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Sleep and Sleep Disorders in Children and Adolescents: Information for Parents and Educators

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Physicians and psychologists estimate that as many as 30% of children may have a sleep disorder at some point during childhood. Sleep disorders have implications both for social-emotional adjustment and for school performance. For this reason it is important for both parents and educators to understand how sleep works and how disruptions in normal sleep patterns can affect children and teenagers. This handout will provide an introduction to normal sleep patterns, definitions and descriptions of the kinds of sleep disturbances that may affect children and adolescents, and a brief description of recommended treatments.

Normal Sleep Patterns

Types of Sleep Patterns

Sleep is broadly classified into two types: REM (rapid-eye-movement) sleep and non-REM sleep (NREM). By studying brain wave patterns we know that NREM sleep consists of several stages, ranging from drowsiness through deep sleep. In the early stages (Stages I and II) you awake easily and may not even realize that you have been sleeping. In the deeper stages (Stages III and IV) it is very difficult to wake up, and if you are aroused you are likely to find yourself disoriented and confused. In NREM sleep your muscles are more relaxed than when you are awake but you are able to move (although you do not because the brain is not sending signals to the muscles to move).

REM sleep is more active. Breathing and heart rate become irregular, your eyes move rapidly back and forth under your eyelids, and control of your body temperature is impaired so that you do not sweat when you are hot or shiver when you are cold. Below the neck, however, you are inactive because the nerve impulses that travel down the spinal cord to body muscles are blocked. Your body is essentially paralyzed. It is during this sleep stage that you dream.

Developmental Characteristics

Infants and children. Both these sleep states develop before birth. Infants cycle through many sleep periods throughout the day. As they develop, they sleep longer at night and have fewer sleep periods during the day. Newborns sleep almost all the time. By 6 months they sleep about 13 hours a day with the longest sustained period being about 7 hours. By 24 months children sleep for 12 hours, including naps, and by 4 years children sleep 10-12 hours with one daytime nap at most.

Throughout childhood children typically get about 10 hours of sleep a night. This drops significantly at adolescence, but less for biological reasons than for socio-cultural reasons. Sleep researchers studying the optimal sleep periods of teenagers have found that when the sleep-wake cycle is studied in the laboratory under controlled conditions (e.g., removing clocks and lighting cues), teenagers typically sleep 9 hours a night. In the real world—especially during the school year—very few teenagers get this much sleep and thus are constantly coping with sleep debt to a greater or lesser degree.

Whereas infants enter into REM sleep immediately, young children move quickly from drowsiness and the lighter sleep stages to Stage IV, then experience cycles of light to deep sleep, arousal, etc., eventually cycling between REM and Stage II sleep, much like the sleep patterns of adults.

Adolescents. Adolescent sleep patterns deserve particular attention because of the potential impact on school performance. It has only been in the last 20 years or so that sleep researchers have recognized that there are distinctive changes in sleep patterns in adolescence. There are changes in the biological clock (also called circadian rhythms) of teenagers. With the onset of puberty, teenagers begin to experience a sleep phase delay such that they develop a natural tendency both to fall asleep later in the evening and to wake up later in the morning. Even youngsters who have experienced sleep deprivation (and therefore accumulated some sleep debt) tend to feel more alert in the evening, thus making it more difficult to go to bed at what parents might consider a reasonable hour.

The onset of sleep is triggered by the release of melatonin, a natural body hormone. Toward dawn, melatonin shuts off as another hormone, cortisol, increases, signaling the youngster to wake up. Research shows that the pattern of melatonin secretion makes it hard for teenagers to fall asleep early in the evening and to wake up early in the morning. Schools with early start times (any time before 8:30 a.m.) place students at a disadvantage in terms of arousal and alertness—not only for early morning classes but throughout the day because the adolescent's biological rhythms are out of sync with typical school routines.

Recognizing and Treating Sleep Disorders

Some sleep disturbances are mild, fairly common, and fairly easy to treat. Others may be more stubborn, or they may be

signs of potential physical problems that could have long-term consequences if left untreated.

Diagnosis

Sleep disorders are generally diagnosed either by a pediatrician or a sleep specialist. If parents are concerned about possible sleep problems, they may want to begin by discussing their concerns with their child's physician. Not all pediatricians recognize the variety of sleep problems children and teenagers experience, and if parents are not satisfied after meeting with their child's physician, they may want to request a referral to a sleep specialist or to a sleep clinic.

At school parents might find some assistance from the school psychologist or social worker, who may use a diagnostic interview as part of an evaluation. This interview should include questions about the child's normal sleep patterns, including bedtime routines, typical bedtime and wake time on school days and weekends, whether the child has trouble falling asleep or staying asleep, and the frequency of nightmares. When parents or teachers have concerns about both attention and behavior problems, sleep problems may be an issue. This is because side effects associated with sleep disturbance or deprivation include inattention, irritability, hyperactivity, and impulse control problems.

Treating Sleep Disorders

Different types of sleep disorders call for different treatments.

Night terrors. Night terrors are sudden, partial arousal associated with emotional outbursts, fear, and motor activity. Occurring most often among children ages 4-8 during NREM sleep, the child has no memory of night terrors once fully awake. If your child experiences night terrors, make sure he or she is comfortable but do not wake the child. In extreme cases, night terrors may require medical intervention.

Sleep walking. Sleep walking is most common among 8-12 year-olds. Typically, the child sits up in bed with eyes open but unseeing or may walk through the house. Their speech is mumbled and unintelligible. Usually children will outgrow sleepwalking by adolescence. In the meantime, take safety precautions (e.g., using a first floor bedroom), but keep efforts to intervene to a minimum. Awakening the child on a regular schedule can reduce or eliminate episodes.

Nighttime bedwetting. This type of bedwetting is a common sleep problem in children ages 6-12, occurring only during NREM sleep. Primary enuresis (the child has never been persistently dry at night) is associated with a family history of the problem, developmental lag, or lower bladder capacity, and is unlikely to signal a serious problem. Secondary enuresis (a recurrence of bedwetting after a year or more of bladder control) is more likely to be associated with emotional distress. Interventions include use of reinforcement and responsibility training (such as keeping a dry night chart), bladder control training, conditioning (e.g., bedwetting alarms), and sometimes medication. In the case of secondary enuresis it might be most helpful to determine any source of emotional stress and address it directly. (For example, if a child starts wetting the bed at night following parents' separation or divorce, providing counseling to address loss issues might help alleviate bedwetting.)

Sleep-onset anxiety. Sleep-onset anxiety refers to difficulty falling asleep because of excessive fears or worries. The problem may be caused by stressful events or trauma or because of ruminating on more commonplace issues of the day. This type of sleep problem is most common among older elementary school children. Intervention strategies include reassurance, calming bedtime routines, and, in some cases, cognitive-behavioral therapy, which is designed to help children develop effective coping strategies to address their worries.

Obstructive sleep apnea. Although more common in adults, 1-3% of children experience difficulty breathing because of obstructed air passages. Symptoms include snoring, difficulty breathing during sleep, mouth breathing during sleep, or excessive daytime sleepiness. In children this type of sleep disturbance is usually not serious, but most children benefit from removal of the tonsils and adenoids. When this is not effective, the condition can be treated (by a physician) with a procedure known as nasal continuous positive airway pressure (CPAP).

Narcolepsy. Narcolepsy is a rare but potentially dangerous, neurologically based genetic condition that may include sleep attacks (irresistible urges to sleep), sleep-onset paralysis, or sleep-onset hallucinations. It affects 1 of every 2,000 adults and may first appear in adolescence. If this disorder is suspected, refer to the child to a sleep specialist. Treatment may include ensuring a full 12 hours of sleep per night or more, scheduled naps, or medication.

Delayed sleep-phase syndrome. This is a disorder of sleep (circadian) rhythm that results in an inability to fall asleep at a normal hour (e.g., sleep onset may be delayed until 2-4 a.m.) and results in difficulty waking up in the morning. Symptoms among children include excessive daytime sleepiness, sleeping until early afternoon on weekends, truancy and tardiness, and poor school performance. Treatment might include light therapy (exposure to very bright light in the morning), chronotherapy (gradually advancing the child's sleep schedule 1 hour per night until a normal routine is achieved), maintaining a consistent sleep schedule, or a short course of sedative medication to help achieve a new schedule. It may be necessary and beneficial to (temporarily) adjust the child's school day to allow for a later start.

Help for Children and Families

A sleep disorder not only results in a sleepy, cranky, and often poor-performing student at school, but also an irritable, unhappy child or teenager at home. A youngster with a disrupted sleep pattern more than likely is wreaking havoc on the sleep and patience of other family members.

If you suspect that your child or teen has a sleep problem that goes beyond a few nightmares or restless nights, do not delay seeking help. Start with your family physician. The earlier a sleep problem is identified and treated, the more quickly a normal sleep routine can be restored—for everyone.

Resources

Carskadon, M. (Ed.). (2002). *Adolescent sleep patterns: Biological, social, psychological influences*. New York: Cambridge University Press. ISBN: 0521642914.

Dement, W. C., & Vaughan, C. (1999). *The promise of sleep*. New York: Delacourte. ISBN: 0385320086.

Ferber, R. (1985). *Solve your child's sleep problems*. New York: Fireside. ISBN: 0671620991.

Websites

The American Academy of Sleep Medicine— www.aasmnet.org

The National Sleep Foundation— www.sleepfoundation.org

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