

Sleep and Children

Judith Owens, MD, MPH, on the reasons behind sleep problems and how you can help

DOES YOUR CHILD HAVE TROUBLE SLEEPING? Studies indicate that up to sixty percent of children and adolescents with ADHD do. Lack of sleep impacts a child's behavior and school performance, as well as overall development and health. So, it's very important that parents recognize the symptoms of sleep problems, and it's best to find treatments or strategies that help before sleep issues become chronic or lifelong. But why do so many kids with ADHD have these difficulties, and what can parents do about it?

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When should parents become concerned about sleep problems?

Sleep problems in children with ADHD are very common; studies have estimated that up to sixty percent of these children have significant sleep issues. But what constitutes a "significant" sleep problem often varies from one family to another, depending upon parent's expectations, the child's temperament, and stress levels in the family. In addition, sometimes parents are not even aware that their child may be having difficulty falling asleep or is waking up frequently during the night. If your child's sleep issues seem to be negatively impacting his or her daytime functioning, if they are disruptive for the family, or are affecting your relationship with your child, these are all important reasons to seek help in dealing with them.



Judith Owens, MD, MPH

At what point can it be determined whether a child is not sleeping well due to ADHD or sleep apnea?

There is a great deal of overlap in the daytime symptoms of ADHD and a condition called sleep apnea (such as inattentiveness, hyperactivity, poor impulse control, mood changes, and school problems). However, children with sleep apnea usually have specific nighttime symptoms (loud nightly snoring, breathing pauses, restless sleep, sweating at night) and are more likely to be "sleepy" during the day

(difficulty waking in the morning, dozing off on car rides) compared to children with ADHD. In addition, the presence of certain risk factors for sleep apnea (large tonsils, asthma and allergies, being overweight, a family history of sleep apnea) should also alert parents and healthcare providers to the possible presence of a sleep disorder.

What markers can be used to tell the difference between insomnia and ADHD "night owlism"?

Typically, children who are natural "night owls" (a delay in circadian rhythms) have trouble falling asleep at an earlier bedtime (say, nine o'clock), but fall asleep readily at their own preferred bedtime (eleven o'clock, perhaps). If allowed to, they will also "sleep in" later the next morning. Children with sleep-onset "insomnia," on the other hand, typically have difficulty falling asleep no matter what time they go to bed, and often have problems with night wakings as well.

Parents often wonder how to get children with ADHD to "wind down" and fall asleep. As one mother writes, "Is there anything that can help my son fall asleep faster at night? I'd prefer to go a non-medication route, as he already has so much in his little system. And what can be done to help him sleep more soundly when he does fall asleep?"

Basic common sense rules of healthy sleep, sometimes called sleep hygiene, are the building blocks of good, restful sleep. These include practices which help to regulate the sleep drive and strengthen circadian rhythms. Among these practices are having a regular bed and wake time on weekdays and weekends, minimizing light exposure in the evening (including from computer and television screens), and maximizing it in the morning (up with the shades!). The second category of good sleep habits involves those practices which help with "sleep conditioning"; the association of sleep-promoting activities with bed (having a regular bedtime routine) and avoiding wake-promoting activities in bed (watching television, texting, doing homework, talking on the phone). Parents should avoid using the bed for punishment (time out) or staying up late as a reward for good behavior. In addition, sleep practices which promote relaxation (reading as part of the bedtime routine) and avoid stimulation (rough-housing or vigorous exercise within an hour or two of bedtime, lying in bed worrying, consuming caffeinated beverages) help to foster a good night's sleep. Finally, parents should set a bedtime and wake-up time that ensures

with ADHD

adequate opportunity for sleep. Children's sleep needs vary by age (see the sidebar chart on page 20), so it's important for parents to be aware of the amount of sleep their child is likely to need.

Many parents ask about the connection between ADHD and circadian rhythms. One writes, "If my son had his way, he would like to stay up all night and sleep all day. We don't know if this is just avoidance of typical daily interactions or if there is such a thing as having an innate 'switched' clock. Is it possible for the internal 'sleep clock' to be switched, and that a person's sleep disorder is really just a biological clock that is reversed so the person prefers to be up in night hours and sleep in day hours day?" Another asks about the sleep/wake transition in both directions: "It seems to be very hard for my son to get to sleep, and then hard for him to wake up in the morning. This seems to be independent of how much sleep he gets. I'd like to know whether this is likely still part of the ADHD or whether there are other conditions that may also be involved."

A number of studies have suggested that some individuals with ADHD may have a delayed circadian clock; in other words, they are exaggerated "night owls" who are "wired" to fall asleep much later (and sleep in later) compared to most of us. This underlying biological tendency is often exacerbated by environmental factors (such as engaging in stimulating activities late at night or light exposure in the evening which suppresses the body's release of melatonin, the "sleep hormone"). Because most of us need to get up fairly early in the morning in order to fulfill our daily responsibilities, this situation often results in significant problems with school, work, and so forth. The good news is that there are a number of treatments available, including sleep scheduling, morning bright light therapy and evening melatonin, which have been shown to be effective in reversing the sleep-wake schedule.

Tell us about the various over-the-counter products that can help with sleep, such as melatonin. And some people claim that alternative remedies (valerian, tea made from hops or chamomile, etc.) are effective. Do any of these interact with ADHD medications? Are they safe for children? Is there anything to be concerned about?

In general, instituting principles of good sleep hygiene should be the first step in addressing sleep problems in children with or without ADHD. Although generally safe and for the most part not known to interact with ADHD medications, herbal or "natural" preparations such as chamomile or valerian root have very little scientific data to back up their use in children, and could be harmful if given in too large doses.



A light bedtime snack with a glass of milk, which contains tryptophan (a precursor of melatonin) is probably just as effective and less expensive as a sleep-promoter.

Melatonin, which may also be purchased over-the-counter, is a synthetic form of the sleep-promoting circadian system hormone produced by your brain in response to darkness. Studies have suggested that some children with ADHD may have a delay in their melatonin production at night, resulting in a circadian rhythm disturbance called sleep phase delay. These studies have also suggested that supplementation with artificial melatonin in these children results in a shorter sleep onset. There is some controversy, however, in regards to optimal timing and dose of melatonin. Studies in adults suggest that very small doses (such as a half-milligram) at dinnertime may be more effective at “re-setting” the circadian clock, while larger doses (three to five milligrams) just before bedtime have a mildly sedating effect. So check with your doctor before starting any of these preparations for sleep.



Recommended Sleep for Children and Adolescents

How much sleep does an infant, child, or teenager need? Here's the recommended amount of sleep by developmental stage:

- › Infants (2 months to 12 months): 14 to 15 hours
- › Toddlers (12 months to 3 years): 12 to 14 hours
- › Preschoolers (3 years to 6 years): 11 to 13 hours
- › School-Aged Children (6 years to 12 years): 10 to 11 hours
- › Adolescents (12 years to 18 years): 8.5 to 9.5 hours

See **Take Charge of Your Child's Sleep** (2005) by Judith Owens, MD, MPH, and Jodi Mindell, PhD, for further information.

One parent who has tried giving melatonin to her son writes, “I have found that melatonin before bedtime helps our son get to sleep easily. But why does he routinely wakes up at three o'clock in the morning? Most nights we can walk him back to his bed and he goes to sleep until six thirty the next morning. But that disrupted sleep pattern can't be good for him—or me!”

Parents often don't realize that it's normal for children to wake briefly up to four to six times a night, when they reach the end of a “sleep cycle.” This typically does not become a problem (most children will just roll over and fall back to sleep) unless a child has become dependent upon certain conditions (needing a parent to be present, having the television on, or medication) in order to fall asleep at bedtime. These same conditions are then necessary for the child to fall back to sleep after a normal nighttime awakening. So the likely culprit here are these problematic “sleep onset associations” and the focus should be on helping your son to fall asleep on his own at bedtime.

Is it harder for children with ADHD to adjust to different sleep routines on weekends? A parent writes: “We have started to require our daughter to get up earlier on the weekends, because if she sleeps in on Saturday, she can't get to sleep early on Sunday night for school. Have doctors noticed that children with ADHD can't vary their sleep schedule like other children can?”

In fact, the opposite seems to be true; in general, children with ADHD appear to have more “night-to-night” variability in their sleep patterns, bedtimes, and wake-up times. That is why it is important for parents who are concerned about their child's sleep to keep a sleep diary for one to two weeks to document actual sleep patterns over time. It's common for parents to report, for example, that their child

doesn't fall asleep until midnight every night, when the sleep diary reveals that this only happens once or twice a week.

Restlessness and night movements concern some parents. One asks, “Why does my son twitch and jerk so much in his sleep? He doesn't have Tourette syndrome. As a young baby, he did have a quick startle reflex. Do they have anything in common? This issue concerns me for his emotional well-being as he grows and matures. It will be difficult for another adult to sleep with him.”

Several studies have suggested that children with ADHD move around more at night and are more restless sleepers compared to typically developing children (not surprising, given that they are also more active during the day). A number of studies have also reported that children with ADHD are more likely to have two related sleep movement disorders called restless legs syndrome (RLS) and periodic limb movement disorder (PLMD). Symptoms of RLS include an “urge” to move, especially the legs, that is worse at

rest and at night, often accompanied by uncomfortable feelings in the legs (“creepy-crawlies”) that are relieved by movement. As a result, children with RLS often have difficulty falling asleep. Many children and adults with RLS also have PLMD with “kicking” or “flexing” leg movements during sleep, which may be manifested as restless sleep or “growing pains.” Both RLS and PLMD tend to run in families, and are more common in children with iron deficiency.

Bedwetting is another issue of concern for some, as this parent writes: “My elementary-school age son with ADHD still wets the bed several times a week. The doctor has ruled out all medical conditions and reassures me that this is due to his being an extremely sound sleeper. I have heard of treating bedwetting with a prescription nasal spray called desmopressin acetate. I would like to use this medication for special occasions like sleepovers, which are a big source of anxiety as you can imagine. What is your opinion on this?”

It is actually a misconception that bedwetting only occurs during deep sleep; in fact, it occurs during all stages of sleep. Bedwetting is common, especially in boys and in children whose parents had a history of bedwetting themselves. While the vast majority of children with bedwetting will outgrow it by adolescence, it can pose a problem with sleepovers and overnight camps, and affect self-esteem in the meantime. In general, our preference is to use behavioral methods (like bedwetting alarms, sticker charts, evening fluid restriction, and avoidance of caffeine) to address chronic bedwetting, as these methods are more likely to be effective in the long term. For occasional bedwetting control, the prescription drug desmopressin acetate in nasal spray or pill form is a reasonable alternative (it is a synthetic form of a hor-

mone naturally produced by the body which controls urine production). You should be aware, however, that in rare cases, chronic use of desmopressin acetate has been associated with seizures caused by low sodium levels, so be sure to discuss this option with your doctor

Is it true that stimulant medications can actually help with sleep? Has methylphenidate been proven to normalize sleeping EEGs?

The issue of effects of stimulant medications on sleep in children with ADHD is somewhat controversial. While parent-report studies frequently report a detrimental effect of stimulants, especially in regards to sleep onset, more “objective” overnight sleep studies (which include EEG measurements) have not consistently supported these findings (most of the latter studies were also done using multiple doses of shorter-acting stimulants which are less often used today). There are children whose sleep onset problems seem to be a result of their stimulant medication wearing off in the late afternoon or early evening, with a return or even worsening (rebound) of ADHD symptoms, which may in turn cause difficulties with settling down for sleep. Potential strategies to address this situation might include adding a small late-day dose of short-acting stimulant medication to “cover” the evening hours or switching to a nonstimulant 24-hour ADHD medication.

How do you differentiate sleep disorder as a factor in attention difficulties from the effects of medication or anxiety?

See my answer above for the effects of medications on sleep. Children with ADHD often have comorbid mental health conditions, such as oppositional defiant disorder, anxiety disorders, or symptoms of depression, all of which in and of themselves increase the risk of sleep problems. For example, we often see difficulties falling or staying asleep as one of the first manifestations of an anxiety disorder in school-aged children. These children often have difficulty turning off their worries at night, separating from their parents, and coping with developmentally normal nighttime fears. Treatment is targeted towards helping children to develop appropriate coping skills. For children ages nine through twelve, Dawn Huebner’s book, *What To Do When You Dread Your Bed* (Magination Press, 2008) is a helpful resource.

What are the most recent significant findings on sleep and ADHD?

We now have an understanding of the overlap in daytime symptoms between ADHD and “primary” sleep disorders like sleep apnea and restless legs syndrome. We also know that treating these underlying sleep disorders often results in significant improvement, and in some cases, complete resolution of the ADHD symptoms. So the take-home message is that it is important to screen all children being evaluated for ADHD for symptoms of sleep disorders and that children with ADHD need to be continuously monitored for the emergence of sleep concerns. 🗨



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