Evaluation of Pediatric Sleep Disorders

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Pediatric sleep complaints are common in pediatric practice. Twenty five percent of children will have a sleep complaint at some point. These issues are obviously of great concern to parents, so they quickly become the concerns of pediatric providers as well.

Assessment:

History and physical: A useful screening algorithm is BEARS:

B = Bedtime problems
E = Excessive daytime sleepiness
A = Awakenings during the night
R = Regularity and duration of sleep.
S = Snoring

Sleep diaries: Useful for determination of sleep patterns. Have the families fill them out the next day.

Actigraphy: Uses a watch-like device to precisely determine sleep-wake patterns over several weeks. Used if sleep diaries are thought to be imprecise or unreliable.

Polysomnography: The primary role of polysomnography is to a) determine the presence/absence of OSA and determine severity b) assess for other disorders of sleep fragmentation such as periodic limb movements of sleep, bruxism, nocturnal seizures, etc.

Developmental overview of pediatric sleep disorders

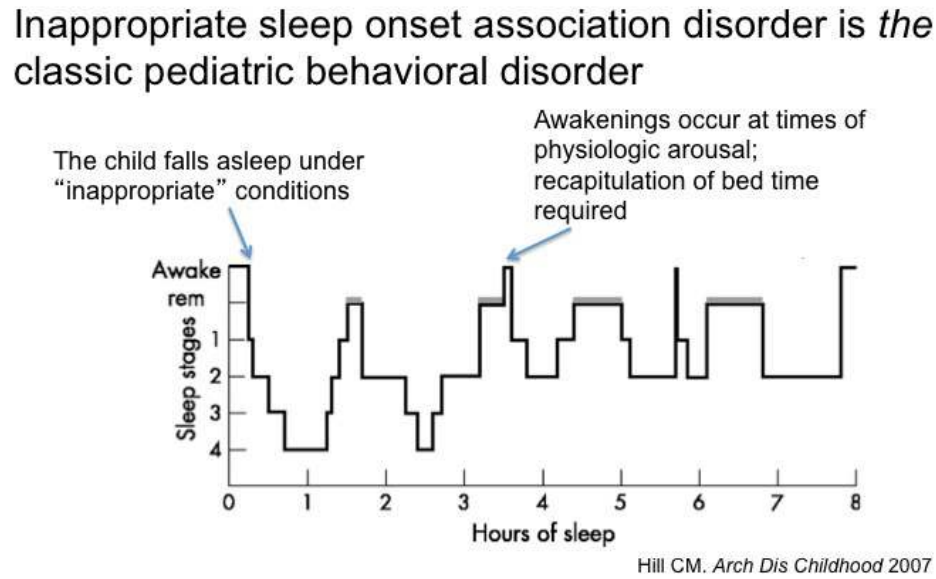
Newborn/ Young Infant	Older Infant & Toddler	Pre-schooler	School Age	Teenager
Usually normal Developmental Self limited	Night wakings Difficulty settling Night terrors Rhythmic movements Bedtime fears OSA	Night wakings Bedtime resistance Night terrors Sleep walking Rhythmic movements Bedtime fears Nightmares OSA	Insufficient sleep Bedtime resistance Sleep walking Enuresis Bruxism OSA	Insufficient sleep Delayed sleep phase Narcolepsy OSA

Problems falling asleep

Problems falling and staying asleep are both common complaints in the sleep clinic and frequently "travel" together.

- *Inadequate sleep hygiene:* Is the child's schedule chaotic and variable? Is the child's bedroom not conducive to sleep? Does the child take a late afternoon nap? Is there significant caffeine intake? If the answer to any of these questions is yes, the first step is to encourage development of a regular bedtime and removal of obstacles to a decent night's sleep.
- *Behavioral insomnia of childhood:* These two disorders are frequently differentiated into *Sleep Onset* and *Limit Setting* subtypes. In practice, there are frequently elements of both problems present in children presenting to clinic, and similar techniques are used for both problems:
    - *Sleep Onset Type:* This is the classic condition described in Ferber's book. Children form "inappropriate" sleep associations. As they cycle through the night, affected children cannot re-establish sleep unless the conditions present at bedtime recur—so if Mom is rubbing Junior's back at bedtime, he will need her there every few hours at night. May be complicated by excessive milk intake at night. **Most children are physiologically ready to sleep through the night between 4-6 months.** Although this is mostly commonly described in

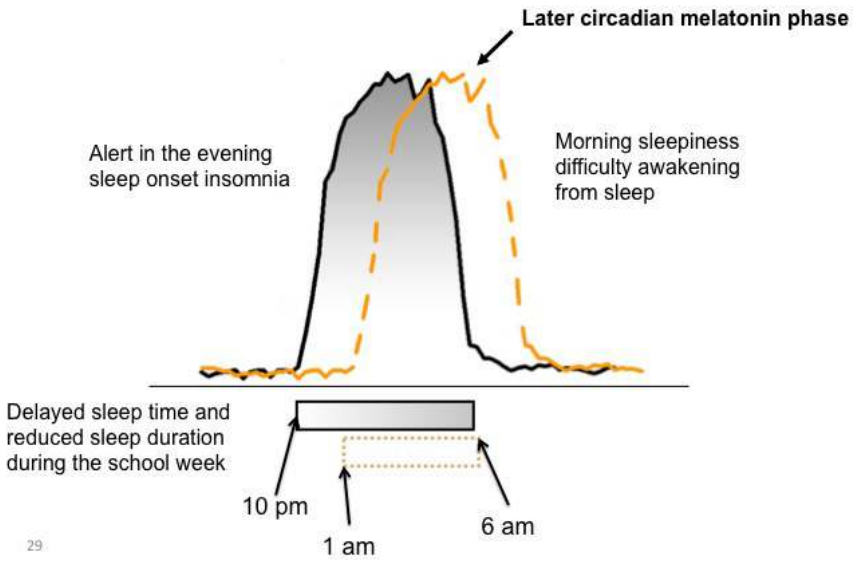
younger children, it can be present in older children, as well.



Normal sleep architecture

- *Limit Setting Type:* This is characterized by bedtime refusal, delaying tactics, and "curtain calls"—e.g. requests for "one more story, a glass of milk, a back rub, etc. Usually this emerges once children are in their own bed.
- *Treatment of behavioral insomnia:* Various techniques exist. Those with evidence to support them are detailed below.
    - Extinction: "Crying it out"
        - Unmodified
        - Graduated extinction
        - Extinction with parental presence.
    - Graduated extension: The method of extinction with periodic checking popularized by Dr. Ferber.
    - Positive bedtime routines/Bedtime fading: This involves moving the bedtime 30-60 minutes later (to increase sleep drive) and creating a structured bedtime routine with frequent praising.
    - Bedtime pass: For bedtime resistance exclusively. The children are given one "pass" for a trip out of their room. After this is used the parents are to ignore further entreaties.
    - Reinforcement, e.g. sticker charts.
    - Scheduled awakenings
    - Barriers to success
        - Inconsistency
        - "Sneaky sleep"
        - The extinction burst

- *Nighttime fears:* Can be difficult to differentiate from limit setting/bedtime resistance. In this setting, the parent needs to judge if the child is truly scared or is endorsing fears to extend bedtime.
- *Rhythmic movement disorder:* Various phenotypes exist. Characterized by head rolling, body rocking, etc. at sleep onset and sleep-wake transitions. Benign and rarely results in injury. Commonly confused with seizures.
- *Restless leg syndrome (RLS):* Underdiagnosed in children, this disorder is surprisingly common. It is characterized by leg discomfort that is worse in the evenings, improves with motion, and interferes with sleep onset. May be associated with periodic limb movements of sleep disorder (PLMD). This may present with "growing pains". Mild symptoms may respond to acetaminophen or ibuprofen. May also be associated with iron deficiency, specifically a ferritin level < 50.ng/mL. More severe cases usually require medication. I usually start with clonidine or gabapentin and escalate to a dopaminergic agent if necessary.
- *Delayed sleep phase syndrome*: Common in teenagers. All teenagers have physiologic phase delay (e.g. go to sleep later and get up later). Teens with this problem have a marked delay in sleep onset (usually after midnight but can be as late as 3-5 AM) but sleep normally if allowed to sleep on their own schedule. May present with truancy, failure in morning classes, and excessive daytime sleepiness. Treatment includes appropriate sleep hygiene, fixed awakening times 7 days per week, melatonin, chronotherapy, and bright light exposure.



- *Psychophysiologic insomnia:* Occurs in older children. Characterized by anxiety specific to the act of falling asleep without other signs of an anxiety disorder.
    - *Treatment:* Medication is generally avoided in children. Techniques may include sleep restriction (shortening time in bed to the actual sleep time), stimulus control (avoiding all activity in bed besides sleeping), and relaxation techniques. Medications and/or cognitive behavioral therapy may be indicated in severe cases.

Problems staying asleep

Nocturnal awakenings are common with behavioral insomnia of childhood, sleep onset type as noted above.

- *Isolated awakenings:* Brief awakenings are common and physiologic. If the awakenings occur multiple times per night it is worth screening for obstructive sleep apnea (OSA) symptoms and considering a sleep study to look for disorders of sleep fragmentation such as OSA or frequent periodic limb movements of sleep.
- ***Obstructive sleep apnea:*** A common disorder especially in obese children, comprised of repetitive upper airway obstruction resulting in sleep fragmentation and gas exchange problems. Fifty percent of obese snoring children may have some degree of OSA. Treatment includes CPAP, medical therapy for allergies, orthodontic work, and adenotonsillectomy. Recent data suggests that the latter is not curative in many patients.
- *Mood disorders*, especially depression, may be associated with early AM awakenings but will usually present with other symptoms.
- *Parasomnias:* These are comprised of unusual events which occur at night and take various forms:
    - Confusional arousals
    - Sleepwalking
    - Night terrors
    - Nightmares
- *Periodic limb movements of sleep disorder (PLMD):* PLMs are a polysomnographic finding. They are frequently elevated in patients with RLS. They may also rarely be a cause of significant sleep disruption.
- *Early morning awakenings in young children:* Sometimes more of a problem to the parents than the child. I recommend black out shades and an age appropriate bedtime. Children with autism and other developmental issues may have this to a severe degree e.g. a wake time around 3-4 AM. Then it may respond to shifting bedtime later and long acting melatonin.

Excessive daytime sleepiness

Excessive daytime sleepiness is defined by the propensity to fall asleep, and must be differentiated from fatigue, which is a lack of energy. It has a limited number of causes. In young children this may manifest paradoxically, with hyperactivity and irritability.

- Inadequate sleep: Common especially in teenagers. May be associated with sleep onset problems.

- Fragmented or poor quality sleep: May be environmental or related to disorders of sleep fragmentation such as OSA, PLMs, nocturnal seizures, pain, technology (e.g. on oxygen or ventilator), or underlying medical issues (e.g. asthma).
- Increased sleep drive: Conditions such as narcolepsy, idiopathic hypersomnia, menstrual hypersomnia, and Kleine-Levin syndrome. Narcolepsy is rare but frequently presents during adolescence. It is characterized by sleep attacks, hypnagogic hallucinations, sleep paralysis, and cataplexy.

Suggested references:

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