Insomnia ROUNDS

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Pediatric Behavioural Insomnia – "Good Night, Sleep Tight" for Child and Parent

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Good sleep is important for optimal growth and development, with sleep duration changing from infancy to adulthood. Sleep problems during infancy and early childhood are among the most frequent complaints with which parents present to healthcare professionals. The problems are frequently related to the initiation and maintenance of sleep during the night. The most common childhood sleep disorder is behavioural insomnia. Difficulties in settling, falling asleep, and staying asleep affect up to 25% of children in the general population and more than 50% of children with physical and mental health problems.[1] It is important for the primary care physician to have a framework to evaluate and treat behavioural insomnia in children. This issue of *Insomnia Rounds* highlights common causes, and outlines evaluation and treatment strategies for children who present with behavioural insomnia.

What is Pediatric Behavioural Insomnia?

Insomnia includes disorders that cause problems with sleep initiation (difficulties settling and falling asleep), sleep maintenance (staying asleep), or waking too early in the morning. Pediatric behavioural insomnia is defined as "repeated difficulty with sleep initiation, duration, consolidation, or quality that occurs despite age appropriate time and opportunity for sleep, which results in some form of daytime functional impairment for the child and/or family" in children over the age of 6 months.[2,3]

In this definition it is important to note that the insomnia results in daytime consequences for children and their family.[4] In children, consequences may include poor psychosocial and/or physical health such as difficulties with school performance, memory, learning, mood or behaviour; for their parents, the impact of insufficient sleep may be increased daytime fatigue and loss of work productivity.[5]

Insomnia should be considered a symptom rather than a diagnosis. Many physical and mental health disorders lead to, or contribute to, insomnia in children. Some examples of physical health disorders include conditions that result in pain (eg, recurrent otitis media, gastrointestinal reflux), nocturnal asthma, and eczema. Examples of mental health disorders include anxiety, depression, and attention-deficit hyperactivity disorder (ADHD). Children with these or other disorders may have coexisting behavioural insomnia.

In evaluating the child with insomnia, it is crucial to determine if there is a treatable medical or mental health disorder and to evaluate the possible behavioural components contributing to the insomnia. There are 3 types of behavioural insomnia, which present at different developmental stages (Table 1).

How Common is Pediatric Insomnia?

In the general population, it is estimated that 10%–25% of children have behavioural insomnia, increasing to >50% of children with physical and mental health problems.[1]

How Much Sleep do Children Need?

Infants under the age of 6 months have multiple episodes of sleep distributed across the 24-hour period (called polyphasic sleep) and they experience multiple night awakenings. Around the age of 6 months, most infants develop consolidated sleep and acquire the ability to sleep for ≥6 consecutive hours, which at this age is considered "sleeping through the night." Infants who fail to develop this ability may be considered to have a sleep problem. Beyond 6 months of age, sleep duration continues to vary across childhood. Table 2 provides guidelines for average sleep need at dif-

Table 1. Three common types of childhood behavioural insomnia

Disorder	Age of occurrence	Features
Sleep-onset association	6 months to school age	Infants/children who require parental presence to initiate sleep and at times of night waking
Limit setting	Toddler to school age	Difficulty establishing limits, including (but not always limited to) bedtime routines
Sleep timing	School age to adolescent	Children/adolescents who prefer an early or later sleep onset and offset; in teenagers, this is typically the later type, called a delayed sleep phase preference

ferent ages; however, there is large individual variability. The most important factor when assessing if a child is getting enough sleep is not the duration of sleep, but whether the child is well rested during the day. Until about 3–4 years, napping is usual. Some wakefulness during the night is not unusual. However, children should be able to return to sleep on their own or with minimal intervention depending on their age.

What is the Difference Between Adult and Pediatric Insomnia?

There are many differences between insomnia in adults compared with children, as outlined in Table 3. The chief difference is that adults recognize when they have insomnia and may feel anxious about the problem, thus compounding their sleeplessness. When children cannot get to sleep, cannot stay asleep, or wake early in the morning, their parents may be anxious about this pattern, but the child may not have any motivation to change behaviours around sleep.

Table 2. Average sleep needs

Age	Average total sleep hours/ 24 hours
≤2 months	16 – 18
2 – 6 months	14 – 16
6 – 12 months	13 – 15
1 – 3 years	12 – 14
3 – 5 years	11 – 13
5 – 12 years	10 – 11
12 – 18 years	8.5 – 9.5

Adapted with permission from Weiss SK. *Better Sleep for your Baby and Child*. Toronto (ON): Robert Rose Inc; 2006.

How is Pediatric Insomnia Evaluated?

There are many methods to evaluate pediatric insomnia.

- Clinical examination, including sleep history and physical examination by a healthcare professional
- Parent- or patient-reported sleep questionnaires
- Sleep diaries
- Overnight sleep study (polysomnography)
- Actigraphy, which is a computerized motion detector that is the size of a watch and detects sleep/wake cycles by limb movement; it is used in clinical care and research by sleep specialists

For the purposes of this review of pediatric insomnia, one sleep questionnaire (BEARS) and a link to a website with child-friendly sleep diaries are provided. In many cases, assessment with a questionnaire and sleep diary will provide enough

Table 3. Difference between adult and pediatric insomnia

Factor	Adult	Pediatric
Etiology	Variety of physical and mental health causes	Often precipitated or perpetuated by behavioural factors; as outlined in this *Rounds*, need to rule out physical and/or mental health causes
Whose problem is the insomnia?	Adults with insomnia want to improve sleep habits and are motivated to use techniques that are suggested	Although the child has the daytime consequences of insomnia (eg, problems in learning, behaviour, memory), the child may or may not be motivated to change his/her sleep habits
Insight	Adults understand the need for good sleep and consequences of poor sleep	Depending on age of child, there may or may not be an understanding of consequences of poor sleep
Use of behavioural strategies to improve sleep	Adults have control over changes used to improve sleep; eg, sleep/wake schedule, sleep environment, and other sleep hygiene issues	Parent(s) must understand sleep hygiene changes and use behavioural strategies to improve sleep in the child
Treatment strategies	Doctors may use behavioural strategies with/without pharmacotherapy	For most typically developing children, behavioural strategies are often adequate to resolve insomnia
Outcome	Can be a chronic or recurring problem, which is improved with cognitive behaviour therapy for insomnia (see *Insomnia Rounds* issue 3)	Excellent chance for resolution of sleep problem in children with behavioural insomnia

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information to determine the underlying behavioural causes of insomnia and, as such, will direct treatment.

Pediatric Sleep Questionnaires

Questionnaires have an important role in the evaluation of pediatric sleep disorders. It is important to understand that they are meant to be screening tools in order to identify children who require further investigation of their sleep disturbance. Many published and unpublished sleep questionnaires are available.[6] There are also brief screening tools that can be used in pediatric encounters to trigger the clinician/health care worker to ask questions about sleep.

BEARS sleep screening questionnaire

The BEARS sleep screening questionnaire[7] is outlined in Table 4. The BEARS was developed by Owens and Dalzell for professionals to screen children in clinical encounters. It is a useful tool with a simple acronym for question recollection: **B**edtime problems, **E**xcessive daytime sleepiness, **A**wakenings during the night, **R**egularity of evening sleep time and morning awakenings, and **S**noring/sleep-related breathing problems. The limitation with this screening tool is that there are no questions about periodic limb movements, restless legs syndrome, parasomnias (unusual behaviours in sleep), or enuresis.

The BEARS instrument is divided into 5 major sleep domains, providing a comprehensive screen for the major sleep disorders affecting children in the 2- to 18-year-old range. Each sleep domain has a set of age-appropriate "trigger questions" for use in the clinical interview.

Sleep Diary

Sleep diaries involve the patient or (in the case of children) parent/caregiver documenting the times of lights off, sleep onset, and waking up, and answering questions about sleep quality. Entries are usually made every 24 hours and recorded for multiple consecutive days and nights (typically a minimum of 2 weeks.) A variety of sleep diaries or logs are available, with differing questions and instructions as to when to fill them out. For example, there may be information about napping, or parental ratings of their child upon awakening. An example of a sleep diary was provided in the first issue of *Insomnia Rounds*. A variety of child-friendly sleep diaries can be downloaded from the National Sleep Foundation's (NSF) Sleep for Kids website (http://www.sleepforkids.org/ index.html) or ordered from the NSF at http://www.sleepfoundation.org.

Treatment of Behavioural Insomnia of Childhood

Behavioural interventions are the most effective treatment for pediatric behavioural insomnia for the majority of typically developing children. Behavioural interventions have been proven effective for both short- and long-term symptom reduction, are safe, and are viewed favourably by parents.[8] There is evidence that these interventions are effective to not only improve sleep in children, but also increase daytime functioning of the child and parents.[9] Current research literature supports behavioural interventions as the first-line treatment for behavioural insomnia of children.[10]

Before implementing behavioural therapy for childhood behavioural insomnia, it is important to consider whether a physiological factor may be contributing to the sleep problem. Night-waking problems in young children could be triggered or exacerbated by physiological factors such as allergies, breathing problems, and colic.[3]

In typically developing children with behavioural insomnia, medications are not recommended. If behavioural strategies are ineffective, the primary care physician should consider a consultation request to evaluate possible underlying comor-

Table 4. BEARS sleep screening questionnaire
Examples of developmentally appropriate trigger questions:

	Toddler/preschool (2–5 years)	School-aged (6–12 years)	Adolescent (13–18 years)
1. **B**edtime problems	Does your child have any problems going to bed? Falling asleep?	Does your child have any problems at bedtime? (P) Do you have any problems going to bed? (C)	Do you have any problems falling asleep at bedtime? (C)
2. **E**xcessive daytime sleepiness	Does your child seem overtired or sleepy a lot during the day? Does he/she still take naps?	Does your child have difficulty waking in the morning, seem sleepy during the day or take naps? (P) Do you feel tired a lot? (C)	Do you feel sleepy a lot during the day? In school? While driving? (C)
3. **A**wakenings during the night	Does your child wake up a lot at night?	Does your child seem to wake up a lot at night? Any sleepwalking or nightmares? (P) Do you wake up a lot at night? Have trouble getting back to sleep? (C)	Do you wake up a lot at night? Do you have trouble getting back to sleep? (C)
4. **R**egularity and duration of sleep	Does your child have a regular bedtime and wake time? What are they?	What time does your child go to bed and get up on school days? Weekends? Do you think he/she is getting enough sleep? (P)	What time do you usually go to bed on school nights? Weekends? How much sleep do you usually get? (C)
5. **S**noring/sleep-related breathing problems	Does your child snore a lot or have difficult breathing at night?	Does your child have loud or nightly snoring or difficulty breathing at night? (P)	Does your teenager snore loudly or nightly? (P)

P = parent-directed question; C = child-directed question

bid conditions contributing to the insomnia prior to consideration of a sleep medication. Medications (including melatonin) are not recommended for the treatment of behavioural insomnia in typically developing children due to the following:

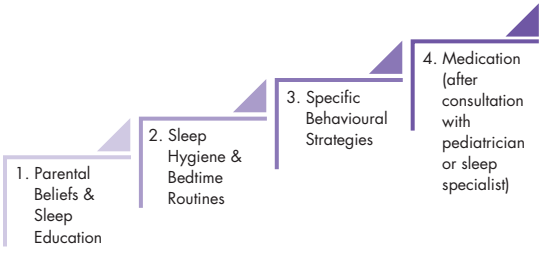
- There are no approved medications for insomnia in children
- There are concerns about the safety and adverse events of these medications
- Medications do not necessarily treat the underlying factors that may have precipitated the insomnia
- These medications are ineffective in the long term[11]

How do behavioural interventions work to address insomnia in children?

Behavioural insomnia occurs in the context of the parent-child relationship. As such, treatment strategies often consist of behaviour-centred parent management strategies. These strategies are based on the principle that healthy sleep is a learned behaviour. A staged approach has been recommended in the treatment of behavioural insomnia of childhood.[9] Using this approach, the primary care physician would start with the least intensive intervention and progress to more intensive interventions as required. Higher-level interventions may require referral to a sleep specialist. Figure 1 represents a staged approach that the primary care physician could follow in treating a child with behavioural insomnia.

Providing information to parents about sleep in children, in addition to being key to treating behavioural insomnia, can also be helpful during routine visits to prevent insomnia in children. For example, information sheets could be made available to parents in the waiting room. Brochures are available from the Canadian Sleep Society at http://www.canadiansleepsociety.ca/publisher/articleview/frmArticleID/341. Addressing parental beliefs, providing education on sleep and sleep hygiene, and using specific behavioural strategies (Stages 1–3) must precede the use of medication. The majority of typically developing children will respond to these behavioural treatment strategies and will not need medication. The first stages of intervention can be implemented at the primary care practice. The third stage encompasses specific behavioural strategies and may require referral to a consultant such as a psychologist, pediatrician, child psychiatrist, or physician with a specialization in sleep medicine. Children who require specific behavioural strategies often need a high degree of monitoring and program modifications in order to successfully treat their sleep problems. The use of medication (Stage 4) can be considered, in conjunction with behavioural strategies, after consultation with a pediatrician, child psychiatrist, or sleep specialist. Behavioural strategies have been shown to be effective in typically developing children as well as in children with neurodevelopmental disabilities.

Figure 1. Staged approach to the treatment of behavioural insomnia



Stage 1: Parental beliefs and sleep education

Parents' knowledge regarding children's sleep has been found to influence their beliefs and strategies, and as such impacts their child's sleep.[12,13] Therefore, it is important to discuss parents' knowledge and beliefs as well as strategies they have used to help address their child's sleep problems. Providing parents with accurate information about children's sleep is an essential component of behavioural sleep interventions.[10] The following points are important to share with parents, especially given that parents tend to have misconceptions related to this information.[13,14]

- **Causes of insomnia:** Most sleep problems are behavioural in nature, and behavioural strategies are an effective treatment.
- **Potential signs of sleep problems:** Difficulties with settling or staying asleep or early awakenings constitute behavioural insomnia in most children.
- **Consequence of poor sleep:** Sleep is critical for physical health, mental health, and learning.
- **Realistic sleep expectations:** Sleep needs may vary, but there are guidelines that help parents know how long their child should sleep (Table 2).
- **Sleep scheduling is modifiable:** Parents can learn the strategies to change their child's sleep patterns.
- **Sleep is responsive:** There are many factors that promote sleep and many factors that can result in poor sleep.

Stage 2: Sleep hygiene and bedtime routines

Good sleep hygiene consists of practices that promote sleep that happens during the day as well as at nighttime. Sleep hygiene involves ensuring that the child is following healthy sleep habits and creating a sleep-conducive environment. It plays an important role in most sleep interventions. The **ABCs of SLEEPING**[15] can be used to remember key sleep-hygiene principles:

1) **A**ge-appropriate **B**edtimes and wake-times with **C**onsistency
2) **S**chedule: daily routines, including meal times
3) **L**ocation: dark, quiet room, comfortable bed, and consistent location
4) **E**xercise and diet: regular exercise, nothing too exciting close to bedtime; regular diet, including avoidance of caffeine and big meals before bed
5) no **E**lectronics in the bedroom or before bed
6) **P**ositivity: positive time together during the day, positive and relaxing routines at bedtime
7) **I**ndependence when falling asleep: after a relaxing routine and pleasant goodnight

8) Needs of child met during the day: affection, attention, activity
9) all together equals Great sleep!

What do you explain to parent(s) about bedtime routines?

One important component of sleep hygiene that requires particular attention is bedtime routines. Consistent and positive bedtime routines (ie, activities leading up to the child going to bed) help the child learn appropriate bedtime behaviours and reduce stress leading up to bedtime. The bedtime routine should be the same each night and this routine should not be rushed; positive one-on-one time between the child and parent is an important component. A typical bedtime routine might consist of: a) a reminder from parents that it will soon be time to get ready for bed; b) a snack; c) brushing teeth and washing up; d) putting on pyjamas; e) a story/time with parents; and f) lights out. Bedtimes should vary by no more than 30 minutes across weekdays and weekends, and wake times should also remain as consistent as possible with a goal to be no more than 30 minutes difference between weekdays and weekends.

Table 5. Specific behavioural interventions to combat behavioural insomnia in children

Intervention	Description
Unmodified extinction	The infant is placed in bed while awake, left alone until asleep, and night wakings are ignored. The infant learns to self-soothe once realizing that nighttime crying does not result in parental attention.
Extinction with parent presence	The parent remains in the room during extinction, acting as a reassurance for the child but providing little interaction.
Graduate extinction	This involves ignoring negative behaviours (ie, crying) for a given amount of time before checking on the child. The parent gradually increases the amount of time between crying and parental response. Parents provide reassurance through their presence for short durations and with minimal interaction.
Bedtime fading	This technique involves delaying bedtime closer to the child's target bedtime. The goal of this treatment is for the child to develop a positive association between being in bed and falling asleep rapidly. Bedtimes can be gradually moved earlier.
Sleep scheduling	Scheduling regular, appropriate sleep and wake times that allow for an adequate sleep opportunity.
Cognitive strategies	These strategies are used to address nonproductive beliefs about sleep, including the belief that the child cannot change his/her sleep difficulty. Coping strategies are also included (eg, relaxation skills such as abdominal breathing).

Stage 3: Specific behavioural strategies

A number of specific behavioural strategies can be used to help children with behavioural insomnia to sleep better. These strategies are based on psychological principles of learning (ie, operant conditioning).[16] An in-depth discussion about these strategies is beyond the scope of this article; a brief overview of the main strategies is provided in Table 5. For the interested reader, a number of comprehensive reviews give more detailed information.[3,9,10,16-22]

Stage 4: Medication

A wide variety of prescription and over-the-counter medications are being used to treat insomnia in children, including antidepressants, atypical antipsychotics, anticonvulsants, antihistamines, and supplements such as melatonin.[10,23] None of these medications, including melatonin, are recommended for long-term use by primary care physicians treating typically developing children with behavioural insomnia. For further information on the use of melatonin, the Canadian Pediatric Society has recently published a position statement (http://www.cps.ca/documents/position/melatonin-sleep-disorders-children-adolescents).[24] Briefly, melatonin is considered to be a "natural health product;" it is available in both short-acting and sustained-release forms. In Canada, standards to assure the reliability of preparations have been in effect since 2004 under both the Natural Health Products Regulations and the Food and Drugs Act. Melatonin use for children is considered to be "off-label," as Health Canada considers melatonin to be recommended for use for sleep problems in adults only.[25] There is no evidence to support the use of melatonin in children younger than 2 years of age.

Red Flags

Examples of 'red flags' that would trigger a referral for further sleep evaluation/consultation with a pediatrician or other consultant include the following:

- Loud nightly snoring or breathing difficulties at night
- Symptoms of mental health disorder; eg, anxiety
- Extreme restlessness or repeated unusual movements in sleep
- Significant daytime behaviour disorder in addition to behavioural insomnia
- Insomnia in child with mental health and/or physical health comorbidity that does not respond to behavioural treatment
- Insomnia leading to school failure or academic difficulties
- Excessive daytime sleepiness from insomnia

Conclusion

Pediatric sleep disorders are a common problem seen by family physicians. Behavioural insomnia is the most common of all the pediatric sleep disorders, reported in 10%–25% of children in the general population. Most children respond with resolution of the sleep difficulties with a behavioural approach to treatment. It is important for the primary care physician to have a strategy for the evaluation and management of pediatric behavioural insomnia, and to refer (eg, to a child psychiatrist, psychologist, pediatrician or sleep specialist) in cases where these strategies are ineffective.

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Online Resources

Canadian Sleep Society
http://www.canadiansleepsociety.ca

Canadian Paediatric Society
http://www.cps.ca

American Academy of Sleep Medicine
http://www.aasmnet.org

National Sleep Foundation
http://www.sleepfoundation.org

Sleep for Kids
http://www.sleepforkids.org/index.html

Better Nights, Better Days
http://betternightsbetterdays.weebly.com

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