THE BRAIN HEALTH MAGAZINE

Never Give Up HOPE

The Sleeping-Learning *Connection*

COVID *Dreams*

Living Your Best Life After Brain Injury | May/June 2021

THE SLEEP ISSUE

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FROM THE EDITOR

As I am typing this, we are nearing the one-year mark since the US (and entire world) went into lockdown in an effort to control the spread of COVID-19. My birthday in 2020 was celebrated with a friend I was visiting in South Carolina, as she scrambled to prepare for at-home school for her two children.

My drive home was surreal with hardly any traffic on the freeways and empty rest stops. All the overhead DOT signs had alerts and messages about washing your hands to prevent the spread of the virus.

This year, I was able to spend my birthday with several hundred of my favorite survivors — virtually — during my **#NOTINVISIBLE** brain injury awareness day event.

While we are all still reeling from the effects of lockdown, isolation, lost income, death of family members, and maybe even overcoming COVID ourselves, we are continuing to move forward in our lives and our recoveries.

This issue is all about sleep — such an important topic in the TBI community. Many can't get to sleep, or if they do, they sleep poorly, while others may sleep too much. It's a frustrating battle, to say the least.

When you can't sleep, or get poor sleep, you are tired all day … struggling to get through the day and waiting to go to bed only to start the cycle all over again. Lack of sleep can't be "caught up" with a nap; it's more complicated than that. Sleep loss begins to affect your mood, your cognition, your memory, and so much more — on top of what we already struggle with.

I feel fortunate to have found relief through CBD oil. It's no secret I am a fan of Entangled Biome and their line of full spectrum hemp oil (FSHO) products. I use their wellness tincture every single night before bedtime, and it has given me the ability to sleep through the night — something I didn't think was ever going to happen again.

Additionally, I use their clarity tincture in the mornings to give me focus throughout the day. I also use the relief salve on any of my aching joints, often my neck or lower back.

I had tried melatonin and OTC sleeping pills for years before finding a CBD brand I completely trusted. None of it worked. Or if it did, it worked for a while before my body became used to it and needed more.

In this issue, you will read about sleep and how it affects many of the 3.5 million Americans who sustain a TBI each year. You will begin to understand the mystery of sleep and why it is so bothersome for those who can't sleep. But most importantly, this issue will give you hope a good night's sleep is still possible!

AMY ZELLMER, EDITOR-IN-CHIEF
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The Sleeping-Learning Connection:

Three Sleep Mistakes That Can Wreck Your GPA

BY AMY LAWSON MOORE, PHD

Most of us acknowledge the prevailing wisdom that students of all ages need optimal sleep to function in school, but we don't always think about sleep as an integral part of the actual learning process. But we should! It's fairly obvious the acts of acquiring new information and recalling previously-learned information both occur while we are awake. But there is a third aspect of learning called consolidation. Consolidation is the process that occurs in the brain while we sleep to solidify our memory of anything we recently learned. It turns our recent memories into long-term memories. It also connects recently-learned information with previously-learned information to enhance our understanding. When the process of consolidation is disrupted by lack of sleep, learning is impaired. With that in mind, here are three common sleep mistakes that impact the learning process and the benefits of overcoming them:

Sleep Mistake #1. Overnight Study Sessions

Most students at some point have pulled an all-nighter cramming for a big test. And many have even gotten an A on it. Unfortunately, that "A" is a temporary illusion of learning. If we don't sleep after studying new information, we may not be able to remember the information a week later. Why? Because it may not have been consolidated into long-term memory — a process that happens during sleep. Not only does sleeping after learning help consolidate the information to long-term memory, it also protects the newly-learned information from being overwritten by any subsequent learning. In essence, it protects the information from interference from distractions after waking.

How can you optimize your chances of retaining and protecting what you've learned? Sleep on it! Toss out the idea of staying up all night to study. The best way to learn a lot of information for a test is in chunks over time. Study a little bit every day in the days leading up to the test. But if cramming is your only option, even a 90-minute nap after studying most of the night can help consolidate and cement recently-learned information to long-term memory.

Key benefits of sleeping after learning:

- *We remember what we just learned for a longer period of time.*
- *What we learn is protected from distractions.*
- *New information is connected to previously-learned information.*

Mistake #2. Sleeping Fewer Than Eight Hours a Night

Not only do we need to sleep after we learn new information, we also need to sleep before we learn something new. The American Academy of Sleep Medicine recommends 8-10 hours of sleep a night for teens and adults. Less sleep than that has a significant impact on learning. In fact, research has shown that sleep deprivation significantly impairs our ability to learn new information by up to 40%. Why? Sleeping prepares the brain to form memories. And because sleep deprivation can impair attention and concentration, the ability to acquire new information is also impacted.

When sleep deprivation causes difficulty with focus, learning becomes inefficient. We take in fewer details and our brain struggles to determine where the information should be stored. Lack of sleep overworks our neurons and keeps the synapses excited for too long. This inhibits neuroplasticity, or the brain's ability to grow and change with new experiences.

But there is another function of sleep in the learning process. According to the homeostatic theory of sleep, our brain works while we sleep to prune unnecessary connections between neurons created during the day to free up space for learning new things the next day.

Finally, an interesting study with college students showed that lack of sleep significantly reduced performance on creativity tasks. The part of the brain we use for creative thinking — the hippocampus — is directly impacted by lack of sleep. In fact, sleep deprivation reduces synaptic plasticity in the hippocampus, preventing it from growing and changing by learning new things.

Key benefits of sleeping before learning:

- *Increases focus, attention, and creativity*
- *Helps us pay attention to details*
- *Maximizes neuroplasticity*
- *Makes room in the brain for new information*

Mistake #3. Not Having a Consistent Sleep Schedule

Staying up later some nights, waking up early some days, and sleeping in on weekends to catch up, sounds like a fairly typical schedule for many students. But a recent study conducted at Harvard found that students with irregular sleep schedules performed worse academically than students with regular sleep schedules. One reason may be that having a set schedule makes it more likely to get sufficient sleep. And we know sleep deprivation inhibits learning.

But another reason may be that irregular sleepers have less light exposure during the day and more exposure to light at night which can disrupt their internal circadian clock regulated by the sleep hormone melatonin. Light, especially blue light from electronics, suppresses melatonin, so onset of sleep is delayed. Delayed sleep means less sleep. And that impacts our capacity for learning!

Key benefits of a consistent sleep schedule for learning:

- *Enhances academic performance*
- *Promotes a regulated circadian clock*
- *Increases likelihood of getting enough sleep*

The connection between sleep and learning is well established, and research continues to reveal the importance of both the quantity and quality of sleep for learning, memory, and academic performance for students of all ages. Wondering what the first step to improving learning capacity should be? Sleep on it!

Dr. Amy Moore *is a cognitive psychologist in Colorado Springs, Colorado, at the headquarters of LearningRx, the largest network of brain training centers in the world. She specializes in cognition and learning in neurodevelopmental disorders, brain injury, learning disabilities, and age-related cognitive decline. She is also Editor-in-Chief of Modern Brain Journal, a board-certified Christian counselor, and co-host of the podcast Brainy Moms. Learn more about her work at* ***www.LearningRx.com***

THE STUFF COVID DREAMS ARE MADE OF

BY ED ROTH

Constant worry about catching the virus, not seeing loved ones, job insecurity, the future of human civilization. The pandemic may have made you exhausted and listless, but that's only during your waking hours. Sleep has brought a whole new world upon us.

People are reporting vivid, intense dreams like never before. Those bizarre "feels so real" dreams, like one about bugs, are affecting people throughout the world. And we have COVID to thank for it. Kind of.

Lauri Leadley, CCSH, RPSGT, is president and clinical sleep educator of Valley Sleep Center in Mesa, Arizona. She explains sleep is the number one component to overall health. "The brain is our battery. If there's trauma, the brain is affected. If we're not getting enough REM sleep, which is about 25% of total slumber, we don't get proper restoration."

Normally, we use dreaming to distill the information we deem most important – separating the wheat from the chaff, if you will.

However, when people are under stress, they produce more cortisol, leading to sleep disorders, which can make us feel as though we've run a race all night. The activation of this "fight or flight" region of the brain is actually a form of brain trauma and parallels the experience of those in life-threatening situations, e.g., military personnel in combat situations.

Julie Rake, MSPAS-PAC, of Chopra Global, explains, "If you were running from a bear, the part of your brain where 'fight or flight' starts would be fully engaged. When this is experienced daily, such as during a military combat deployment, the over utilization of this part of the brain reinforces the structures to be expended and causes it to be constantly worked."

These brain changes, which can be seen under a functional MRI scanner, include more blood flow, activity, and neuronal connections being utilized, making the "stress brain," aka the amygdala, more utilized. This is commonly referred to as "amygdala hijack."

When we are in "fight or flight" mode, the prefrontal cortex, aka the executive center where decisions, plans, and priorities are made, goes offline. "In a life-or-death situation, the last thing you want to be doing is analyzing the stock market or planning your dinner. Your only focus should be fighting off, or fleeing from, the threat," said Rake.

Julie Rake, MSPAS-PAC, explains the battle of "fight vs. flight."

As a result of the reduced blood flow, this part of the brain gets smaller and tighter. When this occurs regularly, the brain takes a negative hit. A functional MRI scanner would show decreased blood flow, decreased activity, and ultimately, decreased grey matter.

As for the aforementioned bugs, that dream is a result of the brain processing information throughout the day. When a great deal of your input revolves around COVID-19, the brain translates "virus" into literal bugs.

People with physical or emotional brain trauma experience similar shocks. First responders are often fast asleep when they're forced to jump out of bed to respond to an emergency. Over the course of time, the adrenaline rushes are hard on the body. Subsequently, they tend to dream more literally. This is particularly true during the pandemic when they witness more jarring incidents of people dying alone.

In fact, in an ongoing study for the general public, one Harvard psychologist indicates the increase of vivid, longer-lasting, more-detailed dreams is similar to those reported by healthcare workers and first responders after 9/11. A typical dream has them unable to save a patient's life. It's their responsibility, and there's nothing they can do.

Your mind has other ways of sending subconscious messages when stressed. You know that one where your body twitches as you drift off into slumberland? It's called a hypnagogic or hypnic jerk and reflects the disconnect between mind and body – your mind is ready to sleep, but your body has other thoughts.

Other common stress-related dreams include drowning and being shot in the chest, both of which are often the result of a brief cessation of breathing.

Being caught between sleep and wakefulness can also lead to hypnagogic hallucinations, or sleep paralysis. People in this state are convinced what they're imagining is real; it's like a dream, but they're not asleep. These strong sensations are often distorted and can be quite scary. While not exclusively stimulated by stress and anxiety, those two factors are common causes.

So, when should you be concerned about your dreams and nightmares? If you're having disturbing dreams at least five times a week, or if nightmares affect you during the day, it might be time to consult a professional.

"An increased number of clients tell us that they're having trouble falling and staying asleep," says Carrie Collins-Fadell, executive director of the Brain Injury Alliance of Arizona. "Many also report disturbing or frightening nightmares.

"In addition to the stress, grief, and loss of the past year, many survivors of brain injury have experienced trauma from the accident, illness, or event. The impact can also be felt with the ensuing changes in employment and relationships," states Collin-Fadell.

"There is help and there is hope. Educating yourself and reaching out to the brain injury community is a great place to start."

Lauri Leadley, president of Valley Sleep Center, links COVID anxiety to nightmares.

As a trained respiratory therapist, Leadley believes the most effective way to avoid sleep disorders (and subsequent nightmares) is to learn how to breathe. "It's the first thing we do when we're born, and the last thing we do before we die. We need to consciously use breath to create power within our bodies.

"Deep breathing can guide you through meditation and bring about a more peaceful sleep and better dreams. You can also train yourself to have better dreams."

Wait, what?

"Through dream imagery rehearsals, you can rewrite the script of your dreams. About 20 minutes before going to sleep, imagine a beautiful place. Take in everything around you. Then immerse yourself in that environment, writing a script for yourself. When you finally drift off, your dreams will likely be more pleasant," said Leadley.

In addition to dream imagery, Yale Medicine recommends three strategies for restful sleeping.

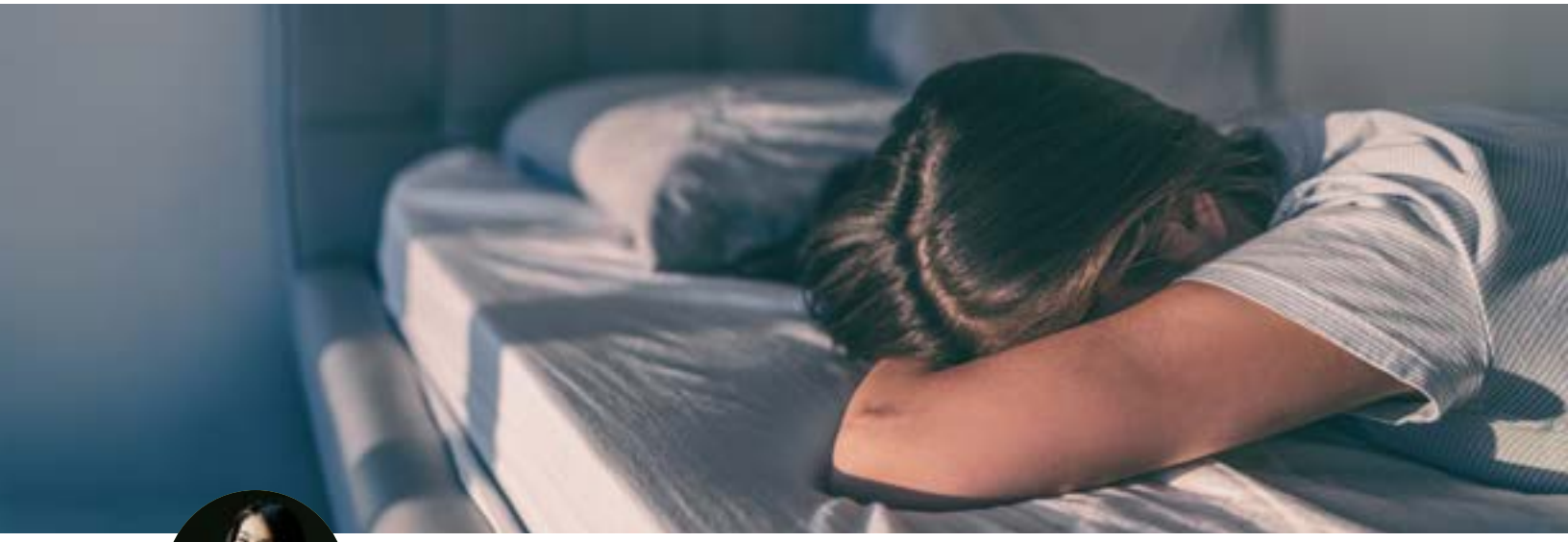
Three strategies for restful sleeping:

- *Create a healthful daytime regimen with exercise, good eating, and stress relief.*
- *Be calm before bed. Turn off that TV or laptop an hour before turning in and stay from media, especially the news or stories that get you riled up.*
- *Avoid alcohol since it can often cause fitful sleep and intense dreams.*

Follow these guidelines and you'll be on your way to a good night's sleep. After all, that is the new American Dream.

Ed Roth *was raised in Chicago and has had a long and diverse career in the entertainment and media industries. He currently resides with his family in Scottsdale, Arizona, where he enjoys playing tennis year-round.*

MEDICATION MANAGEMENT *of Sleep Disorders after TBI*



BY SHAUNA HAHN

It is estimated sleep disturbances occur in 30-70% of all individuals who have suffered a TBI.[1] Unfortunately, insomnia, fatigue, and daytime sleepiness are all common problems associated with brain injuries. Interestingly, those with mild TBIs are more likely to report sleep problems than those with severe brain injuries (although that may be secondary to lack of insight, awareness regarding the sleep problem, specifically).[2] Sleep problems may present as difficulty getting to sleep and difficulty staying asleep. Many reasons brain injury survivors experience insomnia include pain, injury to sleep/wake regulatory nuclei and pathways to the brain, PTSD, poor sleep preparation behaviors, and various other causes. Briefly, I am going to identify the different medications that may be beneficial.

Before we start, a brief reminder about the two different factors at work with regard to using psychiatric medications. One is how the medication design scientist manufactured a drug. This is called pharmacodynamics and is about the expected effects of medications. Two is how your body acts on the medications; how your genetics influence metabolism of the medications (pharmacokinetics). Some of these effects happen at a brain level and some happen in the liver where most medications are broken down and made useful. And your injured brain may also mean that drugs are metabolized more slowly.

There is no perfect medication for everyone. Always remember that.

Older Antidepressants

Many "sleep" medications are actually older antidepressants we utilize for their negative side effect of creating sleepiness.

- **Trazodone:** *Trazodone is one of the most commonly prescribed "sleep" medications. It blocks both serotonin and histamine receptors. It is mostly well-tolerated, although it does have a "sleep window," meaning that you would want to take it with the intention of going to sleep immediately. Common complaints about Trazodone include morning grogginess (although this is not a universal complaint) and an increase in vivid dreaming (it is demonstrated to decrease nightmares, though).*

- **The Tricyclics (Amitriptyline/ Nortriptyline/ Doxepin):** *There are numerous benefits to using the tricyclic antidepressants as sleep agents (and a few downsides, too). The first benefit is that, because we increase all the neurotransmitters (serotonin, dopamine and norepinephrine) with these medications, we can address many common issues following brain injury: insomnia, mood disorders like anxiety and depression, and also pain like migraines, neck or back pain. The downside to these medications is that they have a drying*

1 *Ouellet MC, Savard J, Morin CM., "Insomnia following traumatic brain injury: a review." Neurorehabil Neural Repair. 2004;18(4):187–98. Epub 2005/01/26.*

2 *Mahmood O, Rapport LJ, Hanks RA, Fichtenberg NL,. "Neuropsychological performance and sleep disturbance following traumatic brain injury." The Journal of head trauma rehabilitation. 2004;19(5):378–90. Epub 2004/12/15*

effect (anticholinergic side effect) which can contribute (although not commonly) to confusion or disorientation. More commonly, they cause dry mouth and sometimes constipation.

Controlled Substances

The following are controlled substances,[3] meaning their prescribing is monitored by the Drug Enforcement Agency (DEA). They are controlled because, with continued use, patients may be vulnerable to both psychological and physiological dependency (their minds and bodies get used to and expect more of that medication) and to addiction (using the medication for reasons other than for which the medication was prescribed or using more than prescribed). Some of the advantages of this class of medications is that they almost always work and get patients to sleep, which can be very helpful for daytime functioning, and they have actually been researched in the treatment of insomnia in brain injury.

- **Benzodiazepines (Lorazepam, Alprazolam, Clonazepam):** *This class has been called "Mommy's Little Helper." Often, these medications can have different benefits in terms of managing daytime anxiety in addition to nighttime insomnia. Lorazepam (and diazepam) can be helpful as muscle relaxers, too. The big downside to benzodiazepine use can be daytime sedation, cognitive impairment, and increased risk for falls. As well, it is not uncommon for patients just starting them to have worsened memory problems (which do tend to subside over time). The long-term risks of these medications may make them hazardous to even start.*
- **Z-Drugs (zolpidem, zopliclone):** *These are the sedative-hypnotic class of medications. They were specifically designed for one use only: treatment of insomnia. They, too, can cause daytime sedation (although this is uncommon based on their discrete, short half-life). The most sensational stories about these medications center around zolpidem. If users take this medication and do not go to bed immediately, they may do strange things they will not remember later. There are rare instances, too, of medications causing sleepwalking type behaviors (sleep eating, sleep texting, etc.). They are less likely to cause cognitive or motor dysfunction than the benzodiazepines.*

Obviously, this is not a comprehensive list of all that can be done to manage insomnia. My chief advice is to try whatever feels comfortable to you, whether that be a medication, a supplement, acupuncture, meditation, or Cognitive Behavioral Therapy. Our injured brains get so tired! And they deserve a good night's rest. Sweet dreams.

Shauna Hahn *specializes in the treatment of post-brain injury psychiatric disorders and often lectures on this topic. Shauna is excited to bring her expertise to TMS at her beautiful destination clinic, Framework Functional Psychiatry and TMS, in Lake Oswego, Oregon.* ***www.frameworktms.com***

3 *Sirdifield C., Chipchase S.Y., Owen S., Siriwardena A.N., "A Systematic Review and Meta-Synthesis of Patients' Experiences and Perceptions of Seeking and Using Benzodiazepines and Z-Drugs: Towards Safer Prescribing." Patient. 2017;10:1–15.*

PODCAST HIGHLIGHT

Adapting to Focal Dystonia:
The Billy McLaughlin Story

BY IAN HEBEISEN

When talking with Amy Zellmer on the Faces of TBI Podcast, world-renowned guitarist McLaughlin described his focal dystonia by saying, "The trouble is in my fingers, but the problem is actually in my brain, and the inability of my brain to talk to my fingers individually."

McLaughlin has built quite a career since he started touring in 1988, producing over a dozen albums in that time. Not only has he appeared on Billboard's Top 10 Charts, he's also received five Minnesota Music Awards, three National Campus Entertainer of the Year Awards, and an Emmy. But in 1999, his illustrious career faced its greatest challenge yet: a neuromuscular disease known as focal dystonia.

Often misdiagnosed as cerebral palsy, dystonia is a blanket medical term that encompasses several different conditions, each one involving some sort of muscle

Continued …

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contraction and contortion. Generalized dystonia affects the entire body, while cervical dystonia causes abnormal twisting in the neck. Other forms of dystonia may affect the vocal cords, the eyelids, and other parts of the body.

"Often misdiagnosed as cerebral palsy, dystonia is a blanket medical term that encompasses several different conditions, each one involving some sort of muscle contraction and contortion."

As for McLaughlin, his focal dystonia targeted his right hand. McLaughlin noticed he was having trouble playing his music correctly. Unsure of what the problem was, McLaughlin began seeing various hand specialists. "I went to hand doctor after hand doctor. They said, 'We can't find anything wrong,'" said McLaughlin. Many of the doctors believed his condition was psychological.

Oftentimes, people who receive traumatic brain injuries will develop some form of dystonia, possibly weeks or months after the initial incident. For example, someone who walks away from a bad biking accident may find themselves contorting their neck afterwards. As for McLaughlin, he is unsure if a specific event caused his dystonia. "I remember being in a car crash in my high school years, but all of my development of my technical skills happened after that," said McLaughlin.

"Oftentimes, people who receive traumatic brain injuries will develop some form of dystonia, possibly weeks or months after the initial incident."

In time, McLaughlin turned to the Mayo Clinic and finally began making steps towards a diagnosis. Following a day of appointments, a neurologist identified McLaughlin's condition. "It was an important step for me because it had been such a mystery," said McLaughlin.

The diagnosis led to Botox treatments at the National Institutes of Health in Bethesda, Maryland. Unfortunately, the injections did not work effectively, and McLaughlin started looking into other possible remedies. "It was very clear that there wasn't any kind of pill ... that would help you with this," says McLaughlin. "A couple other treatments ... didn't sound attractive to me, like denervation, where they go in and snip the nerves."

It became apparent the focal dystonia would not simply go away with treatment, so McLaughlin turned back to music. As a musician, McLaughlin's focal dystonia appeared very task specific: he could operate a fork and knife fine, and he could use a comb and other handheld objects, but "The minute I pick up that guitar and assume that certain posture, things go completely haywire." Determined to continue playing, McLaughlin decided to adapt to the limitations of the focal dystonia.

All his life, McLaughlin played his guitar with his right hand. Now that his playing hand kept contorting, he flipped the guitar around and began teaching himself to play left-handed. "It took a long time for me to get good on the guitar right-handed. But I thought to myself, well, what if I could get good at it left-handed?" McLaughlin developed a tapping style of guitar playing, and with some patience and determination, found himself playing the guitar once again.

This amazing display of neural plasticity not only allowed McLaughlin to overcome his dystonia, but also permitted him the opportunity to put his career back on track. In addition, McLaughlin started raising awareness for dystonia in all forms by serving as an ambassador for awareness of the Dystonia Medical Research Foundation.

In 2010, McLaughlin earned another award to showcase his illustrious career: the Public Leadership in Neurology Award, whose previous winners include Paul Allen, Julie Andrews, Leon Fleisher, and Michael J. Fox.

Ian Hebeisen *graduated from Saint Mary's University in May 2020, earning a degree in Literature with a Writing Emphasis. Now living in the Twin Cities, Ian writes comics, graphic novels, and poetry. In his spare time, he enjoys playing board games with his family.*

THE POWERFUL WAY

Sleep Cleans Your Brain and Protects You from Dementia

BY JONATHAN CHUNG, DC

Sleep is arguably the most powerful and least expensive treatment we have in our arsenal to help support brain health. We all know this intrinsically, and most of us really do want to get more sleep. For most of us, getting a good night's sleep helps us feel better throughout the day, but the latest research in neuroscience is showing us that patients who were sleep deprived had 1.68 times the risk for developing cognitive impairment or Alzheimer's Disease.

In order to understand how sleep can impact our risk of dementia, we have to understand an important piece of anatomy called cerebrospinal fluid (CSF). CSF is a water-like substance that acts as a cushion inside of our head and serves to protect the brain from the jagged edges inside the skull. CSF also plays a role in the transportation of nutrients and waste that can build up in the brain and spinal cord. From a clinician's stand point, procedures like spinal taps are an important diagnostic tool because we can see evidence of infection or degeneration that has entered the brain.

The role of CSF in brain disease has gotten stronger recognition in the last decade and more recent neuroscience studies are pointing to a massive role of deep sleep. A groundbreaking study published in 2013 by Xie et al. showed that sleep increases the flow of CSF through a mouse brain, and this increased flow removed the toxic protein clumps associated with Alzheimer's disease. This system wasn't working during the mouse's awake phase.

Said another way, the system responsible for cleaning our brains of a toxic protein that causes Alzheimer's Disease works primarily in sleep.

This was a massive finding that changed our understanding of why sleep is a powerful contributor to recovery. But does this effect happen in humans? So far, studies are saying yes.

Three major papers corroborate some of the early findings seen in mice:

1. *A PET scan study by Shokri-Kojori et al. on healthy patients showed that just one night of sleep deprivation increased the buildup of beta-amyloid by 5%.*

2. *A study by Fultz et al. using functional MRI, EEG, and CSF flow measurements has identified an electrical signal that precedes a rush of increased spinal fluid movement during sleep.*

3. *Finally, a longitudinal study by Lucey et al. studied patients with Alzheimer's disease and used sleep-tracking data. The study showed a strong relationship between loss of deep sleep and greater Alzheimer's pathology.*

So what does this mean for patients with brain injury?

We know a history of brain injury puts some patients at higher risk of neurodegenerative disease. While the big suspicion is that the brain damage itself contributes to the disease process, there's also a possibility other physiologic processes from brain injury could be drivers of dementia.

A well-known phenomenon after concussion is an increased prevalence of sleep disorders following the injury. Patients with concussion have poorer sleep quality and feel worse on waking than patients without a concussion. A variety of sleep disorders associated with concussion include sleep apnea, insomnia, circadian rhythm disruption, and narcolepsy. No matter what the disorder is, the result is a loss of the healing potential of deep sleep.

> "A variety of sleep disorders associated with concussion include sleep apnea, insomnia, circadian rhythm disruption, and narcolepsy. No matter what the disorder is, the result is a loss of the healing potential of deep sleep."

This has become such an important issue in my clinic that if any concussion patients report problems with sleep, I consider referring them for a sleep study right away. Prevention of dementia and neurodegenerative disease is certainly a consideration, but a loss of sleep is also going to impair the results patients can get from post-concussion syndrome.

We can do some amazing things rehabilitating the brain in patients with persistent concussion problems, but there will be barriers to cognition and pain improvement if the patient continues to sleep poorly.

Jonathan Chung, DC *is the founder and upper cervical chiropractor at Keystone Chiropractic and Neuroplasticity in Wellington, Florida. Learn more about their cervical vestibular rehabilitation program at* ***www.chiropractickeystone.com***

ARTICLE AND PHOTOS
BY AMY ZELLMER,
EDITOR-IN-CHIEF

NEVER GIVE UP HOPE

In June 2009, Kate D'Orazio flew to Mississippi to visit her husband, who was at Air Force Reserves training. After an evening of dining out and celebrating their time together, her husband found her on the floor of their room. She was unconscious and bleeding from the back of her head. After they got her cleaned up, they went back to bed.

The next morning, Kate assumed she just had a hangover and continued her visit. A few days later as she flew home, she knew something was wrong because she had excruciating pain in her head and was throwing up.

Kate went back to work, even though she struggled with her symptoms and vomited into a wastebasket by her desk. They sent her home. She saw her doctor who ordered a CT scan and x-rays. He told her she just had a concussion, and she should feel better in a few weeks.

Kate had several concussions in her life as an athlete, as well as a broken nose and several hospitalizations, but she always bounced back and never struggled with any lingering symptoms.

At the end of July, Kate's husband returned home and noticed that her symptoms had worsened. She made an appointment with a neurologist who performed an MRI scan and prescribed amitriptyline, an antidepressant. She continued seeing the neurologist, but he had no answers for her and her symptoms persisted.

"Kate had several concussions in her life as an athlete, as well as a broken nose and several hospitalizations, but she always bounced back and never struggled with any lingering symptoms."

In October Kate was attending a festival at church when a girl pulled a chair out from under her as she was sitting down. The fall knocked her out for 45 minutes and she was hospitalized. After a battery of tests, doctors concluded she had complex migraines and her autonomics weren't working, so she continued to see the neurologist for follow-up care.

Kate was losing time and staring into space, so the doctor prescribed anti-seizure meds, thinking she was having absence seizures. She could no longer drive, her headaches were getting worse, and stimuli often made her nauseous enough to make her vomit. She often thought at that time, "I guess this is just how I am now." She was giving up hope.

"She could no longer drive, her headaches were getting worse, and stimuli often made her nauseous enough to make her vomit. She often thought at that time, 'I guess this is just how I am now.' She was giving up hope."

In her quest to find answers, Kate had testing done for gene mutations, which showed nothing. She tried acupuncture and massage therapy, but nothing helped. She struggled to find the energy to even consider trying a new therapy, and was discouraged because nothing worked, but her husband kept pushing her, saying, "We have to keep trying."

In 2013, Kate and her husband moved to Colorado, where she started seeing a neuropsychologist. She tried doing EEG brain mapping and controlled breathing, yet again, nothing helped. A Google search led to Integrated Brain Centers in Colorado. Her aunt told her about Dr. Carrick and how he had helped hockey player Sydney Crosby, and suggested Kate consider Functional Neurology. Kate was skeptical, as nothing had helped her thus far, but in July 2014, she gave Integrated Brain Ceneters a try.

"She struggled to find the energy to even consider trying a new therapy, and was discouraged because nothing worked, but her husband kept pushing her, saying, 'We have to keep trying.'"

Continued ...

... continued from previous page.

Dr. Shane Steadman was different than anyone she had seen. He was confident he could help her through nutrition, brain-based exercises, adjustments, and supplements. She agreed to go all-in 100% and did an eight-week elimination diet. When they reintroduced foods, they found she had sensitivity to dairy, wheat, potatoes, and nightshades (foods including potatoes, tomatoes, peppers, and more).

"'The entire staff motivated me and made me feel encouraged to follow the plan and make the commitment to get better. I felt like I had the whole team on my side! They believed in me and I believed in them,' said Kate."

Kate had to shift her way of thinking about food, as she had a deep love of food and enjoyed trying different things. She started to think of food as a way to nourish her body.

As she began her treatment, she noticed little changes, but didn't feel substantially better yet. However, after about six months of treatment, she experienced major improvements: she hadn't had a major headache in weeks, and her balance was improving.

"The entire staff motivated me and made me feel encouraged to follow the plan and make the commitment to get better. I felt like I had the whole team on my side! They believed in me and I believed in them," said Kate.

Dr. Steadman explained Kate's injury was close to her cerebellum, and her body tensed to keep her upright instead of falling over. He told Kate her headaches weren't actually migraines, but were from her body constantly tensing. Once her headaches and nausea were eliminated, everything else started feeling better.

"Kate's injury was close to her cerebellum, and her body tensed to keep her upright instead of falling over. [...] her headaches weren't actually migraines, but were from her body constantly tensing. Once her headaches and nausea were eliminated, everything else started feeling better."

With regard to her recovery, Kate stated, "I'm in the best shape of my life right now!" She is currently enrolled in a masters in clinical mental health counseling program at Denver Seminary. She wants to help others who have experienced trauma.

BY DR. SHANE STEADMAN, DC, DACNB, DCBCN, CNS

The initial evaluation of Kate revealed difficulty with the coordination of her eyes, head, and her vestibular system. The mismatch of systems caused difficulty with eye movements, especially to the left. She also had trouble with balance and gross motor movements, showing dysfunction with the cerebellum. In addition, she had difficulties with fine motor movements and coordination.

She underwent therapies to reestablish communication between her eyes, head, and vestibular system.

We used gaze stability exercises and other vision therapy exercises with coordination of the head. For cerebellar rehab, gross motor movements and core exercises involving the left side of the body were utilized.

As she improved, the exercises became more complex and more intensive. With continued monitoring of her symptoms and findings, she was able to do more activities on her own as she felt more stable. Currently, she is able to do activities like rock climbing.

With the areas of her brain working efficiently, she is able to know where she is in space and is able to participate in life.

Dr. Shane Steadman, DC, DACNB, DCBCN, CNS *is the owner and clinic director of Integrated Brain Centers. To learn more about how they can help with concussions, stroke, and TBIs, please visit* **www.integratedbraincenters.com. For a free consultation, please call 303-781-5617.**

The Inauguration of My Life with **Traumatic Brain Injury**

BY JOANNE SILVER JONES

Inaugurations are times that mark a significant change or achievement, a changing of the guard or the opening of a new structure. For me, the first inauguration of President Obama has bifurcated my life. I went to Washington, D.C., in January 2009 with a carefully-planned wardrobe to protect me from the January cold and unbounded enthusiasm about being present at this historic event. Plans are just ideas. Real life owes no responsibility to ideas.

My plans disintegrated ten minutes after stepping off the D.C. Metro when a stranger assaulted me with a hammer. My skull was cracked, my hands broken, and my life re-arranged.

Since then, my life has been a journey through traumatic brain injury and post-traumatic stress disorder. My recovery has been called miraculous. I can write, speak, run, laugh, and travel. Behind the successes are daily struggles. I wrote about the hurdles and challenges in essays and in my book, Headstrong: Surviving a Traumatic Brain Injury.

On the anniversary of the assault, January 16, and during the Biden/Harris inauguration which was enveloped in violence and fear, I thought about the lessons I learned during the years since 2009. What I can offer at this point are not treatments or strategies, readings or practices. I'm not suggesting a to-do list or a don't-do-this list.

When I close my eyes and drift through time, these thoughts arise:

Hold on to your worries and fears, successes and dreams with an open hand.

To grasp is to hold tightly, giving most of your attention to what is held, rather than what is present. What is clutched can resist changes, even minor ones. An open hand allows for movement and, when necessary, letting go. A major step forward for me was learning to keep my mind in the present, and thinking softly about the future.

Let sorrow land, but not nest.

So much of what is written about trauma and healing focuses on being guided by gratitude and positivity. I agree these are important practices. But to live with a body and mind that have changed, to live with limitations that are often not visible to others, brings sorrow. Grieve for what has been lost. Feel the disappointment that some of what was lost cannot be regained. Let sorrow visit, but not become a permanent part of you.

I told my therapist during the first decade of my recovery I felt like trauma was imbedded in me. She said, "Can you think of it as a backpack, something that is on you now, but that comes off?" Her wisdom has been an invaluable guide for me.

A little kindness goes a long way.

While searching for big answers to my periods of depression or bouts of anger, I realized a simple kindness immensely uplifted me: a friend who called and asked me to lunch (pre-COVID); a stranger who helped me reach for something or made a flattering comment; the look of appreciation when I thanked the checker at the supermarket, or offered to babysit for a friend. These weren't big acts, but they shifted my emotional state.

Love yourself, love others, but be wary of loving plans and schedules.

At the time of my assault, I was on sabbatical from my college teaching position. I had plans to go away and write. I had the plane tickets. Everything was in order. Of course, none of it could happen, then or ever. I know, for certain, that we have no guarantees a plan, once made, will happen. That's when it's important to hold onto the plan with an open palm.

Healing is an inside job, but can't be done alone.

For the first year after my injuries, I went to many different kinds of therapies: hand, balance, eye, emotional. Each was painful in the beginning, and required a great deal of determination and perseverance on my part. I could not have managed to get through the therapies and daily challenges without the support of others. I needed rides and food. I needed skilled therapists and attentive friends. I needed my family to love me at each tiny or big step along the way. I felt the pain of flexing my swollen, repaired hands, but I didn't go to or leave the appointment alone.

Travel gently on your own journey.

JoAnne Silver Jones *was a college professor, and is now a TBI survivor and author.*

Sleep & TBI

LEGAL CORNER

BY JAMES A. HEUER, PA

Most traumatic brain injury patients suffer from sleep disturbances following their accidents. The brain directs sleep by putting your body to rest, but injuring your brain causes changes in sleep. The chemicals in our body help us to know when to sleep and, when you've become injured, those chemicals are affected. Taking medications after a TBI can cause additional sleep problems, such as falling asleep or staying asleep. They can also cause sleepiness that can make functioning and participating in daily activities difficult.

With sleep disturbances come an increase of issues such as depression, anxiety, fatigue, irritability, traffic accidents, and poor work performance. Studies show sleep disturbances affect roughly 60% of people with a TBI. Whether the brain injuries are mild or severe, an array of sleep problems can occur.

TBI patients frequently suffer from insomnia, which is the struggle to fall or stay asleep. Insomnia can create behavioral and cognitive problems, as well as increase the severity of slowed reaction time, creating a higher risk of car accidents. Insomnia usually improves with time, because it is at its worst right after the brain injury has occurred.

Another sleep problem detected in TBI patients is excessive daytime sleepiness, also known as extreme drowsiness. The inability to maintain wakefulness and alertness during the major waking hours of the day can increase problems in daily life. Some TBI victims suffer from daytime sleep attacks, resulting in sleeping at inappropriate times of the day. A total of 10-15% of the general population suffers from sleep attacks, while in contrast, 50-80% of TBI patients struggle with this sleep syndrome. This uncontrollable and sudden falling asleep is defined as narcolepsy and can lead to safety concerns. One example is falling asleep behind the wheel of your car while driving on a busy road.

Common sleep syndromes can coincide with sleep disorders found in TBI patients such as restless leg syndrome (RLS), which is the urge to move your legs because they feel uncomfortable, especially at night or when lying down. Another common condition is bruxism that leads you to grind and clench your teeth.

Sleep disordered breathing, more specifically sleep apnea, consists of brief pauses in breathing during sleep and is a very serious concern. Breathing control during sleep changes after a TBI, resulting in spurts of apnea. Since the sleep apnea makes your breathing stop for a time, your blood oxygen levels drop and you may snore loudly. Severe sleep apnea may even cause death.

Other mental states that TBI sleep disturbances can activate include, but are not limited to, depression, anxiety, and post traumatic sleep disorder. Patients with traumatic brain injuries have high rates of depression and anxiety. Often a TBI heightens that anxiety and depression, and at other times the traumatic injury creates the disorder. Not treating either of these conditions can and will prevent successful treatment of TBI patients with a sleep disturbance.

Although living with a TBI can cause these sleep disturbances, refractory and conventional treatments are available to help improve patients' conditions. Cognitive behavioral therapy is used for patients with insomnia to improve sleep quality, and includes stimulus control, sleep restriction, cognitive restructuring, and fatigue management. Some patients are given sleep aids for insomnia like benzodiazepines. In some cases, acupuncture is considered a viable treatment for helping with the quality of sleep following a TBI.

Different aids can treat sleep apnea following a TBI such as a continuous positive airway pressure (CPAP) breathing device, which delivers air pressure to keep your airway open. Others have had success with a mandibular device a dentist makes to reposition the lower jaw and tongue forward. The result is a reduction in throat constriction and increased airflow. It is important to use either suggested device continually, as about 50% of people abandon the treatmenttoo early, therefore making it unsuccessful.

Before treating a patient with post-TBI sleep disorders, all underlying anxiety and depression issues must be identified and attended to. Treating sleep disorders and syndromes persistently is crucial because they can delay the recovery post-TBI.

James A. Heuer, PA, *a personal injury attorney helping individuals with TBI after suffering one himself, is located in Minneapolis, Minnesota.*

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UNPACKING FATIGUE

BY JOANNE SILVER JONES

I'm an expert on fatigue. Living with TBI for 12 years, I know fatigues ebbs and flows, what mitigates and what exacerbates its intensity. I have an intimate understanding of the terrain of my fatigue and the ways in which tiredness reveals itself during the course of a day.

Discussing and describing fatigue is made more difficult because of inadequate language. I've come to realize a nuanced, temporally-focused, and explanatory vocabulary is needed to portray, to myself and others, the daily experience of being incessantly tired. Language is needed to capture the feeling of being wrapped by a casing that never comes off, sometimes weighty, sometimes light, its heft fluctuating daily like the tides. In the vast Traumatic Brain Injury community, fatigue is the most common lament.

While I don't have a new vocabulary, I can offer my view of how I unpack living with weariness that has compromised my quality of life.

Morning. Grinding fatigue.

I am retired. The alarm clock, with snooze buttons, is both a cultural relic and no longer a necessity. Typically, I get seven-plus hours of sleep each night. When I wake up, I feel as if a weight is pressing me. It's not the same as wishing for 15 more minutes' sleep after the alarm goes off, or the desire to luxuriate in bed as a way to start the day. It's more like the lead apron used in a dentist's office. My eyes open and close, as if it's very late and I'm trying to stay awake. Sometimes I do fall back asleep. Sometimes I just lie still, hoping the heaviness will lift. When it does, it feels as if a window shade has opened.

When I am actually awake, I might complain to my wife, Debby, that I feel as if I haven't slept at all. She is always non-judgmental and tells me it's OK to stay in bed. With all of the knowledge I've gained about TBI over the years, I still feel the need to apologize for lingering in bed. I'm not sure who I'm apologizing to. Maybe an inner critic who applauds a get-up-and-go attitude, or maybe a cultural critic who sees staying in bed as lazy and unproductive, or maybe voices surprised I still feel fatigue so many years after my "accident," or those who have forgotten entirely that I have TBI, and see fatigue as a sign of illness or lethargy.

Mid-morning: Groggy, need coffee

When I do get up, the first thing I do is make coffee and take medication to help me be alert. Over time, I learned the importance of starting the day with a routine. Once up and coffee made, I read the newspaper, organize and write down my plans for the day, and, typically, put those plans in sequence of most essential to the least to do. I limit the list to three or four items, such as read or walk on the beach. Then I'm ready.

Late morning to early afternoon: Most energy; most cognitive focus

This is the time of day that most approximates what I imagine I was like pre-TBI. This is when I take a yoga class, go to an exercise class, or exercise on my own. It's when I plan visits with friends or do necessary errands. It is also when I can do my most intensive cognitive work. I write or review the work I've written. I read for pleasure and for inspiration. During these hours, I can digest and analyze ideas, focus on content, and articulate my thoughts. Typically, words flow easily and I can remain engrossed in whatever I'm doing.

Mid to late afternoon: The veil of fatigue

I grew up in San Francisco. Every afternoon between 3 and 4 pm, the fog rolled in. At first, just a hint of grey appeared on the horizon, and then gusts of wind arrived to blow damp air and obscure the blue sky. I think of the San Francisco fog when, in the late afternoon, a mental fog descends on me. My eyelids begin to feel heavy, and it takes exertion to keep them open. At this point, all I want to do is lie down and close my eyes. I don't want to talk, hear noise, or focus on anything.

Now, I build an afternoon rest into my daily schedule. Even if I don't fall asleep, closing my eyes, lying still, and surrounding myself with silence all help to loosen the cloak of fog, and make space for the evening.

Early evening: Limited energy

After a rest, the fog-wrap lifts and I have energy, though limited, for the remainder of the day. It is the time of day when my cognitive capacity is noticeably compromised. I may mispronounce a word or say one word when I mean another (green for yellow; tomorrow for yesterday). I forget small things or larger things, like a time commitment. My thinking is more concrete, nuances in a conversation escape, and my sense of humor is dulled. This is not the best time for social engagements, though it is the most conventional time. I find myself in the uncomfortable position of saying no to invitations, or wanting to leave a social event earlier than others. I'm still the tired one. Early evening is a time of day when I can do things like cook, clean, or watch TV.

Evening: Full circle to grinding fatigue

Late evening for me is about 9 or 10 pm. I used to be a "night owl." I liked to stay up late reading, working, or watching a movie. It's now the time when I again experience what I call grinding fatigue. By the end of my day, the grinding fatigue has returned. I find the energy to get into bed. Sleep finds me quickly.

I took years to acknowledge and accept that fatigue is part of my brain injury. Complaining won't make it go away. Perhaps the most important step has been accepting and recognizing I need to live as harmoniously as possible with this reality.

Some lessons I've learned about how to live in concert with my fatigue:

- **Acknowledging and naming:** *TBI and fatigue are part of my life. Wishing it weren't so does not change the truth or the impact, and resisting this fact only adds stress to an already stressful truth.*
- **Stop apologizing and explaining:** *Daily tiredness is part of my chronic medical condition. I don't need to apologize any more for the sequelae of TBI more than a diabetic has to apologize for taking insulin and eating on a regular timetable.*
- **Mitigating to reduce stressors:** *While fatigue is a product of TBI, I can do things to moderate the resulting limitations and consequences. I can adjust my days in accordance with my own rhythms of weariness. I can exercise some control over the degree to which my life is upended.*
- **Finding band width:** *About seven years into living with TBI, my doctor told me, "Find your band-width," meaning the range in which I felt most relaxed and least stressed. Finding my band-width meant letting go of things that appropriated my energy and things that absorbed my focus and imposed non-stop, anxious, thought loops. One significant step I took was to reduce the size of my living space. I moved from a four-bedroom house to an apartment. I no longer had to deal with snow, lawns, repairs, or replacing a roof or appliance. For me, this change significantly reduced the stress in my life and the running commentaries in my head.*
- **Building a scaffold:** *I identified basic components of the day that provided me with structure and calm, including coffee, naps, exercise, writing, less time on social media, and reducing news intake.*
- **CPAP:** *I had resisted the idea of using a CPAP machine. My concerns were all connected to self-consciousness. Two years ago, I finally started to use one. My doctor said even a 1% increase in sleep would make a significant difference in my brain health. I almost immediately noticed a change in the quality of my sleep and an increase in cognitive focus.*
- **Medication:** *I have taken medication consistently over the past 12 years. I take medication to reduce anxiety and depression, to deal with pain, to control seizures, and to help me be more alert. I am so grateful for the quality of life pharmaceuticals afford me.*
- **Meditation:** *Four years ago, I took a course called Mindful Meditation for Stress Reduction. After several weeks in this course, I noticed a distinct decline in the frequency of mind-loops, the incessant going over conversations or events that had happened or might happen. I also noticed more often that, when my mind started to wander, I was more able to interrupt and pull myself back into the moment. This skill, which I am always trying to maintain and improve, helps reduce stress and bring a sense of calm.*

Dealing with fatigue remains a daily battle. As with any effort to improve health, I need to remain vigilant to do what helps and be careful to avoid behaviors and practices that exacerbate the ever-present TBI fatigue. I am learning to build a satisfying, joy-filled life, with limitations, but also with bountiful hope.

JoAnne Silver Jones *was a college professor, and is now a TBI survivor and author.*

CAREGIVER CORNER

BY IAN HEBEISEN

My mom's TBI started the way most do: unnoticed. Six-and-a-half years ago, she stopped at a red light only to realize the car behind her wasn't slowing down. On instinct, she braced for impact, causing severe whiplash, which ended up doing more damage than if she had relaxed. She walked away with what she thought was a headache and minor back tightness, only to be later diagnosed with a TBI.

Shortly after the collision, my mom learned she suffered five herniated discs, as well as soft tissue damage. Four months later, she was diagnosed with a concussion. More issues began to arise including nerve damage, vision impairment, and tremoring. Many doctors, tests, and appointments later, my mom's current diagnosis is a traumatic brain injury with a related movement disorder. As time goes on, our family is still discovering new information regarding my mom's condition.

Following the accident, we noticed immediate differences in our family functions. Many projects were suddenly put on pause: yardwork, cleaning the garage, even daily chores like doing the dishes. Tasks my mom used to handle began overloading her system, causing fatigue and convulsions. Something as simple as a song with a little bit of dissonance could knock my mom out of commission.

Our family has always been the clownish type. Family dinners consisted of whizzing one-liners and quips. Nowadays, Mom repeatedly comments on how she can't keep up with us. She takes jokes quite literally, so more often than not, a punchline will go over her head. This results in hurt feelings because she cannot tell if we're genuinely picking on her or just making jokes. At best, she understands the basic idea behind the joke; at worst, the humor gets to be too much and she starts getting overloaded.

Needless to say, my mom's TBI tore an irreparable rift in our original family dynamic that changed who we are and what we used to be to each other. But it also forced us to change how our family worked together, and who we are as people. Instinctively, I started reading food labels with greater diligence because my mom's allergies grew worse. I now ask my mom how she's handling chores and life multiple times a day. This has actually carried over to my work; I continually ask my coworkers if they need any assistance.

Our family began listening more. We grew more patient with one another. We communicated our needs with greater efficiency. I'm not trying to frame my mom's TBI as some magnificent blessing that united us; if I could undo my mom's accident to relieve her of pain and improve her functions, I would do so in a heartbeat. But this TBI has forced us to adapt and overcome in a manner we never would have known otherwise. It challenges us every day, and we will continue to face this challenge head-on for the love of our family.

Ian Hebeisen *is a Minnesota-based writer, currently living in Minneapolis. He graduated from Saint Mary's University in May 2020, earning a degree in Literature with a Writing Emphasis. Ian began interning for Faces of TBI in the spring of 2021. In his spare time, Ian writes comics and poetry, and enjoys playing board games with his family.*

Can a Pair of Eyeglasses Influence Sleep?

Short Answer: YES

BY DEBORAH ZELINSKY, O.D.

Eyeglasses may improve eyesight, but will they reduce the impact traumatic brain injury can have on a patient's sleep? Based on a growing amount of global research, including studies and clinical experience at the Mind-Eye Institute in Northbrook, Ill., the answer is "yes."

But, to understand the "how's" and "why's," we must first explain the neurobiology of sleep and role of the brain's hypothalamus, which is directly connected to the retina.

The sleep-wake cycle encompasses complex functions involving both internal hormonal systems (chemical signaling) and the reticular activating system (RAS), a network of neurons (electrical signaling) that emanate from the brainstem and link to the brain's hypothalamus, according to authors of a study published in 2019 in the journal *Nature and Science of Sleep*. The hypothalamus not only plays a critical role in sleeping and waking patterns by regulating production of hormones like melatonin, but it is also tied to many other essential physiological functions, including body temperature, blood pressure, appetite, emotions (limbic system), motor control, and circadian rhythm. Indeed, the hypothalamus is part of what maintains the body in a condition of healthy balance. In addition to all the internal signals, the sleep-wake cycle is influenced by external stimuli, such as sunlight and blue light projected from computers.

Traumatic brain injury (TBI), as well as stroke and other neurological disorders, can disrupt the body's balance in several ways including interrupting biochemical communications to and from key brain structures, such as the hypothalamus; directly inflicting damage on brain structures; and disrupting synchronization among eyes, ears, and other sensory systems.

Loss of sensory synchronization affects visual processing and may lead to multiple symptoms: vertigo, headaches, light and sound sensitivities, anxiety and stress, attention and comprehension problems, an inability to read and interact normally in social situations, memory problems, and a general sense of "not feeling like yourself."

Experts contend that nearly 50 percent of patients with brain injury — even those with mild TBI — experience some form of a sleep disorder like insomnia, hypersomnia (extreme daytime sleepiness), sleep apnea, and narcolepsy. Why? Because TBI oftentimes changes the brain's responses to light, and any disruptions in those responses can impact basic physiological functions, including normal sleep patterns.

"Experts contend that nearly 50 percent of patients with brain injury — even those with mild TBI — experience some form of a sleep disorder like insomnia, hypersomnia (extreme daytime sleepiness), sleep apnea, and narcolepsy."

Now we'll go back to the therapeutic role of eyeglasses and how optometry can work as an adjunct profession during rehabilitation from a brain injury.

Light stimulates different types of receptors in the retina, which is composed of brain tissue and functions as part of the central nervous system. Those receptors in the retina activated by light obtain "information" from the light and "communicate" — in the form of electrical impulses — with the hypothalamus and other important brain structures.

Continued …

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Light governs major, internal physiological systems including circadian rhythm (which helps regulate sleep and alertness), our sleep drive, and other behaviors associated with the sleep-wake cycle. Indeed, regular shifts in lighting — from day to night — set the body's circadian clock, "telling" us, through the release of hormones and production of internal biological chemicals, when to sleep, when to awaken, when to eat, when to exercise, when to work, and when to relax. If this normal rotation of light is disturbed, such as by flying across time zones, for example, we can experience fatigue, functional and attention difficulties, and other debilitating symptoms commonly described as jet lag. Light is even associated with body temperature and other basic functions. For example, in the dark, while we sleep, heart rate and body temperature drop, appetite is suppressed, and movement lessens.

"Light governs major, internal physiological systems including circadian rhythm (which helps regulate sleep and alertness), our sleep drive, and other behaviors associated with the sleep-wake cycle."

Scientists tell us to avoid the "blue" light from computer monitors, iPads, and mobile phones before going to bed. That is because blue light blocks the retinal receptors that produce melatonin. With those receptors blocked, people do not feel as sleepy and remain alert. During the daytime, this is helpful, but blocking those receptors by using computer screens or falling asleep with a television screen flickering at night is detrimental. Even through closed eyelids, blue light can make a difference in sleep quality and brain activity. Meanwhile, some researchers suggest use of red lights before going to bed because light's red wavelength enables more productive, refreshing sleep. Science also notes the link between light and rapid-eye-movement (REM) sleep, when noradrenaline levels change.

The goal of the Mind-Eye Institute team is to guide brain-injured patients in gaining a larger range of comfort and tolerance, as well as a quicker ability to recover from internal or external changes. With a larger range of comfort and tolerance, often symptoms decrease, and quality of life is enhanced. And one of the ways in which the Mind-Eye Institute accomplishes that goal is with therapeutic "brain" glasses, which are highly individualized and prescribed only after comprehensive patient testing. This type of eyeglass prescription is designed for activating peripheral eyesight, rather than clear, central eyesight. When the peripheral eyesight is comfortable and stable, the central eyesight becomes clearer, because depth perception and aiming ability improve.

By varying the intensity, amount and angle of light passing through the retina, "brain" glasses literally help create new information signaling pathways in the brain. These new pathways circumvent damaged or disrupted "communication" lines and re-establish more typical signaling patterns between the outside environment the retina takes in and many other brain pathways. The glasses also integrate eyes, ears, and other sensory systems and enhance visual processing, often restoring patients to a more stable sense of balance. All this is possible because the brain is readily able to change at a cellular level, meaning it can adapt to new light pathways that "brain" glasses help develop.

The investigators writing in *Nature and Science of Sleep* conclude that "future research should continue to focus on diagnosis and treatment questions" related to "early identification and management of sleep disorders" in brain-injured patients.

At the Mind-Eye Institute, that "future" is happening now.

Deborah Zelinsky, O.D., *is a Chicago optometrist who founded the Mind-Eye Connection, now known as the Mind-Eye Institute. She is a clinician and brain researcher with a mission of building better brains by changing the concept of eye examinations into brain evaluations. For the past three decades, her research has been dedicated to interactions between the eyes and ears, bringing 21st-century research into optometry, thus bridging the gap between neuroscience and eye care.*
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Mind-Eye Helps Head-Injured Marine 'Return to Person I Was'

Utah Patient 'Blown Away' by What Eyeglasses Do for His Injured Brain

If you or someone you love has experienced a brain injury or feel like "something is different," please take our free online "Brain Quiz" or speak with one of our New Patient Advocates and come in for a Mind-Eye exam today by contacting our office at 847-750-4616 or visiting us at https://mindeye.com/tbiquiz

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WHERE AND WHEN

Do I Contact a ***Lawyer*** *for My* ***TBI****?*

BY JEFFERY M. HELLER

Soon after an accident that causes a TBI, a hundred things will be thrown at you almost immediately. Medical bills will start coming in, and after a couple months, possibly even collections notices. Letters from insurance companies asking you to sign forms will start flooding your inbox. Your car or other belongings that were damaged in the accident will need to be replaced or repaired – who will pay for that? All the while, your employer expects you to show up every day and your family needs you. This is not to mention the entire time these things are flying at you, you are suffering the effects from an injury that will likely be with you forever. So what do you do? The answer is easy: hire a TBI lawyer.

What to Do After a TBI Accident

- *Call 911 and get medical help.*
- *Make sure the police properly investigate the circumstances surrounding the accident.*
- *Call a lawyer who specializes in TBI cases and have them handle all the paperwork for you.*
- *Monitor your symptoms and go back to the doctor if they worsen or do not go away.*

A TBI lawyer can organize everything being thrown at you and take care of it for you. Instead of trying to respond to all the paperwork, phone calls, and e-mails yourself, the lawyer can work as your advocate and speak on your behalf. They will protect your rights and make sure you are not being taken advantage of. They will also guide you through the insurance claim and ensure you receive a fair result. After an accident, the only way to attempt to be made whole is through an insurance claim against the person or company who caused your accident, and only a TBI lawyer can help you achieve that.

Finding a lawyer who specializes in TBI is crucial. Although numerous lawyers handle personal injury cases, TBI cases are different. The injury is unique and is not always straightforward. Because of this, a TBI survivor needs a lawyer who specializes in TBI cases.

When you speak to a lawyer about your case, you should ask them what their specialty is. Nowadays, all lawyers specialize. If they do not say they specialize in TBI cases, you should probably look elsewhere. Of the lawyers who tell you they specialize in TBI, you should ask them how many TBI cases they have successfully resolved in the past five years, and how many TBI cases they have taken to trial. You should also ask them whether they have represented clients with the same symptoms as you have and what the result of those cases were. Your case is too important not to ask these questions. If you were going in for heart surgery, would you let a back doctor perform the surgery? It is the same thing with lawyers. Make sure to protect yourself after your accident by hiring a TBI lawyer.

Jeffrey M. Heller *is a trial attorney with Nurenberg, Paris, Heller & McCarthy Co., L.P.A., in Cleveland, Ohio. Mr. Heller focuses his practice solely on personal injury and medical malpractice. He frequently represents traumatic brain injury (TBI) survivors in a wide range of cases, including medical malpractice, motor vehicle accidents, premises liability, and construction defect cases. Mr. Heller firmly believes in the right to trial by jury and has tried more than 25 cases to jury verdict. In the past three years, he has obtained more than $3 million in jury verdicts alone. Mr. Heller has been included on Ohio's Rising Star list, which is selected by the research team at Super Lawyers. He has also been selected to America's Top 100 Personal Injury Attorneys and the National Trial Lawyers Top 40 Under 40*

YOGA: *WARRIOR III*

BY AMY ZELLMER, EDITOR-IN-CHIEF

Yoga is a powerful tool for recovery after brain injury. Contrary to some beliefs, everyone can do yoga — you don't need to be super flexible, have great balance, or even be able to stand up. The beauty of yoga is that every pose can be modified to accommodate anyone.

An important aspect of yoga is your breath. Connecting your breath to your body and flow, and getting oxygen flowing to your brain, is what makes yoga so powerful for recovery. Yoga is also a time to quiet the mind by helping anxiety and distracting thoughts drift away.

Warrior III Pose (Virabhadrasana III) is an intermediate pose that adds a balance challenge to the standing Warrior sequence. It's an energizing pose that will help you build lower body and core strength, as well as mental focus.

Some of its many physical benefits include strengthening the legs, building core strengths, and improving balance.

Instructions:

1. *Begin in a lunge with your right foot forward, knee bent 90 degrees over the foot and your rear leg extended.*
2. *Lean forward and bring your weight into your right (forward) foot. Keep your left knee bent as you begin to lift your left foot up.*
3. *Straighten your right leg and continue to position your torso parallel to the floor.*
4. *Extend your left leg straight back, while reaching your arms forward.*
5. *Keep both hips level and pointing toward the floor.*
6. *Keep your upper foot flexed with your toes pointing to the floor, actively engaging the leg muscles.*
7. *Bring your arms back to your side when you are ready.*
8. *Bend your right leg to step back into Warrior I*
9. *Repeat the pose on the other side.*

Adjustments and modifications:

- *Beginners may wish to do this pose by a wall, either facing the wall with your hands on the wall, or turning around and bringing your lifted foot onto the wall.*
- *You can also hold onto a chair for balance.*

Join me for weekly accessible yoga classes for only $10 a month through my Patreon membership site: ***www.patreon.com/amyzellmer***

Tapping Into **ANGELITE** *for Sleep*

BY KRISTEN BROWN

HEALTHY LIVING

Sleep can be elusive or we can sleep too much. Sleep can recharge us or it can drain us. The fine balancing act in finding the right sleep schedule, routine, and timing can be tricky business indeed. But many crystals can help us find peaceful, healing, and restful sleep.

One awesome stone for sleep is Angelite. The soothing greyish-blue crystal induces calm, brings connection to the Universe, and reduces stress.

Here are three specific ways Angelite can help you get better sleep:

1. *Calms Your Thoughts – One of the most common reasons we can't sleep is a spinning mind. Angelite helps calm an overactive brain.*
2. *Heals Emotional Pain – Often sleep becomes problematic when we are going through emotional turmoil. Angelite helps soothe painful feelings.*
3. *Creates Inner Peace – Angelite helps align our energies and bring focus to overactive or distracted thoughts. When you feel scattered, this stone helps bring you back to yourself.*

Angelite can be set anywhere in your bedroom to help you sleep. Set it next to your bed to call in soothing energy or under your pillow for a reminder you are supported in your sleep habits and rest routine.

Kristen Brown *is a bestselling author, keynote speaker, and energy medicine practitioner who charges up her clients by syncing up their body/mind/spirit for work and life growth.* ***www.namaSync.com***

ESSENTIAL OILS: *Peace & Calming*

BY AMY ZELLMER, EDITOR-IN-CHIEF

HEALTHY LIVING

Essential oils are a complementary tool that can help you achieve a healthy lifestyle. They are easy to use, versatile, and smell great.

> **All oils are not created equal. Young Living is the only brand I personally trust because I know they have complete control over their product from seed to seal.**

Oils sold at health food stores can be misleading. They are not regulated by the FDA, so you must look closely at the labels. The labels may say they are 100% therapeutic-

Continued …

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grade oils when they are not. If the ingredients list anything other than the plant stated, or if the label has statements like "For external use only," "For aromatic use only," and/or "Dilute properly," the oil inside that bottle may have been cut with other oils, synthetics, or chemicals.

Peace & Calming

Peace & Calming® is a gentle, sweet blend of Blue Tansy, Orange, Tangerine, Patchouli, and Ylang Ylang and is one of Young Living's most popular essential oil blends. With a calming, sweet aroma, this blend is one you'll love using during your children's bedtime and for yourself after the house has settled down.

This fragrant oil blend is a wonderful addition to your meditation, evening routine, or playtime with the kids. With a comforting, fresh aroma, Peace & Calming has become a popular oil for everything from enhancing the environment in your home to applying as a personal fragrance for any occasion.

- *Apply Peace & Calming to the bottoms of your feet at night as part of a bedtime ritual for your whole family.*
- *Dilute the essential oil with V-6 Vegetable Oil Complex for a calming back massage before naps or bed.*
- *Add 4–5 drops to 1 cup of Epsom salt for a centering bath at the start of the day or as part of a calming evening routine.*
- *Add the oil to Young Living Bath & Shower Gel Base for a cleanser your entire family will love.*

For more information on how to use essential oils, please visit: ***www.facesoftbi.com/eo***

EGG & TURKEY STUFFED PEPPERS

BY AMY ZELLMER, EDITOR-IN-CHIEF

HEALTHY LIVING

Ingredients:

- *4 eggs*
- *4 egg whites*
- *2 tbsp. almond milk*
- *1 tsp. coconut oil*
- *1 small onion, chopped*
- *1 lb. (450g) lean ground turkey*
- *2 tsp. oregano*
- *1 tsp. cumin*
- *2 cups (60g) spinach, chopped*
- *4 red medium bell peppers*
- *½ cup (50g) cheese (dairy or plant-based)*
- *parsley, chopped to serve*

Instructions:

1. *Heat oven to 400°F (200°C).*
2. *Beat the eggs, egg whites and milk, then set aside.*
3. *Heat the coconut oil in a pan over medium heat. Add the onion and cook for 3 minutes until softened and browned.*
4. *Add in the turkey, oregano and cumin, season with salt and pepper. Cook until meat is cooked through, about 5 minutes. Then add the spinach, and mix until it wilts about 2 minutes.*
5. *Increase the heat and add in the eggs. Pull the eggs across the skillet with a spatula. Repeat for about 3 minutes until eggs are cooked. Then set aside.*
6. *Cut the peppers horizontally and remove the seeds, then stuff with the scrambled eggs and turkey.*
7. *Place the peppers in a baking dish and sprinkle them with grated cheese.*
8. *Bake in the oven for 15 minutes, until cheese has melted and the edges have browned.*
9. *To serve, sprinkle with chopped parsley.*

Serves: 4
Prep: 5 Mins
Cook: 20 Mins

STAYING ASLEEP or GOING TO SLEEP?

BY DR. SHANE STEADMAN, DC, DACNB, DCBCN, CNS

One of the most common complaints among patients is sleep, for a variety of reasons. They simply don't get enough sleep, or it's disrupted sleep. When patients say they can't sleep or they have insomnia, the first question I ask is, "Do you have a hard time going to sleep or staying asleep?" As you are reading this article, ask this question of yourself, and then explore ways to promote sleep. The answer is usually one or the other, sometimes both. Let's investigate the most common causes. Hint: there are similarities between the two main categories.

1. Difficulty Going to Sleep

Falling asleep is a frustrating aspect of sleep and can cause a lot of anxiety. Patients will talk about having anxiety after dinner knowing they can't fall asleep. Sometimes, they lie in bed thinking about how they can't fall asleep and eventually proving themselves correct. Others will sit in bed or watch TV until they fall asleep. These patients are essentially engaging in an activity until their system finally calms down enough to go to sleep.

Potential mechanisms to start evaluating are blood sugar and/or adrenal imbalances. The most common causes of blood sugar imbalances are associated with higher-than-normal blood sugar (fasting glucose levels above 100). The most common group to experience this is people who are insulin resistant or diabetic. However, people who are dysglycemic or have fluctuating levels of blood sugar can also experience this type of insomnia. One strategy to balance blood sugar levels is exercise and monitoring carbohydrate intake. Exercising helps with increasing the cells' need of fuel, thereby utilizing sugars in circulation. Along with exercise, monitoring carbohydrate levels and the intake of sugar can be crucial to getting to sleep sooner. The most common sources of carbohydrate/sugar intake are ice cream, wine, chocolate or some other type of dessert. Even when people have a "little piece," it still creates a surge of glucose, and then insulin. Additionally, abnormal surges at night and instability of glucose can impact the production of serotonin in the brain, which converts to melatonin for sleep.

In addition to blood sugar, the next area to evaluate is adrenals. Adrenals are involved in stress responses and cortisol production. Most people have experienced a stressful event, and then lie in bed trying to fall asleep. These episodes are acceptable, and everyone knows it's temporary. However, for the person who has been under chronic stress, going to sleep can be very difficult. Chronic stress can be related to a job, family dynamics, friends, or physical stress (health issues or inflammation). Most do not understand that if the body is inflamed, an adrenal component is involved. Blood sugar instability can also cause an elevation in cortisol affecting sleep, which then leaves the person waiting for their blood sugar or cortisol to lower to allow them to fall asleep. Finally, cortisol can activate the area of the brain called the midbrain. This area of the brain is involved in the fight or flight mechanism.

To summarize, altering blood sugar levels can affect serotonin and the conversion of melatonin, both of which aid in sleep. Cortisol can increase the sympathetic stress response and activate the brain.

While sleep issues are incredibly frustrating, some solutions include:

- *Maintain blood sugar stability throughout the day and especially into the evening.*
- *Reduce simple carbohydrates and consume more complex carbohydrates, and include quality fats and protein in each meal.*
- *Exercise in the form of walking can help with cortisol levels and can help with blood sugar levels.*

- *Deep breathing and/or meditation can help calm the midbrain and reduce stress.*
- *Reduce the amount of light stimulation at night such as computers, tablets, cellphones, and TVs. These devices can increase arousal of the brain.*
- *Use adaptogenic herbs such as ashwagandha and holy basil for adrenal support.*
- *Use supplements that support proper blood sugar when levels are high.*
- *Develop a sleep routine each night.*

2. Difficulty Staying Asleep

The other side of the coin is those individuals who have a hard time staying asleep. Often, they can fall asleep within 20 minutes, but can wake up 2-5 times a night. Some are able to fall back asleep fairly quickly, while others can be awake for an hour or two at a time. People will also talk about either waking up and lying there, or waking up and their brain will not stop. Some will even mention waking up in a cold sweat and worrying about events from the previous day or things they need to do the next day.

Again, looking at the mechanisms, two major areas need evaluation. The first is glucose and the second is adrenals. The opposite from the previous section will be discussed with these patterns, low glucose and low adrenal function. Low glucose levels are the more common patterns for blood sugar. In my office, we look at a more narrow range, which is called a functional range, as opposed to traditional ranges, but subtle changes for some individuals can have a big impact on sleep. Clinically, patients whose blood sugar levels test below 80 will describe symptoms of low blood sugar. An important item to note is that a neurotransmitter called GABA is utilized to help with inhibition (calming) of midbrain structures and limbic structures. GABA is converted from glutamate which is a byproduct of the TCA cycle involving glucose. Therefore, low levels of glucose can have an impact on GABA production. This is seen when someone becomes "hangry," jittery, shaky, or anxious. Someone sleeping requires a level of glucose the brain needs to function and GABA to keep the brain calm and in a state of sleep. With low blood sugar, sleep can be disrupted, and individuals will wake up. Often, they will complain of waking up hungry. In a low blood sugar state, or hypoglycemia, the brain can release epinephrine via the brainstem and cause arousal and even a stress response. The effects of that are waking up and having difficulty going back to sleep.

With regards to adrenal function, it's common to see low cortisol levels throughout the night. This can be measured using salivary testing at night. One of the many roles of the adrenal function is to support glucose during times of fasting. When looking at circadian rhythms (sleep patterns), glucose levels decrease throughout the night over time, while cortisol levels increase over time. Cortisol levels remaining low can lead to a neurological response that results in arousal. Symptoms can include waking up sweating, hot, heart racing, or anxious.

Low glucose can influence an abnormal production of GABA, which is used in the midbrain and the brainstem for sleep. Low levels of cortisol, or an abnormal rhythm maintained by the hippocampus, can cause a loss of sleep in the middle of the night.

Solutions for disrupted sleep due to poor adrenal function include:

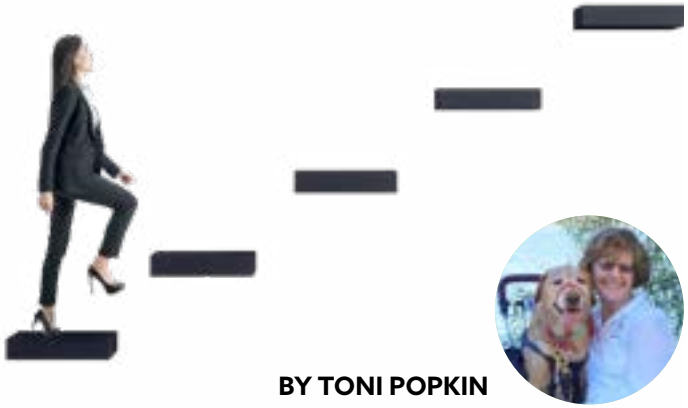
- *Make sure to eat enough at dinner with good quality protein and fat, in addition to healthy carbohydrates.*
- *If needed, consume an evening snack (i.e., ½ apple with almond butter) to support blood sugar before going to sleep.*
- *Utilize supplements such as phosphatidylserine for support of circadian rhythms and hippocampal function.*
- *Take adaptogenic herbs such as ashwagandha and holy basil for adrenal support.*
- *Develop a proper sleep routine.*
- *Maintain proper blood sugar throughout the day and do not skip meals.*

There are other opinions, options, apps and techniques for sleep. Focusing on the basics and understanding how physiology works is the baseline for identifying the cause of sleep issues. Once a person has identified whether they have a hard time falling asleep or staying asleep, finding tools to help the individual will be quicker and easier.

Dr. Shane Steadman, DC, DACNB, DCBCN, CNS *is the owner and clinic director of Integrated Brain Centers. To learn more about how they can help with concussions, stroke, and TBIs, please visit* ***www.integratedbraincenters.com.***
For a free consultation, please call 303-781-5617.

THE CLIMB

Post-COVID Long Haulers



BY TONI POPKIN

April 2020. That was about a year ago when I was diagnosed with COVID-19. Little did I know what a roller-coaster, foggy ride I'd have. Little did I know how similar it would feel to experiencing my Climb following my TBIs.

I started a diary 35 days after my diagnosis. My intention was to post my "Recovery" writing online. In writing this article, I referred back to read the entries I had written … all 13 of them! So much for my initial idea of being consistent in documenting my Climb.

As anyone who has had a Traumatic Brain Injury knows, it's not always possible to be consistent. Brain fog and fatigue are two of the many reasons for this. I found this theme running through all my entries.

Let's go back to the beginning.

I wasn't hospitalized when first diagnosed with COVID. I was, and am, very fortunate to have a wonderful team of doctors who believe COVID can cause multiple issues in our body. They don't downplay what has been happening nor brush it off as I've sadly heard other Long Haulers have experienced.

In fact, I had quite the opposite experience. I received daily (seven days a week) phone calls to check on me for any changes in my symptoms, my vital signs, and my overall well-being for the first month.

I had a wonderful support group of friends who made sure I had food and meds, as well as made sure I received phone calls and cards. Bud, my service dog, got the needed care I couldn't give him. These friends understood I very much appreciated all of it, even if I was too tired to reply right away.

I encountered many surprises along this bumpy roller coaster ride in addition to the fatigue and brain fog.

When I was young, I had a few medical conditions that have been well controlled for many, many years. One is asthma. I had gone from frequent trips to urgent care and being on multiple inhalers and a nebulizer in my youth to going for about 20 years of almost never needing to use an inhaler. I didn't even have one that wasn't expired. Suddenly, in the middle of last summer, I found I started having more and more asthma attacks with no idea why. My doctor didn't seem surprised. The suspected explanation: COVID, which is an inflammatory virus and attacks vulnerable organs that have been inflamed in the past.

During the fall of 2020, I was hospitalized three times for double pneumonia as a result of the damage COVID caused. It had to be one of the scariest periods of my Climb. Alone, without Bud for the first time, no visitors allowed, and, as I later found out, in guarded condition in a hospital I had been to before but that looked very different due to COVID, was awful. I found myself in tears more times than I can count as nurses, respiratory therapists, aides, and doctors came in wearing protective gear that looked scary to me and looked very uncomfortable to spend all day wearing.

I still don't know if the respiratory damage from COVID is permanent.

The asthma is only one of several suddenly uncontrolled medical issues that had been well controlled for years. Like having my TBIs, I was also surprised every time something new popped up and surprised whenever I suddenly realized I could no longer do something.

Anger: that was another theme I found running through my diary. I felt anger at people who did not take the virus seriously, those who refused to wear a mask and those who believed as soon as you are no longer contagious, you are OK. I also felt anger at the misleading messaging coming from our elected leaders. Overall, I felt anger that I have one more very real invisible disability severely impacting my life through no fault of my own.

I have a piece of artwork I made on my wall. It reads "Remember What's Going Right."

Some days I still find I'm in such a fog, I look at an email or Facebook post and realize I'm taking in nothing I'm seeing. Some days Bud very persistently stares at me if I get out of bed for more than 10 minutes telling me, "Get back to bed. You're too exhausted to safely do anything." Some days it's mid-afternoon and I realize I have not yet eaten.

On all of those days, I have to look at my sign and remind myself I'm still alive. I have a great team of friends and professionals who support me and help me believe the bumps on this roller coaster ride will get smoother. I just don't know when. Growing up, I never liked going on roller coasters. I don't think I'll give it another try.

Be safe. Wear a mask, not for yourself, but for those around you that you care about. Hope others do the same to protect you and those you love.

Toni Popkin *along with her service dog, Bud, live in Virginia, where she advocates and educates about service dogs and about people like herself who have a TBI.*

LIFE LESSONS LEARNED *From a* TBI

AMY ZELLMER
EDITOR-IN-CHIEF

I first became a Citizen's Advocate with the Minnesota Brain Injury Alliance (MNBIA) during the 2016 Legislative session. All the noise and stimulation at the Capitol was a little overwhelming for me at first, but by 2017, I became a regular fixture for "Tuesdays at the Capitol."

During one of our Tuesdays, several members from the MNBIA were present to help us create our mask for the "Unmasking Brain Injury" project. I was hesitant at first because I just wasn't feeling very artsy that day. But I knew it was an important project and made my way to the room to work on my mask.

As soon as I started painting my mask with some pink and purple (my two favorite colors), and then added some sparkles to it, I was having a really good time. The art project actually became a bit therapeutic. I had been a writer and a photographer all my life and was good at expressing myself through these two art forms; however, creating the mask opened a whole new chapter for me.

In February of 2017, MNBIA had an exhibit at the Capitol for "Disability Awareness Day" and a reporter from Channel 5 News briefly interviewed me about my mask. My take-away message was that while my injury may be invisible, I am NOT! This has turned into my mantra, and I even began an awareness campaign of my own because of it: **#NOTINVISIBLE**.

The project gave voice to survivors who may not be able to express themselves more clearly than through art. It gave the public and opportunity to pull back the curtain and see what brain injury means to those living with it every single day. Through the unmasking project, I hope we are able to create a bridge between those living with brain injury and the community at large to help them better understand the daily struggles of life with a TBI.

Moral of the story: Always be willing to share your story, whether that's through writing, art, speaking, or even creating your own mask. The process can be deeply therapeutic, and you never know who your story may touch.

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