



ADVANCING INTEGRATED HEALTHCARE

Pediatric Sleep ECHO[®]

Kick off Meeting and Session 1:

Sleep 101

Date: May 23, 2024

PLEASE NOTE: Project ECHO case consultations do not create or otherwise establish a provider-patient relationship between any clinician and any patient whose case is being presented in a project ECHO setting

Care Transformation Collaborative of RI

Welcome

- This session will be recorded for educational and quality improvement purposes
- Please do not provide any protected health information (PHI) during any ECHO session

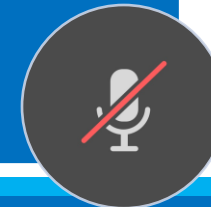
- Please turn on your video
- Please enter your name and organization in the chat box

Introduce Yourself



- Please mute your microphone when not speaking

Microphones



Agenda

Time	Topic	Presenter
7:30 – 7:50 AM	Welcome Introductions Project Overview	Linda Cabral Liz Cantor Dr. Patricia Flanagan
7:50 – 8:55 AM	Sleep 101 Q&A	Dr Julie Boergers Dr. Richard Millman
8:55 – 9:00 AM	Wrap up & Next Steps	All

Thank you to Blue
Cross Blue Shield
of Rhode Island for
funding and
support.



**Blue Cross
Blue Shield**
of Rhode Island

Project Team Introductions



Liz Cantor, PhD,
CTC-RI Pediatric IBH
Practice Facilitator



Julie Boergers, PhD
Co-Director, Hasbro
Pediatric Sleep Clinic



Linda Cabral, MM,
CTC-RI Senior
Program Manager



Pat Flanagan, MD,
CTC-RI Clinical
Director/PCMH Kids Co-
Chair



Edyth Dwyer, MPA, MPH
CTC-RI Program
Coordinator

Practice Team Introductions

Track 1

Practice	
Track 1	Anchor Medical
	Atlantic Pediatrics
	Blackstone Valley Pediatrics
	Partners in Pediatrics
	P.R.I.M.A.
Track 2	Waterman Pediatrics

If you have additional staff members to add to the project, please email us their contact info!

Project Goals

- Increase practice learning on healthy sleep across the age span in pediatrics
- Learn how to provide developmentally targeted guidance to families on healthy sleep using behavioral health principles
- Exchange information, experiences, cases, and ideas on how to improve care for sleep disorders for pediatric patients

What is Project ECHO?

- ECHO = Extension for Community Healthcare Outcomes
- A tele-mentoring program designed to create communities of learners by bringing together health care providers and experts using didactic and case-based presentations
 - “All teach, all learn”
 - Encourages knowledge exchange
 - Utilizes technology
 - Promotes case-based learning

What does an ECHO session look like?

- Introductions/Housekeeping (5 min)
- Lecture (followed by short Q&A) (15-20 min)
- De-identified Case Discussion (25 min)
 - Case Presentation by participating practice
 - Facilitator summarizes case; asks for clarifying questions
 - Recommendations/Discussion
 - Facilitator summarizes recommendations
- Wrap-up (5 min)

ECHO sessions are smaller than the typical webinar to allow for more active participation. Much of the learning comes from the discussions

iECHO Platform

Example of email invitation



Invitation to join “Program Name”

Hello Participant,

You have been invited to join the “Program Name” program by Care Transformation Collaborative Rhode Island.

[Join Program](#)

Thank you,

Care Transformation Collaborative Rhode Island Team

For any concerns or issues about the Program or Session, please write back to this email.

Project ECHO

1650 University Blvd NE
Albuquerque NM 87111
United States

Things to consider:

Please remember to check your spam folder if you do not see the initial invitation

If the invitation does not prompt you to sign up/in, you may do so at www.iecho.org

You will receive the ECHO session link via email 30mins before the session begins.

Don't forget to check your *spam folder!*

CME Credits

(Pending credit for MDs, PAs, Rx, RNs, NPs, PsyD, PhD)

- CME Credits – Please request session credits when filling out the evaluation at the end of the meeting.
- Evaluation/Credit Request Form:
<https://www.surveymonkey.com/r/echosleep>



The AAFP has reviewed 'Advancing Community-Oriented Comprehensive Primary Care Through Improved Care Delivery Design and Community Health,' and AAFP credit is pending. Term of approval is from 04/19/2024 – 04/19/2025. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NPs and RNs can also receive credit through AAFP's partnership with the American Nurses Credentialing Center (ANCC) and the American Academy of Nurse Practitioners Certification Board (AANPCB).

Practice Expectations (Track 1)

- Identify team membership (provider champion, nurse care manager/care coordinator, behavioral health clinician) to attend all 12 monthly ECHO sessions and complete pre and post-surveys
- Submit and present one patient case study for discussion at one of the ECHO Learning sessions
- Attend 11 monthly virtual or on-site practice facilitation team meetings
- Complete pre and post assessment surveys and any other evaluation surveys requested
- Submit and complete a Quality Improvement (QI) project. Support will be provided by the practice facilitator to select an area of focus and complete a PDSA.
- Present a patient success story at final meetings

Practice Expectations (Track 2)

- Identify at least one clinician from the practice to attend at least 10 of the 12 monthly virtual ECHO sessions
- Complete pre and post assessment surveys and any other evaluation surveys requested
- Complete post-ECHO session satisfaction surveys
- Submit and present one patient case study for discussion at one of the ECHO Learning sessions

Payment Schedule

Track 1

- Payment of \$7,000 in two installments (at project start and end), that practices can use to offset costs associated with staff time to participate in ECHO and quality improvement activities.

Track 2

- Payment of \$1,000 in two installments (at project start and end), that practices can use to offset costs associated with staff time to participate in ECHO and quality improvement activities.

ECHO Curriculum and Case Study Sign-ups

Session #	Date	(Tentative) Content to be Covered	Practice presenting case study?
1	5/23/24	Sleep 101	No case study
2	6/27/24	Focus on Infants	
3	7/25/24	Focus on Young children (ages 1-3)	
4	8/22/24	Focus on Preschool aged children (ages 3-5) – Session 1	
5	9/26/24	Focus on Preschool aged children (ages 3-5) – Session 2	
6	10/24/24	Autism and sleep	
7	<u>11/21/24*</u>	Focus on Elementary school aged children (ages 6-10)	
8	<u>12/19/24*</u>	Focus on Middle School aged children (ages 11-13)	
9	1/23/25	Focus on High school aged children (ages 14-18) – Session 1	
10	2/27/25	Focus on High school aged children (ages 14-18) – Session 2	
11 & 12	3/27/25 4/24/25	Practices present success stories	

Sessions are 7:30-8:30am, 4th Thursday of the month*

- Every practice will sign up for a session to present a case study
- [A template will be sent](#) out for the practice to fill in, ~10min presentation
- Sign-up to present a case study with Liz Cantor

*except for Nov and Dec

Case study slide template

1. Basic Patient Information

Age/Grade in school (if relevant)	
Gender Identity	
Race/Ethnicity	
How long has this individual been in your care?	
Who does the patient live with/family constellation?	
Insurance type (Commercial, Medicaid, Uninsured, Other)	

2. Reasons for Selecting this Case

Presenting problem	
What questions do you have for the group?	

3. Relevant Background

Relevant medical and/or behavioral comorbidities	
Relevant medications	
Relevant lab results	
Relevant BH Screening results	
Relevant SDOH Screening results	
Any previous interventions for sleep?	

4. Relevant Social History

Family history of sleep disorders?	
School related concerns?	
Other social history concerns?	

5. Patient /Family Successes and Strengths?

Questions?



Faculty Introduction

Dr. Julie Boergers is a pediatric psychologist, Co-Director of the Pediatric Sleep Clinic at Hasbro Children's Hospital, and Professor of Psychiatry & Human Behavior and Pediatrics (Clinician Educator) at Brown Alpert Medical School. She has over 25 years experience in delivering behavioral sleep interventions to children and adolescents with sleep disorders, as well as training other health care professionals in the provision of these interventions. She has longstanding research interests in cultural influences on sleep, the effect of childhood sleep disruption on family and academic functioning, and sleep patterns in children with chronic illness.

Dr Richard Millman is the Director of the Sleep Disorders Centers of Lifespan Hospitals and Co-Director of the sleep medicine program at Hasbro Children's Hospital. He is a Professor of Medicine and Pediatrics at the Alpert Medical School of Brown University

Pediatric Sleep 101

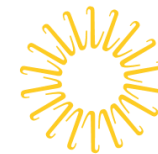
JULIE BOERGERS, PH.D.

RICHARD MILLMAN, M.D.

MAY 23, 2024



BROWN
Alpert Medical School



Hasbro Children's Hospital
The Pediatric Division of Rhode Island Hospital
A Lifespan Partner

Objectives

- Describe importance of sleep and consequences of sleep deprivation
- Identify developmental and cultural issues in sleep
- Discuss screening for pediatric sleep problems
- Define common sleep disorders
- Identify indications for polysomnography and other testing

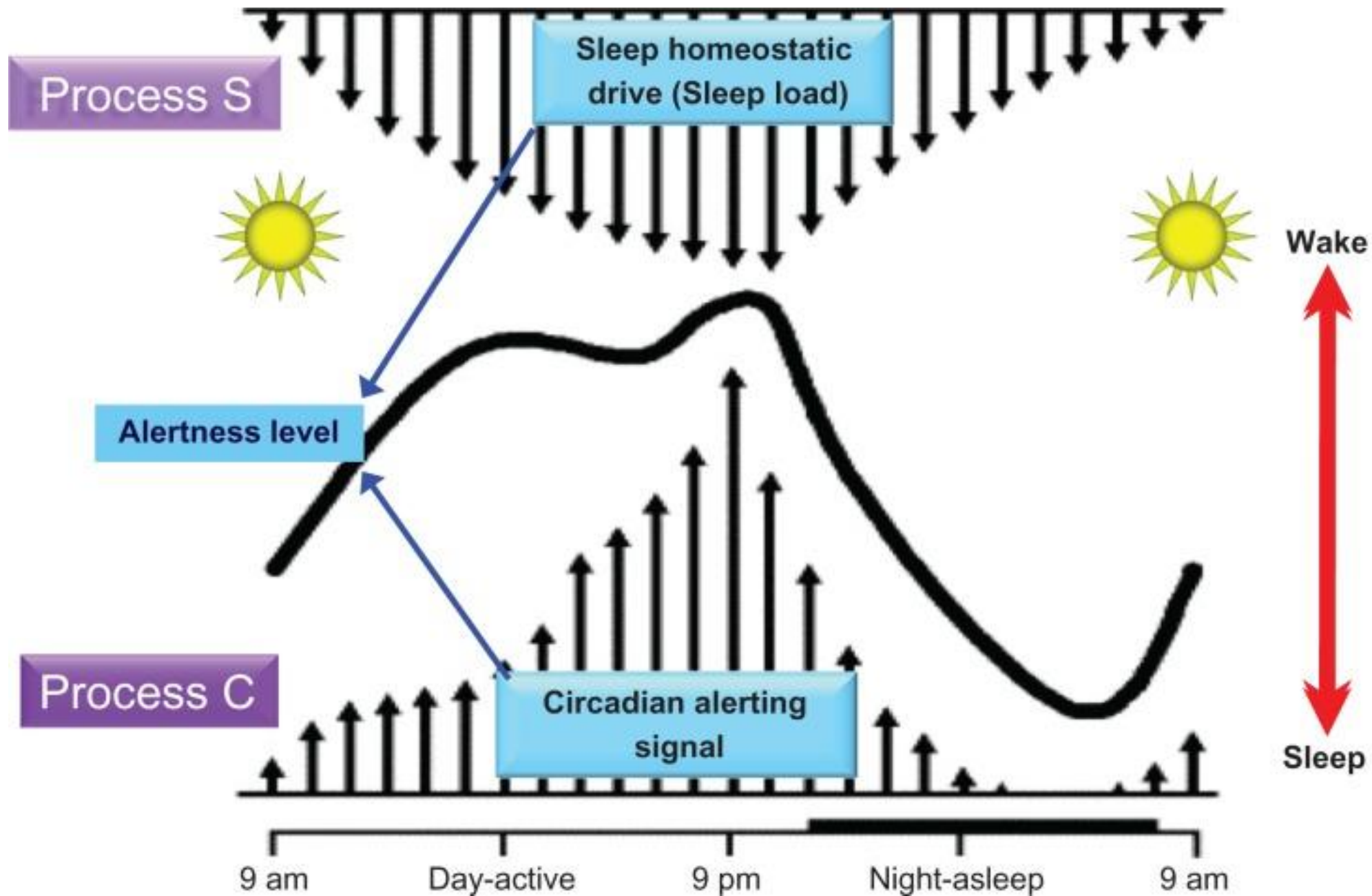
Importance of Sleep

- Energy, performance, reaction time
- Attention/concentration
- Memory consolidation, learning
- Immune function
- Wound healing, muscle growth
- Mood regulation



Consequences of Sleep Deprivation

- **Cognitive:** attention and memory problems, increased impulsivity, decreased judgment, lower test scores, increased tardiness, absences, drop-outs
- **Behavioral Health:** depression, irritability, suicidal ideation, risk taking behaviors, family conflict
- **Physical Health:**
 - Cardiovascular: inflammation, > cortisol, higher blood pressure
 - Metabolic: > ghrelin/lower leptin (weight gain, obesity risk)
 - Endocrine: < insulin and > cortisol (diabetes risk)
 - Overall higher rate of illness (due to decreased immune function)



Sleep Stages

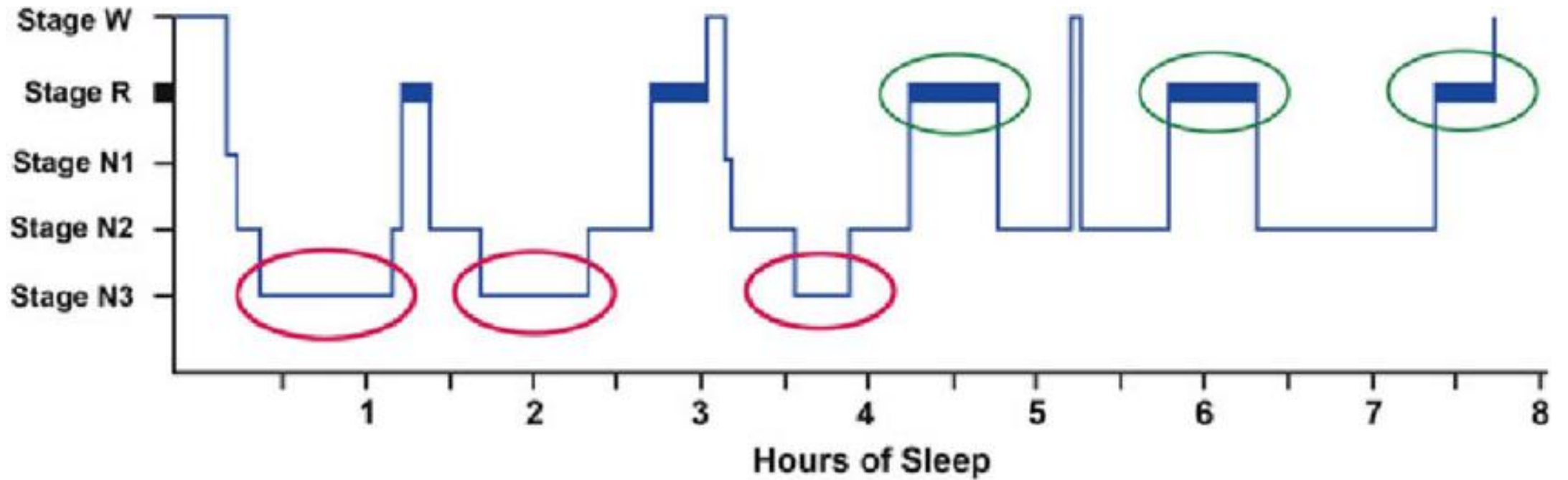
- Younger children have shorter sleep cycles
- By ~ age 10 through adulthood, sleep cycle is about 90 minutes or a little longer
- Most adolescents and adults will have about 4-7 cycles per night (depending on length of cycle)
- As the night goes on, periods of slow-wave (or N3) sleep get shorter, and periods of REM sleep become longer
- No particular sleep stage is more important than the other – need the right balance for restful and restorative sleep

Sleep Stages

- **N1:** very light, brief, easily awakened
- **N2:** eye movements stop, muscles begin to relax, body temperature drops
- **N3:** AKA slow-wave sleep, delta sleep, or deep sleep. Brain waves and breathing slow, blood pressure drops, more difficult to awaken. Deepest and most restorative sleep. Parasomnias occur in this stage. Essential hormones are released (e.g. GH, leptin, ghrelin).
- **REM:** AKA rapid eye movement or “dream sleep”. Brain is very active. Eyes move but other muscles remain paralyzed to keep from acting out dreams. Memories are consolidated.



Sleep Stage Hypnogram



Developmental Features of Sleep

- **Infants**

- Day/night pattern emerges around 12 weeks; 20-30% still awoken during night at 9 months
- Importance of consistency and putting to bed drowsy, but awake)

- **Toddlers/Preschoolers**

- Sleep problems (20-40%) and nighttime wakings (up to 60%) common; importance of bedtime routines, transitional objects

Developmental Features of Sleep

- **School Age Children**

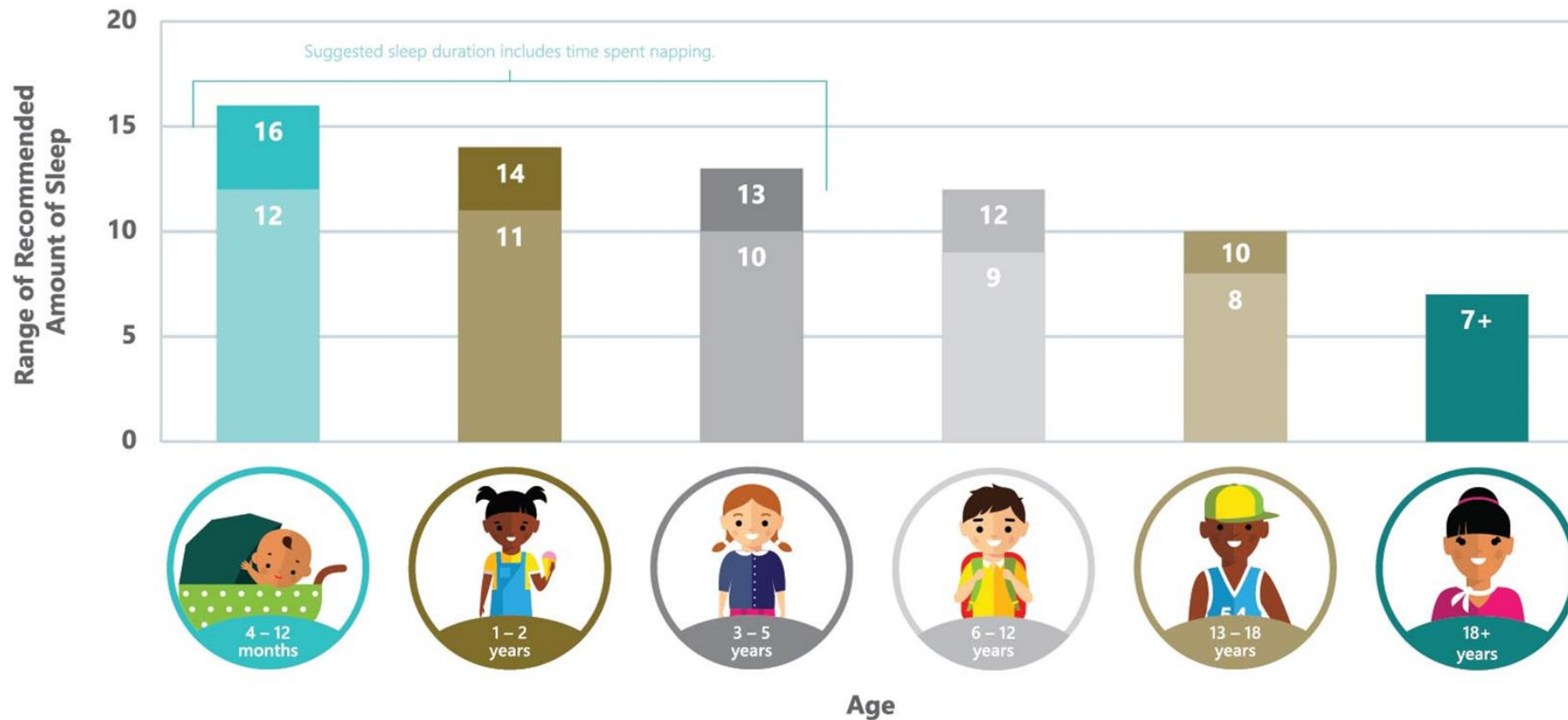
- Sleep pattern more stable; daytime sleepiness, napping rare

- **Adolescents**

- Epidemic of inadequate sleep duration (>2/3 of HS students get <8 hrs weekdays)
- Impact of school start times, electronics, social pressures
- Pubertal shift in dim light melatonin onset - more vulnerable to circadian disturbances

Healthy Sleep Duration

The American Academy of Sleep Medicine recommends that you get the following hours of sleep on a regular basis for optimal health at each stage of life.



Racial, Ethnic, & Socioeconomic Disparities in Sleep

- Black children report < sleep duration than NLW children
- OSA disproportionately affects Black and Latino children and children with low SES
- Insomnia disproportionately impacts Black and Latino people
- Children in historically marginalized groups and those with public insurance are less likely to receive timely testing and diagnosis as well as access to T&A for OSA.
- Implications for long-term health and development, achievement gap

Sleep Disparities – Why?

- Urban stressors e.g. air pollution, noise, light, neighborhood safety, indoor pest exposure, and psychosocial stress all decrease sleep duration
- Children experiencing racial discrimination report lower sleep duration and more sleep disruption
- Emotional or physical threats to safety >> increased vigilance/arousal >> increased sleep/wake problems
- Impact of cultural beliefs and practices on sleep patterns
- Need to improve sleep health access, address clinician bias, culturally tailor interventions, and establish a foundation of healthy sleep for life

Importance of Routine Sleep Screening

Sleep Problems Co-occur with:

- Psychiatric problems (> in clinical samples vs controls; e.g. 25-50% of children w/ ADHD have sleep problems)
- Chronic and acute pediatric illnesses (Effects of symptoms e.g. pain; medication; parental response to sleep behaviors)
- Neurodevelopmental disorders (44-83% of children with autism and/or ID have sleep problems)

Differentiating Symptoms

Effects of inadequate sleep on children include symptoms commonly seen in clinical practice:

- Mood swings, irritability, family conflict
- Behavior and attention problems, hyperactivity
- Difficulties with memory, learning, academics

E.g., OSA, RLS can be misdiagnosed as ADHD

- T&A for OSA leads to improvements in behavior, neurocognitive functioning; less likely to meet criteria for ADHD following T&A

High Yield from Addressing Sleep Early

- Early success with concrete goals solidifies rapport
- Well-rested children and parents have greater ability to manage stress and conflict and engage with other therapeutic recommendations



Taking a Brief Sleep History: “BEARS” (*Owens & Dalzell, 2005*)

- B**edtime problems
- E**xcessive daytime sleepiness
- A**wakenings during the night
- R**egularity and duration of sleep
- S**nororing



Sleep Hygiene Basics



- No caffeine
- Regular timing of bedtime, waketime, meals
- Regular physical activity (but not too late)
- Quiet, dark room, comfortable temperature
- Avoid using bed/bedroom for punishment or for other activities
- No electronics within 1 hr of bed (and no electronics in bedroom)
- Presence of a bedtime routine!

Other High-Yield Behavioral Strategies

Assist parents with limit setting and reward systems

Relaxation training

Stimulus control (e.g. go to bed only when sleepy; get out of bed if unable to sleep; use bed only for sleep)

Sleep restriction (e.g. limit time in bed, no naps)

Cognitive restructuring/avoiding “sleep effort”

Medical Screening

- Labwork
 - Especially CBC, ferritin (>50 kids, >75 adolescents), vitamin D
 - If warranted, thyroid, Lyme, etc.
- Video of nocturnal events can be helpful
- Indications for referring for overnight sleep study vs. sleep clinic evaluation







0

Surgically removed tonsils



1

Tonsils hidden within tonsil pillars



2

Tonsils extending to the pillars



3

Tonsils are beyond the pillars



4

Tonsils extend to midline

The Mallampati Score



CLASS I
Complete
visualization of
the soft palate



CLASS II
Complete
visualization
of the uvula



CLASS III
Visualization
of only the
base of the uvula



CLASS IV
Soft palate
is not
visible at all

Assessing and Treating Common Pediatric Sleep Disorders

Disorders that disrupt sleep onset (and/or maintenance)

- Insomnia
 - Behavioral Insomnias of Childhood
 - Psychophysiological Insomnia
- Delayed Sleep Phase Disorder
- Restless Legs Syndrome

Disorders that interfere with sleep quality

- Parasomnias
- Obstructive Sleep Apnea
- Periodic Limb Movement Disorder
- Restless Sleep Disorder

Insomnia

- Trouble falling asleep (aka initial insomnia)
 - *>20-30 minutes*
 - *And/or needing significant parental intervention*
- Frequent and/or prolonged night wakings (aka middle insomnia)
- Waking for the day earlier than desired (aka terminal insomnia)

- Occurs at least 3x/wk for at least 3 months
- Despite adequate sleep opportunity for age

Insomnia Subtypes

- Behavioral Insomnia of Childhood
 - child falls asleep under certain conditions (e.g. laying next to parent), requires those conditions to return to sleep after night wakings
 - Treatment – Sleep training (options include extinction, Ferber method, graduated extinction), limit setting, bedtime fading
- Psychophysiological Insomnia
 - Learned sleep-preventing associations - Bed associated with alertness, intense focus on sleep problems and their consequences
 - Difficulty relaxing body and quieting thoughts
 - Treatment - CBT-I (relaxation, stimulus control, sleep restriction, cognitive restructuring)

Parasomnias

Sleep terrors, sleepwalking, sleep talking, etc.

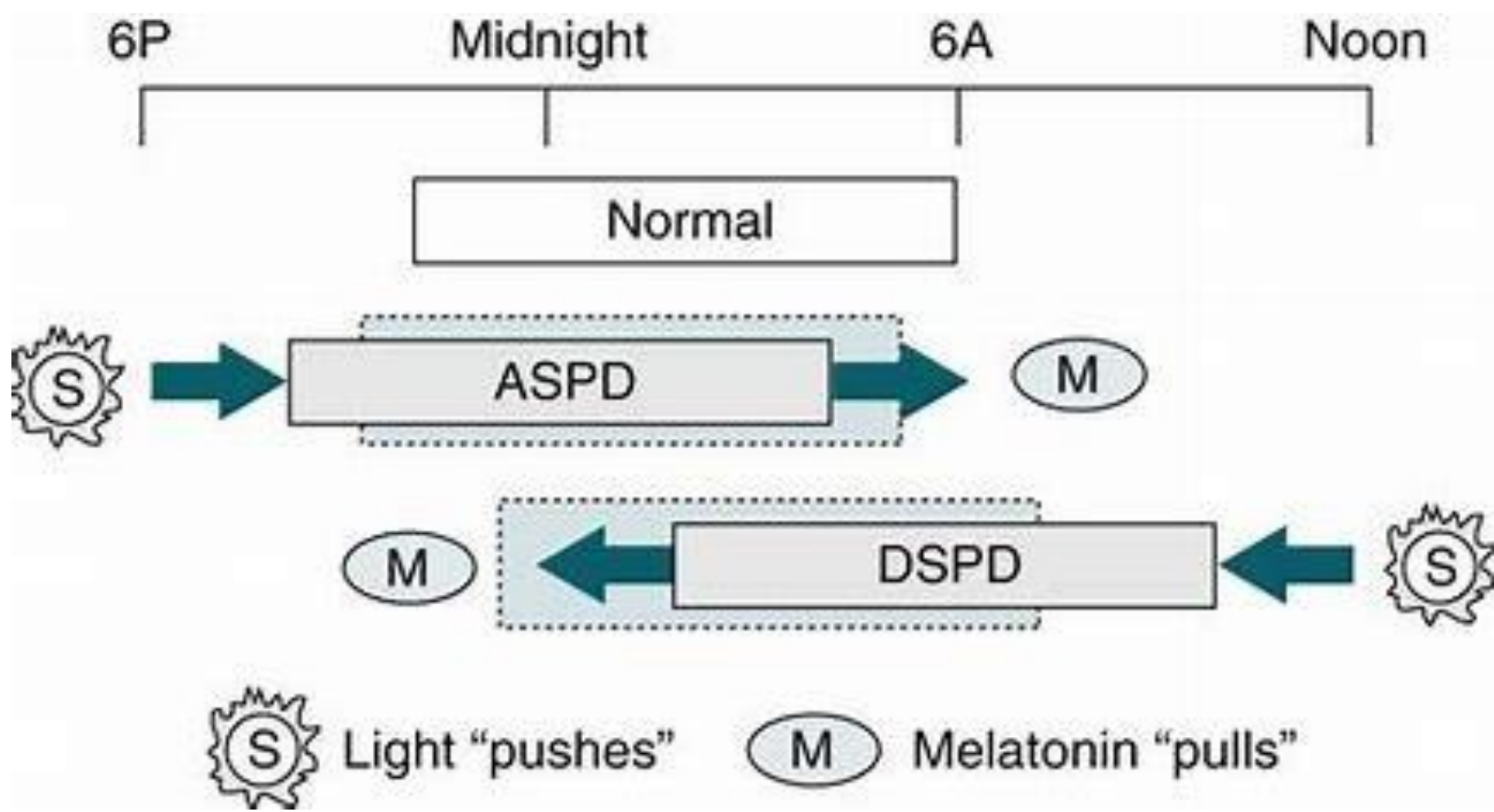
- Usually occur in SWS; 1st third of night
- Clinical features of sleep (high arousal threshold, unresponsiveness) and wakefulness (ambulation, vocalizations)
- Attempts to wake the child can cause increased confusion/agitation
- Amnesia for events
- Exacerbated by factors increasing SWS, sleep fragmentation
- Genetic component

Parasomnia Treatment

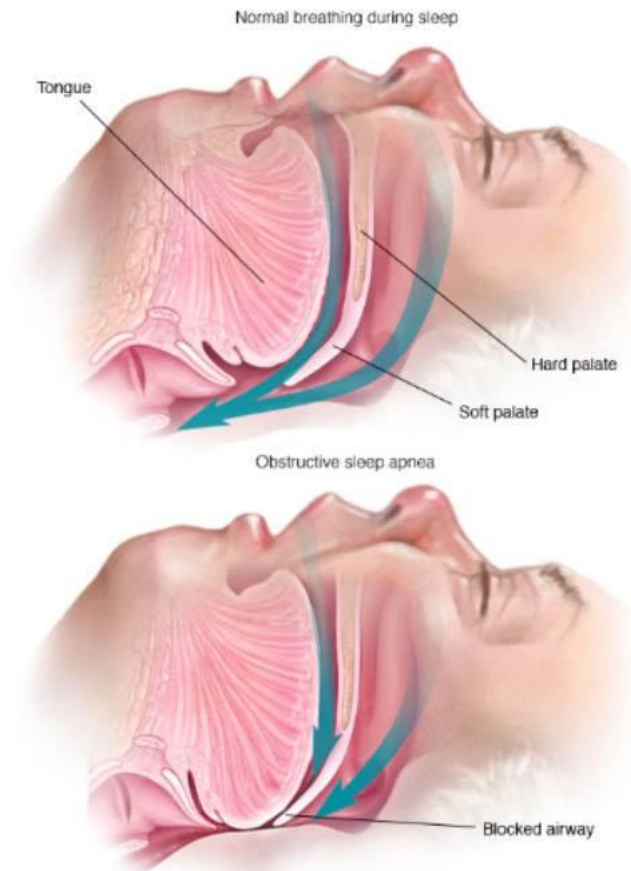
- Assess/treat underlying pathology (e.g. OSA, restless sleep, anything that can fragment sleep – ferritin level often helpful)
- Maximize sleep duration
- Reduce stress
- Reduce triggers such as noise (use white noise)
- Ensure safety
- Scheduled awakenings (if frequent/consistent)

Delayed Sleep Phase Disorder

- Circadian clock conflicts with family expectations or societal demands
 - Sleep onset & offset delayed, but regular
 - Difficulty waking, daytime sleepiness (often missed school)
 - Increased risk at transition to adolescence and during adolescence
- Treatment
 - Chronotherapy (Phase delay or phase advance)
 - Sleep hygiene (particularly strict 7 day wake up time and no naps)
 - Light exposure on waking and avoidance of bright light in evening



Sleep Disordered Breathing - Pathophysiology



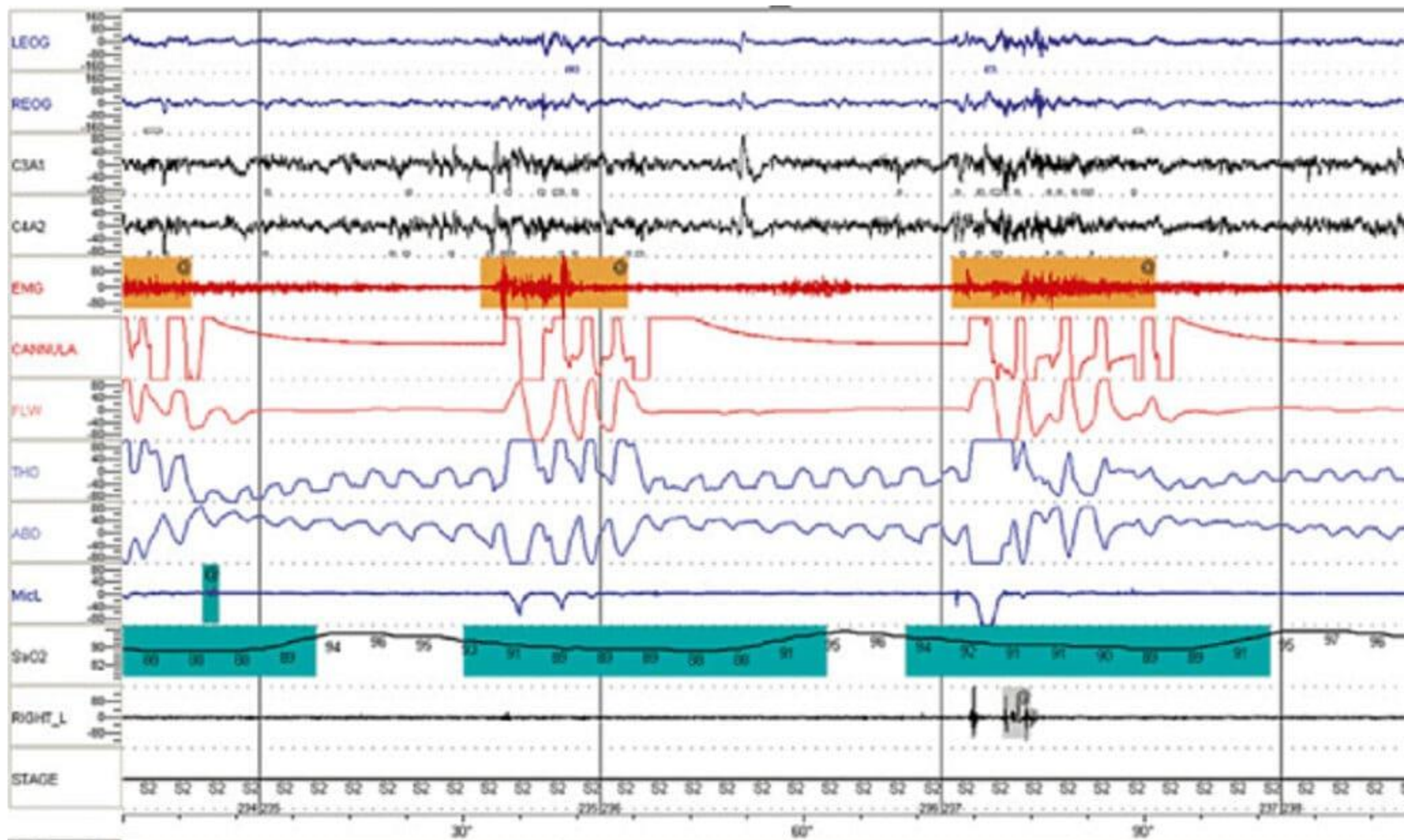
Upper airway narrowing

Soft tissue enlargement

Reduced upper airway muscle tone

Reduced central ventilatory drive

Leads to intermittent hypoxia and sleep fragmentation



Obstructive Sleep Apnea

SYMPTOMS

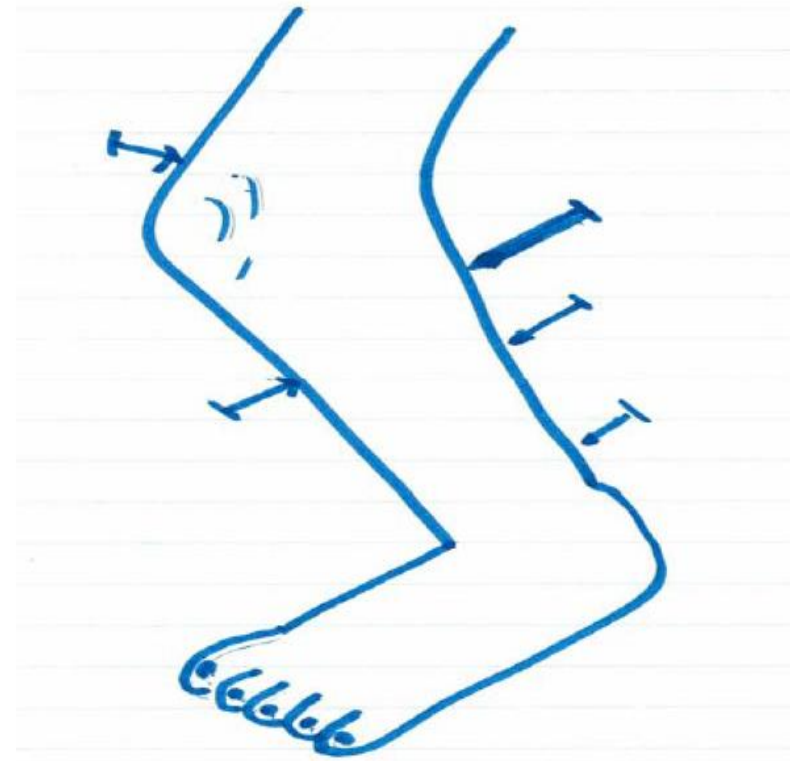
- Snoring
- Apneic pauses/gasping/snorting
- Night wakings
- Open mouth breathing
- Nocturia
- Nocturnal diaphoresis
- Excessive daytime sleepiness
- Hyperactivity/Inattention

RISK FACTORS

- Adenotonsillar hypertrophy
- Obesity
- Allergic rhinitis
- Upper airway hypotonia
- Retro/micrognathia
- Mid-face hypoplasia
- Macroglossia
- Hypothyroidism

OSA Treatment

- Adenotonsillectomy
- Weight loss
- Nasal Continuous/Bilevel Positive Airway Pressure (CPAP/BiPAP))
- Oral appliances
- Medications (e.g. nasal steroids)
- Positional therapy



Restless Legs Syndrome, Periodic Limb Movement Disorder, and Restless Sleep Disorder

RLS

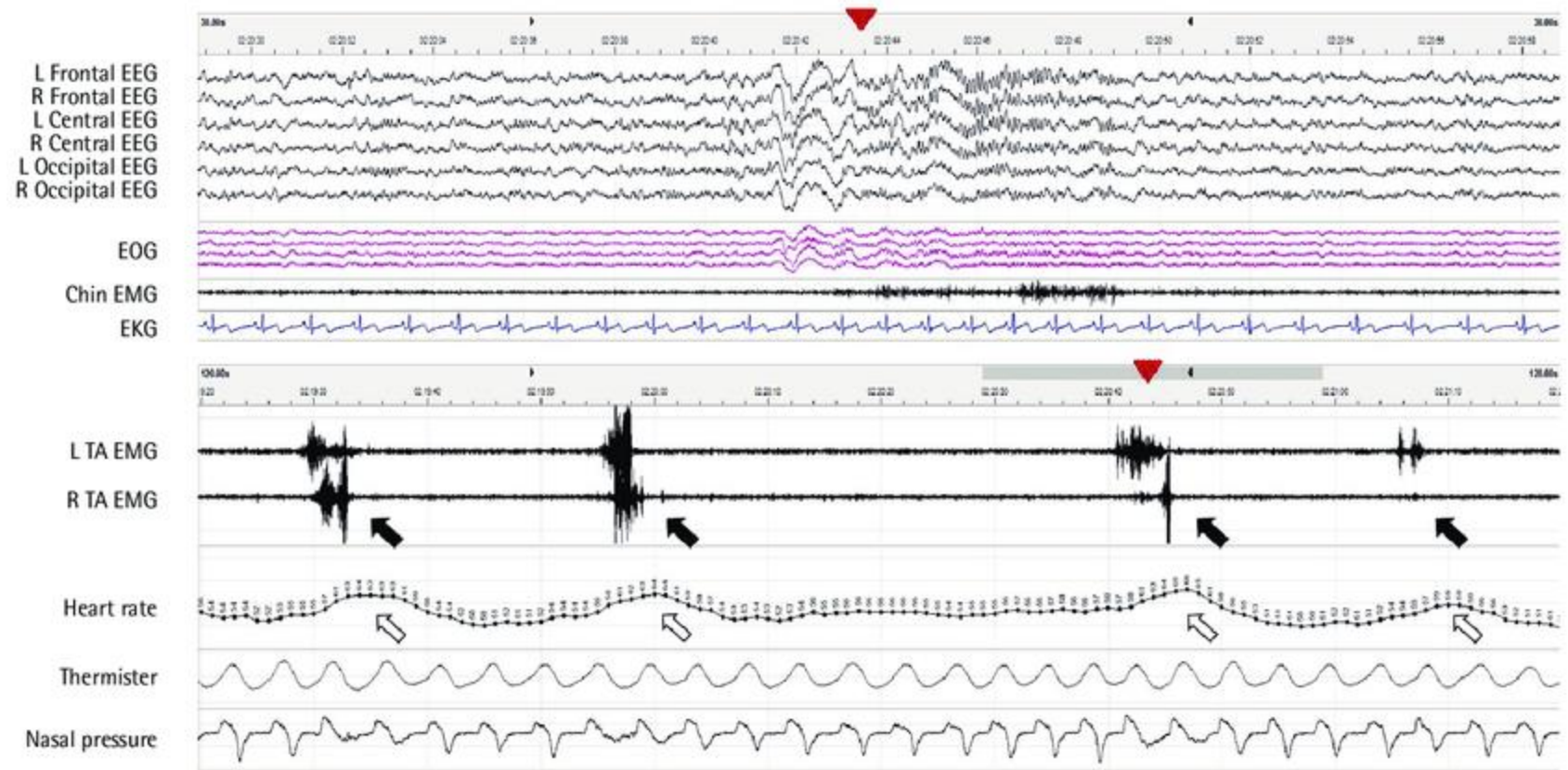
- Clinical diagnosis
- Occurs while awake
- Urge to move legs, usually accompanied by uncomfortable/unpleasant sensations
- Begins or worsens during periods of inactivity and during evening; sensations are partially/totally relieved by movement, at least as long as activity continues
- Genetic link, iron deficiency
- Co-occurrence with ADHD

PLMD

- Diagnosis by sleep study
- Occurs while asleep
- Jerking movements of lower extremities
 - Brief (0.5-10 sec)
 - repetitive (≥ 4 consecutive movements 5-90 sec apart)
- > 5 per hour
- Often confused as growing pains
- Bed is a mess in the morning
- Genetic link, iron deficiency

Restless Sleep Disorder (RSD)

- First defined in 2018
- Sleep study needed for diagnosis
- Frequent (>5 per hour) large body movements during sleep
- Sleep disruption and impairment in daytime function
- Lack of other causes for the restlessness
- Iron deficiency implicated



Treatment

- Optimize iron stores (*ferritin target >50 kids, >75 adolescents*)
- Restrict/eliminate caffeine
- Increase physical activity
- Massage, relaxation
- Regular sleep schedule/adequate duration for age
- Magnesium
- Medication (e.g. clonidine, gabapentin, ropinirole, pramipexole)

Next Steps

- Please fill out CME/feedback survey
- If you are interested in presenting a case study next month, please email Liz Canor
 - **Next ECHO session: Thursday, June 27th, 2024 (7:30-8:30am)**
Session topic: “Focus on Infants”

CME Credits

(Pending credit for MDs, PAs, Rx, RNs, NPs, PsyD, PhD)

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