



# Sleep Disorders and Treatment Options in Pediatric Patients

---

Terrence Shenfield MS, RRT-ACCS,  
RPFT, NPS, AE-C



# Objectives

- Describe the most common childhood sleep disorders
- Describe normal sleep parameters with children
- Describe the diagnostic criteria and treatment options of these disorders
- Describe the role of obstructive sleep apnea with children
- Describe sleepwalking in children
- Describe nighttime arousals
- Describe nightmares and sleep terrors
- Describe restless leg syndrome in children





# Things we are going to talk about

- Up to 50% of children will experience a sleep problem
- Negative consequences, such as daytime sleepiness, irritability, behavioral problems, learning difficulties, motor vehicle crashes in teenagers, and poor academic performance
- Obstructive sleep apnea occurs in 1% to 5% of children
- Parasomnias are common in childhood; sleepwalking, sleep talking, confusional arousals, and sleep terrors tend to occur in the first half of the night, whereas nightmares are more common in the second half of the night
- Management begins with consistent implementation of good sleep hygiene practices, and, in some cases, use of extinction techniques may be appropriate
- Delayed sleep phase disorder is most common in adolescence, presenting as difficulty falling asleep and awakening at socially acceptable times
- Diagnosing restless legs syndrome in children can be difficult; management focuses on trigger avoidance and treatment



# Let's talk about normal sleep

- Why do we need sleep?
  - Sleep is an opportunity for the body to conserve energy, restore its normal processes, promote physical growth, and support mental development.
- So, what happens when we don't get good sleep?
  - Daytime sleepiness it manifests itself in the irritability, behavioral problems, learning difficulties, and poor academic performance
- Age-related changes in sleep patterns
  - Sleep changes occur frequently during the first few years of life as individuals mature and develop.



## Table 1. Summary of Normal Sleep Parameters in Children

<i>Age</i>	<i>Total sleep time</i>	<i>Naps (on average)</i>
0 to 2 months	16 to 18 hours	3.5 per day at 1 month of age
2 to 12 months	12 to 16 hours	2 per day at 12 months of age
	Most children 6 to 9 months of age sleep through the night	
1 to 3 years	10 to 16 hours	1 per day at 18 months of age
3 to 5 years	11 to 15 hours	50% of 3-year-olds do not nap
5 to 14 years	9 to 13 hours	5% of whites and 39% of blacks nap at 8 years of age
14 to 18 years	7 to 10 hours	Napping in this age group suggests insufficient sleep or a possible sleep disorder



# What are the most common sleep disorders in children?

- Obstructive sleep apnea
- Parasomnias
- Sleepwalking
- Confusional arousals
- Sleep terrors
- Nightmares
- Behavioral insomnia of childhood
- Delayed sleep phase disorders
- Restless leg syndrome





# Obstructive sleep disorders in children





# Obstructive sleep apnea

- Prevalence is 1% to 5%
  - Normal onset is between the ages of two and eight years of age
  - Impacts males and females equally
  - More common in black children and those with craniofacial abnormalities
- 
- Common clinical features include snoring
  - Sleep related paradoxical breathing
  - Morning headaches
  - Enlarged tonsils and adenoids
  - Pectus excavatum
    - Laryngomalacia



# Obstructive sleep apnea diagnostic criteria and treatment

- PSG is required for the diagnosis with an apnea hypopnea index greater than 1.5 per hour
- First line of treatment is adenotonsillectomy
  - 25% have complete response
- Continuous positive pressure
- Nasal steroids
  - In a prospective, randomized, double-blinded trial, 25 children with mild to moderate OSAS were treated with a 6-week course of either nasal steroids or placebo.
  - The authors demonstrated a moderate improvement in sleep-disordered breathing with nasal steroids. The apnea hypopnea index decreased from 11/h to 6/h
- Maxillary expansion devices
  - Only about 10% of children need and benefit from them



# Maxillary expansion devices

---



## Sleepwalking in children



## Sleepwalking (somnambulism)

- The prevalence of sleepwalking is about 17% in children and 4% in adults
- Typically peaks between the ages of 8-12 years of age
- More common in males
- Family history is important where one parent has a history there's a 45% risk and if two parents have a history it's a 60% risk



# Sleepwalking diagnosis and treatment options

- Diagnosis is made by history and not PSG
- Generally, occurs in deep nonrapid eye movement (NREM) (stages 3 and 4) sleep
- Sleepwalking typically resolves spontaneously
- Patients who suffer from this can benefit by increased total sleep time
- Scheduled awakenings during the night
- Home safety counseling to protect the child
- Benzodiazepines are sometimes offered for this group





# Confusional arousals

- The prevalence of this is about 17% in the age group of 3- to 13-year-olds and 2.9% to 4.2% those older than 15
  - Impacts males and females equally
  - Genetics plays a key role here where familial history is important
- 
- Typical signs of confusional arousals or
  - Sleep drunkenness
  - Inappropriate behavior
  - Slowed responsiveness
  - Slurred speech
  - Typically occurs during the first half of the sleep and typically children don't remember what happened





Confusional  
arousals  
diagnostic criteria  
and treatment  
options

---

---

Typically diagnosed by history of the patient especially with family history

---

PSG is not required

---

Usually resolves spontaneously

---

Treatment options include increase total sleep time

---

Scheduled awakenings

---

Bedroom/home safety counseling

---



# Sleep or Night Terrors

## Things you should know about **SLEEP TERRORS**



- With sleep terrors the child suddenly wakes up from deep sleep.
- Usually happens after 2-3 hours of going into sleep.
- The child is confused and frightened.
- Often crying and screaming.
- It is most common in young children.
- The child usually has sweating, increased heart rate and breathing.
- The child usually does not remember the event next day morning.



# Sleep terrors

- Prevalence of sleep terrors is anywhere between one to 6.5% in children and even some adults have them approximately 2.2%
  - Onset is early
  - Impacts males and females equally
- Perceived intense fear such as screaming, crying, confusion
  - Foreboding sense of fear or terror by screaming, thrashing around or crying while they are asleep
  - Difficult to awaken from the episode
  - Potentially dangerous activities
  - Usually occurs during the first half of sleep with no memory of the event



# Sleep terrors diagnostic criteria and treatment options

- Typically diagnosed by history
- PSG is not required
- Treatment options consist of increasing total sleep time
- Scheduled awakenings
- Benzodiazepine therapy
- Usually resolves spontaneously



# Nightmares in Children



# Nightmares

- Prevalence is anywhere from 10% to 50% in 3 to 5-year old's
  - Onset is between three years and six years of age and peaks around 6 to 10 years of age
  - Strong genetic component
- Typical symptoms include unpleasant dreams
  - Increase sympathetic response resulting in an increased heart rate and respiratory rate and diaphoresis
  - Usually occurs during the second-half of the sleep and typically the child remembers the event
  - There is a reluctance to go to sleep having nightmares
  - Associated with mood disorders and post traumatic stress disorder
  - Nightmares are very common in clinical practice associated with psychiatric disorders



# Diagnostic criteria and treatment options for nightmares

Diagnosis is made by history

PSG is not required

- Nightmares are treated by increasing total sleep time
- Scheduled awakenings
- Bedroom home safety counseling
- Cognitive behavioral therapy
- Medication that suppress rapid eye movement such as selective serotonin reuptake inhibitors



# Cognitive behavioral therapy for nightmares

- There are different cognitive behavioral therapies
- CBT places an emphasis on helping individuals learn to be their own therapists
  - Imagery rehearsal therapy (IRT)
  - Exposure techniques
  - Exposure relaxation and rescripting therapy (ERRT)
  - Lucid dreaming therapy (LDT)
  - Hypnosis; eye movement desensitization and reprocessing (EMDR)







# Behavioral insomnia of childhood

---



# Behavioral insomnia of childhood

- Prevalence is anywhere from 10 to 30%
  - Impacts both males and females
- 
- Difficulty in initiating or maintaining sleep
  - Frequent nighttime awakenings are very common
  - Falling asleep is delayed and very demanding on parents
  - Significant parental distress
  - Bedtime refusal stalling techniques
  - Parents failed to set boundaries and give in to the child and sometimes like the child sleep with the parents



# Diagnostic criteria and treatment options for behavioral insomnia of childhood

Diagnosis is  
made by history

PSG not required

- Treatment options include prevention
- Parental education
- Extinction techniques



# Extinction techniques

---

- Unmodified extinction
- Graduated extinction
- Extinction with parental presence





# Delayed sleep phase disorder

---



# Delayed sleep phase disorder

Prevalence is 7% to 16% in adolescence

Onset is typically found with adolescents and peaks around the age of 20

40% of those affected have a family history of the condition so there is a genetic component

- Initiating or maintaining a sleep
- Frequent nighttime awakenings are very common
- Typically demanding of the parents because falling asleep is a timely process
- Causes significant parental distress
- Difficulty in maintaining sleep
- Bedtime refusal of stalling techniques by the child
- Parents typically fail to set boundaries with their children





# Restless Leg Syndrome



# Restless leg syndrome

Prevalence is approximately 2% based on limited studies

More common in women

Family history is often associated with primary restless leg syndrome therefore being a genetic component

- Typical symptoms include the urge to move legs with associated discomfort
- Often begins in the evening worsens with rest and eases with movement
- May be associated with an iron deficiency
- Associated with negative behavior and mood and decreased cognition and attention
- There is a higher prevalence with those with attention deficit hyperactivity disorder





# Diagnostic criteria and treatment options and restless leg syndrome

Diagnosis is made by history

PSG may be indicated

Many times, the child is unable to describe the symptoms and the diagnosis can be made with history with at least two of the following present

- Sleep disturbances
- First degree relative has the condition
- Five or more periodic limb movements per hour during PSG

- Treatment includes the avoidance of nicotine and caffeine
- Discontinuing of certain medications such as antihistamines , selective serotonin reuptake inhibitors ,tricyclic antidepressants
- Iron replacement therapy if less than 50 micrograms per liter
- Severe cases can be treated with dopamine agonist, gabapentin , and benzodiazepine's



# Summary



Sleep disorders in children may not be recognized



Identify child's behavior and make sure you're not part of the problem



Treatment options vary based on diagnoses



Surgery and CPAP for OSA may be indicated



Good evidence is available on the web



# References

- Esposito, D., Belli, A., Ferri, R., & Bruni, O. (2020). Sleeping without prescription: management of sleep disorders in children with autism with non-pharmacological interventions and over-the-counter treatments. *Brain Sciences*, 10(7), 441.
- Kansagra, S. (2020). Sleep disorders in adolescents. *Pediatrics*, 145(Supplement\_2), S204-S209.
- Reiter, J., Ramagopal, M., Gileles-Hillel, A., & Forno, E. (2022). Sleep disorders in children with asthma. *Pediatric pulmonology*, 57(8), 1851-1859.
- Stores, G. (2022). Aspects of sleep disorders in children and adolescents. *Dialogues in clinical neuroscience*.

