

# Sleep in Infants and Young Children: Part Two: Common Sleep Problems

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Approximately 25% of children younger than 5 years experience some type of sleep problem. Whether the problem is acute or chronic, significant disruption to the child's sleep can occur and have a negative impact on the child and family. This article is the second in a two-part series on sleep in infants and young children. The purpose of this article is to provide fundamental information regarding common pediatric sleep problems for the clinician to use when assessing a child's sleep behaviors or addressing parental concerns. The definition, impact, and clinical evaluation of sleep problems are discussed.

Knowledge of normal sleep is necessary to recognize, assess, and manage variations from normal sleep behaviors. Pediatric health care providers are not well prepared in the basic aspects of pediatric sleep (Mindell, Moline, Zendell, Brown, & Fry, 1994; Owens, 2001; Report of the National Commission on Sleep Disorders Research, 1993). Children with sleep problems who are seen in general pediatric clinics rarely have problems addressed, diagnosed, or treated, even when providers ask about sleep issues during the visit (Chervin, Archbold, Panahi, & Pituch, 2001). Failure to recognize sleep problems can be attributed to parental lack of knowledge, lack of clinician expertise, or hurried discussions regarding the child's sleep behaviors. Falsely attributing sleep problems to a concurrent illness such as sore throat or ear pain and lack of parental recognition that a problem exists also are factors that allow sleep problems to go unaddressed (Chervin et al., 2001; Report of the National Commission on Sleep Disorders Research, 1993). Because 20% to 30% of young children have some type of sleep disturbance, adequate knowledge regarding sleep problems is essential (Dahl, 1998).

The delineation between normal sleep and a sleep problem is not well defined. Newborn sleep, because of its irregular and inconsistent nature, should not be labeled as a problem. However, after the newborn period, normal sleep can be defined as the quantity and quality of nonrapid eye movement (NREM) and REM sleep necessary to refresh the child. Conversely, a sleep problem is any sleep pattern that interferes with the refreshing nature of sleep or that appreciably disrupts the sleep of others (Adair & Bauchner, 1993). Young children, compared with older children or adolescents, typically do not complain that their sleep patterns are a problem, regardless of how severe the problem is or the effect on their daily functioning. Therefore, when dealing with young children, the health care provider, the parents, or both usually determine that a certain sleep pattern is a problem.

Some sleep problems are clear-cut. For example, any sleep pattern that interferes with the child obtaining the optimal amount of sleep required for normal growth and development, emotional and psychological health, and proper immune function constitutes a sleep problem. Minor sleep problems that do not adversely affect the child's health should be addressed with the parent as well; however, modification of the sleep pattern in this case would depend on whether the parents viewed the sleep pattern as a problem. For instance, the clinician may believe that a child who awakens the parent nightly for a drink of water may be a problem. However, if the parent does not think that the particular behavior is bothersome, no action is necessary.

A sleep problem in young children also can be defined solely by the context of parental expectations. Not all problems are abnormal, nor do they all need treatment. For example, some children are inclined to go to bed in the early evening and arise very early in the morning (commonly referred to as "larks"). This sleep pattern is not abnormal, nor does it need treatment from a medical standpoint; however, this sleep schedule may be a problem for parents who would prefer to sleep past 5 am. Treatment of most sleep problems is a good idea and worthwhile even if the sleep pattern that is deemed a problem by the parent is essentially normal and not causing any medical dysfunction. Sleep patterns that are simply variations of normal can constitute a real problem when the family's routines are disrupted. As in the example above, parents may need to sleep later in the morning to obtain enough

sleep to be well rested. However, educating the family regarding normal sleep development is of utmost importance to ensure that parents do not have unrealistic expectations of their child's sleep behaviors. By being open and willing to work with the family to modify existing sleep patterns into ones that are still normal but cause less disruption, the clinician can make significant contributions towards a family's functioning and overall harmony (Ferber, 1996).

Sleep problems are classified into two major categories, the dyssomnias and the parasomnias. Dyssomnias are problems in which the child has trouble either falling or staying asleep at night, or experiences excessive sleepiness during the day (Mindell, 1999). Dyssomnias are the major cause of disturbed nighttime sleep and daytime sleepiness (American Academy of Sleep Medicine, 2000), compared with parasomnias. The most common of these problems in children include sleep-onset association disorder, limit-setting sleep disorder, inadequate sleep hygiene, insufficient sleep syndrome, and obstructive sleep apnea syndrome.

Conversely, parasomnias involve behaviors or physiologic events that interrupt sleep after sleep onset, and include disorders of arousal, partial arousal, or with transition between the stages of sleep (Mindell, Owens, & Carskadon, 1999). Although the exact prevalence is unknown, as a group, parasomnias are frequently experienced between the ages of 3 to 8 years (Dahl, 1998), and children who experience one of these problems are likely to experience symptoms of another sleep problem (Anders & Eiben, 1997). Parasomnias are typically a developmental phenomenon and tend to subside as the child matures. In general, parasomnias are exacerbated by poor sleep schedules and inadequate sleep. Therefore, parental education regarding proper sleep hygiene is essential for these children. Examples of common parasomnias include confusional arousals, sleepwalking, sleep terrors, nightmares, and rhythmic movement disorders.

Night wakings in the infant and preschool-aged child are a normal event, occurring approximately five to eight times per night at the conclusion of each sleep cycle (Dahl, 1998). The difference between children who are "good sleepers" and sleep through the night and those who are "poor sleepers" and wake frequently is the ability to self-soothe after awakening. Children learn to expect those conditions that are present at sleep onset and often become dependent on them to return to sleep after a night waking. For example, children who are put down while sleepy, but not fully asleep, learn to fall asleep alone in their own bed and are more likely to be able to put themselves back to sleep after a night waking. Conversely, children who are used to falling asleep in their parents' arms while being rocked or nursing or fed a bottle often cry for their parents to re-establish these conditions after a night waking. These children are unintentionally trained by their parents to expect these conditions (Ferber, 1996) and can experience many disruptions in their nighttime sleep leading to sleep loss. Parents also experience stress and a profound sleep deficit themselves because of night waking, resulting in potential for a negative impact on overall family functioning.

Management of sleep-onset association disorder includes teaching parents how to help their children fall asleep in their cribs or beds and return to sleep during the night with minimal parental intervention. A method termed "graduated extinction" is an efficacious technique that can be used by parents. The first step in this process requires the parent to place the child into the crib or bed before he is fully asleep to allow the child to develop an association with the surroundings that will be present when he awakens during the night. During episodes of nighttime crying, the parent should only make scheduled checks on the child while he is crying and gradually increase the time between checks. During the checks, the parent should not hold or rock the child, as this will reinforce the crying and the need for parental intervention to return to sleep. By simply checking on the child, the child is reassured that his parents are still present but learns self-soothing techniques and often will accept that he is safe, his parents are near, and that he can fall asleep without help from his parents. Parents usually tolerate this type of management very well because they are encouraged to check on the child and gradually extend the interval between the checks as they feel comfortable (Ferber, 1985).

Preschoolers making excessive demands at bedtime to delay sleep onset is the most typical presentation of limit-setting sleep disorder. This behavior is often a result of poor limit setting by the parents (Ferber, 1994). Repeated requests for stories, water, or another television show are common, and bedtime is frequently inconsistent. Children often go to bed with another family member or demand that a parent be present in their room at bedtime (Ferber,

1994). Bedtime resistance often leads to delayed sleep onset, which is classified as requiring longer than 20 minutes to fall asleep after going to bed (Owens, Spirito, McGuinn, & Nobile, 2000). The degree of sleep loss depends on the actual length of time children require to fall asleep but is often enough to result in behavior and learning problems during the day. Management solutions to bedtime resistance include appropriate bedtime routines, a consistent bedtime, and a clear program for parents to help children become secure in their own beds and bedrooms. Parents also should be encouraged to be firm in their limit setting, both day and night, because any departure encourages children to continue to procrastinate and intensifies their demands. Such a program also would include the parent spending time with the child in his or her bedroom during the day engaged in pleasant games or activities. Children also should have input into how their room is arranged or decorated (to a reasonable extent) so they feel comfortable spending time there alone.

Appropriate sleep hygiene includes those habits and activities that promote the initiation and maintenance of effective sleep (American Academy of Sleep Medicine, 2000). Conversely, inadequate sleep hygiene includes those habits that enhance wakefulness and interrupt the sleep period, which can lead to a decrease in the quality or quantity of sleep and excessive daytime sleepiness. Examples of these habits include engaging in stimulating activities near bedtime, using the bed for non-sleep-related activities (eg, playing, watching television, time out), routine consumption of caffeine near bedtime, and allowing the bedroom to be uncomfortable to the sleeper (too cold, hot, bright, noisy, etc) (American Academy of Sleep Medicine, 2000). Inconsistent bedtimes and wake times with or without inappropriate napping also are a major contributor to the sleep disturbance (Lee-Chiong, 2002). Practitioners can suggest that parents develop a consistent, calming bedtime routines involving storytelling or taking a bath. Activities such as reading or singing lullabies also can foster sleep onset. Parents should be educated regarding poor sleep hygiene habits such as those listed above, and the practitioner can assist in brainstorming with the parent to identify new sleep hygiene habits that would work with the family's schedule and lifestyle.

Insufficient sleep syndrome arises when a child regularly fails to get an adequate amount of sleep to maintain appropriate wakefulness during the day. The child's usual sleep period is shorter than predicted by age-based norms, and the child may experience daytime sleepiness or other behaviors indicative of sleep loss in a child (eg, problems with attention and concentration, irritability, and hyperactivity). When the usual sleep schedule is not enforced, such as on vacation or weekends, children often will sleep longer than usual and awaken easily without an alarm or parental involvement (American Academy of Sleep Medicine, 2000).

Adequate or optimal sleep in children is not well defined in the literature (Dahl, 1995), and the total amount of sleep necessary for peak functioning varies from individual to individual (Dahl, 1998). Therefore, it is difficult to answer that frequent parent question, "How much sleep does my child need?" It is often best to provide a physiologic answer. The child is getting enough sleep if he or she can (a) fall asleep easily at night (in less than 20 minutes), (b) wake easily at his or her normal wake time, and (c) does not require daytime naps (except when developmentally appropriate). Often children and parents are caught up in the 24-hour lifestyle that is pervasive in current American culture. It is easy for other activities to restrict the child's valuable sleep time, including sports, music, or family time pushed late into the evening because of the parent's work schedules. Sleep is often forfeited to gain additional time to interact as a family, or parents may be too exhausted to properly enforce bedtime rules and limits and allow children to stay up late. Parents need to be educated regarding the importance of sleep to a child's health and well-being. Adults may assume that if they can function with less sleep, so can their children. However, many adults do not realize the pervasive and profound effects that even a small amount of sleep loss can have on a child's cognition and behavior.

Obstructive sleep apnea syndrome (OSAS) is a disorder of breathing characterized by partial or complete upper airway obstruction during sleep. The obstruction can be intermittent or protracted and interferes with normal ventilation and normal sleep patterns (American Thoracic Society, 1996). Only a few studies have examined prevalence, but all have reported similar rates of 2% to 3%, with highest prevalence in preschool-aged children. Symptoms include nightly snoring frequently accompanied by sporadic pauses, gasping or choking, disrupted sleep, and daytime attentional and/or behavioral problems (American Academy of Pediatrics, 2002). Associated problems include chronic rhinitis (American Academy of Pediatrics, 2002), nasal congestion, mouth breathing, otitis media,

sore throats, halitosis (Carroll & Loughlin, 1995), and frequent upper respiratory infections (Guilleminault, 1987). Frequent complications include attention and behavioral difficulties, restless sleep, and growth impairment (American Academy of Pediatrics, 2002). The pathophysiology for the many complications of OSAS is proposed to be hypoxia resulting from apneas leading to numerous arousals from sleep (Owens, Opiari, Nobile, & Spirito, 1998). Dahl (1998) asserts that the single most important clinical aspect of OSAS is sleep loss caused by multiple arousals. Children with suspected OSAS symptoms should be referred to a pediatric otolaryngologist for evaluation, and a sleep study should be considered. Tonsillectomy and adenoidectomy are often indicated to remove the obstructive tissue. This usually results in improvements in effort of breathing during sleep and improved daytime function such as improved behavior and concentration abilities (Adair & Bauchner, 1993; Gozal, 1998).

Confusional arousals occur in the first 3 hours after sleep onset when the child experiences an abrupt transition from the deepest phases of NREM sleep, stages 3 and 4, to a lighter stage of sleep. This transition can be associated with minor episodes of mumbling or grimaces, disorientation, or inappropriate behaviors (Mindell et al., 1999; Rosen, Mahowald, & Ferber, 1995). For the most part, the child remains asleep throughout the episode and has no recall of the occurrence the next day. Most episodes are brief, averaging 2 to 10 minutes in duration, and end when the child re-enters deep sleep (Rosen et al., 1995). Predisposing factors for confusional arousals include obstructive sleep apnea, overtiredness, sleep deprivation, and irregular wake/sleep schedules, all of which alter patterns of stage 3 and 4 NREM sleep (Rosen et al., 1995). Prevalence rates are most likely underestimated because children have no recollection of the event and parents often do not observe these nighttime occurrences (Mindell et al., 1999). Parents should be reassured that these episodes are harmless and that they should not awaken their child. Confusional arousals diminish as the child matures.

Sleepwalking is common, occurring in 1% to 15% of children, and usually begins when the child is between the ages of 4 and 8 years. A sleepwalking episode consists of minor actions such as sitting up in bed, walking around the room or house, or other activities. Because the sleepwalker may try to unlock doors or windows and go outside, precautions must be taken to ensure the safety of the child, such as locking doors and windows and placing barriers in front of stairwells. The sleepwalker does not meaningfully interact with people and is often easily agitated. Arousal is difficult and, if successful, the child will appear confused. Recollection of the event is rare (Adair & Bauchner, 1993). Management includes informing the parent that the child is truly asleep and should be gently redirected back to bed without awakening. Parents should intervene, however, if the child is in danger. Parents may place a bell on the child's bedroom door to alert them whenever he leaves the bedroom, and locks placed out of reach on outside doorways may be necessary. Extremely agitated sleepwalkers may benefit from sleeping on the first floor of the house. Sleepwalking can persist into late adolescence and adulthood (Ferber, 1985).

Sleep terrors are reported in 1% to 6% of the pediatric population, are generally seen after 18 months of age, and usually disappear by age 6 years (Anders & Eiben, 1997; Mindell et al., 1999). Sleep terrors are typified by an extremely agitated child suddenly aroused from stage 4 sleep and are often accompanied by screaming, increased heart rate, and dilated pupils. Children appear confused and are usually inconsolable (Dahl, 1998). Children experiencing a sleep terror appear awake, but are not; they will not coherently interact with people or their surroundings. During an episode, children are extremely difficult to arouse and will not remember the event if aroused or upon awakening in the morning (Adair & Bauchner, 1993). In fact, it is advisable to gently direct children away from danger (stairs, windows, doors to the outside) and back to their own beds. Children will then promptly fall back to sleep. Children with more violent, prolonged, or unusual episodes should be evaluated at a pediatric sleep disorders center. Although sleep terrors are often very disturbing to parents, they can be reassured that sleep terrors are a developmental phenomenon and are not a sign of underlying psychopathology.

The incidence of nightmares ranges from 25% to 50% of children aged 3 to 6 years, and both sexes are equally affected (Adair & Bauchner, 1993). Nightmares are frequently confused with sleep terrors, but there are fundamental differences between the two (see the ). Nightmares occur during REM sleep and therefore are seen during the last half of the night. Children become fully awake after a nightmare, can remember graphic details, and frequently remember and talk about their nightmare the next morning (Mindell et al., 1999). Occasional nightmares are not

worrisome, but recurrent nightmares or those with disturbing content may indicate excessive daytime stress (Adair & Bauchner, 1993). Clinicians and parents should gently question children regarding their daytime experiences such as television shows or encounters with other children to try to determine possible frightening content or situations. Once the basis for the nightmares is discerned, measures should be taken to eliminate or reduce the child's exposure to the causative factor.

**Table. Differentiation between sleep terrors and nightmares**

	<b>Sleep terrors</b>	<b>Nightmares</b>
Average age of onset	>18 mo	36-72 mo
Timing	First third of night	Last half of night
Sleep stage involved	NREM	REM
Agitated appearance of child	Yes	Sometimes
Child awakens or consolable	No	Yes
Returns to sleep easily	Yes	No
Recall of event	No	Yes

Data from Ferber, R. (1985).

Rhythmic movement disorder involves the rhythmic movement of large muscle groups, such as the head and neck, and occurs when the child is drowsy, attempting to fall asleep, and can continue into stage 1 sleep. The first incidence usually occurs before the second birthday; headbanging and body-rocking are the most common types seen in practice. Polysomnographic monitoring during an episode can rule out a medical cause such as seizure activity (American Academy of Sleep Medicine, 2000). The disorder is usually transient and self-limited and seldom requires treatment (Hoban, 2003).

There is increasing evidence that sleep problems can have a negative effect on children's cognitive, behavioral, and emotional functioning. Dahl (1998) asserts that the rising rates of behavioral and emotional problems in children can be associated with sleep problems. Most young children do not have typical symptoms of sleep loss such as yawning or obvious sleepiness that are observed in adolescents and adults. Rather, children often manifest symptoms that are paradoxical to sleepiness such as irritability, hyperactivity, short attention span, and low tolerance for frustration (Dahl, 1996). These indicators are often overlooked because children may have a long history of these symptoms or they may be mild in nature (Ferber, 1994). Few experimental studies have examined the effects of sleep loss on daytime functioning in children.

Considerable clinical and anecdotal evidence supports an association between sleep loss and resultant cognitive and behavioral changes. Children's emotional and behavioral problems often significantly improve when underlying sleep problems are identified and rectified resulting in the attainment of adequate amounts of sleep (Dahl, 1996). Furthermore, several studies have found a link between typical symptoms of inadequate sleep in children and symptoms characteristic of attention deficit/hyperactivity disorder (ADHD) (Dahl, 1996). Children diagnosed with ADHD have been shown to have a higher incidence of sleep problems and shorter average sleep duration than children without ADHD (Owens, Maxim, Nobile, McGuinn, & Msall, 2000).

Injury-related morbidity and mortality represents one of the most important health problems for children (Pless, Taylor, & Arsenault, 1995). Sleep loss has been implicated in childhood injuries such as falls, pedestrian accidents,

and bicycling accidents. A study reported that children who experience sleep loss were more likely to have accidents in the subsequent 24 hours than children who get adequate sleep, and the more hours children are continuously awake, the higher the risk for injury (Valent, Brusafarro, & Barbone, 2001). Children involved in traffic accidents as a result of their own behavior were rated higher on measures of hyperactivity, impulsivity, and attentional difficulties than were age-matched controls (Pless et al., 1995). Clearly, the related cognitive and behavioral effects of sleep loss can have negative consequences with potentially fatal outcomes.

Evaluation of sleep problems involves a thorough history of the child's 24-hour routine focusing on bedtime habits, nighttime behaviors, naps, and daytime behavior. All behaviors and activities need to be evaluated for appropriateness for the child's age and time of day, recognizing the opportunity to make beneficial changes to restore optimal sleep for both the child and family. Comforting bedtime routines include evening activities such as nonviolent television programs or computer games, reading, or bathing. The clinician needs to ask specifically about other behaviors that the parent may not discuss without direct questioning such as bedtime refusal, stalling, and difficulty falling asleep. Nighttime behaviors after sleep onset such as confusional arousals, sleep terrors, nightmares, number and duration of night wakings, and symptoms of obstructive sleep apnea (ie, snoring, gasping, breathing pauses, and restless sleep) also should be assessed. Daytime behaviors including weekday and weekend activities (eg, day care, play groups, preschool, sports), nap frequency and timing, meal schedules, medications, timing and amount of caffeine intake, and signs of sleepiness (eg, falling asleep at inappropriate times, hyperactivity, irritability, and behavior problems) should be reviewed with the parent. Also, stress within the family such as moving to a new neighborhood, marital discord, and financial troubles can all negatively affect a child's sleep (Mindell et al., 1999). The Sidebar provides a checklist of examples of topics that should be addressed when assessing a child for sleep problems. Data show that pediatric clinicians rarely ask more than one question pertaining to sleep during well-child visits, a practice that is inadequate to identify many sleep problems. Additionally, many parents may fail to bring up issues surrounding sleep problems to the health care provider, so direct questioning is the key to initiating a discussion (Owens, 2001). The checklist can be used by the clinician as a visual cue to ask multiple questions about sleep and provide a record of those pertinent sleep behaviors, routines, and family issues that were addressed during the visit. Also, the subjects on the checklist are an excellent source of talking points to stimulate conversation and provide parent education.

A sleep diary can be helpful in delineating the exact sleep pattern. Sleep diaries collect information regarding bedtime, frequency and duration of nighttime wakings, nap frequency and duration, time of morning waking, and total sleep time (Mindell et al., 1999). Data should be collected for a minimum of 2 weeks, including weekends, to gain an accurate picture of the sleep problem. Parents of a child with sleep problems often overestimate the frequency and severity of the problem ("She wakes up five times every night"). By keeping a sleep diary, parents can objectively document these problems.

A thorough physical examination should be performed on any child with a sleep complaint to assess for medical causes such as otitis media (pain), chronic rhinitis (airway obstruction), and eczema (nocturnal itching). Chronic disorders such as asthma, cerebral palsy, and blindness can also result in sleep problems. However, underlying medical issues are rare. Most sleep problems are alterations of normal sleep behavior created by poor sleep hygiene, developmental sleep phenomena, or stressful daytime activities and schedules (Adair & Bauchner, 1993).

Referral to a pediatric sleep specialist may be needed for more complex or persistent problems. An overnight sleep study using polysomnography is occasionally warranted in children where a physiologic abnormality is suspected, such as OSAS. Polysomnography can also be helpful in determining the cause of nighttime behaviors if the clinical picture is unclear, for example, differentiating parasomnias from nocturnal seizures (Mindell et al., 1999).

During the evaluation of any sleep problem, cultural differences in perception of the problem are important to consider because definitions of bedtime resistance and night waking are, to a large extent, culturally determined. American society values and expects independence, even in very young children. This encourages the widely held belief that all infants should sleep alone, achieve the developmental milestone of "sleeping through the night," and that co-sleeping (sleeping with a parent or sibling) impairs a child's ability to develop his or her independence (Owens, 2000). However,

in many cultures, co-sleeping is the normative practice, especially in African-American and Hispanic cultures (Lozoff, 1995), and co-sleeping is becoming increasingly more common in the United States (Willinger, Ko, Hoffman, Kessler, & Corwin, 2003). Breastfeeding families also tend to have high rates of co-sleeping. Research on co-sleeping infants and children has shown mixed results; some studies report that the children experience decreased slow wave sleep and more frequent night awakenings and bedtime protests, whereas other studies do not support these findings (Lozoff, 1995). Whether co-sleeping is reactionary to a current sleep problem or antecedent to sleep problems remains a question. Families must be assessed, in light of their cultural views, if increased night wakings or bedtime protests are viewed as stressful or a problem to the parents before practitioners intervene. However, clinicians must always assess the health and safety of the child, regardless of cultural beliefs, and are obligated alert the parents to any risks or safety issues associated with certain bedtime practices (eg, the increased risk of sudden infant death syndrome [SIDS] when placing an infant in the prone position to sleep). Finally, it is important that practitioners be aware of their own cultural values to avoid transferring their ideals onto parents without assessing the parents' cultural and familial contexts.

Sufficient sleep is required for optimal mental and physical health. Sleep problems are common in young children and can result in sleep loss, which may have extensive negative effects on children's daily functioning and often results in considerable sleep loss for parents. Therefore, a basic understanding of common sleep problems and their impact is essential for pediatric clinicians. This fundamental information will provide clinicians with the skills to adequately assess and evaluate common pediatric sleep problems and appropriately address parental concerns (see Sidebar).

### **Daytime behaviors**

- Weekday activities
- Weekend activities
- Nap frequency and timing
- Meal schedules
- Medications
- Caffeine intake (amount, frequency, time of day)
- Signs of sleepiness (hyperactivity, irritability, behavior problems)

### **Bedtime routines**

- Television/computer
- Reading
- Bathing/tooth brushing
- Any problems?
- Frequency
- Severity

### **Nighttime sleep behaviors**

- Any problems?
- Frequency
- Severity

### **Family**

- Major stressors

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