

CHICAGO SLEEP GROUP



A Newsletter from Chicago Sleep Group and Suburban Lung Associates

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Board Certified Sleep Specialists

Robert W. Hart MD, ABSM
Medical Director

Clifford A. Massie PhD, ABSM,
CBSM
Clinical Director

Timothy J. McGee DO, FCCP,
ABSM

Anna Ivanenko MD, PhD,
ABSM
Pediatric Medical Director

Clinical Coordinators

Andrea Early
Julie Levin
Carolyn Potasky
Jennifer Skweres

Administrative Assistant

April Catalano

Convenient Locations

Elk Grove Village, IL
(t) 847.981.3660

Winfield, IL
(t) 630.690.4993

Naperville, IL
(t) 630.355.8776

Visit us at:
www.chicagosleepgroup.com

Editors

Anna Ivanenko MD, PhD
Clifford A. Massie PhD
Carolyn Potasky RPSGT

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Spring Ahead...Lose Sleep

This spring we will “spring ahead” and lose one hour of sleep. This is especially problematic for those who are already in a “sleep slump” or sleep deficit. The 2005 National Sleep Foundation “Sleep in America” poll found that, compared with 1998, more people are sleeping less than 6 hours each night. In fact, 71% of American adults are getting less than 8 hours of sleep each night, averaging only 6.8 hours on work nights.

Getting enough sleep as well as getting good quality sleep is vital to our mental and physical well being and is equally important for children, adolescents and adults.

The Effect of Lack of Sleep On The Brain

Time is a precious commodity. As our daily schedules become more demanding we struggle to find balance between our commitments at home and work. It is very tempting to rob our sleep time to accomplish our goals....but is it really wise to shortchange our sleep?

Sleep helps to rejuvenate the brain and reinforces what we learn. Brain scans have revealed that cerebral activity associated with learning new information is replayed while we sleep and this helps to consolidate our memory. Scientists also know that sleep deprivation impairs spatial learning—the learning that is used in navigation and remembering how to get to a new destination—as well as cognitive functioning.

Your brain learns as you perform spatial tasks during the day and this learning actually *increases* the production of new brain cells in an area of the brain called

the hippocampus. The more we perform spatial tasks, the greater the rate of new brain cell growth in the hippocampus. In essence, learning rejuvenates the brain and sleep plays a vital part in helping those new brain cells survive.

A team of researchers at the University of California and Stanford University recently studied the effects of inadequate sleep on spatial learning. Researchers tested rats that had been sleep restricted in a way that closely mimicked the common human experience of not getting adequate sleep during the work week. Lead researcher, Ilana Hairston, stated, “Sleep is necessary for general health, but it now appears that the brain needs sleep more than any other part of the body.” During their study Hairston and her team of researchers found that well rested rats completed and achieved their goal in spatial learning exercises, subsequently increasing their brain cell growth in the hippocampus. Interestingly, the sleep restricted rats found a “work around”. They completed the same task but did so using alternate cues such as their sense of sight and smell. The sleep restricted rats did not use spatial learning to complete the tasks and therefore did not benefit from an increase in brain cell growth like their well rested counterparts.

We know sleep restricted individuals have a shorter attention span, impaired memory and a longer reaction time. We now also know that sleep restriction suppresses new brain cell growth that is induced by spatial learning. Essentially, there are fewer brain cells for the weary; robbing yourself of sleep is not a very smart trade off.

Waking Up Alert vs. Being Well Rested

Sleep experts agree that on average adults need between 7 to 9 hours of sleep each night to function most effectively during the day. The National Sleep Foundation reports, “the interaction between sleep, waking and the brain is complex and a full night of sleep is the best thing for sustained alertness, a positive outlook and healthy cognitive and physical performance throughout the day”.

In a recent issue of the *Journal of the American Medical Association*, a brief research letter was published relaying findings of a study in which nine adult subjects were given an arithmetic test immediately upon awakening and at various other times during the day. The subjects performed the series of arithmetic tests after sleeping a full eight hours and also after being sleep deprived for 26 hours. The study found that cognitive performance on the test taken immediately upon awakening was worse than the test taken after being sleep deprived.

This is not surprising, as the brain needs time to “warm up” following many hours of sleep. Similar to a computer rebooting, this process is referred to as “sleep inertia” and is the brain making the transition from sleep to wake. For some of us “non-morning people”, this transition can occur very slowly—and may even require a cup or two of coffee.

In conclusion, the report does not advocate sleep deprivation, but rather cautions against awakening and immediately performing high risk activities such as driving or other tasks requiring a high level of cognitive functioning.

Children Five and Under Are Sleeping Less Than Recommended

It is a cause for concern that the problem of too little sleep is extending into the youngest members of our families. While it is widely recognized that older children and adults are not getting enough sleep, recent studies are revealing a startling fact—our preschool children are not getting sufficient sleep either.

A recent study performed by researchers at Bradley Hospital and Brown Medical School found that children five and under get considerably less sleep than the 12-15 hours of sleep per day that has historically been recommended by pediatricians and pediatric sleep experts for this age group.

During the study, 169 children between the ages of one and five were studied in their homes with actigraphy monitors, which resemble a watch and record sleep and wake activity. The children wore the monitors on their wrist or ankle and the mothers chronicled their children’s sleep habits in a separate, detailed sleep diary.

“We were very surprised to find how little preschool aged children actually slept at night, which we could measure with our activity monitors. Children in our sample slept only about 8.7 hours at night and less than 9.5 hours per 24 hours when naps were included. This contrasts with the 12 to 15 hours usually recommended for children this age,” says lead author Christine Acebo, PhD, of the Bradley Hospital Sleep and Chronobiology Research Laboratory.

Acebo explained that they wanted to study sleep in preschool aged children because most research in this area was over 25 years old. This is one of the first studies to capture sleep patterns in this age group with the use of objective and quantifiable measurement tools. Research from this study was published in the medical journal *Sleep*, and corroborates results of a very extensive survey of parents funded by the National Sleep Foundation and Pampers Baby-Dry™ (2005) which showed similar findings, that children slept an average of 9.7 hours at night.

An interesting aspect of the Bradley Hospital and Brown Medical School study was that the mothers subjectively reported less wake time and less bouts of wakefulness than what the actigraphy monitors actually recorded. Also, children in families of lower socioeconomic status had later wake up times, longer time in bed, more wake minutes and bouts of wakefulness at night, and greater night-to-night variability in bedtime and total sleep time than children of higher socioeconomic status.

We cannot be certain what effect this lack of sleep will have over time on these preschoolers. However, information

learned from these studies is particularly disturbing in light of similar studies of school aged children with poor sleep that show lower physical and academic performance and higher rates of parent-reported behavior problems.

The Less A Child Sleeps, The More Overweight They Are Likely To Become

Researchers from Université Laval’s Faculty of Medicine in Quebec have published a recent article in the *International Journal of Obesity* stating the less a child sleeps, the more likely he or she is to become overweight.

The study was conducted with 422 school children between the ages of 5 and 10 years old. Through BMI measurements, researchers determined 20% of boys and 24% of girls studied were overweight.

The risk of becoming overweight is 3.5 times higher in children who get less than 10 hours of sleep per night compared to those that sleep 12 hours or more. No other factor analyzed in the study—not parental obesity, parent’s level of education, family income, time spent in front of the TV or computer, nor regular physical activity—had as much impact on obesity as time spent sleeping. This relationship between sleep and obesity is felt to be due to hormone production. “Lack of sleep lowers the level of **leptin**, a hormone that stimulates metabolism and decreases hunger. In addition, short nights of sleep boost the concentration of **ghrelin**, a hormone that increases hunger,” explained Professor Angelo Tremblay.

The increase in obesity and decrease in the number of hours devoted to sleep are two social issues that have become increasingly important. Between 1960 and 2000, the prevalence of obesity has doubled while the average night of sleep lost 1 to 2 hours.

Tremblay finds it ironic “that part of the solution to obesity might lie in sleep, the most sedentary of all human activities”. In light of these results, he recommends encouraging children to move more and ensuring they get adequate sleep