SOUND SLEEP LEADS TO A SOUND MIND

By Michael L. Gelb DDS, MS

Most of us are aware by now that sleep is important, in both quality and quantity. It may once have been a badge of honor to get by on 4 or 5 hours a night, but we now know that sleep is essential for the brain and body to function optimally. Processes that occur during sleep reduce toxins and enable us to preserve memory. Sleeping 7 to 8 hours per night is considered ideal, and that need continues as we age, even if our sleep becomes more fragmented.

A lot can get in the way of a good night’s sleep. If we are stressed or anxious, we may not be able to fall asleep, or if we awaken during the night to use the bathroom, it may be hard to get back to sleep. Perhaps we had some wine or alcohol that helped us nod off, but then we find ourselves counting sheep at 3am. Some people who use electronic devices too close to bedtime also find it difficult to fall asleep.

Sleep plays several critical roles for brain health. Memory consolidation happens during rapid eye movement (REM) and slow wave sleep (SWS). Research studies have shown that REM sleep is important for hippocampal neurogenesis, which is the growth of nerve tissue of the hippocampus, the primary memory center of the brain.\textsuperscript{1,2} Decreased REM sleep has been associated with cognitive decline. Sleep also enhances the brain’s ability to remain neuroplastic, i.e. able to form new neural connections.

Toxins and waste products are cleared from the brain during SWS or deep sleep. The brain undergoes a detoxification process where plaque and other debris are removed from the brain via

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There is nothing like the bursting of spring blossoms and new animal life to remind us that life goes on, even though this year of COVID has changed so much in our world. Through it all, lifestyle basics for brain health that Sharp Again Naturally has shared with you have been more important than ever: eat well, exercise, get enough sleep, and spend time with family and friends. We devote this issue of The Sharper Edge to SLEEP—why it’s important for our brains and our bodies and how COVID has impacted our ability to get that restful 7–8 hours per night.

Michael Gelb, DDS, a snoring and sleep apnea specialist and a member of Sharp Again Naturally’s Medical and Dental Advisory Board, explains what happens in our brains during sleep and discusses conditions such as sleep apnea that, if left untreated, can lead to dementia. Sleep psychologist Shelby Harris, Psy.D. answers important questions about sleep in our new COVID world. Vaccinations may make us feel safer, but we are not truly out of the woods yet in terms of our mental health and peace of mind.

There is a strong correlation between exercise and better sleep, and SAN volunteer Barbara Goldenberg talks about how important it has been for her to spend time outdoors these past months not only to stay active but also to engage joyfully with the natural world.

Finally, we include a variety of tips for getting more restful and restorative sleep. Human beings at all ages need a good night’s sleep, and our more anxious, stressful, screen-dominated lifestyles are not helping us. A recently published British longitudinal study followed almost 8,000 people and reported that those who slept fewer than 6 hours a night in middle age were more likely to get dementia 15–20 years later. If we want a sharp brain later in life, we must make a commitment to improve our sleep habits. For more information on sleep and other causes of memory loss, go to SAN’s newly revised website at sharpagain.org.

Wishing you sweet dreams and a clear mind,

Lisa Feiner
Board Chair, Sharp Again Naturally
the cerebrospinal fluid (CSF). In fact, during deep sleep, the brain enlarges the channels for CSF, making the job of detoxification easier. When SWS is disrupted, clearance of waste products is also disrupted, leaving behind higher levels of amyloid beta and tau proteins. These proteins can aggregate to form the plaques and tangles around brain cells which are associated with Alzheimer’s disease (AD).

Obstructive sleep apnea (OSA) is a common problem that disrupts sleep for adults and children. OSA involves the collapse or blockage of the airway which results in insufficient oxygen reaching the tissues of the body and brain, referred to as intermittent hypoxia. The brain then experiences repeated and frequent arousals, resulting in disturbed sleep or sleep fragmentation.

Cognitive impairment has always been a prominent risk factor for long-term OSA sufferers. Once commonly thought to be conditions exhibited by overweight men, snoring, mouth breathing and OSA are now being diagnosed in children. This is particularly concerning as a child’s developing prefrontal cortex is affected, leading to learning and behavioral issues. These same conditions affect the hippocampus in men and post-menopausal women, and if left untreated, OSA and sleep fragmentation increase the odds of developing dementia.

OSA can also result in altered sleep architecture with decreased REM, non-REM, and slow wave sleep. Apnea often leads to increases in oxidative stress, endothelial dysfunction, sympathetic up-regulation (staying in “fight or flight” mode) and systemic inflammation. Due to recurrent brain arousals, OSA may directly impact cognitive performance by disrupting sleep-related attention and memory processes. OSA is also a risk factor for cardiovascular disease which is linked to vascular dementia and AD.

UCLA researchers found increased permeability of the blood-brain-barrier (BBB) in subjects with OSA. Why this happens is not fully understood. Previous studies have shown that reduced oxygen and high blood pressure can damage the BBB, which in turn can injure brain tissue. This breakdown of the BBB contributes to cognitive impairment by allowing harmful bacteria, infections and chemicals into the brain, all of which can cause systemic inflammation in the body.

Individuals with OSA may also develop increased permeability of the gut (known as “leaky gut”) which can lead to inflammation throughout the body. This type of systemic inflammation can cause the brain to become inflamed, leading to Alzheimer’s disease. Inflammation is reflected in elevated blood levels of high sensitivity C-Reactive Protein (hsCRP), IL-6 and TNF-alpha. Researchers advise patients to seek help in identifying the underlying causes of inflammation, and to have it treated promptly.
DIAGNOSIS AND TREATMENT FOR OSA AND SLEEP PROBLEMS

Sleep disordered breathing and obstructive sleep apnea should be recognized as early in life as possible. Often, a parent, partner or spouse will hear snoring or gasping for air during the night. Diagnosis can be made with either a home sleep test or an overnight polysomnogram. As a first step, if you suspect there is a problem, there are several apps that track sleep and arousals, and some also make a recording of your sleep during the night. Some apps may work best with iOS or Android; you can try some of the more commonly used ones such as SleepScore, Pillow, and Sleep Cycle.

A continuous positive airway pressure (CPAP) device is a first line treatment for moderate to severe OSA and has been found to improve executive functioning skills, slow cognitive decline and improve mood. Mild to moderate cases of sleep disordered breathing can be successfully managed with oral devices or airway orthodontics to expand the airway and help reduce intermittent hypoxia.

To find a sleep specialist, consult the resources at the end of the Q&A section of this newsletter. If there is evidence of inflammation or other risk factors for dementia, see your physician or a functional medicine doctor who will be able to help identify where in the body inflammation exists and suggest ways of treating the underlying issues.

NOTES:


3. Oxidative stress occurs when molecules called free radicals and antioxidants are out of balance. Too many free radicals can do damage to fatty tissue, DNA, and proteins in your body. The result is inflammation that can promote aging.

4. Endothelial dysfunction is a type of non-obstructive coronary artery disease (CAD) in which there are no heart artery blockages, but the large blood vessels on the heart’s surface constrict (narrow) instead of dilating (opening).


Dr. Michael Gelb, DDS, MS is an innovator in sleep apnea, painful TMJ / TMD disorders, and other head and neck pain disorders. A pioneer in AirwayCentric Dentistry, Dr. Gelb has studied breathing-related sleep disorders (BRSD), specializing in how they relate to fatigue, focus, pain, and the effects all of these can have on a person’s life. He is a highly rated author and speaker on TMJ, sleep apnea, sleep disorders, and chronic headache treatments, and heads up the Gelb Center, a premier practice in New York City and White Plains, NY that addresses the needs of individuals suffering with these conditions.
HAPPY WANDERINGS
DURING COVID

By Barbara Goldenberg, Sharp Again Naturally Volunteer

Compared to many New Yorkers, I’ve been very fortunate during the COVID pandemic. I’ve been able to stay safe and healthy, without the stress of balancing work with homeschooling, or caring for aging at-risk family members, for example. Yet we have all felt fear and isolation this past year—especially in the early days when we knew so little, and vaccines weren’t even a glimmer on the horizon. New York City was again “Ground Zero”—this time for a new, highly contagious virus claiming thousands of lives. Ambulances raced through our empty streets at all hours, the sirens adding to our anxiety. Getting a good night’s sleep and staying calm seemed impossible.

Luckily, a few years ago I discovered a nearby park called Randall’s Island. I had passed the footbridge to the Island countless times on my usual exercise walks, until one day I decided to explore. It was startling, like going to Oz. Behind me was the rundown East River Esplanade, but over the footbridge was a peaceful urban retreat, with well-tended walkways and trees, sports fields, picnic tables, and a wildflower meadow. In no time, I was hooked. Randall’s became my destination of choice: up the Esplanade and over the bridge to my farthest endpoint. A few stretches, and before heading back, inspecting the new vegetables and greeting the chickens at the Urban Farm, cheering to see actual fruit on the apple and pear trees along the playing field, and watching the river from a favorite bench under a willow tree. Four-plus miles later, my spirits were always restored, and I usually slept well that night.

My park visits haven’t been a cure-all for the anxieties of life during COVID. But the Island has remained a happy place and a refuge. A powerful windstorm knocked down the big willow last year, but park staff have planted dozens of new trees. On cold January walks, I’d check out the species names on the tree tags and try to remember them on my next trip. (Is it a hackberry? Bald cypress?) It’s now a very beautiful spring on the Island, with new flowers and plantings to admire. Urban Farm volunteers are busy preparing the beds, and the chickens will have new expanded digs this year.

The gym in my building has been open for a while now, with the usual guidelines (reservations, time limits, etc.) and since I’m vaccinated, I’ll most likely use it again when the weather is bad. But I know how that park lifts my spirits, helps me stay active and sleep a little better, so I’ll be heading over the footbridge to check on the new trees as often as I can.
Q&A: SLEEP AND COVID

By Shelby Harris, Psy.D.

In the year we’ve been living with COVID, many of our habits have been severely disrupted. People who struggled with getting enough restful sleep before the pandemic are now seeking help from practitioners like Dr. Harris, a clinical psychologist who specializes in sleep, depression and anxiety issues. She responds to our questions below.

Q Many people report that their sleep has been disrupted during COVID. Why is that?

A I’ve seen greater sleep disruption in my patients as the months in social isolation have progressed. Increases in stress, anxiety and job disruption are all obvious causes for sleep problems. For many patients, their sleep issues began once they contracted COVID-19, suggesting insomnia may be a lingering symptom. Interestingly, some patients are actually sleeping better now, because life is simply just not as busy for them.

Q What other sleep-related symptoms have you seen during COVID?

A I see more undiagnosed sleep apnea, the temporary cessation of breathing during sleep that can cause people to choke or gasp for air. Many people have gained weight from eating more and being less active. With weight gain comes more snoring and higher rates of sleep apnea, leading to poorer sleep quality. Research has linked poorer sleep quality with impairment in cognition and poorer memory.

Q Why does getting 7-8 hours of quality sleep make such a difference for the brain?

A A full night’s sleep plays a major role in the consolidation of memory and learning. When you’re asleep, your brain goes through various sleep stages that process the day’s information and form memories. Recent research shows that without enough deep stage sleep, a protein called tau builds up inside the brain in toxic tangles commonly seen in Alzheimer’s disease. In essence, deep sleep is like your brain’s washing machine, helping to clean the brain of tau.

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TIPS FOR IMPROVING YOUR SLEEP

Here are some tips that may help with periodic insomnia. While these can benefit some people, they don’t always do much for more chronic insomnia; that’s when you’d want to consider talking with a sleep specialist. Before taking any medications (natural, over-the-counter or prescription), consult your doctor.

1. Keep a consistent bed and wake-time 7 days a week. Our bodies have an internal clock that craves routine.

2. Use your bed solely for sleep and sex. If you can’t sleep after about 20 minutes, don’t try to force it. Instead, get up, sit somewhere else and do something quiet and relaxing in dim light (without a screen!) Return to bed only when you’re sleepy. If you don’t fall asleep, get up and repeat. Avoid looking at the clock, as clock-watching can worsen the ability to fall asleep.

3. Maintain a cool bedroom temperature (65-68°) to improve sleep. Adjust your thermostat for your personal comfort.

4. Exercise regularly. Sleep is like a battery for the body that needs recharging. If you don’t use it during the day, it won’t need to charge as much at night. But avoid exercising strenuously within 3 hours of bedtime.

5. Get exposure to as much daylight as possible. In the morning, lift your shades and bathe your brain and eyes in light, even on a cloudy day. In the evening, dim the lights and limit screens at least an hour before bed. Move screens away from you during sleep hours.

6. Find a relaxing pre-bedtime routine that does not include screens, perhaps reading or a warm bath, gentle stretching or lavender essential oil.

7. Avoid alcohol and nicotine within 3 hours of bedtime as they can worsen sleep quality.

8. Consider a daily meditation. It can improve sleep and quiet the brain overall. There’s no one right way to do it. Try different types of meditation and find one that works for you.

9. Refrain from eating at least 3 hours before going to bed to ensure proper digestion, improve sleep and optimize brain health.

10. Try supplementing with melatonin occasionally. Melatonin is a hormone produced by the body as part of our circadian rhythm, preparing us for sleep. Working on computers and other electronics can block melatonin production. However, melatonin is not recommended for long-term use.
If people are not sleeping well, what can they do?

The Sleep Tips included on page 7 are a great place to start. If more than these tips are needed, you might consider Cognitive Behavior Therapy for Insomnia (CBT-I) as a nonpharmacologic technique considered the gold standard for insomnia treatment as it is as effective as medication in many cases. CBT-I can be delivered in person, via telehealth or on various apps (CBT-I Coach, Sleepio, Cleveland Clinic, for example). If CBT-I isn’t enough, or if you snore, have excessive daytime sleepiness or engage in other movements in your sleep, consider talking with a sleep specialist. To find a practitioner for sleep and sleep related issues, visit:

https://www.behavioralsleep.org/

UPenn CBT for Insomnia provider directory:
https://cbti.directory/

for sleep centers:
http://sleepeducation.org/find-a-facility

and other sleep specialists:
https://www.aapmd.org

and click on “For Patients” to find a practitioner.


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