

Pediatric Sleep Disorders

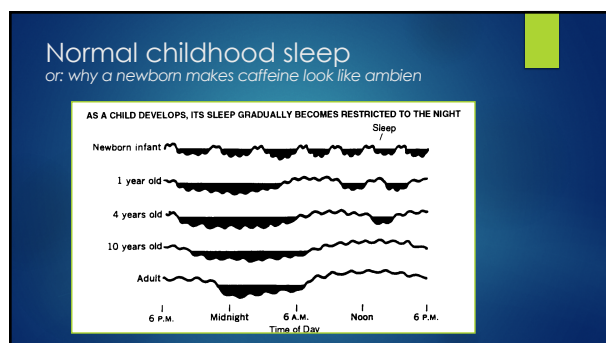
JORDANNA MAE HOSTLER
A DOCTOR AND A MOTHER

Objectives

- ▶ Describe normal sleep during childhood
- ▶ Obtain a thorough and concise pediatric sleep history
- ▶ Recognize, treat, and refer pediatric sleep disorders including:
 - ▶ OSA
 - ▶ Insomnia
 - ▶ RLS
 - ▶ Enuresis
 - ▶ Parasomnias
 - ▶ Narcolepsy
 - ▶ Delayed Phase Circadian Rhythm Disorder

Normal Childhood Sleep

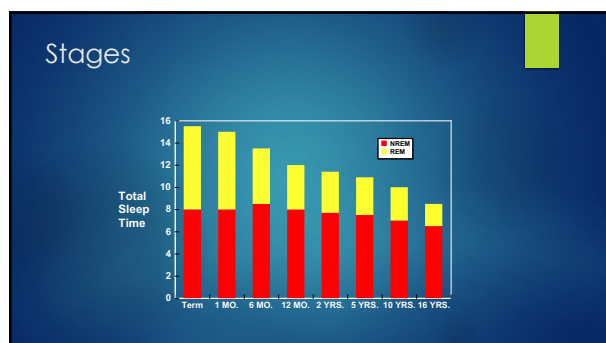




They (should) do more of it!

Newborns/Infants	0 - 2 months: 2 - 12 months:	10.5-18 hours 14-15 hours
Toddlers/Children	12 mo - 18 mo: 18 mo - 3 years: 3 - 5 years: 5 - 12 years:	13-15 hours 12-14 hours 11-13 hours 10-11 hours
Adolescents	On Average:	9.25 hours
Adults/Older Persons	On Average:	7-9 hours

Sleep is *the* primary activity of the brain during early development



Sleep History



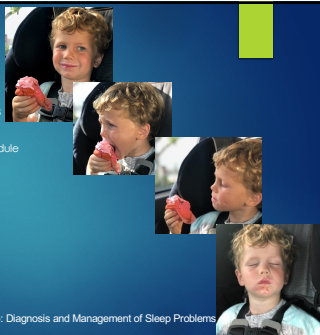
Sleep history

- ▶ How long has this been an issue, car rides, playing games, eating?
- ▶ Sleep schedule on school days and non school days (SOL, NA, WASO, EMA) and napping, bedroom environment
- ▶ Poor school performance, enuresis, asthma, behavioral issues
- ▶ PMH – emphasis on developmental issues and upper airway, comorbidities like obesity, Down Syndrome, craniofacial abnormalities, sickle cell disease, neuromuscular disorders, mucopolysaccharidoses
- ▶ PSH – emphasis on airway stuff
- ▶ Sleep ROS:
 - ▶ Sleep paralysis, hallucinations, cataplexy
 - ▶ RLS
 - ▶ Sleep walking, dream enacting, nightmares
- ▶ Caffeine? YOU WOULD BE SURPRISED
- ▶ FH of OSA?
- ▶ SH – smokers in the home (adolescents?)
- ▶ PEX – BMI, tonsillar size, tongue scalloping, adenoidal facies, high arched palate

BEARS

- ▶ Bedtime
 - ▶ Routine
 - ▶ Resistance
 - ▶ Fears
- ▶ EDS
 - ▶ Hyperactivity
 - ▶ Irritability
 - ▶ Difficulty waking

- ▶ Awakenings
 - ▶ Call outs
 - ▶ Restlessness
- ▶ Regularity
 - ▶ Sleep schedule
- ▶ Snoring
 - ▶ Volume
 - ▶ Pauses
 - ▶ Periodicity



Mindel, JA, & Owens. A Clinical Guide to Pediatric Sleep: Diagnosis and Management of Sleep Problems

APPENDIX

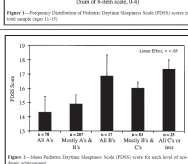
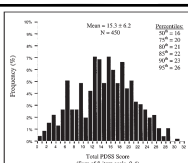
Pediatric Daytime Sleepiness Scale (PDSS)

Please answer the following questions as honestly as you can by circling one answer only:

- How often do you fall asleep or get drowsy during class periods?
Always Frequently Sometimes Seldom Never
- How often do you get sleepy or drowsy while doing your homework?
Always Frequently Sometimes Seldom Never
- Are you usually alert most of the day?
Always Frequently Sometimes Seldom Never
- How often are you ever tired and grumpy during the day?
Always Frequently Sometimes Seldom Never
- How often do you have trouble getting out of bed in the morning?
Always Frequently Sometimes Seldom Never
- How often do you fall back to sleep after being awakened in the morning?
Very often Often Sometimes Seldom Never
- How often do you need someone to awaken you in the morning?
Always Frequently Sometimes Seldom Never
- How often do you think that you need more sleep?
Very often Often Sometimes Seldom Never

Scoring 4 3 2 1 0

***Reverse score this item**



	Yes	No	Don't know
While sleeping does your child...			
...breathe more than half the time?			
...breathe rarely?			
...breathe normally?			
...breathe "noisy" or loud breathing?			
...breathe trouble breathing or struggle to breathe?			
Have you ever...			
...seen your child stop breathing during the night?			
Does your child...			
...fail to breathe through the mouth during the day?			
...lose a dry mouth or waking up in the morning?			
...wake up with the bed?			
...wake up feeling unrefreshed in the morning?			
...have a problem with depression during the day?			
...has a teacher or other supervisor commented that your child appears sleepy during the day?			
...does your child wake up with headaches in the morning?			
...do you think they are having a normal life as a teen (social life)?			
...is your child overweight?			
This child often...			
...does not seem to listen when spoken to directly			
...has difficulty getting tasks			
...is easily distracted by external stimuli			
...climbs with hands or feet or moves or acts			
...is "on the go" or often acts as if "driven by a motor"			
...interrupts or intrudes on others (e.g. with idle conversations or games)			
Total Number of "Yes" Responses _____			
If eight or more statements are answered "yes", consider referring for sleep evaluation			
CHEN, ET AL. PEDIATRIC SLEEP QUESTIONNAIRE, VALIDITY AND RELIABILITY OF SCALES FOR SLEEP DISORDERED BREATHING, SWINING, SLEEPWALK, AND BEHAVIORAL PROBLEMS, SLEEP MEDICINE 2006;11:5-12			

Diaries (by child or parent)

Sleep diary

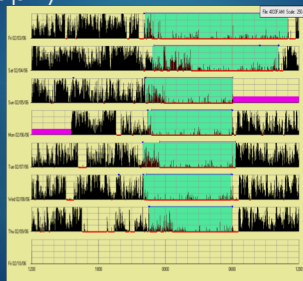
	Mon	Tue	Wed	Thur	Fri	Sat	Sun
Woke time did you get out of bed this morning? (clock time)	7:50	7:00	10:00	10:00	7:00	10:00	6:45am
Woke time did you get into bed last night? (clock time)	10:00	10:30	12:00	12:30	12:30	12:30	12:30
About how long did it take you to fall asleep? (hours/minutes)	3:30	5:30	5:30	2:30	10:00	5:30	5:30
How many times did you wake up during the night (at)?	0	0	2	0	0	0	0
How long were you awake during the night? (in total in hours/minutes)	0	0	0	0	0	0	0
About how long did you sleep altogether? (hours/minutes)	7:00	7:00	7:00	7:00	7:00	7:00	7:00
Comments (Sleep medications used, nightmares)	None	None	None	None	None	None	None
Using the following scale below	0	1	2	3	4	5	6
How well do you feel this morning?	0	1	2	3	4	5	6
How energetic was your sleep last night?	0	1	2	3	4	5	6

General Instructions:

- Keep at bedtime. Fill out the sleep diary EVERY NIGHT.
- Do not look at the clock to measure time. Know when you get into bed and when you get out for sleep.
- The last time, don't check the clock in between. Take your best guess as to time.

Time: The time you got out of bed and did not get back in.
Time in bed: When you get into bed for the night. This should be the same time as you turn off the light.

Actigraphy



Pediatric OSA

- ▶ It's not just little adult OSA
 - ▶ Snoring
 - ▶ Restless sleep
 - ▶ Hyperactivity
 - ▶ Irritability
- ▶ Signs
 - ▶ Mouth breathing
 - ▶ FTT or obesity
 - ▶ HTN
 - ▶ Tonsils
 - ▶ Adenoidal facies
 - ▶ Micro/retrognathia
 - ▶ High arched palate

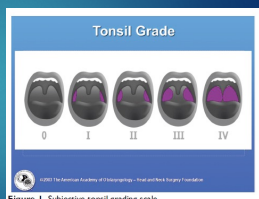
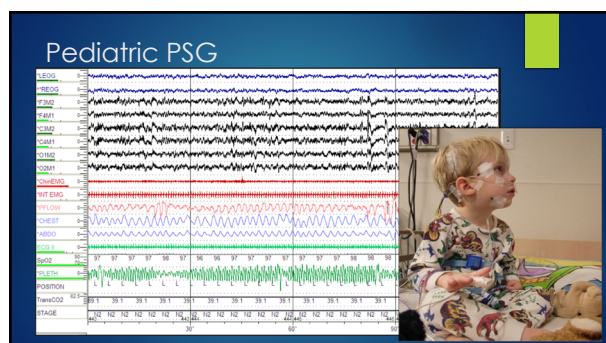


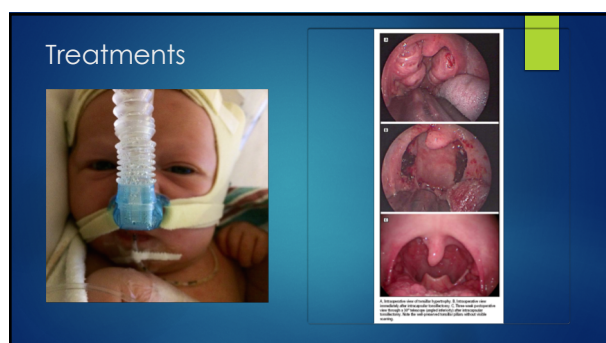
Figure 1. Subjective tonsil grading scale.

When to study/refer?

- ▶ Snoring 3 times a week +
 - ▶ Gasps and pauses in respiration
 - ▶ Academic or attention problems
 - ▶ Other sleep disorders
 - ▶ Adenoidal facies
- ▶ Movement related sleep disorder
- ▶ R/O narcolepsy, idiopathic hypersomnia
- ▶ Persistent and treatment resistant sleep disturbances







Tonsillectomy +/- adenoidectomy

- ▶ One of the most common surgical procedures in the US (289,000 per year)
- ▶ Per the ENT guidelines:
 - ▶ Obtain a prior history including FIT, poor school performance, enuresis, asthma, behavioral issues (i.e. stuff likely to improve with surgery)
 - ▶ PSG prior if: less than age 2, obese, Down's, craniofacial abnormalities, sickle cell disease, neuromuscular disorders, mucopolysaccharidoses
 - ▶ PSG prior if: none of above comorbidities and need uncertain; discordance of PEX and severity of reported SBD
 - ▶ If PSG shows CSA recommend tonsillectomy
 - ▶ Warn parents SDB may persist
 - ▶ Inpatient monitoring post-operatively; less than age 3, severe CSA (AHI >10, O2 nadir 80 or less)
- ▶ Per the AASM and pediatric guidelines:
 - ▶ Everyone gets a PSG prior to T+A

Operative and Post-operative

- ▶ Risks/complications
 - ▶ Bleeding 3-8%
 - ▶ Return to OR 0.8-1.8%
 - ▶ Transient worsening OSA
 - ▶ POPE
 - ▶ Anesthetic complication
 - ▶ Pain
 - ▶ Death
- ▶ Post operative
 - ▶ Inpatient monitoring of high risk patients
 - ▶ Repeat PSG or referral to sleep specialist
 - ▶ Cure rates highly variable

Pediatric PAP therapy

- ▶ Should be done through a center with experience
- ▶ Practice at home first
 - ▶ Patience
 - ▶ Positive reinforcement
 - ▶ Graduated exposure
 - ▶ Counter-conditioning
 - ▶ Selective attention
 - ▶ Escape prevention
- ▶ Restudy/retitrate over time (kids outgrow their OSA)
- ▶ Areas of obstruction are different
 - ▶ Nasopharyngeal versus in the oropharynx
 - ▶ Nasal masks preferred

Pediatric Dentistry



- ▶ RME for high arched palate
 - ▶ Shown to decrease AHI, increase LSAT
 - ▶ Variable "cure" rates to about 26%
 - ▶ Option for those with a high arched palate and small tonsils, those with high-arched palate with tonsillar hypertrophy who decline T+A, and as an adjunct to T+A
- ▶ Pediatric dental devices
 - ▶ I knew one guy who made them in DC and said that they worked. Other than there and with him I am not sure that I would recommend it.

RME for pediatric OSA: systematic review and meta analysis
Camacho et al The Laryngoscopy 31 Oct 2016

Other therapies

- ▶ Positional
- ▶ Provent
- ▶ Nasal CS, leukotriene inhibitor
- ▶ Myofascial reeducation
- ▶ PPI?
- ▶ Not antibiotics

Pediatric insomnia

- ▶ Types
 - ▶ Sleep onset association
 - ▶ Limit setting
 - ▶ Psychophysiological
- ▶ Treatment
 - ▶ Behavioral

Pediatric insomnia

- ▶ General
 - ▶ Educate parents on sleep need
 - ▶ Pick bedtime
 - ▶ Bedtime routine
 - ▶ Get out of their bedroom
- ▶ Extinction
- ▶ Bedtime fading
- ▶ Strategic napping
- ▶ Positive reinforcement

Pediatric RLS

- ▶ Similar diagnostic criteria to adult RLS but a different language
 - ▶ Most present with either sleep concerns or behavioral concerns (ADHD)
- ▶ The sleep concerns are usually
 - ▶ Restless sleep
 - ▶ Sleep onset issues (RLS)
 - ▶ Sleep maintenance (PLMS)
- ▶ PLMS helpful
- ▶ Check a ferritin
 - ▶ Iron supplementation can be helpful

Pediatric restless legs syndrome diagnostic criteria: an update by the International Restless Legs Syndrome Study Group, Sleep Medicine Dec 2013

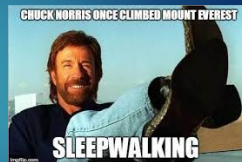


Enuresis

- ▶ Primary V secondary
 - ▶ OSA associated with both types
- ▶ OSA associated with secondary and T+A has been described as curative

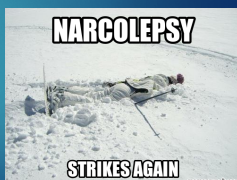
Parasomnias

- ▶ Sleepwalking
 - ▶ Safety is key
 - ▶ They should grow out of it
 - ▶ Worth a sleep study
- ▶ Bruxism
 - ▶ Highly associated with OSA
- ▶ Night terrors
- ▶ Mimics
 - ▶ RLS, NFLE



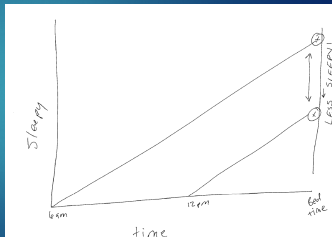
Narcolepsy

- ▶ Diagnosed by compatible history and MSLT
- ▶ Falling asleep
- ▶ REM phenomena
- ▶ Cataplexy



Delayed Phase Circadian Rhythms

- ▶ Or just being a normal adolescent ?
- ▶ Delayed school start times
 - ▶ Make kids smarter



Handy resources

- ▶ Clinical Practice Guidelines: Tonsillectomy in Children (Update 2019, Initial 2011) American Academy of Otolaryngology – Head and Neck Surgery
- ▶ American Academy of Sleep Medicine - AASM.org
- ▶ National Institutes of Health - Starsleep.nhlbi.nih.gov
- ▶ National Sleep Foundation - Sleepfoundation.org
- ▶ A Clinical Guide to Pediatric Sleep: Diagnosis and Management of Sleep Problems (Jodi Mindell & Judith Owens)
- ▶ Sleeping Through the Night – Jodi Mindell
- ▶ Solve Your Child's Sleep Problems - Richard Ferber
- ▶ www.google.com
