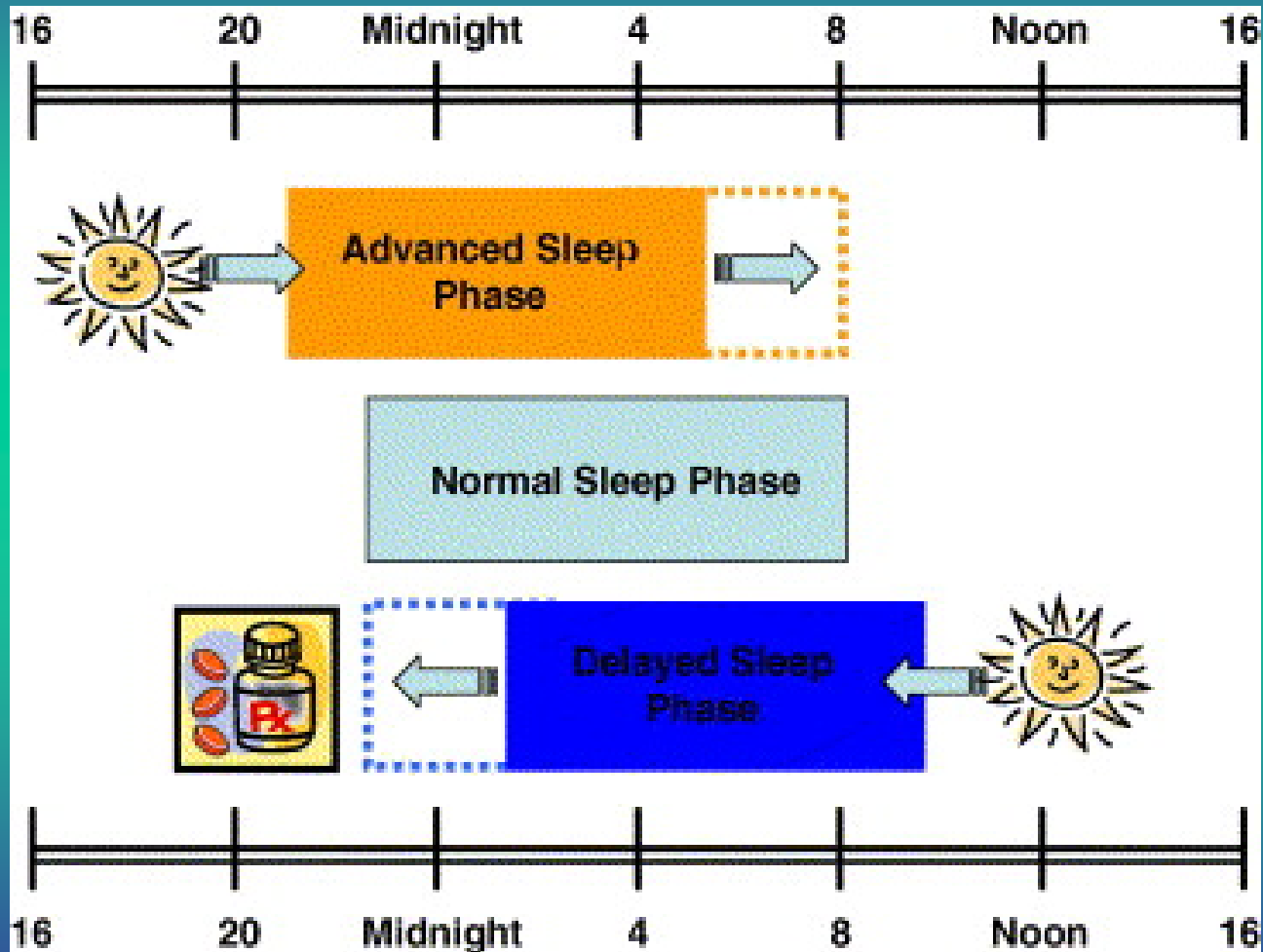
Light

- Most important external cue for circadian clock
- Effect of light on the circadian clock depends on timing of exposure
- Light in the early subjective morning (usually before awakening) will phase advance
- Light in the early subjective night will phase delay

Melatonin

- Synthesized and released by the pineal gland under influence from SCN
- Greatest secretion is at night.
- Secretion is inhibited by light exposure.
- Exogenous melatonin influences the SCN:
 - Phase delays sleep-wake rhythm when taken in the morning
 - Phase advances sleep-wake rhythm when taken in the afternoon or early evening
 - Less effective than light exposure
- Also mildly hypnotic

Treatment for DSPS and ASPS



A clinical approach to circadian rhythm sleep disorders
Sleep Medicine, Volume 8, Issue 6, September 2007, Pages
566-577 Ana Barion, Phyllis C. Zee

Differential Diagnosis for DSPS

- Idiopathic Insomnia
 - Difficulty initiating, maintaining sleep, or short total sleep time
- Psychophysiological insomnia
 - Not a constitutional “nightowl”
 - Counter-productive associations prevalent
- Insomnia comorbid with a drug or substance
- Insomnia comorbid with a psychiatric disorder
- Bipolar II Disorder

Diagnosis of DSPS

- Present with difficulty falling asleep, difficulty waking up, and excessive sleepiness especially in the morning
- Morning or night person?
- How do you sleep during vacation?
 - Without constraints, tend to fall asleep from 2-6am; and wake at 10am-1pm
- Chronic partial sleep deprivation, poor work/ school attendance
- Diagnosis by detailed sleep history, exam, sleep logs, and/or actigraphy for at least 7d (morningness/eveningness questionnaire)

Exacerbating Influences

- Stimulants – caffeine
- Late day phase-delaying zeitgebers
 - Vigorous exercise
 - Light exposure: “screens”
- Adolescence
 - Sleep physiology, school avoidance, social maladjustment, chaotic home environment
- Positive evening opportunities
- Negative morning circumstances
- Psychophysiological insomnia
- Depression

DSPS Management

- Set expectations
 - eg, one-hour phase advance per week
- Address buy-in for behavioral change – what is goal?
 - Conditioned avoidance of morning; gain from evening activities
- Relevant sleep hygiene
- Stimulus control and other CBT techniques, if elements of psychophysiological insomnia present

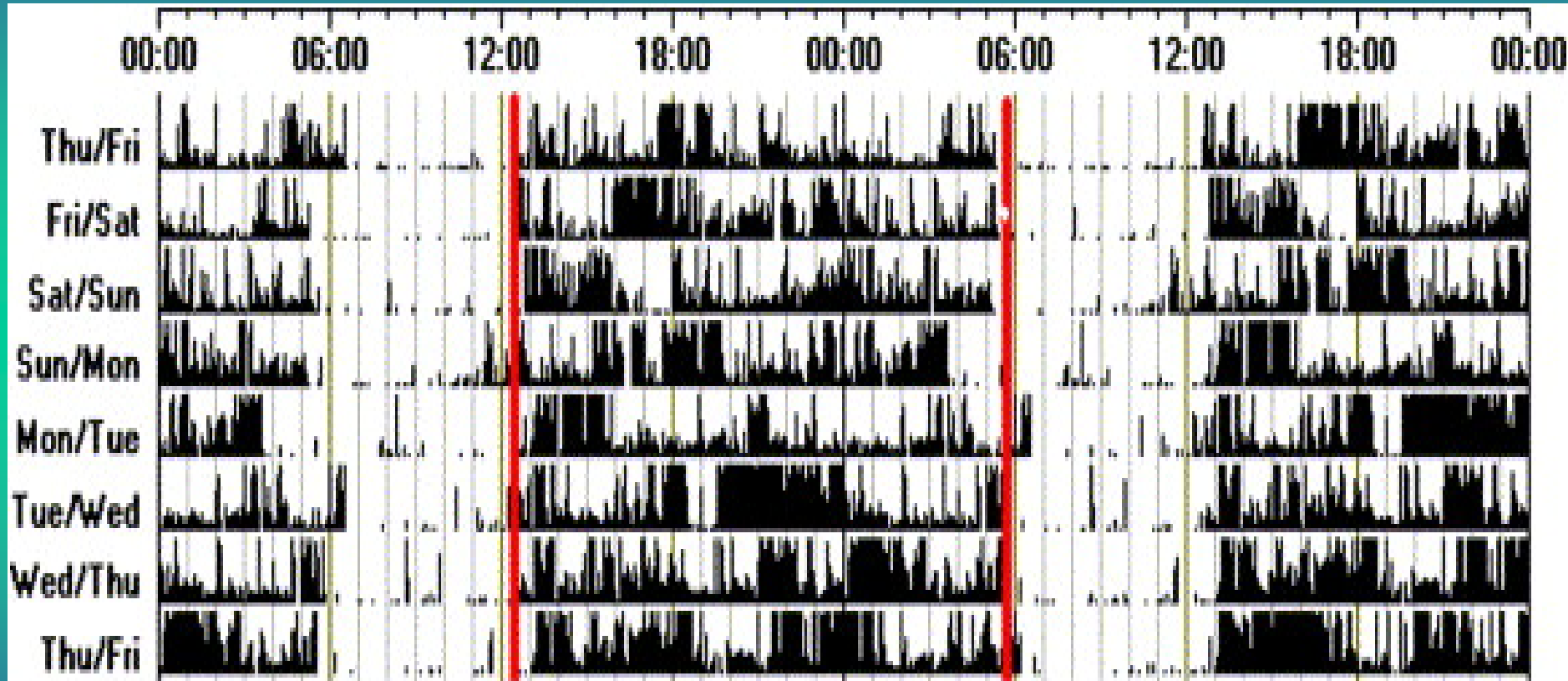
DSPS Management

- Decide whether to phase advance or delay based on circadian phase
- Phase altering techniques
 - Chronotherapy (shifting sleep time later each day until at desired time)
 - Morning bright light (within 15 mins of wake time)
 - Evening melatonin

Case of “Jay”

- 25-year old male
- Sleep time 5-6am waking at 12-2 pm
- History of depression
- Unable to hold down a job but motivated to do so
- Further questions/possible treatment recommendations?

Actigraphy Data

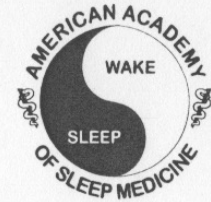


A clinical approach to circadian rhythm sleep disorders
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TX Recommendations for “Jay”

- Sleep education regarding DSPS
- Chronotherapy – shifting bedtime 2 hours later every two days slowing toward the end to 1 hour every 2 days.
- Buffer zone 2 hours prior to his anticipated bedtime (minimizing light exposure)
- Light therapy once patient stabilized sleep schedule

TWO WEEK SLEEP DIARY



INSTRUCTIONS:

1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise.
3. Put a line (l) to show when you go to bed. Shade in the box that shows when you think you fell asleep.
4. Shade in all the boxes that show when you are asleep at night or when you take a nap during the day.
5. Leave boxes unshaded to show when you wake up at night and when you are awake during the day.

SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't get back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7:00 in the morning.

Today's Date	Day of the week	Type of Day Work, School, Off, Vacation	Noon	1PM	2	3	4	5	6PM	7	8	9	10	11PM	Midnight	1AM	2	3	4	5	6AM	7	8	9	10	11AM
sample	Mon.	Work		E					A				l									M				

Sat																										
Sun																										
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week 1

Sat																										
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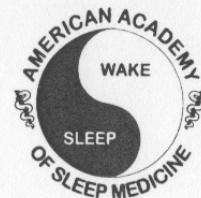
week 2

Depressed ☹️
Depressed!!
Went to gym
gym
gym
grocery store

TWO WEEK SLEEP DIARY

INSTRUCTIONS:

1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise.
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Today's Date	Day of the week	Type of Day Work, School, Off, Vacation	Noon	1PM	2	3	4	5	6PM	7	8	9	10	11PM	Midnight	1AM	2	3	4	5	6AM	7	8	9	10	11AM
sample	Mon.	Work		E					A													C	M			
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week 1

week 2

gym

gym

gym

gym

BL

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Interview!

Light Therapy

- Optimal intensity unknown, probably 50-500 lux blue-green light needed; 2-10k lux often used
- Reduce light exposure in the biological evening (unless phase delaying around the clock)
 - if biological evening occurs during morning commute when sun is coming up, can use red tinted or dark glasses to minimize B-G light
- * Use of light therapy is cautioned when eye disease, seizure or bipolar disorder present



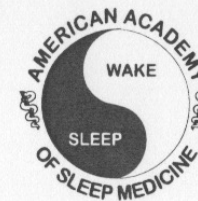
Case of “Maya”

- 16-year old female
- Sleep time 12-1 am waking at 6am during school days, 1-2am – 2pm weekends
- Struggle with parents regarding awakening on school days
- Dozing during class
- Further questions/possible treatment recommendations?

TWO WEEK SLEEP DIARY

INSTRUCTIONS:

1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise.
3. Put a line (l) to show when you go to bed. Shade in the box that shows when you think you fell asleep.
4. Shade in all the boxes that show when you are asleep at night or when you take a nap during the day.
5. Leave boxes unshaded to show when you wake up at night and when you are awake during the day.



SAMPLE ENTRY BELOW: On a Monday when I worked, I jogged on my lunch break at 1 PM, had a glass of wine with dinner at 6 PM, fell asleep watching TV from 7 to 8 PM, went to bed at 10:30 PM, fell asleep around Midnight, woke up and couldn't get back to sleep at about 4 AM, went back to sleep from 5 to 7 AM, and had coffee and medicine at 7:00 in the morning.

Today's Date	Day of the week	Type of Day Work, School, Off, Vacation	Noon	1PM	2	3	4	5	6PM	7	8	9	10	11PM	Midnight	1AM	2	3	4	5	6AM	7	8	9	10	11AM
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week 1

week 2

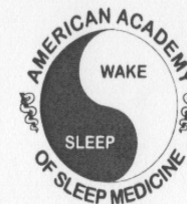
TX Recommendations for “Maya”

- Sleep education and discussion about social jet lag (both parent and child)
- Discuss if Maya is driving to school (motivator for tx implementation)
- Buffer zone 2 hours prior to her anticipated bedtime (minimizing light exposure/filter)
- Anchoring wake time closer on weekends (with parents initial help and then taking ownership of this responsibility)

TX Recommendations for “Maya” continued

- Prophylactic nap initial two-three weeks to help with sleep deprivation during the week (and decrease sleep rebound on weekends)
- Light therapy once patient had wake time closer on weekdays/weekends (learned to use this as a tool)

TWO WEEK SLEEP DIARY



INSTRUCTIONS:

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week 1

S-M																										
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week 2

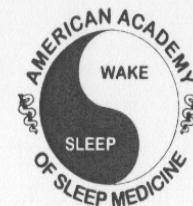
Case of “John”

- 46-year old male
- Sleep time 1-2 am waking at 8am during work days, 3am – 11am weekends
- Struggle to awaken in morning
- History of depression
- Dislikes his job/profession
- Tried light therapy but not enough time in the morning
- Further questions/possible treatment recommendations?

TWO WEEK SLEEP DIARY

INSTRUCTIONS:

1. Write the date, day of the week, and type of day: Work, School, Day Off, or Vacation.
2. Put the letter "C" in the box when you have coffee, cola or tea. Put "M" when you take any medicine. Put "A" when you drink alcohol. Put "E" when you exercise.
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sample	Mon.	Work		E					A				I									M				

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Tues	X															X	X	X	X	X	X					
Wed	X															X	X	X	X	X	X					
Thurs	X															X	X	X	X	X	X					
Fri	X															X	X	X	X	X	X					
Sat	X																X	X	X	X	X	X	X	X	X	X
SUN	X																X	X	X	X	X	X	X	X	X	X

week 1

week 2

John Smith

TX Recommendations for “John”

- Sleep education
- Buffer zone 2 hours prior to his anticipated bedtime (minimizing light exposure/filter)
- Anchoring wake time closer on weekends (8-9am) anticipating 12-1am
- Motivational enhancement as felt best in evening as opposed to during the day
- Melatonin 300mcg (.3mg) 7pm
- Follow up for tx of depression

Melatonin

- Distinguish between phase shifting circadian dose (0.3-0.5 mg) and mildly hypnotic bedtime dose 3 mg
- Not FDA-regulated – uncertain concentrations and impurities
- SE include headache, nausea

Special Consideration: Owls



Longer buffer zone

- Allows sleepiness to surface (unmasking)

Plan for difficulty waking in the morning

- Multiple alarm clocks, staggered temporally and spatially
- Morning exposure to natural outdoor light (or light box)

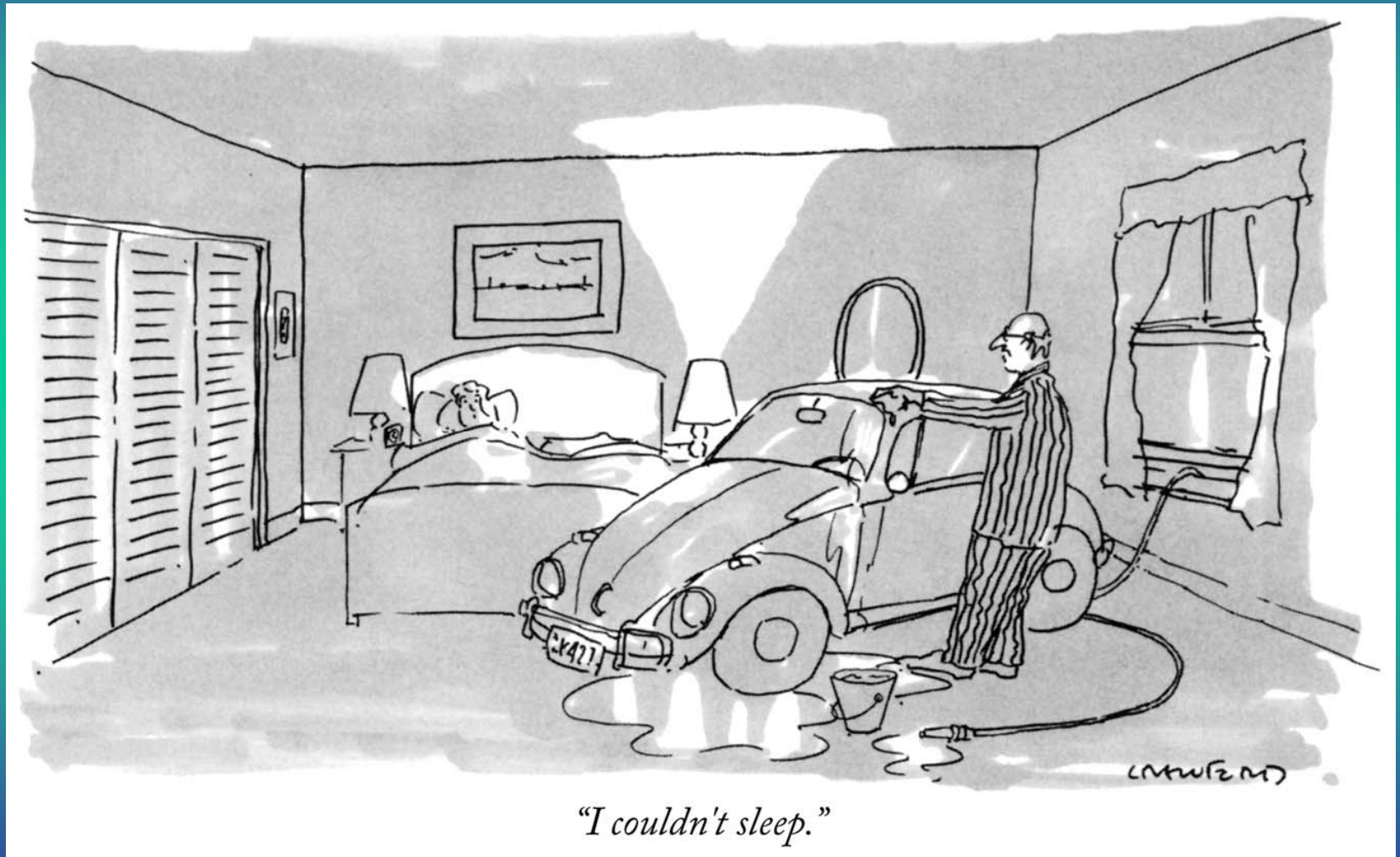
Emphasize importance of fixed rise time

- Strengthens circadian clock signals
- Facilitates waking up
- Prevents relapse

Sleep inertia

- Different than non-restorative sleep due to sleep apnea

Thank You



"I couldn't sleep."