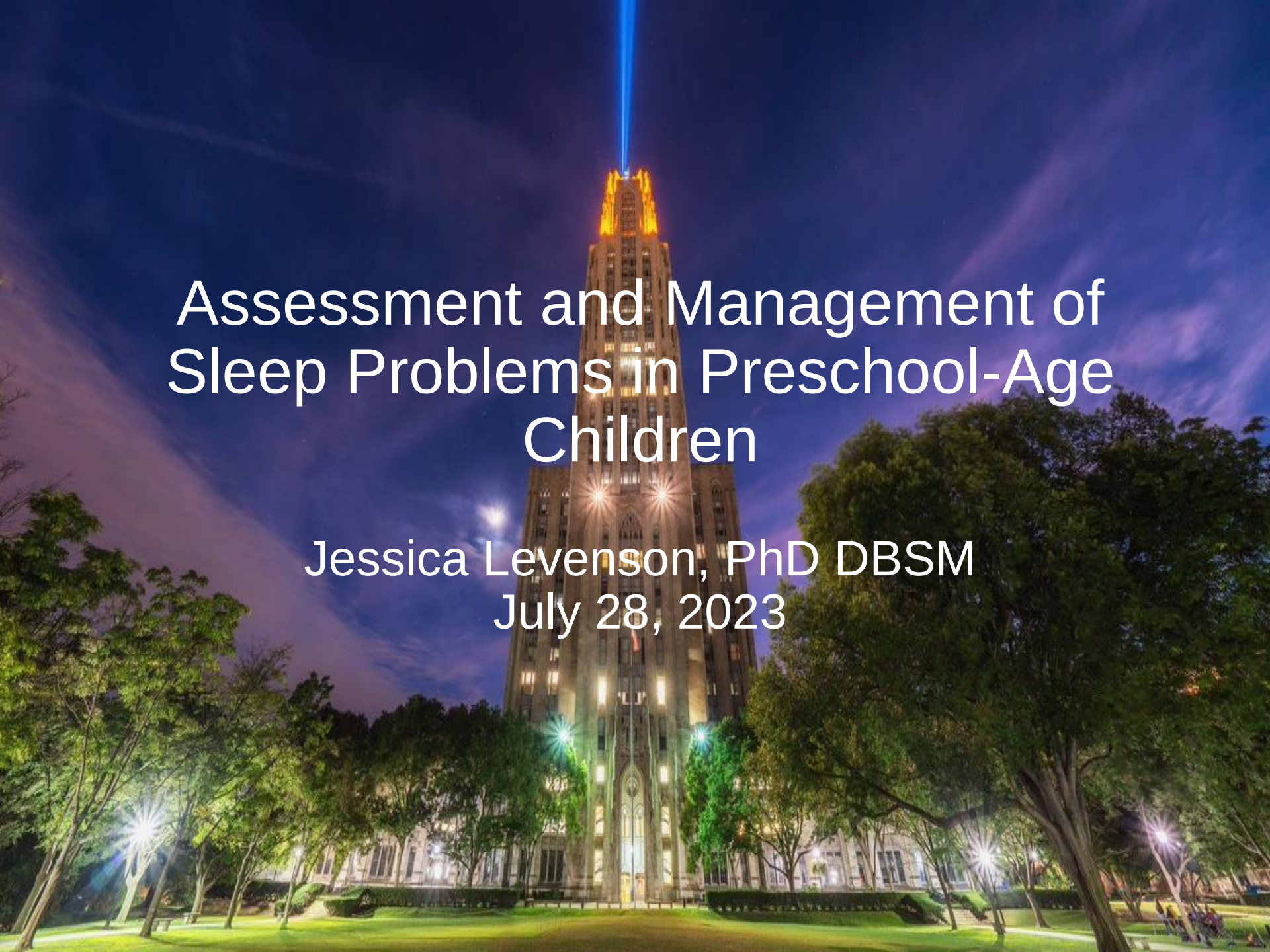

Assessment and Management of Sleep Problems in Preschool-Age Children

Jessica Levenson, PhD DBSM

July 28, 2023

Disclosures

- Research Funding: NIH, University of Pittsburgh
- Royalties: American Psychological Association Books
- Employment: University of Pittsburgh, UPP

Learning Objectives

- Participants will be able to identify developmentally appropriate sleep patterns
- Participants will learn the steps necessary to conduct a quality sleep assessment
- Participants will learn evidenced-based strategies for managing sleep problems with preschool age children

Agenda

8:00 AM: Check-in and coffee/pastries

8:30 AM – 10 AM: Assessment and Management of Sleep Problems in Preschool-age Children

10AM: Adjournment

Outline

- Basics of Sleep
- Sleep in Early Childhood
- Assessment of Sleep Problems
- Treatment of Early Childhood Sleep Problems

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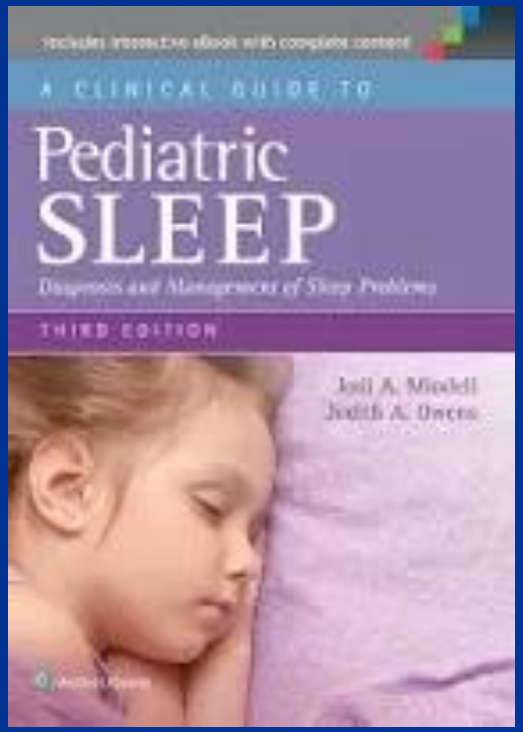
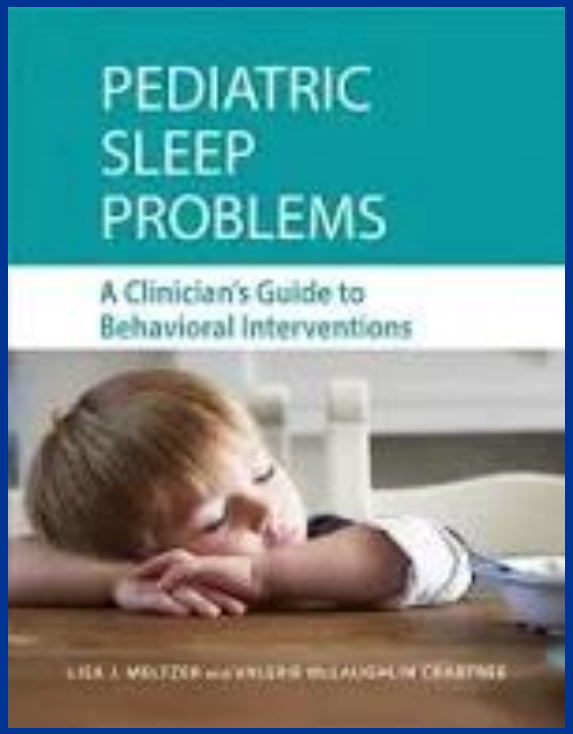
Resources





Pediatric Sleep Council

Babysleep.com

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Basics of Sleep – What is it?

"Sleep is a reversible behavioral state of […]disengagement from and unresponsiveness to the environment […] sleep is a complex amalgam of physiologic and behavioral processes…

…Sleep is typically […] accompanied by postural recumbence, behavioral quiescence, closed eyes, and all the other indicators one commonly associates with sleeping."

Carskadon, M.A., & Dement, W.C. (2011). Monitoring and staging human sleep. In M.H. Kryger, T. Roth, & W.C. Dement (Eds.), PPSM

Basics of Sleep - Stages

NREM (Non-Rapid Eye Movement):

- Stage 1: Sleep-wake transition
- Stage 2: Light sleep
- Stage 3/4: Deep sleep, slow-wave sleep

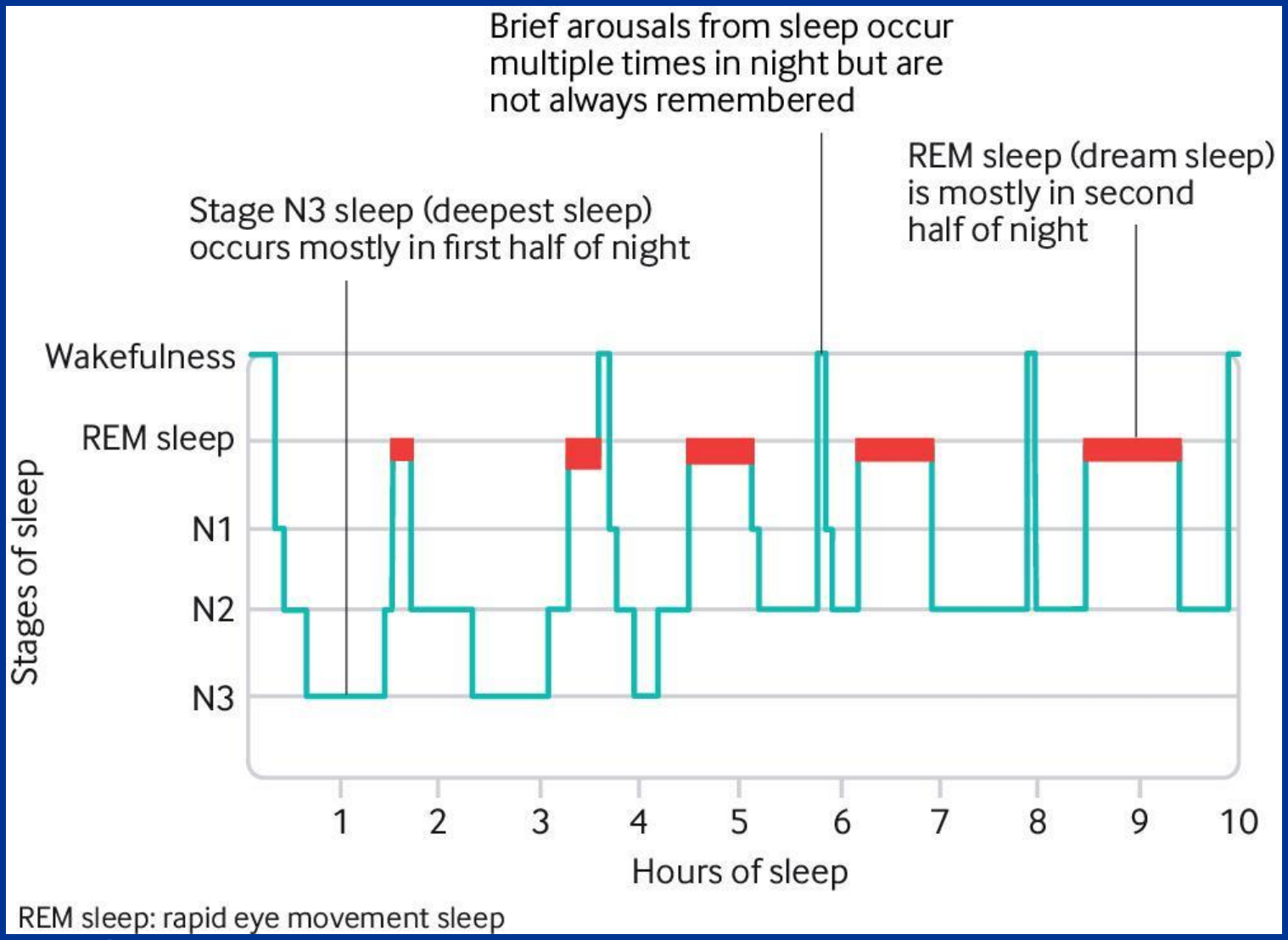
REM (Rapid Eye Movement):

- When dreams occur
- Increases later in the night
- Rapid eye movements
- Muscle atonia

Alternate throughout the night, about every 90-110 minutes

www.nhlbi.nih.gov/health/sleep/stages-of-sleep

Basics of Sleep - PSG



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Hill & Everitt, 2018, BMJ

Changes Across Development

Youth assume a more adult sleep pattern with age:

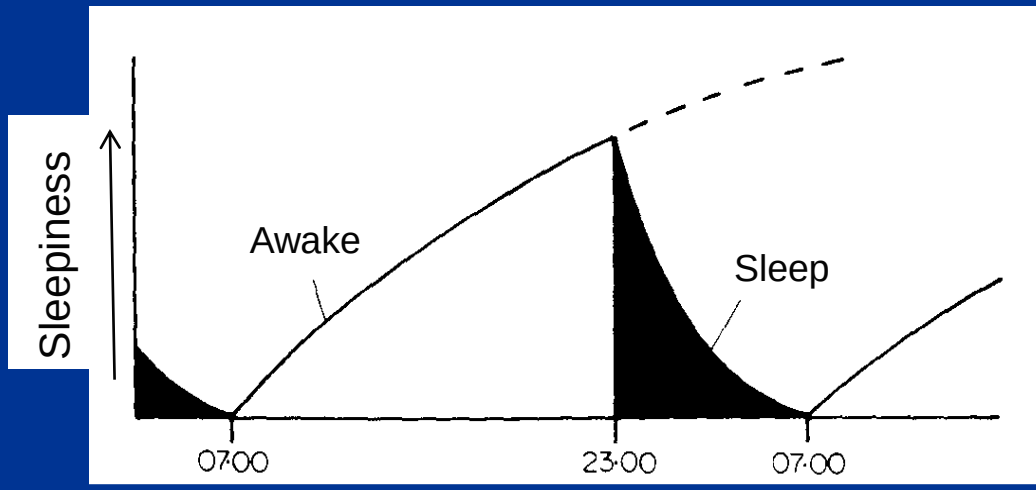
- Decline in average 24-hour sleep duration
- Decrease in proportion of REM sleep
- NREM/REM cycles are about 50 minutes in infancy, gradually lengthen by school age
- Deep sleep (SWS) peaks in early childhood, decreases as we age
- Decrease in number of end-of-cycle arousals
- Shift to later bedtime

Mindell & Owens, 2015

What Controls Sleep?

How long you've been awake (Homeostatic Sleep Drive)

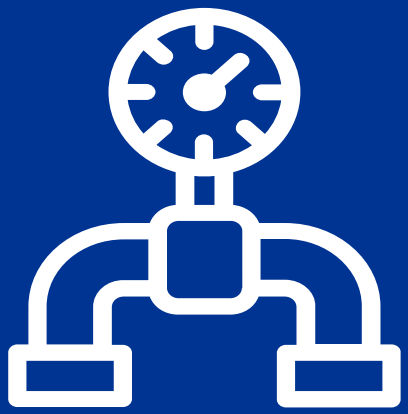
- Sleep "pressure" builds up the longer we are awake



What Controls Sleep?

Sleep Pressure builds:

- With the accumulation of sleep-promoting chemicals
- Without (too much) daytime sleep
- Without caffeine



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Mindell & Owens, 2015

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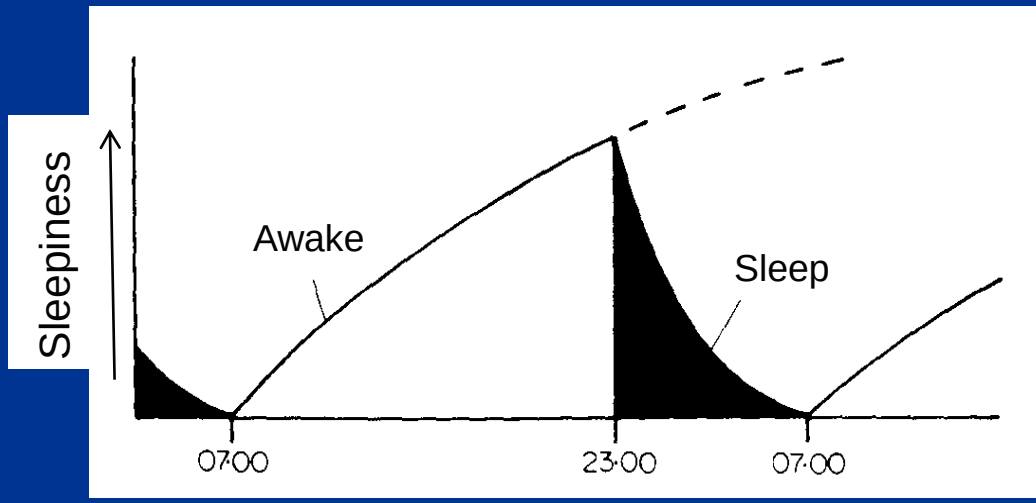

Time of Day (Circadian Rhythm/Biological Clock)

- Based on internal circadian clock
- Independent of when we last slept

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Circadian Rhythms

- Physical, behavioral, mental changes that follow a 24-hour cycle – just over 24 hours in humans
- Governed by the suprachiasmatic nucleus (SCN)
- Can be synchronized by time cues (zeitgebers) in the environment
- Light is the strongest cue

Physiological Rhythms
Behavioral Rhythms

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https://publications.nigms.nih.gov/syndication/factsheet_circadianrhythms.htm

Preschool Sleep

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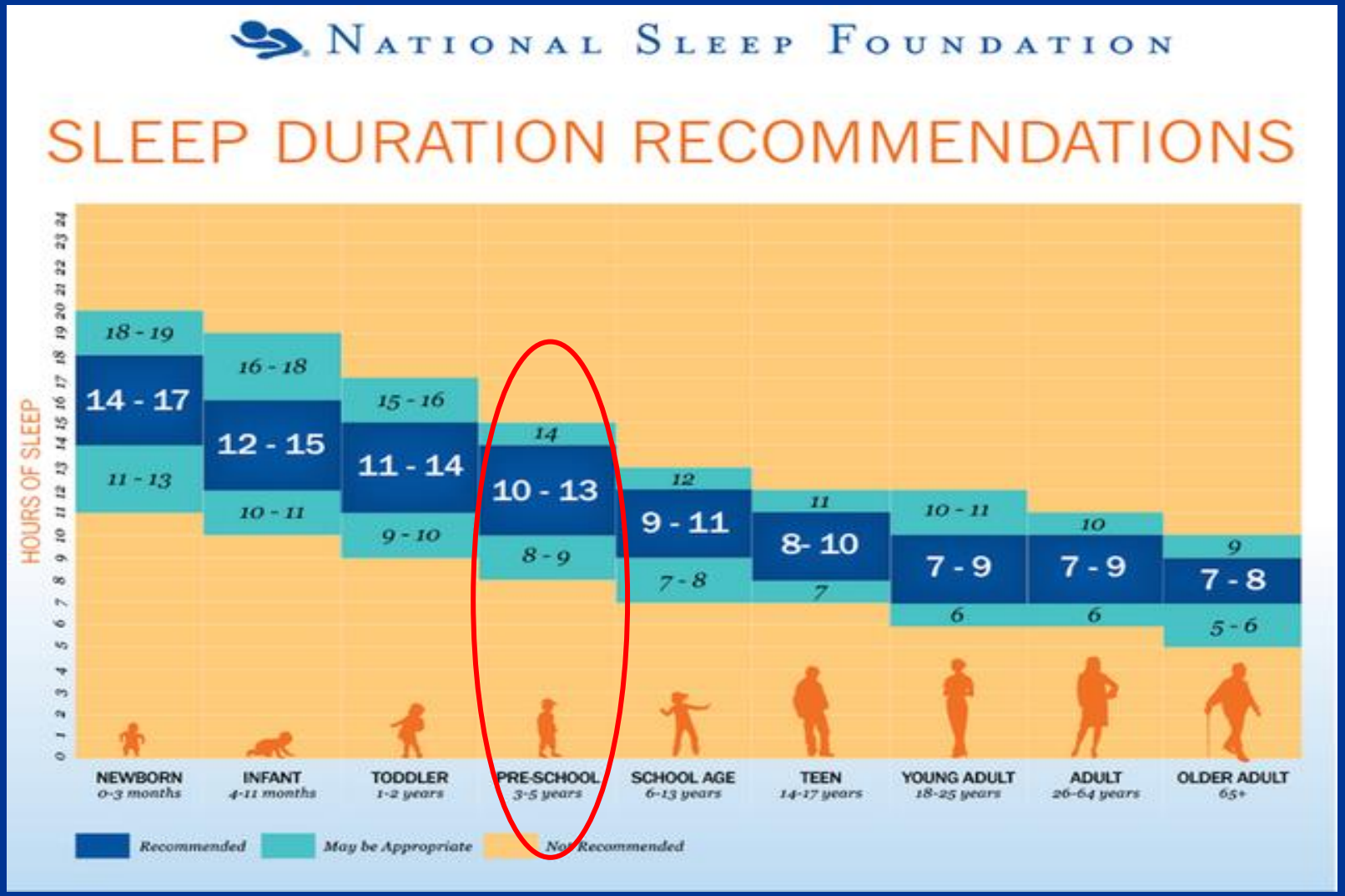
Recommended Sleep Duration



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National Sleep Foundation https://sleepfoundation.org

Preschool Sleep

- Naps decrease from one nap to no nap
- 26% of 4 y/o and 15% of 5 y/o nap
- Nighttime awakenings are natural and normal
- Increased language and cognitive skills may lead to bedtime resistance
- Developing imagination and fantasy can heighten nighttime fears
- A consistent sleep schedule with appropriate bedtime is key

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Mindell & Owens, 2015

Disparities in Sleep Health in Early Childhood

- Black, Latinx, and Asian youth sleep less than their White counterparts
  - May be due to differences in daytime napping
- Children from lower-SES neighborhoods have later bedtimes, long sleep onset latency, and short sleep duration vs higher SES neighborhoods
- Consistent bedtime routines are less prevalent among Latinx and Black children vs White children

Lupini & Williamson 2023 *Sleep Med Clin*

Disparities in Behavioral Sleep in Early Childhood

- A study of sleep disorders diagnosed in primary care found that White infants and toddlers were more likely to receive any sleep disorder diagnosis, including insomnia, than those from Black or “other” racial and ethnic backgrounds

- Caregivers living in neighborhoods with the lowest SES were less likely to report a child sleep problem than those in higher SES neighborhoods, despite shorter caregiver-reported child sleep duration and longer sleep onset latencies among those in lower SES neighborhoods

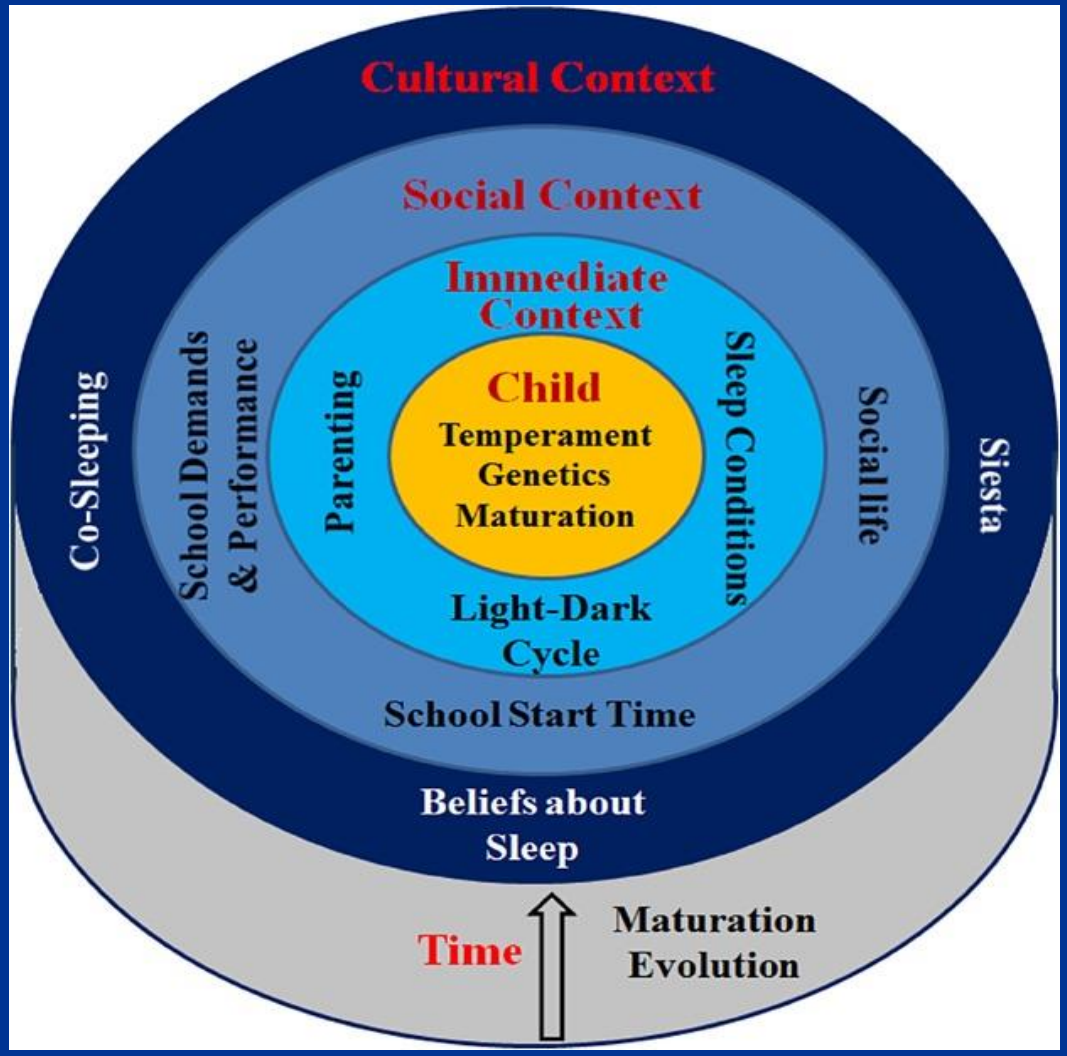
Lupini & Williamson 2023 *Sleep Med Clin*

Disparities in Sleep

"Observed disparities do not result from biological differences by race and ethnicity but rather are a manifestation of historical and ongoing racism, discrimination, and oppression that produce differential exposure to adverse social and environmental factors"

Lupini & Williamson 2023 *Sleep Med Clin*

Factors Impacting Early Childhood Sleep



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El-Sheikh & Sadeh, 205, Monographs Society Res Child

What's the Take Home?

- Assess for and incorporate multilevel social and environmental factors when conducting pediatric sleep evaluation, case conceptualization, and treatment-planning

- Focus on modifiable social and environmental determinants of sleep health disparities can guide equitable sleep health promotion efforts.

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Lupini & Williamson 2023 *Sleep Med Clin*

Preschool Sleep Problems

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How do they present?

- Parent and/or caregiver-reported
- Daytime behaviors – fatigue, sleepiness, dozing off, hyperactivity, behavioral problems, mood problems, cognitive impairment, risk taking
- Sleep disorders
- Insufficient sleep

Scream and shout by mdanys CC BY 2.0

Mindell & Owens, 2015

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Sleep Disorders with Primarily Behavioral Bases

- Insomnia
  - Sleep Onset Association Type
  - Limit Setting Type
  - Combined Type
- Circadian Rhythm Sleep Disorder, Delayed Sleep Phase Type
- Parasomnias
  - Sleep Walking
  - Sleep Terrors
  - Nightmares

Insomnia

- Complaint of dissatisfaction with sleep quantity or quality
  - Difficulty falling asleep, staying asleep, and/or early morning awakenings
- Adequate opportunity for sleep
- Distress or impairment
  - Problems with attention, concentration
  - Mood problems
  - Fatigue
- Occurs 3+ nights per week for at least 3 months
- Not better explained by another d/o or substance

Insomnia: Sleep Onset Associations Type

- What is a sleep onset association?
  - An association between the presence of a certain person/thing and the onset of sleep

- Presence of certain individuals and/or activities are required for falling asleep
  - eg, parent present, rocking, watching TV
  - Applied to beginning and middle of the night

Insomnia: Limit Setting Type

- Presents as bedtime stalling and refusal
- Characterized by insufficient parental limit setting at bedtime
  - Parents often reinforce negative behaviors
  - Tantrums

Combined Type:

Sleep-onset and limit-setting problems

CRSWD, Delayed Sleep Phase Type

- Misalignment of biological rhythms with external environment.

- DSWPD presents as persistent delay in sleep onset with inability to wake at the desired time
- Often interferes with daily demands (daycare)
- Can look like insomnia!

Parasomnias

"Undesirable physical events or experiences that occur during entry into sleep, within sleep, or during arousal from sleep"

- Blurring of state boundaries

- Usually cluster in the first half of the night, when NREM is predominant

Parasomnias

NREM

- Confusional arousals (17%)
- Sleep terrors (34%)
- Sleepwalking (13%)

REM

- Nightmares (recurrent 20-30%)
- REM sleep behavior disorder (VERY rare in childhood)

Assessment of Sleep

Routine Screening is Key!

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BEARS Assessment
2-18 Years

- Screening tool to address the most common sleep issues -- toddler, preschooler, school-age

- Bedtime Problems
- Excessive Daytime Sleepiness
- Awakenings during the night
- Regularity of sleep/wake cycles and average sleep duration
- Snoring

*Does not include sleep behaviors or satisfaction

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Owens J.A., Dalzell V, Sleep Med 2005.
Mindell & Owens 2015

BEARS Assessment
2-18 Years

	Toddler/preschool (2-5 years)
Bedtime problems	Does your child have any problems going to bed? Falling asleep?
Excessive daytime sleepiness	Does your child seem overtired or sleepy a lot during the day? Does she still take naps?
Awakenings during the night	Does your child wake up a lot at night?
Regularity and duration of sleep	Does your child have a regular bedtime and wake time? What are they?
Snoring	Does your child snore a lot or have difficult breathing at night?

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Owens J.A., Dalzell V, Sleep Med 2005.
Mindell & Owens 2015

Pediatric Sleep Assessment

Clinical Interview

- Sleep history
- Medical history
- Developmental history, school functioning
- Family history
- Psychosocial history
- Psychiatric

Key Tools

- Sleep diary
- Actigraphy
- Physical exam
- Questionnaires
- Polysomnography (PSG): not indicated for insomnia except as rule-out

Clinical Interview

- Presenting complaint
- Bedtime schedule, routine
- Sleep associations
- Bedtime stalling or refusal
- Falling asleep, sleeping through the night
- Nocturnal behaviors
- Morning awakening
- Daytime behaviors – naps, sleepiness, fx, fatigue, mood
- Sleep environment*
- Daytime sleep

Clinical Interview

- Medical: Pain, breathing, mobility
- Medications, substances
- Developmental history, school functioning
- Family history of sleep problems
- Psychosocial – family fx, life events
- Psychiatric
- Physical exam

Key Tools

Consensus Sleep Diary

	Sample							
Today's Date	4/5/08							
1. What time did you get into bed?	10:15 p.m.							
2. What time did you try to go to sleep?	11:30 p.m.							
3. How long did it take you to fall asleep?	55 min.							
4. How many times did you wake up, not counting your final awakening?	6 times							
5. In total, how long did these awakenings last?	2 hours 5 min.							
6a. What time was your final awakening?	6:35 a.m.							
6b. After your final awakening, how long did you spend in bed trying to sleep?	45 min.							
6c. Did you wake up earlier than you planned?	☑ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
6d. If yes, how much earlier?	1 hour							
7. What time did you get out of bed for the day?	7:20 a.m.							
8. In total, how long did you sleep?	4 hours 10 min.							
9. How would you rate the quality of your sleep?	☐ Very poor ☑ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good	☐ Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good
10. How rested or refreshed did you feel when you woke-up for the day?	☐ Not at all rested ☑ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested	☐ Not at all rested ☐ Slightly rested ☐ Somewhat rested ☐ Well-rested ☐ Very well-rested

Carney et al., SLEEP 2012

Derived Parameters

Get into bed

Bedtime (lights out)

Wake up time

Sleep onset latency

Sleep onset time

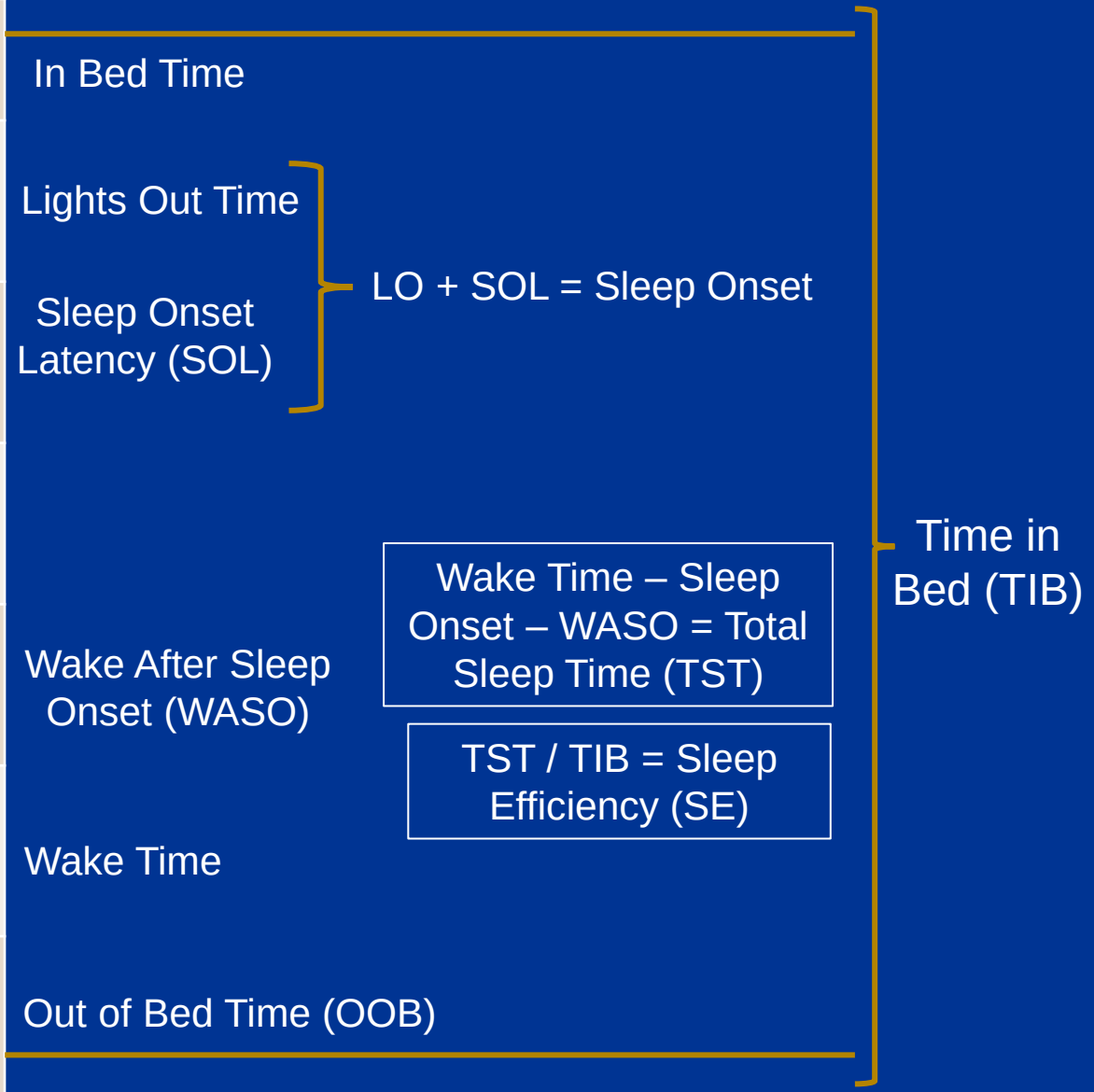
Wake after sleep onset

Sleep duration

Sleep quality

Naps

Question	Time
What time did you put your child into bed?	8:00pm
What time did you turn out the lights for your child's bedtime?	8:15pm
How long did it take your child to fall asleep?	1 hour
How many times did your child wake overnight?	2
IN TOTAL, how long was your child awake?	45 minutes
What time was your child's final awakening?	7:00am
What time did your child get out of bed for the day?	7:15am



Derived Parameters

Get into bed

Bedtime (lights out)

Wake up time

Sleep onset latency

Sleep onset time

Wake after sleep onset

Sleep duration

Sleep quality

Naps

Time starting bedtime routine*

Bedtime difficulties (calling out, leaving the room)*

Visual Sleep Diary

	Date	Noon	p.m.										Midnight	a.m.											Sleep Quality
			Afternoon					Evening						Morning											
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
M																									
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Instructions: Use the symbols below to indicate your sleep times in the grid. Rate your sleep quality each night from 0 (poor) to 10 (excellent).

↓ = Go to bed

↑ = Get out of bed

- = Actual sleep

Blank = Awake

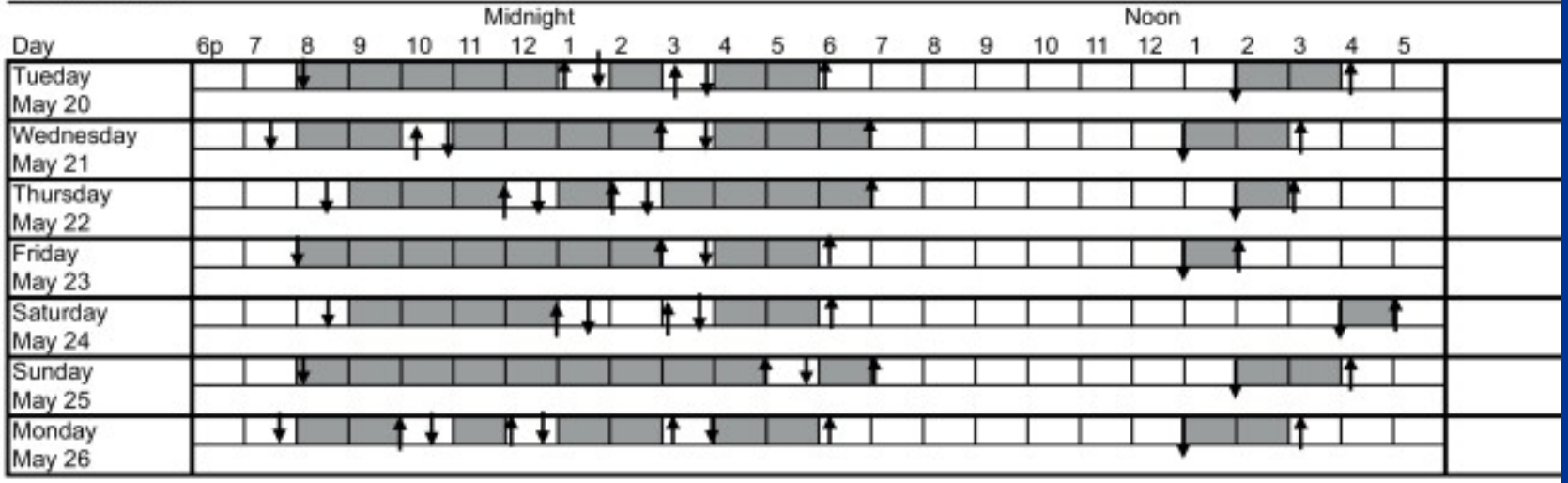
Comments

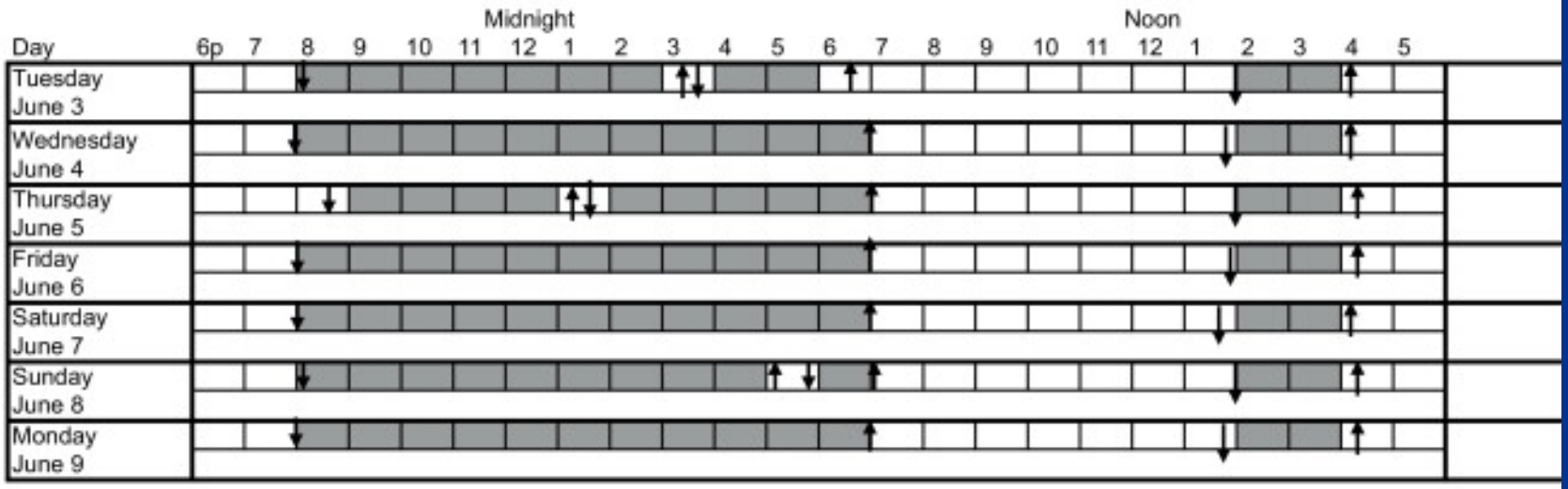
Sleep Diary

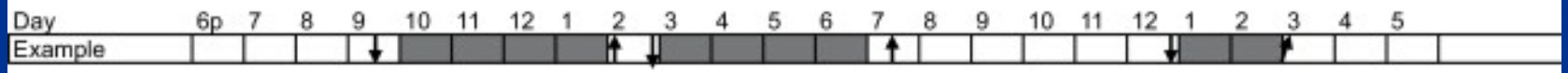
Name: Dob: / /

Date Started: / / Date Ended: / /

List Medications:





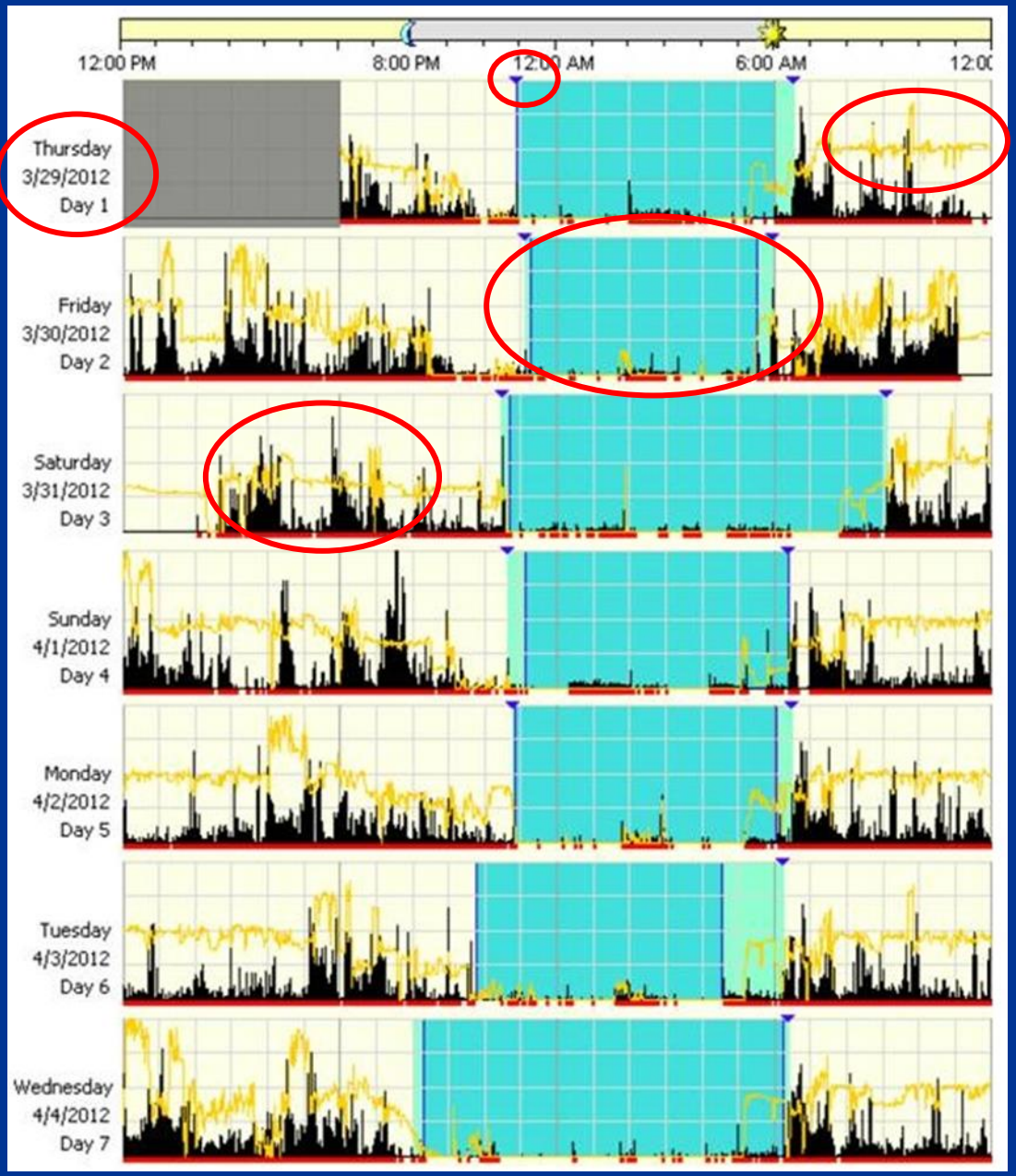


Key: down arrow = in bed up arrow = out of bed shaded = asleep (can have unshaded space between arrows, in bed not asleep)

Questionnaires

- Measurement properties of sleep measurement tools are often not assessed (Phillips et al 2021 frontiers in pediatrics)
- Children's Sleep Habits Questionnaire
- BCSQ
- Lewandowski 2011 JPP

Actigraphy



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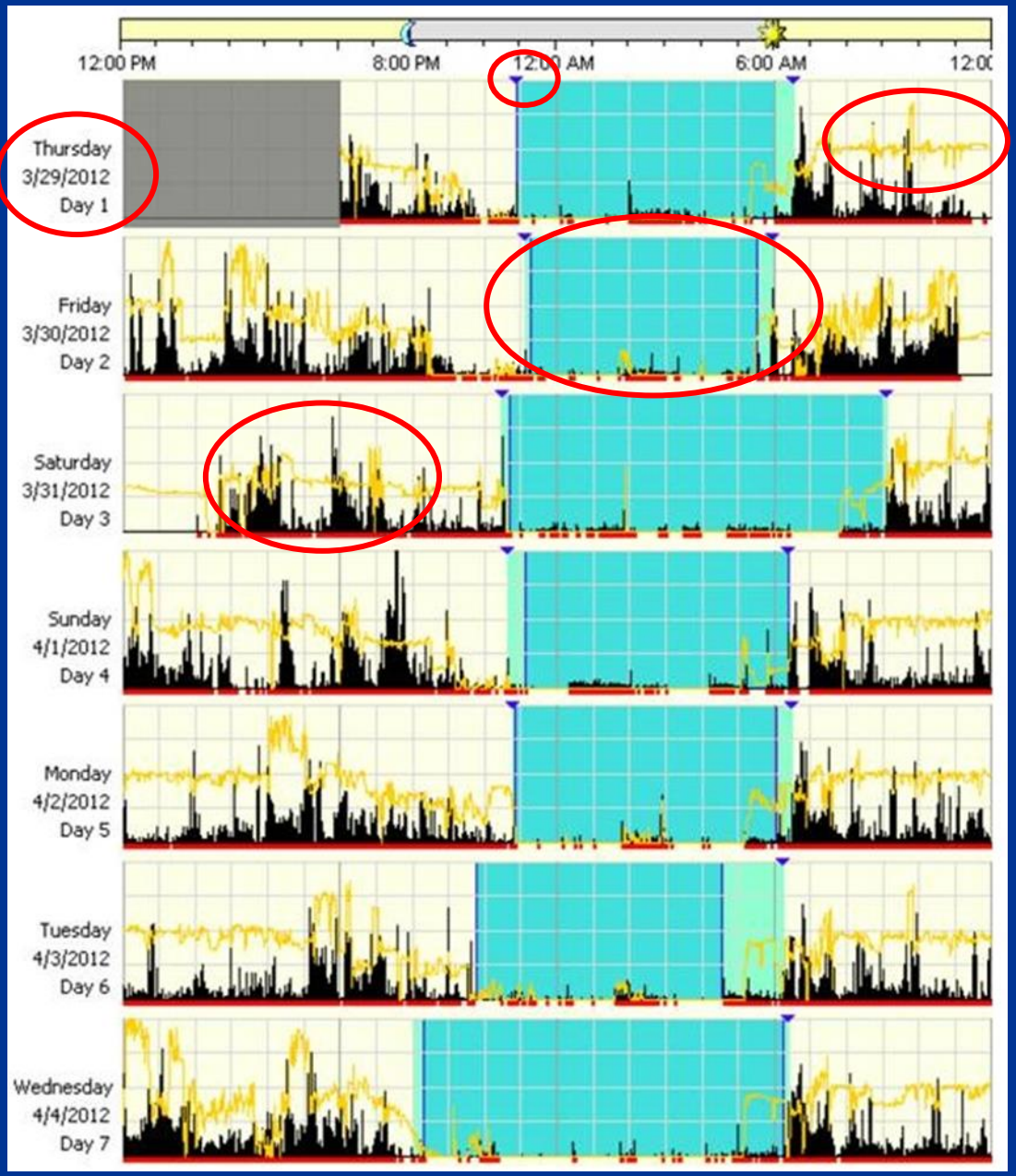
Actogram



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Behavioral Treatment of Sleep Problems

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Setting Goals

Education

Bedtime Routine

- What does the current routine look like?
- Identify a time to start the bedtime routine, as well as lights out time -- consistent across entire week
- Say “goodnight” to electronics and caffeine at set times
- Make bedtime a special time
- Choose activities you and your child enjoy
- Be very specific with the routine
- Develop a routine WITH your child
- Consistency is key – how can bedtime be consistent in any location?

Components of a bedtime routine

We will start the bedtime routine at __ : ___ PM and have child in bed by __ : __ PM

Step 1	Step 2	Step 3
Step 4	Step 5	Step 6 Lights out and goodnight!

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Bedtime Routine

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A Note on Electronics

It can be hard to turn off electronics!

Electronic screens give off **blue** light, making it harder to fall asleep

- Assess which electronics are used, and when
- Make a plan for turning them off, where to store them, what activities to do once they are off
- Consider having other family members turn off electronics at that time too

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Sleep Timing, Duration

Healthy Sleep Habits

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Sleep-Related Fears

- Nightlight
- Flashlight treasure hunt
- Monster spray
- Lovey/stuffed animal

Others

- New bed/sheets

Conclusions


Thank you!
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