Common Sleep Problems in Pediatric Neuropsychology: Impact and Assessment

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Overview

- Why you should care
- Key concepts
- What’s normal?
- Bad sleep = bad news
- Common sleep problems in children
- Sleep assessments
- Now what?
  - What to do when you find a sleep problem
  - Where to find resources

Why You Should Care

The impact on the family can be tremendous

Why You Should Care

Sleep pathology can signal an unaddressed problem in the child, family, or environment.

Untreated sleep problems can cause or contribute to other health problems.
Because you’re a neuropsychologist, and short sleep and/or disrupted sleep can cause or contribute to neuropsychological deficits.

Why You Should Care

Key Concepts

...in 10 minutes or less.

Key Concepts

(España & Scammell, 2011)

Key Concepts

(Espinosa & Scammell, 2011)
Key Concepts

- Stages of Sleep
  - Non-REM
    - Stage N1
    - Stage N2
    - Stage N3 (SWS)
  - REM sleep

(Carskadon & Dement, 2011)

Key Concepts

- All of us have brief arousals
- Most SWS happens early, REM later

(Mindell et al., 1999, p. 697)

Key Concepts

- Early childhood is the golden age of REM and SWS.

(Campbell et al., 2007)

(Anders et al., 1995)
• Arousal largely determined by 2 processes.

Process S (Sleep Homeostat)
- Neuro substrate unclear
- Adenosine in basal forebrain?
- Builds with time awake, dissipates rapidly during sleep, esp. in SWS

Key Concepts

• Arousal largely determined by 2 processes:

Process C (Circadian)
- Suprachiasmatic nucleus
- Core body temp
- “owls” v. “larks”
What’s Normal?

- **Newborns**
  - Total sleep time=16-20 hr/day
  - 24 hour distribution of sleep
  - Sleep episodes 3-4 hrs
- **2 - 3 months**
  - Diurnal cycle established.
- **6 months**
  - Total sleep time= 13-14 hours
  - Sleep episode 6-8 hrs
- **9 months**
  - Consolidated night sleep
  - Daytime naps
  - 70-80% “sleep thru the night”

What’s Normal?

- **Toddlers (1-3 years old)**
  - Total sleep =12-14 hr
  - Most give up 2nd nap by 12 months
  - Sleep problems common (20-40%)
  - Importance of bedtime routines, transitional objects

What’s Normal?

- **Preschoolers (3-5 y.o)**
  - Total sleep=11-12 hr
  - By age 4-5, many children give up regular daytime naps
  - “Signaled” night wakings occur frequently (up to 60%)
What’s Normal?

• Mid-Childhood (6-12)
  • Total sleep=9-11 hrs
  • Sleep more stable, night-to-night consistency
  • Low level of daytime sleepiness; naps rare
  • Circadian preference often established

What’s Normal?

• Adolescence
  • Trouble Brewing on the Sleep Front…

What’s Normal?

Bad Sleep = Bad News
(Daytime Effects of Poor Sleep in Children and Adolescents)

(Hagenauer & Lee, 2012)
Daytime Effect of Poor Sleep in Kids: Correlational Studies

- Short or disrupted sleep correlates with:
  - ↑ Daytime sleepiness
  - ↓ Attention
  - ↓ Regulation of Impulses, Mood, Behaviors
  - ↓ School performance
  - ↑ Risky behaviors and accidental injuries
  - ↑ Accidents in teen drivers
  - ↑ Negative mood

(Beebe, 2011, Pediatric Clinics of North America)

Daytime Effect of Poor Sleep in Kids: Obstructive Sleep Apnea

- Inattention, Hyperactivity / Impulsivity, Externalizing Behaviors
- Mixed evidence of IQ deficits in school-age kids
- IQ deficits more apparent in young kids (4-7 y.o.)
- Poor grades but not poor scores on academic tests.
- Mixed findings on memory tests.
- Frequent findings on tests of attention and executive functioning.

(Beebe, 2006)

Daytime Effect of Poor Sleep in Kids: Obstructive Sleep Apnea (Case-Control Studies)

ON SOME CAUSES OF BACKWARDNESS AND STUPIDITY IN CHILDREN:
AND THE RELIEF OF THESE SYMPTOMS IN SOME INSTANCES
BY NASO-PHARYNGEAL SCARIFICATIONS.

Read in the Section of Otology at the Annual Meeting of the
British Medical Association, held in Leeds, August, 1889.

BY WILLIAM HILL, B.Sc., M.B.LOND.,
Senior Demonstrator of Anatomy and Assistant in the Aural Department,
St. Mary's Hospital; formerly Registrar and Pathologist, Central
London Throat and Ear Hospital.

British Medical Journal, Sept 28, 1889

Daytime Effect of Poor Sleep in Kids: Obstructive Sleep Apnea

- 163 overweight participants aged 10 – 16 yrs underwent overnight PSG
  - 42 Moderate+ OSA (AHI > 5)
  - 58 Mild OSA (AHI = 1 - 5)
  - 26 Snorers (AHI < 1 but reported to snore)
  - 37 No SDB (AHI < 1 and nonsnoring)

- Neuropsych assessment included tests, parent- and self-report of school grades, and parent- and teacher-reports of behavior.
**Daytime Effect of Poor Sleep in Kids: Obstructive Sleep Apnea**

**Questionnaire Data**

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted*</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lambda (df)</td>
<td>P-value</td>
</tr>
<tr>
<td>School grades</td>
<td>3.38 (6, 282)</td>
<td>0.003</td>
</tr>
<tr>
<td>Parent-reported behaviors</td>
<td>1.97 (24, 389)</td>
<td>0.004</td>
</tr>
<tr>
<td>Teacher-reported behaviors</td>
<td>1.71 (30, 227)</td>
<td>0.015</td>
</tr>
</tbody>
</table>

**Neuropsychological Test Data**

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted*</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lambda (df)</td>
<td>P-value</td>
</tr>
<tr>
<td>Intelligence</td>
<td>0.88 (6, 310)</td>
<td>0.508</td>
</tr>
<tr>
<td>Memory</td>
<td>1.37 (18, 422)</td>
<td>0.140</td>
</tr>
<tr>
<td>Attention</td>
<td>0.97 (9, 338)</td>
<td>0.465</td>
</tr>
<tr>
<td>Problem-solving / planning</td>
<td>0.60 (6, 312)</td>
<td>0.732</td>
</tr>
<tr>
<td>Fine motor</td>
<td>1.53 (6, 308)</td>
<td>0.167</td>
</tr>
</tbody>
</table>

(Beebe et al., 2010, Sleep)

**Typical GPA**

- No OSA: 3.26
- Snorers: 3.04
- Mild OSA: 2.85
- Mod-Sev OSA: 2.60

**% earning Cs-Fs vs. A grades**

- No OSA: 20%
- Snorers: 6%
- Mild OSA: 2%
- Mod-Sev OSA: 0%

(Beebe et al., 2010)

**Parent-Reported Behaviors**

- No SDB
- Snorers
- Mild OSA
- Mod+ OSA

**Teacher-Reported Behaviors**

- No SDB
- Snorers
- Mild OSA
- Mod+ OSA
**Daytime Effect of Poor Sleep in Kids: Correlational Studies**

- Short or disrupted sleep *predicts* later:
  - ↑ Externalizing Behaviors
  - ↑ Anxiety
  - ↑ Depression
  - ↑ Weight/Obesity
  - ↑ Drug Use
- Snoring *predicts* later:
  - ↓ School performance
  - ↑ Hyperactivity

(Beebe, 2011; Sadegh et al., 2014, Becker et al., 2014)

**Daytime Effect of Poor Sleep in Kids: Experimental Studies**

- Hundreds of studies on adults
- < 25 published pediatric studies
- In pre-adolescents, sleep restriction causes:
  - ↑ Daytime sleepiness
  - ↓ Attentive behaviors (office tests less sensitive)
  - ↑ In negative mood, especially when challenged
  - ↓ Regulation of behavior or impulses
  - ↓ Some higher-level cognitive skills

(Beebe, 2011, Ped Clin North Am; Berger et al., 2012, Jh Sleep Res; Gruber et al., 2012, Pediatrics)

**Daytime Effect of Poor Sleep in Kids: Experimental Studies**

- 74 healthy 6 – 12 y.o. school children
- 3 week protocol
  - “baseline” week
  - “optimized” week (≥ 10 hr /night)
  - “restricted” week (8 hr for grades 1&2, 6.5 hr for grades 3+)
- Teachers rated behaviors

(Fallone et al., 2005)
Daytime Effect of Poor Sleep in Kids: “Sleepy Teens” Study

- Healthy teens ages 14.0 – 16.9
- Started 4th summer of data collection
- 3-week sleep manipulation protocol
  - Baseline
  - Sleep Deprived (SD; 6.5 hr in bed per night)
  - Healthy Duration (HD; 10 hr in bed per night)

### Parent Report Questionnaires

![Graph showing raw score comparison between Sleep Dep. and Healthy Dur. for various factors.](image)

#### Sleep Schedules

<table>
<thead>
<tr>
<th>Sleep Schedules</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM</td>
</tr>
<tr>
<td>6:00 AM</td>
</tr>
<tr>
<td>4:00 AM</td>
</tr>
<tr>
<td>2:00 AM</td>
</tr>
<tr>
<td>12:00 AM</td>
</tr>
<tr>
<td>10:00 PM</td>
</tr>
</tbody>
</table>

- 6.5 hr
- 9.0 hr

### 99 Adolescents

- Mean Age: 15.5 yr
- % Cauc.: 46%
- % Af. Am.: 46%
- Median Income: 40-50K

### Teen-Report Questionnaires

![Graph showing raw score comparison between Sleep Dep. and Healthy Dur. for various factors.](image)
Daytime Effect of Poor Sleep in Kids: “Sleepy Teens” Study

Simulated Classroom

• Teens view 30-min boring educational films
• Outcomes:
  – Post-video quizzes
  – Video of their behaviors
  – EEG Monitoring

Daytime Effect of Poor Sleep in Kids: “Sleepy Teens” Study

Simulated Classroom (preliminary)

Interim Review

• Why you should care
  – High risk of sleep problems in kids you see
  – Tremendous impact on family
  – Could highlight other problems
  – Other care providers aren’t asking
Interim Review

- Key Concepts

- Developmental Changes

Interim Review

- Bad sleep = bad news
  - In kids, inadequate sleep induces:
    - Sleepiness
    - Inattention
    - Diminished Learning
    - Negative mood
    - Poor regulation of affect and behavior

Interim Review

Time for a break! When we return...

- Common sleep problems in children
- Sleep assessments you can do (and what you need to know about those you can’t do)
- Now what?
  - What to do when you find a sleep problem
  - Where to find resources
Common Sleep Problems in Children

Common Sleep Problems: Poor Sleep Hygiene

Habits that limit / disrupt sleep time or patterns.

Increase arousal
- Excessive/late caffeine
- Smoking
- Stimulating play near bedtime
- Evening "screen time"
- Excessive noise
- Bright light in the p.m.

Disrupt sleep organization
- napping late in the day
- variable sleep-wake cycle
- activities in bed that are incompatible with sleep.

Common Sleep Problems: Insomnia

Global sleep symptom complex marked by
- Difficulty falling asleep
- Frequent or prolonged night wakings
- Early morning awakening
- Daytime impairment

Common Sleep Problems: Psychophysiological Insomnia

- Difficulties with sleep onset or maintenance
- Negative arousal (e.g., tension, anxiety) regarding sleep
- Better sleep when away from own bed
- Intrusive thoughts/rumination
Common Sleep Problems: Psychophysiological Insomnia - Rx

- Behavioral interventions:
  - Stimulus control
  - Cognitive restructuring
  - Sleep restriction
  - Relaxation techniques
- Limited use sedatives, hypnotics in combination with behavioral management

Common Sleep Problems: Adjustment Sleep Disorder

- Acute onset of settling problems or night wakings after stressful event
- Prolonged parental attention may inadvertently reinforce poor sleep

Common Sleep Problems: Adjustment Sleep Disorder - Rx

**Mild anxiety**
- Adjust bedtime for sleep readiness
- Negotiate bedtime strategies
- Encourage transitional objects; pets/fish tank
- Positive reinforcement
- Consistent, firm approach

**Severe Anxiety**
- Focus Rx on anxiety
- Gradual desensitization, relaxation techniques
- Bedtime checks
- May temporarily require parental presence at bedtime
- Consider intensive therapy

Common Sleep Problems: Behavioral Insomnia of Childhood
Common Sleep Problems: Behavioral Insomnia of Childhood

Sleep Onset Association Type

- Child learns to fall asleep under certain conditions, then requires same conditions after nighttime arousals

Common Sleep Problems: Behavioral Insomnia of Childhood

Limit-Setting Type

- Inconsistent or lack of bedtime rules leading to prolonged bedtime struggles, refusals, protests, requests, and excuses

Common Sleep Problems: Behavioral Insomnia of Childhood

Sleep Onset Association Type – Rx

- Extinction: “cry it out”
- Graduated extinction: Use of timed “checks”
- Scheduled awakenings
- Preventative education
  - Establish appropriate sleep associations
  - Transitional objects (maternal T-shirt)
  - Brief nocturnal waking contacts

Common Sleep Problems: Behavioral Insomnia of Childhood

Limit-Setting Type - Rx

- Consistent bedtime, routine, rules
- Bedtime fading
- Return child to bed gently but firmly
- Behavioral reinforcement
Common Sleep Problems: Obstructive Sleep Apnea

Risk Factors
- 2-7 years old
- Big adenoids, tonsils
- Obesity
- ↓ upper airway tone
- Craniofacial anomaly
- Not gender

(Adapted from Owens & Mindell, 2011)

Common Sleep Problems: Obstructive Sleep Apnea – Rx

- Tonsillectomy and Adenoidectomy
- Positive Airway Pressure (CPAP/BiPAP)
- Nasal Steroids (e.g., Flonase, Nasonex)
- Weight loss

Common Sleep Problems: Sleep-Related Movement D.O.

- Restless Leg Syndrome
  - Dysesthesias (“pins and needles”, “growing pains”) increased at rest; relieved by movement
  - “Fidgetiness” at bedtime
  - Difficulty falling asleep; bedtime resistance

- Periodic Limb Movement Disorder
  - Restless sleep, rhythmic jerking movements legs
  - Frequent arousals from sleep

Common Sleep Problems: Sleep-Related Movement D.O.

RLS and PLMS Treatment
- Iron supplements if serum ferritin is low.
- Distraction, massage may help RLS
- In rare cases, medications used
Common Sleep Problems: Delayed Sleep Phase Syndrome

- Sleep period delayed relative to demands
- Symptoms of sleep onset insomnia or difficulty waking at the desired time.
- Once asleep, sleep is OK
- Would sleep enough if allowed to sleep in
- Functional deficits typically due to sleep deprivation and problems waking on time.

Common Sleep Problems: Delayed Sleep Phase – Rx

*Treatment requires motivation*

- Behavioral
  - Phase advancement (best if phase off < 2 hrs)
  - Phase delay (chronotherapy)

<table>
<thead>
<tr>
<th>Baseline night</th>
<th>Bedtime</th>
<th>Wake time</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>7:30 am</td>
<td>12:30 pm</td>
</tr>
<tr>
<td>Tx night 1</td>
<td>10:30</td>
<td>6:30 am</td>
</tr>
<tr>
<td>Tx night 2</td>
<td>1:30</td>
<td>9:30 am</td>
</tr>
<tr>
<td>Tx night 3</td>
<td>4:30</td>
<td>12:30 pm</td>
</tr>
<tr>
<td>Tx night 4</td>
<td>7:30</td>
<td>3:30 am</td>
</tr>
<tr>
<td>Goal night</td>
<td>10:30 pm</td>
<td>6:30 am</td>
</tr>
</tbody>
</table>

Partial Arousal Disorders

- Confusional Arousals
- Sleep Terrors
- Sleep Walking

Common Sleep Problems: Parasomnias

- Bright light shifts sleep earlier if given after circadian nadir (brighter = stronger). Limit p.m. light.

- Melatonin can shift sleep phase forward if given prior to DLMO. Dose-response relationship unclear.
Partial Arousal Disorders
- Confusional Arousals
- Sleep Terrors
- Sleep Walking
  - Usually quiet
  - Can be agitated
  - Can include complex behaviors

Common Sleep Problems: Parasomnias

Partial Arousal Disorders
- Confusional Arousals
- Sleep Terrors
- Sleep Walking
  - Confusion
  - Difficulty waking
  - Sometimes agitation

Common Sleep Problems: Parasomnias

Partial Arousal Disorders
- Confusional Arousals
- Sleep Terrors
- Sleep Walking

Common Sleep Problems: Parasomnias

Partial Arousal Disorders – Rx

<table>
<thead>
<tr>
<th>Parasomnias</th>
<th>Epilepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency per night</td>
<td>1 or less per night</td>
</tr>
<tr>
<td>Timing</td>
<td>First third of night</td>
</tr>
<tr>
<td>Sleep stage from which events arise</td>
<td>N3 (slow-wave sleep)</td>
</tr>
<tr>
<td>Typical duration</td>
<td>&gt; 5 minutes</td>
</tr>
<tr>
<td>Wandering outside of bedroom</td>
<td>Common in sleepwalking</td>
</tr>
<tr>
<td>Complex, directed behaviors (e.g., picking up objects, dressing)</td>
<td>More common</td>
</tr>
<tr>
<td>Dystonic posturing</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Non-convulsive events or automatisms</td>
<td>Uncommon</td>
</tr>
<tr>
<td>Later recall of event when awake</td>
<td>No</td>
</tr>
<tr>
<td>Family history</td>
<td>Very often includes parasomnias, rarely epilepsy</td>
</tr>
</tbody>
</table>

(Owens & Mindell, 2011)

(Beebe, 2012, adapted from other sources)
Common Sleep Problems: Parasomnias

Partial Arousal Disorders – Rx
- Rule out treatable causes
  - Sleep apnea, PLMS
  - Insufficient sleep
- Parental reassurance, education on redirecting child to bed
- Safety precautions
- Stress reduction
- Scheduled awakenings
- Pharmacotherapy rarely needed

Nightmares
- Awakens from sleep with recall of frightening dream
- Reasonably coherent and oriented
- May take time to calm enough to return to sleep
- Can usually later recall having been awake

Nightmares – Rx
- Reduce frightening/stressful events, esp. close to bedtime
- Ensure adequate sleep time
- Provide reassurance
- Build self-soothing skills
- In rare cases, medication

Common Sleep Problems: Parasomnias

Every child is unique. This can affect sleep.
- Involvement of sleep-relevant neuro circuits
- Diminished light input
- Medications & regimen
- Pain
- Craniofacial anomalies
- Hypotonia
- Sensory pursuits
- Sensory sensitivities
- Emotion dysregulation
- Poor understanding of social cues
- Can’t communicate comfort needs
- Problems executing calming routines
- Family and cultural factors

Common Sleep Problems: Special Considerations

Emotion dysregulation
Poor understanding of social cues
Can’t communicate comfort needs
Problems executing calming routines
Family and cultural factors
Applying What You Know

Step 1: Assessment

Sleep Assessment Tools: Polysomnography (PSG)
• Overnight study with limited montage EEG, EOG, respiratory and movement monitors

Good for...
• Sleep Stages
• Sleep-disordered breathing
• Periodic limb movements
• EEG-based arousals
• Some seizures with expanded EEG montage and special review

Bad for...
• Typical sleep latency, onset, offset, behaviors around sleep
• Sleep in kids sensitive to monitoring
• Infrequent events
• Seizure if using traditional PSG montage & scoring

Sleep Assessment Tools: Multiple Sleep Latency Test (MSLT)
• Several standardized nap opportunities across the day, while wearing EEG leads.
Sleep Assessment Tools: Multiple Sleep Latency Test (MSLT)

- Several standardized nap opportunities across the day, while wearing EEG leads.

**Good for...**
- Excessive Daytime Sleepiness
- Sleep-onset REM, which is helpful in narcolepsy Dx

**Bad for...**
- Children whose sleep is highly sensitive to artificial setting and monitors

Sleep Assessment Tools: Actigraphy

- Wristwatch-like accelerometer, with movements used to infer sleep-wake states.

**Good for...**
- General sleep-wake patterns and movement-related arousals
- Recordings lasting multiple nights, even > 1 month
- “Natural” sleep-wake patterns

**Bad for...**
- Respiration, EEG during sleep
- Sleep while moving (e.g., in car, parasomnias, seizures)
- Anything at all if the person doesn’t wear the unit!

Sleep Assessment Tools: Sleep Diaries

- Patient/parent prospectively records bedtime, sleep onset/offset, & other important events.

**(Pedersen & Baumann, 2011)**
### Sleep Assessment Tools: Sleep Diaries

**Bad for…**
- Respiration, EEG during sleep
- Events not witnessed or recalled well by reporter
- Anything at all if the person doesn’t fill it out or has strong recall bias.

**Good for…**
- Recordings lasting multiple nights (usually 1-2 weeks)
- Infrequent but observable events
- "Natural" sleep-wake patterns

### Sleep Assessment Tools: Questionnaires

**Bad for…**
- Same as with sleep diaries, but with added concerns about precision and recall biases

**Good for…**
- Sleep patterns over broad spans in the natural setting
- Infrequent events

### Sleep Assessment Tools: Clinical Interviews

**Good for…**
- Same as questionnaires, but allows examiner to follow up on areas of ambiguity or concern.
- Opening up dialogue about sleep.

**Bad for…**
- Same as questionnaires, but with added concerns about reliability and interviewer quality.
- Slow people in short sessions.

### Sleep Assessment Tools: Questionnaires

**Bad for…**
- Same as questionnaires, but with added concerns about precision and recall biases

**Good for…**
- Sleep patterns over broad spans in the natural setting
- Infrequent events

### Sleep Assessment Tools: Clinical Interviews

- Unstructured or semi-structured interviews about selected aspects of sleep.

**Bad for…**
- Same as questionnaires, but with added concerns about reliability and interviewer quality.
- Slow people in short sessions.
Sleep Assessment Tools: BEARS Interview

- **B**edtime
- **E**xcessive daytime sleepiness
- **A**wakenings
  - night waking
  - early morning waking
- **R**egularity and duration of sleep
- **S**noring

(Owens & Dalzell, 2005)

Sleep Assessment Tools: BOWS Interview (alternative)

- **B**edtime
  - Problems getting to sleep, sleep onset time
- **O**vernight
  - Waking, snoring, sleepwalking, restlessness
- **W**aking
  - Difficulty, time, state of bed
- **S**leepiness during the day, coping with it.

(Beebe, 2012)

Applying What You Know

Step 2: Follow Up

- Be realistic about what to expect
- Start with sleep hygiene
- Consider treatment
- Consider referrals
- Recommendations for schools
Applying What You Know

Step 2: Follow Up

- Be realistic about what to expect
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Be Realistic: Sleep and the Kids You See

- Most studies have looked at the presence, nature, and severity of sleep problems in special-needs kids.
- Some correlations between severity of sleep disturbance and daytime deficits.
- But how much benefit can we expect if we treat the sleep problems?

Be Realistic: Sleep and the Kids You See

Autism

Melatonin helps kids with autism and severe sleep problems fall asleep faster…

Be Realistic: Sleep and the Kids You See

Autism

…and lessens severity of daytime symptoms.

(Wright et al., 2011)
In small open-label & placebo-controlled trials in children with intractable epilepsy and insomnia, melatonin:
- Shortened sleep onset latency
- Reduced sleep disruption
- Improved daytime sleepiness (maybe)
- Reduced seizure frequency (maybe)

(Elkhayat et al., 2010; Jain et al., under review)

Sleep restriction can further reduce attention:

- Inattention (Omission Errors)
- Impulsivity (Commission Errors)

ADHD

But L-dopa improves PLMS in children with ADHD and PLMD without differentially changing behavior...
...melatonin helps insomnia in children with ADHD without differentially helping behavior...

**Sleep Onset CBCL Total T-score**

(van der Heijden et al., 2007)

**Step 2: Follow Up**

- Be realistic about what to expect
- Start with sleep hygiene
- Consider treatment
- Consider referrals
- Recommendations for schools

---

**Start with Sleep Hygiene**

- Avoid caffeine late in the day or at high doses
- Avoid cigarette smoke (second-hand, too)
- Get out in daylight and move around, but have a calming, dimmer-light wind-down routine.
- Limit screen time during the evening “wind-down”
- Make sure the sleep setting is comfortable
- Keep a consistent sleep schedule
- Cater sleep duration, napping to each child’s needs

**Step 2: Follow Up**

- Be realistic about what to expect
- Start with sleep hygiene
- Consider treatment
- Consider referrals
- Recommendations for schools
If You Want to Learn About Pediatric Sleep Treatments

If You Want to Learn About Pediatric Sleep Treatments

Applying What You Know

Step 2: Follow Up

• Be realistic about what to expect
• Start with sleep hygiene
• Consider treatment
• Consider referrals
• Recommendations for schools
Referrals to Specialists: When to Refer

- A polysomnogram is needed:
  - Suspected sleep-disordered breathing
  - Limb movements at night
  - Seizure vs parasomnia
- Unexplained daytime sleepiness
- Sleep problem extremely disruptive
- Meds are being considered
- High risk of injury
- Refractory sleep problems
- You’re in over your head

Referrals to Specialists: How to Find a Specialist

- Board-certified MD/DO with subspecialties in sleep (2007 on):
  [Link](http://www.abms.org/Who_We_Help/Consumers/certifying.aspx)
- Board-certified MD, DO, or Ph.D. in sleep (before 2007):
  [Link](http://www.abms.org/listing.aspx)
- Board-certified Behavioral Sleep Medicine Specialists:
  [Link](http://www.abms.org/bsmspecialists.aspx)
- Certified Sleep Medicine Centers:
  [Link](http://www.sleepcenters.org/)

Applying What You Know

Step 2: Follow Up

- Be realistic about what to expect
- Start with sleep hygiene
- Consider treatment
- Consider referrals
- Recommendations for schools

Recommendations for Schools

- See handout for tips for the school.
- You will likely need to advocate a bit.
- Accommodations are symptom-driven
  - Vigilance/Alertness
  - Executive Functioning
  - Mood
Applying What You Know

Step 3: Keep Learning

Keep Learning!

Mindell & Owens, 2010