



## SLEEP TIGHT!

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**Sleep is such an integral aspect of infants' and children's behaviour that it can be difficult to see it as a developmental entity with its own definitions and structure. This important issue warrants considered intervention by informed parents and caregivers faced with problematic sleep behaviours.**

It is reassuring for parents as well as for clinicians to realize that a body of knowledge is available to help them understand what is happening with their little one's sleep patterns. It is also important to realize that sleep problems are a two-way street for the infant/child, the mother/father, and community settings (e.g. family, school).

These themes wind their way through the literature reviewed in this edition of the *Bulletin*. For instance, Hiscock and Wake's study, found

that interventions did make a difference in the incidence of sleep problems of infants but, startlingly, maternal reports of depression symptoms decreased significantly.

The *Bulletin* highlights that sleeping problems are widespread among infants and children and are not incidental: 25% to 50% of 6- to 12-month-olds have difficulty settling to sleep or wake during the night. By age three, 25% to 30% have sleep problems, with a similar presentation in the 3- to 5-year-old age group.

Sadeh, Owens, and Mindell research presented in this issue points out the consequences of impaired sleep: compromised neurobehavioural functioning, performance impairments and mood dysfunction, harmful effects on the cardiovascular, immune and metabolic systems, attachment difficulties and marital conflict.

Another *Bulletin* article will show how the increased incidence of REM sleep in the infant explains the mysterious-to-some wriggling and noisy behaviour in the crib, while further observation allows parents to note sleep consolidation by three to four months of age and infants' capacity to "self-soothe" or "put themselves to sleep." This is of course the first prin-

ciple for all the interventions mentioned in this *Bulletin*.

We believe that learning about sleep patterns helps observers to distinguish between neuromaturational sleep disturbances (e.g. night terrors) and behaviours indicating problems of airway functioning and respiratory control (snoring, sweating) that require medical evaluation.

Finally, Mindell's review of behavioural interventions showed in this publication lends empirical support to five methods that could be used by clinicians in day-to-day practice. All these interventions are based on the infant's ability to self-soothe and giving the infant the opportunity to use this ability.

Choice is valuable because it is important to customize the intervention to the family's skills, tendencies and culture. For parents, bedtime interactions are an extraordinary way of discovering the infant's capabilities.



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# ALL ABOUT SLEEP

**Sleep plays an important role in early development: a child entering school has typically spent more time sleeping than engaging in any other activity. Yet, sleep problems are one of the most common complaints presented to pediatricians.**

About 25% to 50% of six- to 12-month-olds have difficulty settling to sleep or wake during the night. By age three, 25% to 30% have sleep problems, with similar percentages reported for the three-to-five-year-old age group. Sleep problems range from bedtime struggles, difficulties in falling asleep and night wakings to sleepwalking and sleep terrors. Not only does inadequate sleep have adverse effects on children's cognitive function, educational performance and behaviour, it also places stress on caregivers and the family as a whole.

### THE EFFECTS OF POOR SLEEP

Behavioural manifestations of a lack of sleep include poor attention, hyperactivity and impaired impulse control. Children with insufficient sleep may be less able to regulate emotional responses and thus be prone to impulsive or aggressive behaviour. They may also exhibit learning, retention and recall problems in school. "Studies of school-age children have demonstrated links between poor or restricted sleep and compromised neurobehavioural functioning," notes Dr. Avi Sadeh, from Tel Aviv University in Israel.

"A wealth of empirical evidence indicates that significant performance impairments and mood dysfunction are associated with inadequate or disturbed sleep," says Dr. Judith Owens, a researcher at the Brown Medical School in Rhode Island. Some cognitive functions such as problem solving, cognitive flexibility and the ability to reason and think abstractly, appear to be particularly sensitive to the effects of disturbed or insufficient sleep.

Further health outcomes of inadequate sleep include potential harmful effects on the cardiovascular, immune and metabolic systems, playing a role in problems such as obesity.

Sleep problems in children are also a significant source of distress for families, potentially contributing to attachment difficulties, depression, family and marital conflict, and overmed-

ication. "It cannot be stressed enough that sleep disturbances affect not only the child, but the entire family," says Dr. Jodi Mindell, a researcher and pediatric sleep expert at the Children's Hospital of Philadelphia.

### UNDERSTANDING SLEEP PATTERNS

Infants and toddlers have different sleep patterns than adults, with greater amounts of active (REM) sleep. During REM sleep, respiration is rapid and irregular, with alternating periods of no activity and squirming, stretching, grunting or brief cries, and "rapid eye movements" (REMs) seen as fluttering of the eyelids.

Quiet sleep, by contrast, is characterized by slower, very regular breathing, with little movement and no REMs. With age, there is a reversal in the relative amounts of the two sleep states. REM sleep decreases from 50% at birth to 30% by age three and 20% by adolescence. In contrast, non-REM sleep increases from 50% at birth to 80% by adolescence.

Sleep begins to consolidate by three to four months of age, with night-time sleep periods increasing to between six and eight hours. At around the same time, infants become capable of learning to "self-soothe"; that is, to fall asleep without parental assistance.

By one year of age, typically developing children are sleeping a total of 12 to 13 hours. The morning nap is usually dropped in the second year of life and the afternoon nap in the third or fourth year, although roughly 30% of five-year-olds still require a daytime nap.

Research indicates that preterm infants have slightly different sleep-wake patterns, and that these affect and are affected by their environment and social interactions. In the hospital, for example, infants' sleep is often disturbed by nursing interventions or noise. Holding preterm infants in skin-to-skin contact has been found to increase quiet sleep time. "Given the important effects on psychosocial de-

velopment, service providers need to be aware of how sleeping and waking patterns are affecting the parent/preterm infant interactions," states Dr. Diane Holditch-Davis, of the Duke University School of Nursing in North Carolina, "and intervene as needed to promote more mutually satisfying interactions."

### TYPES OF SLEEP PROBLEMS

In young children, behavioural sleep disturbances are the most common. Children may resist being put to bed, or sleep in locations other than their bed. Recurrent or prolonged night wakings, on the other hand, usually occur when the child has become dependent on parental presence both to fall asleep at bedtime and to fall back asleep during the night. Fears and anxieties associated with bedtime, night-time and sleep are also common.

Less common are biological/neuro-maturational sleep disturbances, which include sleepwalking, night terrors, rhythmic movement disorders such as head banging or body rocking, bedwetting and circadian rhythm disorders, where the child's sleep-wake phases are not aligned with those of the family or community.

Snoring, noisy breathing, breathing pauses and sweating during sleep indicate problems of airway functioning and respiratory control during sleep. Infants or children with these symptoms should undergo medical evaluation.

### INTERVENTIONS AND PROGRAMS

There is now a solid body of literature regarding empirically-based non-pharmacological treatment of bedtime problems and night wakings in infants, toddlers and preschoolers. Karyn G. France and Neville M. Blampied, researchers at the University of Canterbury in New Zealand, describe several behavioural strategies and explain how these treatments are based on basic behavioural principles that



*"It cannot be stressed enough that sleep disturbances affect not only the child, but the entire family."*

reduce or eliminate some behaviours and reinforce others. These strategies are often superior to treatments using prescription and over-the-counter drugs, and are generally more acceptable to parents and practitioners.

Systematically structuring pre-bed routines using quiet, pleasant activities and praise for compliance (termed *Positive Routines*) reduces pre-bed tantrums and resistance. Crying and calling out during initial settling or following later night wakings is reduced or eliminated by a range of interventions, often called *Extinction* or *Graduated Extinction*.

These involve the immediate or progressive withdrawal of parental attention for sleep-disruptive behaviour (i.e. ignoring the child's cries). Both infant distress and parental stress can be

reduced by adding *Parental Presence* to extinction, in which the parent lies near the child but does not interact with him or her.

In older, more verbal children, these strategies can be supplemented by adding praise or tangible rewards for appropriate sleeping behaviour. Positive routines may be supplemented by adjusting bedtime later or earlier (*Bedtime Fading*) and by removal from bed and being kept awake when not sleeping (*Response Cost*). Night-time fears and anxieties are reduced through relaxation, modelling coping, positive thoughts and images, and positive rewards for "bravery."

The researcher note that parents need to be carefully prepared for any intervention, supported during it, and warned of the possibility

of the sleep problem reappearing following illness or changes in routine. Most importantly, they emphasize that interventions where parents systematically ignore their infant or child's crying have no reported long-term adverse effects on children's well-being or development.

Sleep management interventions should also take into account child, parental, environmental and cultural variables. *"The cultural and family context of sleep practices has only recently begun to be identified as an important aspect of services and programs for managing pediatric sleep disturbances and disorders,"* notes Mindell.

#### EDUCATION AND PREVENTION

Mélanie Lambert is the mother of two young children. Since her daughter turned three, she has been having night terrors. It took Lambert and her husband some time before they understood what was going on. Their son, now 15 months old, only began sleeping through the night at nine and a half months, after Lambert realized he had become dependent on nursing to fall back asleep after waking.

Lambert feels that parents need more information on sleep management strategies. *"You know it's important for your child to sleep, but what you need is for a health-care practitioner to say: 'Here's what to do.' At the same time, you want to find a solution that fits with your own values."*

Researchers agree that education is key, not only to the treatment of existing sleep disturbances, but for the prevention of sleep problems and the development of best sleep practices. *"These education efforts clearly go beyond parents to our educational systems and to health-care practitioners,"* says Mindell. 🐾

BY EVE KRAKOW

# SLEEPING <sup>BABY,</sup> HAPPY MOTHER

**Teaching mothers about behavioural sleep strategies can not only help their babies sleep better at night, it may also reduce maternal depression.**

Infant sleep problems and postpartum depression are common. Sleep problems are one of the most common complaints made by parents, while postpartum depression affects an estimated 10% to 20% of mothers in Canada.

Dr. Harriet Hiscock, a pediatrician at the Royal Children's Hospital in Melbourne, Australia, and Dr. Melissa Wake, research director of the hospital's Centre for Community Child Health, conducted a randomized controlled trial of 156 mothers to determine whether a simple behavioural intervention would reduce both

*"Managing the infant sleep problem appears to be an effective way of improving the mental health of some mothers."*

sleep problems in infants and symptoms of depression in mothers.

Mothers were eligible if they reported a sleep problem in their six- to 12-month-old infant: waking more than five nights a week, waking more than three times a night, taking more than 30 minutes to fall asleep, or requiring parental assistance to fall asleep. The women were then assessed for depression.

Mothers in the intervention group attended up to three private consultations over a period of six weeks, and sleep management plans were tailored to each family. The main intervention was controlled crying, where parents responded to their baby's cry at increasing time intervals, allowing infants to fall asleep by themselves.

As well as discussing normal sleep cycles, parents were taught that settling after night waking is a learned behaviour that can be modified, and that infants need to be taught to fall asleep independently. A few parents chose "camping out," where they sat with their infant

until he or she fell asleep, gradually removing their presence over a period of three weeks.

Mothers in the control group were mailed a single sheet describing normal sleep patterns in infants aged six to 12 months, but the sheet did not include any advice on how to manage infant sleep problems.

Two months after the initial intervention, there were fewer infant sleep problems in the intervention group than in the control group. And while maternal depression scores fell in both groups, there was greater improvement in the intervention group.

At four months, although there was little difference in infant sleep problems between both groups, maternal reports of symptoms of depression had decreased significantly, especially for mothers who initially had high depression scores.

*"Managing the infant sleep problem appears to be an effective way of improving mental health for some mothers. Thus, in a clinical setting, health professionals should always ask about the infant's sleep and the mother's well-being,"* explains Dr. Hiscock. If appropriate, she says, they should manage the infant sleep problem first and then reassess the mother's mental health afterward.

Dr. John LeBlanc, an associate professor of pediatrics at Dalhousie University and pediatrician at the IWK Health Centre in Halifax, suspects that most pediatricians do not make the link between maternal depression and infant sleep problems. *"Usually, when families come to see us, it is the infant sleep problem that motivates the visit,"* he explains. *"However, pediatricians and family physicians should routinely ask mothers about postpartum depression, since sleep problems in mothers caused by their infant's sleep patterns can make depression symptoms worse."*

LeBlanc adds that families should be receiving information on sleep management strategies from their health professional. Prenatal classes and post-natal home visiting programs would also be good places to raise these issues. However, LeBlanc notes that controlled crying is one of many sleep management strategies that have been shown to work. 🐾

**BY EVE KRAKOW**



# BEDTIME

## DOESN'T HAVE TO BE A CHORE!

**Behavioural strategies have been proven the most effective way to help infants and children who resist bedtime or wake during the night to sleep.**

To determine the best way to deal with sleep problems, a task force appointed by the American Academy of Sleep Medicine reviewed 52 studies of behavioural interventions for treating bedtime struggles and night wakings in young children. Their findings indicate that behavioural therapies produce reliable and durable changes. *"For parents and health-care practitioners, this review and subsequent standards of practice provide guidelines on well established treatments,"* explains lead researcher Dr. Jodi Mindell, a pediatric sleep expert at the Children's Hospital of Philadelphia.

### REVIEW OF FIVE TYPES OF BEHAVIOURAL INTERVENTIONS

#### • Extinction:

Parents put the child to bed at a designated time and then ignore the child's calls or cries, no matter how long they last, until a set time in the morning (unless they suspect illness or injury). Because this method can be stressful for some parents, some studies used extinction with parental presence, where the parents stay in the child's room but ignore his/her behaviour.

#### • Graduated extinction ("sleep training"):

Parents ignore the crying but go into the room briefly at specific intervals. The duration of these intervals may be tailored to the child's age and temperament, and the parents' judgment of how long they can tolerate the child's crying. They can follow a fixed schedule or wait for progressively longer intervals.

#### • Positive routines/Bedtime fading:

Parents develop a set bedtime routine characterized by quiet activities that the child enjoys. Faded bedtime with response costs involves taking children out of bed for a pre-

scribed period of time when they do not fall asleep. Bedtime is also delayed to ensure rapid sleep onset. Once the behavioural chain is well established and the child is falling asleep quickly, bedtime is moved earlier by 15 to 30 minutes over successive nights until a pre-established bedtime goal is achieved.

#### • Scheduled awakenings:

The parents wake and console their child about 15 to 30 minutes before a typical spontaneous awakening. This is followed by the parents' usual response to a spontaneous waking, such as rocking or nursing the child back to sleep. Scheduled awakenings are then faded out by slowly increasing the time between awakenings.

#### • Parent education/prevention:

Strategies typically target bedtime routines, developing a consistent sleep schedule, parental handling during sleep initiation, and parental response to night wakings. Almost all programs recommended that babies be put to bed "drowsy but awake" to help them develop independent sleep initiation skills at bedtime, enabling them to sleep without intervention following naturally occurring night-time arousals.

After reviewing the 52 studies, which involved over 2,500 infants and toddlers, the researchers concluded that extinction (including extinction with parental presence) and parent education/prevention had the strongest empirical support, while graduated extinction, bedtime fading/positive routines and scheduled awakenings were also effective interventions.

Dr. Shirley Blachman, a community-based pediatrician who also works at the Montreal Children's Hospital, sees parents of young children with sleep difficulties on a daily basis. She says it's very helpful to know that the strategies



she and other pediatricians have been recommending are backed by solid evidence. *"When talking to parents, we can show them that this is not just what grandma or their neighbour says, but that it is truly evidence-based, it does work, and it has no adverse effects."* 🦋

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