THE BRAIN HEALTH MAGAZINE

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Ketogenic Diet for TBI

Nutrition-Learning *Connection*

THE NUTRITION ISSUE

Living Your Best Life After Brain Injury | July/August 2021

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FROM THE EDITOR

Can you believe summer is half over already? As we slowly begin to return to our first sense of normalcy since the pandemic began, it's important to acknowledge the fact we all managed to survive a year and a half of isolation and disrupted life —

Way to be resilient!

In this issue we are focusing on nutrition. Nutrition is especially important for those living with brain injury, but equally important for our caregivers and loved ones. Whether it's staying hydrated, taking supplements, or trying a keto diet, you're sure to find some great information in this issue.

With farmer's markets in full-swing, this is the perfect time to read up on nutrition and find recipes to help you meet your nutrition goals while supporting your local farmers.

For me personally, upping my protein intake was a huge game-changer in my symptoms. Eating a high-protein breakfast first thing in the morning, munching on high-protein snacks throughout the day, and eating a nutritious protein snack several hours before bed are all a part of my daily ritual.

Additionally, upping my water intake was important in my recovery as well. With the brain being roughly 73% water, you can imagine it needs a lot of hydration to function properly. The average person needs an amount of water arrived at by dividing their body weight in half … example: a 150-pound person should be drinking 75 oz of water every day. Additionally, if you drink caffeinated or alcoholic beverages, you will need to drink more water to counteract the dehydrating effects of caffeine and alcohol… example: if you drink 16 oz of coffee, you need an additional 16 oz of water in additional to the 75 oz you should already be drinking.

Choose your beverages wisely!!

Also, if you've ever been concerned about which foods to invest the extra money for organic, we have a handy guide for you in this issue. We list the "clean fifteen" and the "dirty dozen" to help you make informed shopping decisions.

As you flip through the pages of this magazine, I encourage you to take notes and reach out to the professionals to seek further guidance.

There's no reason to continue having difficulty making good choices with your nutrition when so many treatment options are available to you.

AMY ZELLMER, EDITOR-IN-CHIEF
@amyzellmer

The Nutrition-Learning Connection:

Three Food Mistakes That Impact Your Child's Brain

BY DR. AMY MOORE

Research and reports about the importance of nutrition for our health and the health of our children are ubiquitous. Nearly every day, we hear about calorie intake, balanced meals, and key vitamins and minerals. And the latest diet trends permeate social media. From keto to Paleo to intermittent fasting, there's always something new to consider before we eat that next bite! But how often do we think about food choices when it comes to our children's ability to learn and perform in school? Here are three common food mistakes that impact the function of the developing brain along with tips for minimizing them:

Food Mistake #1: The Sugar Binge

You've no doubt read that excessive sugar intake is directly correlated with childhood obesity and the development of type 2 diabetes. But what about the impact of excess sugar on a child's brain? Many teachers dread Halloween and Valentine's Day classroom parties at school. They lament over the hyperactive chaos that ensues following games, crafts, music, and the ingestion of pounds (seriously, pounds) of candy, cupcakes, cookies, and soft drinks. But it might surprise you to learn the sugar isn't causing all that hyperactivity. It's just the excitement about the celebration (and maybe a little caffeine).

Sugar actually has a sedating effect. Consuming excess sugar inhibits the production of the hormone orexin, which stimulates the brain into feeling awake. Ironically, even though sugar creates sleepiness, it also inhibits rapid eye movement (REM) sleep, the type of sleep we need to feel rejuvenated in the morning.

So, the day after Valentine's Day or Halloween is when we see the influence of all that sugar. The day after a sugar binge looks like the mind-numbing aftermath of being hit with a tranquillizer dart. A child cannot participate meaningfully in learning while coming off a sugar-induced sleepless night. The brain simply can't manage to concentrate or focus in that condition.

"The day after a sugar binge looks like the mind-numbing aftermath of being hit with a tranquillizer dart. A child cannot participate meaningfully in learning while coming off a sugar-induced sleepless night. The brain simply can't manage to concentrate or focus in that condition."

How can we minimize this food mistake? Combining protein-rich foods with sugary foods helps prevent the problems with reduced orexin production. Include a meat and cheese tray alongside the cupcakes and encourage kids to eat both!

Food Mistake #2: Skipping Breakfast

I get it. Mornings with kids are rough. You wake them up six times, send them back to their closet for a re-do of that hideous outfit, sign a permission slip that was due the day before, find a missing backpack, let the dog out and back in, find a missing gym shoe, and help with last-minute math homework, all before the bus arrives. And all while getting yourself dressed and ready for the day! It's easy to see how breakfast can be too time-consuming for the morning routine.

However, research has shown time and time again that breakfast is essential for attention, memory, and executive functions—all key skills that underlie the ability to think and learn. Science also tells us that children who eat breakfast not only focus better in the classroom, they also have higher grades and standardized achievement test scores than children who skip breakfast. (Even after controlling for differences in socioeconomic status.)

> "Research has shown time and time again that breakfast is essential for attention, memory, and executive functions—all key skills that underlie the ability to think and learn."

Children's brains need glucose for energy, but they metabolize it twice as fast as adults. What isn't used up during waking hours is depleted overnight. This means children need a source of glucose first thing in the morning if their brains are going to function properly at school.

How can we minimize this food mistake? Provide well-rounded breakfast options for your children. A combination of protein, fiber, and complex carbohydrates is ideal for maximizing the brain's potential at school. It requires a little planning and a few extra minutes, but the rewards are much bigger than the effort it takes us.

Food Mistake #3: Not Drinking Enough Water

Water sounds boring to many kids. Instead of arguing with them, it's sometimes easier to hand them a juice box on the way out the door. But water is essential for brain function. The brain depends on water to provide energy to brain cells which need twice as much energy as any other cells in the body. Without it, the brain cannot produce neurotransmitters, the chemicals responsible for nerve signaling and communication. Therefore, when kids don't drink enough water, basic cognitive functions like attention, memory, and reasoning ability are compromised. These skills are required for performing math, learning to read, and acquiring new information.

You may be wondering if drinking other beverages is adequate for kids, especially for those who don't like plain water. The answer? Yes…and no. Fluid intake is the goal, but research has shown that kids who drink less water also tend to drink less milk and more sugar-sweetened beverages. So, it's important to be choosy when choosing those fluids.

> "When kids don't drink enough water, basic cognitive functions like attention, memory, and reasoning ability are compromised."

How can we minimize this food mistake? Encourage kids to drink plain water rather than sports drinks and soft drinks. Save those for special occasions. Allow them to choose their own water bottles for school and activities outside the home. Water bottles come in a variety of colors with fun patterns and favorite characters that can help entice younger children to drink. Older children may benefit from choices for more mature taste buds, such as unsweetened, but flavored sparkling water.

The connection between nutrition and learning is firmly grounded in science. Research on brain development and learning continues to confirm the downsides of consuming excess sugar, skipping breakfast, and not drinking enough water. A few adjustments to our daily routines and refrigerator shelves can make a big difference in school performance for kids of all ages.

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***

FASTING

Part of a Good and Healthy Brain Diet

BY SANA U. KHAN, MD, PHD

When discussing brain health and nutrition, one's mind often starts thinking about fruits, vegetables, dietary supplements, vitamins, proteins, etc. Rarely does one consider intermittent fasting as a potentially valuable part of brain nutrition. Well, let's look into some medical benefits of why fasting should be part of a good and healthy brain diet.

In a process called "metabolic switching," fasting actually triggers a shift in the resources your body uses for energy. The process of metabolic switching allows the body time to first use stored glucose in the liver, and then utilize fatty acids and ketone bodies for energy. This triggers a biological cascade in the body which scientists believe may build the brain's resilience and productivity, as well as boost its support system. Metabolic switching between glucose and ketones is when cognition is best and degenerative diseases are kept at bay. As a recent paper in *Nature Reviews Neuroscience* put it: "Metabolic switching impacts multiple signaling pathways that promote neuroplasticity and resistance of the brain to injury and disease."

Fasting for extended periods may also help generate new brain cells. Studies have shown that when groups of mice were deprived of food every other day for windows of between 12 and 16 hours, they had higher levels of specific protein markers compared to mice that were not deprived. These markers indicate new brain cells were being made, suggesting the fasting mice may have been making new brain cells more efficiently and at a faster rate than the control mice.

Interestingly, fasting boosts a chemical called Brain Derived Neurotrophic Factor (BDNF) that can help make your neurons more resistant to stress. Research in the *Journal of Nutrition Health & Aging* found that after three months of intermittent fasting, study participants reported improved moods and decreased tension, anger, and confusion. Another study from 2018 investigating weight-loss strategies found intermittent fasting was associated with significant improvements in emotional well-being and depression. "One thing we found pretty recently, that may explain the ability of intermittent fasting to reduce levels of anxiety and also protect against a number of neurological disorders, is that intermittent fasting will enhance the ability of nerve cell networks to control their activities and electrochemical activity," says Mark Mattson, head of the National Institute on Aging's neuroscience laboratory.

> **"[A]fter three months of intermittent fasting, study participants reported improved moods and decreased tension, anger, and confusion."**

Avoiding high blood sugar levels in our bodies is beneficial for many reasons. Research in the *British Journal of Nutrition* shows that intermittent fasting produces greater improvements in insulin sensitivity, which helps you prevent high blood-sugar levels and type 2 diabetes. The journal Neurology has published findings showing high blood sugar is associated with a smaller hippocampus, the seahorse-shaped structure in your temporal lobes associated with mood, learning, and memory.

Studies have also shown that anxiety and depression are two to three times higher in patients with type 2 diabetes than in the general population. Dr. Mattson noted that mice who fasted regularly were healthier by some measures than mice subjected to continuous calorie restriction; they had lower levels of insulin and glucose in their blood, which signified increased sensitivity to insulin and a reduced risk of diabetes.

Scientists at the Buck Institute for Research on Aging have shown how fasting benefits the brain on a neurological level. Within only a few hours, dietary restriction triggered a response from molecular pathways that govern synaptic activity, or neurotransmitter release. By reducing the release of neurotransmitters from synapses in the brain, fasting may also give the nervous system a break. Neuroscientists have linked overactive synaptic activity with neurodegenerative diseases such as Alzheimer's, Huntington's and Parkinson's disease, and therefore fasting could be an effective preventative measure. "We believe that tuning of synaptic activity as a result of acute fasting might be beneficial for people who are at high risk for neurodegeneration," says Dr. Pejmun Haghighi, a professor at the Buck Institute.

"Studies have also shown that anxiety and depression are two to three times higher in patients with type 2 diabetes than in the general population."

Fasting helps remove damaged mitochondria, the powerhouses of our cells, in a process called autophagy. This can lead to improved energy pathways and give us that extra boost in energy and brain power! Essentially, autophagy is the process by which your brain "takes out the trash" that builds up during the day. This self-cleaning process helps detoxify the brain, clear out old and damaged cells, and sweep away debris. This nightly housekeeping promotes the regeneration of newer, healthier cells. A wealth of research has shown that problems with autophagy have been linked to Alzheimer's disease, depression, bipolar disorder, schizophrenia, and other neuropsychiatric disorders.

Fasting boosts brain function and can improve learning efficiency. Restricting the hours when you eat has been shown to significantly improve memory, according to a study in the *Journal of the Academy of Nutrition and Dietetics*. In this study, after four weeks of intermittent fasting, performance on a spatial planning and working memory task and on a working memory capacity test increased significantly. Additional research on animals has found intermittent fasting improves learning and memory.

"Fasting boosts brain function and can improve learning efficiency. Restricting the hours when you eat has been shown to significantly improve memory, [...]"

Fasting also leads to reduction in the body's internal inflammation. Chronic inflammation has been linked to many brain disorders, including depression, bipolar disorder, obsessive compulsive disorder (OCD), schizophrenia, Alzheimer's disease, and more. According to a study in *Nutrition Research*, intermittent fasting decreases inflammation, which can have potent benefits for your brain health and mental well-being.

Intermittent fasting helps reduce blood pressure which is beneficial for the heart, and anything that's good for your heart is also good for your brain. Having hypertension or pre-hypertension lowers blood flow to the brain. Low blood flow on brain imaging scans has been seen with depression, bipolar disorder, schizophrenia, ADD/ADHD, traumatic brain injury, substance abuse, suicidal thoughts, and more. In addition, low blood flow is the #1 brain imaging predictor that a person will develop Alzheimer's disease.

While these are some of the benefits of fasting for our brain's health, they are certainly not all. As research in the area of brain nutrition grows, we will certainly continue to learn how to eat better to improve our brain functions and perhaps how not to eat to accomplish the same.

Dr. Sana Khan *is an accomplished radiologist, researcher, teacher, and entrepreneur. He was the first radiologist in the United States with the Stand-Up Weight-Bearing MRI and has contributed significantly to the advancement of this technology. He is a nationally- renowned scientist conducting ongoing research with the Departments of Orthopedic Surgery at UCLA, USC, UCSD, and the US Department of Defense. Having developed state-of-the-art MRI techniques, Dr. Khan brings extensive expertise in the medical-legal aspect of imaging musculoskeletal and traumatic brain injuries.* ***www.expertmri.com***

The Potential of *Ketogenic Diet* for TBI

BY JONATHAN CHUNG, DC

Ketogenic diets have become popular within mainstream culture as a controversial methodology to promote health and weight loss. This dietary approach that emphasizes a diet high in fats with very-low carbohydrates was popularized by Dr. Robert Atkins for weight loss. While the benefits of keto for weight loss and cardiovascular health are up for debate, the origins of the ketogenic diet suggest a therapeutic benefit for the health of the brain and the treatment of neurological disorders.

Use of the ketogenic diet for medical purposes can be traced back to 1921, when it was used for drug-resistant epilepsy. The theory was that a high-fat diet would induce a shift in cells utilizing the metabolic products of fat metabolism (ketone bodies) for energy instead of the default energy source of glucose. The dietary goal of increasing more ketone bodies in the blood is known as ketosis, and which is where the ketogenic diet derived its name. Clinical trials on the diet found that this dietary strategy was able to reduce seizure events by 50% in many cases.

With the discovery that ketosis had therapeutic value in seizures, additional studies observed the effect of ketosis on other neurological diseases. Studies in humans have shown some potential in patients with mild cognitive impairment/ early Alzheimer's disease, migraine headache, Parkinson's disease, and multiple sclerosis.

> **"Studies [on ketosis] in humans have shown some potential in patients with mild cognitive impairment/ early Alzheimer's disease, migraine headache, Parkinson's disease, and multiple sclerosis."**

So, what about concussion and other forms of traumatic brain injury?

Currently we don't have clinical trials to inform us, but there have been animal studies and anecdotes in humans that may give us some insight. Animal models of traumatic brain injury have shown that a ketogenic diet helped to reduce neuron cell death, decreased swelling, and reduced the production of inflammatory free radicals in the brain after TBI. It also appeared to improve cerebral blood flow and energy production of mitochondria in animal brain tissue. Overall, a ketogenic diet after brain injury appeared to increase survival in small animal models.

While animal studies can inform on some of the unique biochemical effects of a ketogenic diet, they are not great at translating into human outcomes. What have human studies shown us so far? Unfortunately, not a whole lot. We know that a keto diet can be used safely in patients with brain injury, and a small pilot study on post-concussion syndrome showed some small improvements.

While my practice is primarily focused on structural and neurological rehabilitation, I frequently get asked about nutritional strategies or recommendations for patients with concussion and other brain-related issues. While the clinical evidence for post-concussion patients is weak, I have often recommended a ketogenic type diet for some patients if they don't have any cardiovascular or endocrine risk factors. The ability of keto to reduce oxidative damage and neuroinflammation in epilepsy could translate for some concussion patients.

This appears to be most effective for patients with migraine type of headaches and lingering cognitive issues, especially if a patient may be prone to metabolic issues related to insulin resistance.

Currently larger studies are being done to figure out this problem, but in the meantime, keto may be a safe action to try to overcome some problems related to TBI.

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***

YOU ARE WHAT YOU EAT

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

Our brain is the most metabolically-active organ in the body. In a resting state, the brain utilizes about 20% of the body's energy. Even when we are sleeping, the brain is active with processing and transmitting information. Food and nutrition play a role with mood, behavior, cognitive function, sleep, and energy. People often notice certain foods will influence function. For example, dark chocolate can make some people feel happier, whereas caffeine helps others to feel sharper and more productive. While some food and nutrition can improve function, it can be the opposite for other foods. Inflammatory foods can lead to brain fog and changes in memory, as well as contribute to migraines. There is even discussion of a connection between diabetes and Alzheimer's.

There is much discussion around certain diets, foods, and supplements. The ketogenic diet has become popular with supporting certain conditions like seizures. The Mediterranean diet has been viewed as beneficial for brain function due to the consumption of healthy fats, oils, and fish. A change in dietary habits can be the quickest way to make a change for a better brain. Many studies and articles suggest that reducing inflammatory foods and decreasing oxidative stress can improve longevity of brain. Implementing changes can start with vegetables.

Your mom always said to eat your veggies and now you have good reasons to do so. Vegetables provide antioxidants, vitamin K, folate, beta carotene, vitamin E, and much more. The rule of thumb is the more color and darker, the better. This rule of thumb also pertains to fruit. Fruits like blueberries, blackberries, pomegranates, kiwi, and strawberries contain flavonoids, antioxidants, and vitamins such as vitamin C. Many articles and studies suggest eating fruits high in flavonoids and antioxidants can help with nerve signals, transmission, and even supporting the hippocampus for memory. When following the rule of thumb, two to three cups of vegetables and one to two cups of fruit a day is the goal.

The human brain is about 60% fat. Consuming nuts, seeds, and healthy oils is the next step into promoting a healthy brain. Foods like almonds and walnuts are high in antioxidants and essential fatty acids (EFAs). Seeds such as flaxseed, chia seed, and pumpkin seeds are other foods that provide EFAs and support the brain. As mentioned earlier, the Mediterranean diet consists of healthy fats and oils. Olive oil is synonymous with this eating style. Unhealthy fats such as trans fats can lead to inflammation and oxidative stress. Cooking with and consuming healthy fats can yield big rewards later with aging. Simply substituting olive oil or coconut oil instead of vegetable oil for cooking is a start. Other oils such as grapeseed, flaxseed, and olive oil can be great on salads.

Along the same thinking as fat, another great way to get healthy fats into our diet is consuming fish. Fish provides high-quality protein and essential fatty acids that are great for brain function. Two different type of fats come from fish: EPA and DHA. DHA is the primary fatty acid that helps with reducing inflammation, cognitive function, memory, signaling, recovery, and much more. The body can only make a small amount of DHA, and therefore needs to be supplemented through diet. The goal is to consume fish once a week. For those who cannot and do not like eating fish, supplements can be used instead. When taking a supplement, maintenance is approximately 2,000 – 3,000 mg per day.

Overall, when looking at nutrition and brain health, we can consume many foods daily or weekly to support a healthy brain. It does not need to be difficult or expensive to implement something like this into your regimen. In addition to the above, other foods to look at for brain health include foods such as avocados, turmeric, broccoli, dark chocolate, and green tea. Go online, learn new recipes, and have fun.

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.

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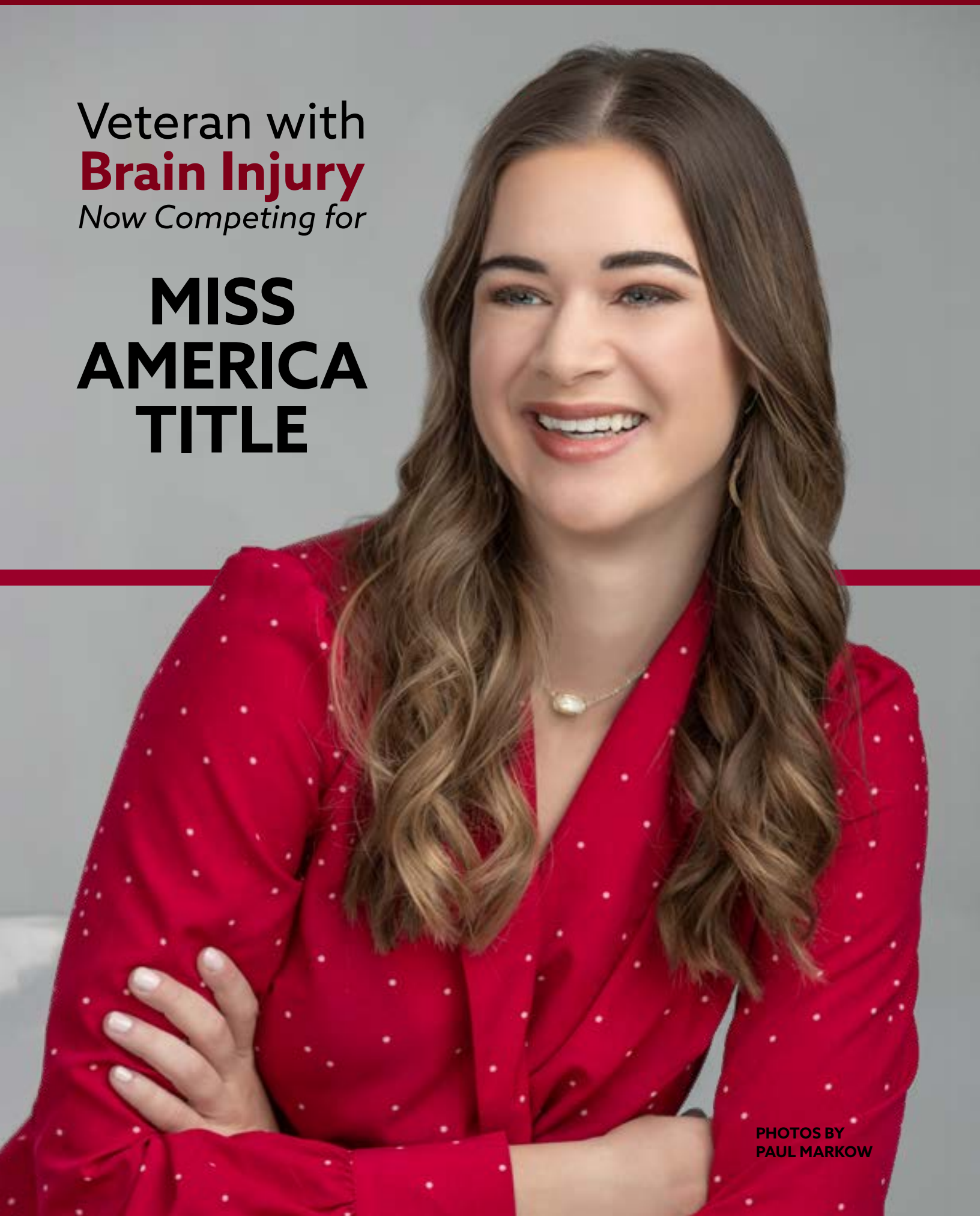

PHOTOS BY
PAUL MARKOW

BY ED ROTH

On the surface, Danielle Skranak seems to be living the American Dream.

For the past four years, she has been a paralegal; for the past six months, the Army veteran has been Program Coordinator for the Arizona Foundation for Women. In addition to helping women and children create better lives for themselves, the reigning Miss Gilbert (AZ) is in the running for the 100th Miss America competition.

But the story behind the story runs much deeper.

The eldest of five children, Danielle led a very active high school career, running cross country and track. She passed up college scholarships to follow her father's footsteps and joined the Army as an enlisted Military Police soldier.

In her second week of basic training at Ft. Leonard Wood (Missouri), her life changed in an instant. She was carrying 40 pounds of gear, as was the recruit in front of her. He dropped his gear, knocking her off balance, and she fell headfirst onto the hard concrete.

In 2014, the accepted wisdom among the sergeants was to shake off a head injury by sleeping it off and staying quiet in a dark room. Three days later, she was still in pain and finally made her way to the ER, where an MRI and CT scan revealed she had contusions on her brain.

Army doctors prescribed amitriptyline and she was sent on her way. Suffering from long- and short-term memory loss, as well as aphasia (inability to remember words), she somehow managed to finish basic training.

Four months later, she was stationed at Ft. Leavenworth (Kansas), working inside the prison. One night while on shift, she passed out, losing her hearing and eyesight. At the hospital, her dosage was increased, and she was later medically discharged from the Army.

Separated from the service, she didn't know where to turn. However, she wasn't prepared for the uphill battle. "The Army really didn't help me transition to the civilian world. You know, we have no personal responsibility and are not encouraged or seek outside help. It was viewed as a weakness."

> **"The Army really didn't help me transition to the civilian world. You know, we have no personal responsibility and are not encouraged or seek outside help. It was viewed as a weakness."**

Danielle cites fellow enlistees who had been bullied for seeking help to treat their brain injuries. "These invisible disabilities were debilitating," she says. "Instead of referring these troops to programs, they were told to 'Be a leader, be on your own.'"

She also felt resentment from others who didn't believe she had a brain injury; instead, many thought she was trying to get out of work, specifically overnight shifts at the prison. "The stigma is the biggest thing to overcome. And when you're a woman, it's even tougher. You can't show vulnerabilities." She soon left the job and looked for something else.

> **"The stigma is the biggest thing to overcome. And when you're a woman, it's even tougher. You can't show vulnerabilities."**

Living in Kansas City and working as a dietitian's aide, she found herself in an abusive relationship with nowhere to turn. "One night I thought I would die; I was hanging out of the window screaming for help. When the police showed up to arrest him, I was so embarrassed. How could I go from working in a military prison complex where I walked among criminals, studying them, to being in a domestically violent relationship myself? I honestly didn't know what to do next. I just remember feeling very lost."

Fortunately, Friends in Service of Heroes (FISH) discovered her plight and helped her get basic living supplies, including food and furniture. To this day, she remains active with the organization that helps disabled veterans overcome the unique challenges they face, especially those with traumatic brain injury (TBI) and post-traumatic stress disorder (PTSD).

Danielle's journey was just beginning.

She had to find a way to support herself and build a career. She met an attorney, Elizabeth Brown, who had experienced similar tragedies and took her under her wing, training her to become a paralegal. Almost overnight, Danielle was making a substantial income and had her own apartment.

In 2018, and off medication, an amazing thing happened: both her short- and long-term memories started flooding back. As she explains, "It's not like all was blank, it was more like a dream. Now I feel normal because I can relate to family stories and events. I'm not quite sure how it happened, but you know what they say about each brain injury being like nobody else's."

Continued …

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Today, Danielle is the Young Professional Program Coordinator for the Arizona Foundation for Women, helping make a difference in the lives of women.

She also urges veterans to tell their stories, encouraging those who have served to join support groups at the Brain Injury Alliance of Arizona, where she's involved with veterans' and women's groups. She says the healing can begin even before joining. "Writing every day in a journal is a great way for you to see how far you've come. It's like looking at 'before and 'after' pictures."

> **"Writing every day in a journal is a great way for you to see how far you've come. It's like looking at 'before and 'after' pictures."**

"As a professional speaking about her personal experience with abuse and brain injury, Danielle is a trailblazer," says Carrie Collins-Fadell, Executive Director of the Brain Injury Alliance. "There can be such an unnecessary stigma around brain injury. We have people that would rather go without help than reveal they might have a brain injury.

"Military personnel are particularly vulnerable due to their unique culture of hiding perceived weaknesses. It's always wonderful when you hear of someone like Danielle not only working hard to live well after brain injury, but using it as a platform to help others."

Speaking of "after" pictures, the 25-year-old is representing her hometown of Gilbert, AZ, as Miss Gilbert, the first step to hopefully being crowned Miss America later this year.

"I'm proud of the strides I've made, and I want others with brain injury to understand there's always hope," beams Danielle. "You can really make a difference in your life once you realize you can."

For Danielle Skranak, the future couldn't be brighter.

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.*

How To ***FAST-TRACK*** Your ***ROAD TO RECOVERY*** Through INTERMITTENT FASTING

BY ERIK REIS, DC, DACNB, CBIS

I have yet to meet a patient who told me exactly how to fix them after their injury. Why? Because every single person has different needs, requirements, and issues that need to be addressed in some capacity. Some may require specific therapies, while others might need a detailed nutrition program. Many patients benefit from counseling, and for others, an integrative approach to healing meets their needs. Regardless of these individual requirements, all patients inevitably share one thing in common: their hope of recovery.

And while this may sound simple, as most of you know, it isn't always easy. Healing from a brain injury isn't always guaranteed and can be full of many ups and downs before finding answers to the endless number of questions one may have. But that doesn't mean answers aren't out there. Thinking outside the box can be very beneficial when you have yet to find a solution to your problems.

The brain isn't binary, yet we know a tremendous amount of information regarding it, related to function and steps towards recovery. And this is where the rubber meets the road because regardless of the amount of knowledge one may have about clinical neuroscience, it comes down to taking action and implementing strategies for healing and recovery.

These strategies don't have to be earth-shattering, as very few need to be, because once we understand some basic metabolic principles of the brain and body, we can start to develop a program for healing. And this is where intermittent fasting (IF) comes into play.

What Is Intermittent Fasting?

Intermittent fasting is a cyclic pattern of eating where you switch between periods of eating and periods of fasting. It can consist of specific time intervals (12, 16, 18, and even 24 hours) and carries no limitations on what types of foods you can eat, as long as you do not ingest any calories during your fasting timeframe. Most protocols suggest starting in the evening and ending the following day because most of the fasting process will occur while you're asleep, easing any feelings of hunger or energy crashes that may occur along the way. This also allows the novice user to ease into a fasting protocol, which can improve compliance and facilitate consistency over time.

In most instances, sugar-free drinks such as coffee, herbal teas, and even lower doses of MCT (medium-chain triglyceride) oil are tolerated to alleviate any hunger pangs. Caffeine has also been shown to further enhance the beneficial effects of fasting, as it carries the potential to increase the brain and body's ability to use ketones for fuel instead of glucose.

Intuitively, this may sound like a punishment, but many people report feeling higher energy levels, improved mood, greater mental clarity, and enhanced sleep. Why? Because fasting has a diverse spectrum of healing benefits.

Fasting Does A Body Good

Although it may sound counterintuitive, fasting is very beneficial for our brains, bodies, and gut. First, fasting helps us balance our blood sugar and increase insulin sensitivity, which is a big deal considering 42.4% of our adult population in the United States is considered obese. And even if you aren't obese, increasing insulin sensitivity can be very beneficial for cellular growth and repair, as these mechanisms also enhance protective action within our DNA. It can also trigger beneficial changes in inflammatory markers, including c-reactive protein (CRP) and tumor necrosis factor-alpha (TNF-α), along with improvements in the circulating levels of adiponectin, leptin, and brain-derived neurotrophic factor (BDNF).

Breaking down food in the stomach and absorbing nutrients in the digestive tract is a highly demanding and energy-intense process. Fasting allows the body to take a break from digestion, allowing the body to allocate this energy to increase reparative processes globally.

Fasting can also help optimize circadian rhythms, which can become dysfunctional with injuries and head trauma. And although these circadian rhythms are commonly associated with sleep, they also affect the gut microbiome, positively altering the diversity and concentrations of beneficial bacteria.

Your Brain Loves Ketones; It Hates Inflammation

Your brain is primarily fueled by glucose, but following a traumatic event, energy-producing mechanisms dependent on blood sugar become dysfunctional, triggering a destructive neuro-inflammatory cascade. These energy-producing processes are flexible, which is why the utilization of ketones from fasting can be so beneficial in promoting healing and recovery.

Intermittent fasting, when utilized for extended periods, causes glycogen stores within the liver to become depleted and promotes the production of ketones via lipolysis from fat cells. These ketones subsequently become the primary fuel source for our cells. They can even downregulate pathways that utilize glucose, allowing time for healing and recovery in these pathways that become damaged or dysfunctional due to injury.

Luckily, ketones can be used as a primary fuel source for neurons, facilitating fat loss and decreasing overall inflammation levels. And since excessive visceral and subcutaneous fat has been correlated with altered cognitive processing and reduced volume of the medial temporal lobe, fasting can serve multiple purposes for optimizing the brain and nervous system.

Fasting also upregulates cellular autophagy, a process where new cells replace old cells, which become dysfunctional with conditions like Alzheimer's, Parkinson's, and multiple sclerosis. Some studies even point to signs showing intermittent fasting can promote the growth of new neurons within the hippocampus, which could significantly improve treatment outcomes in Alzheimer's, dementia, and medication-resistant seizures.

Actions Speak Louder Than Words

The best part about fasting is that it's free, effective, and can be easily implemented into a daily routine. When done once or twice a week, fasting can yield significant health benefits. Still, it should always be done underneath the supervision of a licensed medical provider to ensure adequate follow-up and consideration of medical history.

So, if you are looking to fast-track your road to recovery, take a back seat and give your brain and body some time to repair through intermittent fasting.

Dr. Erik Reis *is a chiropractic physician and board-certified chiropractic neurologist at The Functional Neurology Center in Minnetonka, Minnesota. He holds a diploma in neurology from the American Chiropractic Neurology Board and is a certified brain injury specialist (CBIS) with the Brain Injury Association of America. He has completed numerous hours of additional post-graduate coursework utilizing clinical applications and therapeutic interventions in the neurological and nutritional rehabilitation of traumatic brain injuries, concussions, and vestibular disorders through the Carrick Institute of Clinical Neuroscience.*
www.theneuralconnection.com

If You Are What You Eat, Then You Are What You See

BY DEBORAH ZELINSKY, O.D.

When it comes to nutrition, the eyes have it – literally.

In other words, what you put into your mouth (and thus, stomach) determines what enters your bloodstream. The blood carries oxygen, nutrients, and other needed elements to the retina (lining) of your eye. If the blood fails to deliver proper nourishment, the photoreceptors (rods and cones) of the eye can suffer.

Rods and cones are the photoreceptor cells that provide for eyesight. Each eye contains about six million cones and 120 million rods. Cones are activated in daylight and bright, artificial light, while the eye is dependent on the rods in dim light. If unhealthy particles are circulating in the blood and escape through retinal barriers, they can damage the photoreceptors over time.

"The blood carries oxygen, nutrients, and other needed elements to the retina (lining) of your eye. If the blood fails to deliver proper nourishment, the photoreceptors (rods and cones) of the eye can suffer."

Typically, the rods and cones work as a team, with the rods governing peripheral eyesight used for spatial judgment of surroundings, such as shape, size, location, and speed of targets in the background, and the cones are used for seeing sharp details on non-moving targets. A degeneration of the cones, for example, would affect central eyesight and require using peripheral eyesight more, relying on the general glimpsing judgments rather than seeing details with the brain filling in what it thinks is seen. When glimpsing, it is easy to make mistakes. For instance, when using mainly peripheral eyesight, during this time of COVID-19, the word "vacation" can fool the periphery into thinking it reads "vaccination."

However, it is not simply dependency on one set of photoreceptors more than another that makes poor nutrition so potentially impactful. The retina is composed of brain tissue and is a functioning part of the central nervous system. Only a portion of it is devoted to eyesight. The retina serves as a two-way communication portal between the outside eyesight and internal systems in addition to eyesight centers, such as sleep centers (seen in jet lag), posture centers and mood regulation. Entering light

activates chemical signals in the retina which eventually convert into electrical signals and, in turn, control eye movement and visual attention.

Retinal processing impacts physical, physiological, and psychological systems including motor control, biochemical activity, and perception. Just as in cases of brain injury and neurodegenerative disorders, like Alzheimer's and Parkinson's diseases, improper nutrition can create a toxic environment for retinal tissue and lead to disruption of the delicate balance between central and peripheral eyesight.

When central and peripheral eyesight systems fail to interact appropriately, and sensory systems, especially eyes and ears, fall out of synchronization, impacting internal stress levels, patients become confused about their surrounding environment, have a narrowed perception and awareness, exhibit inappropriate reactions and responses, and experience difficulties with visual skills, such as learning and memory.

"Just as in cases of brain injury and neurodegenerative disorders, like Alzheimer's and Parkinson's diseases, improper nutrition can create a toxic environment for retinal tissue and lead to disruption of the delicate balance between central and peripheral eyesight."

Research also indicates that nutritional deficiencies increase a person's risk for developing eye diseases, most notably macular degeneration, which is a deterioration of the center portion of the retina. In a study published in a 2017 issue of the Proceedings of the National Academy of Sciences, investigators reported finding a link between nutrition and retinal damage. Specifically, authors indicated rodents fed a high glycemic diet – namely, foods that spike blood sugar levels and cause the body to produce more insulin – were more likely to exhibit signs of retinal damage similar to that of patients with a certain type of macular degeneration. Switching the mice to low-glycemic foods delayed or even reversed the accumulation of harmful metabolic particles in the eye, the scientists reported. They concluded that proper nutrition might play an important future role in treatments to prevent progression of the degeneration.

"[N]utritional deficiencies increase a person's risk for developing eye diseases, most notably macular degeneration, which is a deterioration of the center portion of the retina."

Age-related macular degeneration (AMD) is the leading cause of loss of eyesight in people over age 50. Nearly 2.1 million Americans have late-stage AMD – a number expected to grow as the population ages. Widely recognized studies of nutritional supplementation for AMD were done by the Age-related Eye Disease Study Group (AREDS), which concluded that supplementation with vitamin C, vitamin E, beta-carotene, zinc, and copper slowed its development. The risks of beta-carotene supplements must be carefully considered. A 1994 study in The New England Journal of Medicine found an increased correlation between beta-carotene supplementation and the development of lung cancer in smokers. A systematic review in the International Journal of Cancer by Druesne-Pecollo, et al., in 2010 found an increased incidence of lung and stomach cancer when beta-carotene was supplemented in smokers and asbestos workers. The study found no significant association with beta-carotene supplementation and cancer prevention in non-smokers, but it is worth noting that beta-carotene toxicity also is linked to yellowing of skin and nails. The AREDS2 study published in Opthalmology in 2012 by Chew, et al., considered supplementation with lutein, zeaxanthin, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), and omega-3 containing fish oils. The AREDS2 formula removed beta-carotene due to research concerns noted above regarding beta-carotene supplementation in smokers.

In an earlier study, published in 2005, the authors suggested that "high-fat diets have been overall associated with a number of retinal diseases." Recently, Agron et al., in 2021 found an increased association of AMD with consumption of saturated, monounsaturated, and unsaturated fats. The study, however, found a decreased incidence of AMD was associated with increased fish and fish oil intake. The information on monounsaturated fats such as olive oil is mixed. Research by Cougnard-Grégoire et al., in 2016 suggests that a diet rich in olive oil may be protective against AMD. Given the above research on fish oil and olive oil, and a systematic review in 2019 by Chapman et al., which correlated the Mediterranean diet with a decreased incidence of late development of AMD, it seems prudent to advise most people looking to prevent AMD to follow a diet high in fresh, whole vegetables and grains, frequent fish consumption, and minimal amounts of saturated fats and processed foods. A study by Hernandez et al. in 2021 suggests vitamin D may also play a role in AMD. Vitamin D is fat soluble, so testing is important before supplementation. When considering vitamin and mineral supplementation, it is crucial to discuss your needs with a professional who will be able to personalize the recommendation to take into account any medical conditions, medications, lab results, and supplement interactions.

Continued …

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Meanwhile, in research published in 2014 in the journal *Arteriosclerosis, Thrombosis, and Vascular Biology*, scientists wrote that a low-salt diet protects the retina from vascular changes that threaten eyesight, including abnormal neovascularization – the proliferation of new, fragile blood vessels that can leak and obscure sight – such as occurs in diabetic retinopathy.

But, of course, nutrition is only one factor in general eye health and must be considered as just a component in an overall healthy lifestyle. Because of the prevalence of macular degeneration and other eye disorders in the United States, my advice is multifactorial:

1. *Develop enhanced usage of your peripheral eyesight as well as central eyesight. Should the macula deteriorate, you will be able to adapt more readily to the peripheral retinal skills, lessening overall stress and accelerate decision-making.*

2. *Consider carefully what you put into your mouth. Eating and drinking are analogous to rubbing creams or ointments on your skin or scalp. The chemicals eventually enter the bloodstream and can cause havoc to the eye, brain, and other structures. Consider minimizing toxin exposure by choosing cleaning products that minimize chemicals, choose glass instead of plastic for food storage, chemical-free personal care products, and organic foods where possible. The Environmental Working Group has a list of the Dirty Dozen and Clean Fifteen foods that will assist in prioritizing which items are most important to purchase organic.*

3. *Eat a wide variety of vegetables and fruits in a wide variety of colors. Strive for eating more non-starchy vegetables at each meal rather than starchy ones.*

4. *Minimize processed foods.*

5. *Consider adopting a Mediterranean style diet, high in fresh vegetables and fruit, including fish, nuts and olive oil, and low in saturated fat, processed carbohydrates, and sugar.*

6. *Develop a personalized supplement plan with your medical and nutrition professionals.*

7. *Have routine eye check-ups to assess your use of peripheral eyesight and the stability of the linkage between visual and auditory perception of space.*

To quote American author E.A. Bucchianeri, "If you are what you eat, [then] you are what you see...."

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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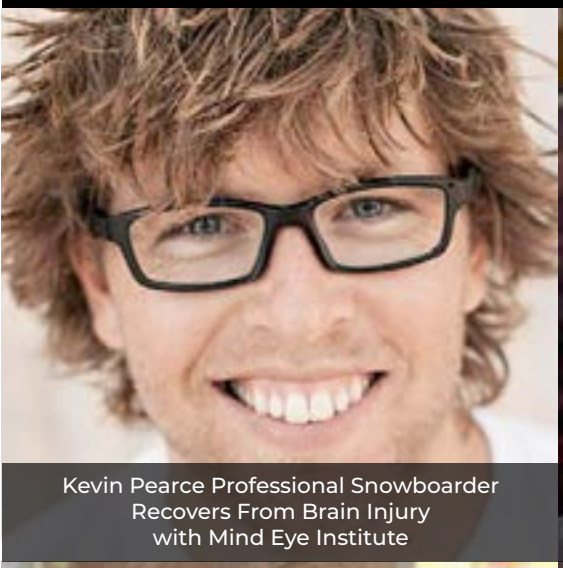

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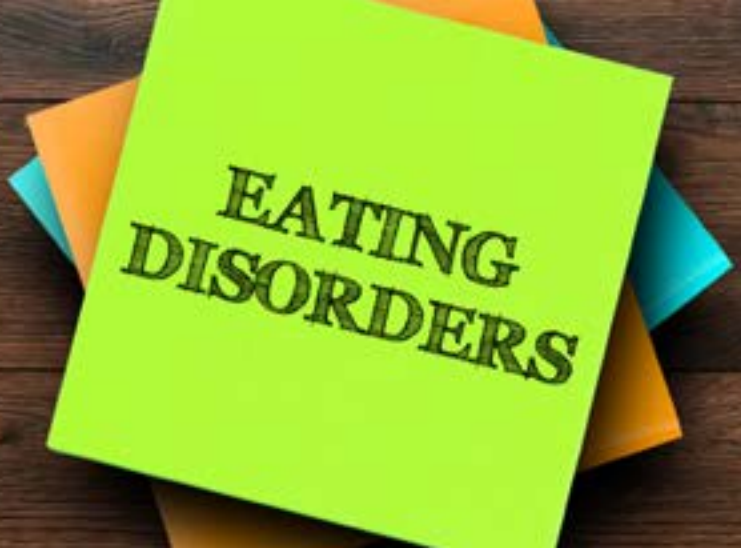
The Complicated Relationship Between **BRAIN INJURY** and ***EATING DISORDERS***

BY ED ROTH



It's widely accepted that brain injuries can cause mental health issues such as depression and anxiety. But what about eating disorders? Anecdotal evidence would suggest so, but are anorexia, bingeing, and purging related to brain trauma?

The answer is, well, complicated.

A recent 38-month study of 107 traumatic brain injury (TBI) survivors found that 42% gained and 29% lost weight. While much could be attributed to changes in behavior, these results strongly indicated a common denominator was recognizing the importance of providing specific nutritional care.

Others suggest something more is going on. A well-documented study of four patients with severe TBI concluded that eating disorders among people with TBI don't resemble typical forms of anorexia and bulimia. Various factors affecting changes in eating patterns were noted, including reduction in physical disorders and use of psychotropic drugs.

One patient in this study was admitted to the clinic with a gastrostomy catheter due to his refusal to eat. Upon discharge 14 months later, he was apathetic, obsessive, and refused to eat, claiming he wasn't hungry.

All patients presented a wide range of appetite disorders, from reduction to total anorexia. There were also changes in food preference and taste, a condition many have reported during the pandemic.

So, since COVID-19 is known to affect the brain — one of the primary indicators is loss of taste and smell — could this virus reveal a key to this mystery?

Dr. Lesley Williams, Family Medicine Physician at Mayo Clinic, is a member of the international Academy for Eating Disorders. She believes the correlation can be found between malnutrition and the brain.

"With severe malnutrition, a body can't function appropriately, including cognition and memory. In chronic cases of anorexia, brain scans reveal evidence of atrophy. The brain actually ages at a more rapid pace.

"Most younger people who are treated will improve." Dr. Williams recalls a nurse who had restored her weight, but not the nutrition. As a result, her brain was smaller than was age appropriate. What's worse is that it was irreversible, and she couldn't return to her career as a nurse.

"Eating disorders can starve the brain. With bulimia, you can see an electrolyte imbalance. Losing phosphorus can translate into difficulties with cognition, putting a person at higher risk for seizure or heart attack.

"I realize it's difficult when someone can't see potential risks and reasons for the disorder, and their health is secondary. Many have the vision: 'I'll be successful at dealing with my eating disorder or will die.' And they're fine with that."

"With severe malnutrition, a body can't function appropriately, including cognition and memory. In chronic cases of anorexia, brain scans reveal evidence of atrophy. The brain actually ages at a more rapid pace."

Dr. Williams says the most common complaints heard by psychologists are those of cognition, including mood, memory loss, and inattention. The first sign is they usually have trouble focusing. "It's often hard to see damage if someone was successful beforehand," because they have more cognitive wiggle room. "The A student with an eating disorder who is now getting A's and B's doesn't fire off alarms. You have to be aware of baseline functioning before seeing the difference."

Phoenix public relations executive Elizabeth Lowney can vouch for a link between brain injury and a change in her eating habits. She has had five concussions, each of which brought about a range of manifestations, including amnesia and brain fog. But her most recent brain injury two years ago was different.

"I never put the two together, but for the past two years, I don't get hungry until dinner," she recalls. "The concussion may have affected my central nervous system,

slowing down my metabolism. The effects of brain injury are just so random."

Malnutrition plays a key role in people of all shapes, sizes, and economic status, but the causes vary. It occurs more often in lower income households due to limited access to nutritious food, while those with higher incomes have access to it, but restrict themselves.

Misperceptions are also partially to blame. "In the general media, carbs are bad. But that's not true. Without them, you can't fire on all cylinders. However, they're necessary for better energy levels, sleep, concentration, and reduction of irritability, even if there's no weight change."

What's more, the pandemic has had a tremendous impact on the general population around the world, especially with traditional coping mechanisms removed. "There was so much media focus on access to food, and that if you're overweight, you'll die unless you stay in your house. It's no wonder anxiety and eating disorders shot through the roof."

Dr. Williams believes the decline in COVID-19 cases represents an opportunity for people to reevaluate their relationship with food. "We should cut ourselves a break and stop obsessing after gaining 'the COVID 15'. We got through this and should celebrate.

"Think about it, from an emotional standpoint, we've survived something that has impacted the world. This is a triumph. If 15 or 20 pounds is what I have show for survival, I should be proud."

"We should realize that with smart eating and dealing honestly with potential eating disorders, our bodies will take off this on their own.

"This is true whether you've had a brain injury or not."

Lesley Williams, MD
Mayo Clinic Department of Family Medicine

USE YOUR BRAIN to *Feed Your Brain*

While there's no such thing as a magic brain food, there are dietary choices are superior to others. Incorporating these is smart way to promote brain health:

1. **Green veggies:** *Kale, spinach, collards, and broccoli are full of vitamin K and Lutein to help slow cognitive decline.*
2. **Fatty fish:** *These are great sources for omega-3 fatty acids, which lower blood levels of the protein that lead to Alzheimer's.*
3. **Berries:** *Flavonoids, which give them color, help improve memory.*
4. **Dark chocolate:** *This, too, contains flavonoids, which also improve blood flow to the brain.*
5. **Tea and coffee:** *This should come as no surprise to anyone who thinks clearer after a cup or two in the morning.*
6. **Walnuts:** *An excellent source of protein and healthy fats, they may help improve memory.*
7. **Many herbs and spices:** *Turmeric and ginger are chock full of antioxidants.*
8. **Red wine:** *The resveratrol found in the skin of red grapes may protect against the development of destructive plaque in the brain. Of course, moderation is the key.*
9. **Whole grains:** *Oats, barley, and quinoa are rich with B vitamins, which are believed to preserve memory.*
10. **Eggs:** *They have protein, vitamins B, D, and E, as well as yolks to help improve memory. Cholesterol can be kept to a minimum by eating in moderation.*

Ed Roth *was raised in Chicago and has had a long and diverse career in the entertainment and media industries. He is the Communications Director for the Brain Injury Alliance of Arizona. He currently resides with his family in Scottsdale, Arizona, where he eats well and enjoys playing tennis all year long.*

Nutrition & Supplements: *The Brain's Perspective*

BY AANIKA PARIKH

While physical appearance is most commonly equated with nutrition level, we often overlook the impact our diet has on the powerhouse of our body: the brain. In fact, making the right changes to our diet can aid in combat with all types of brain-related issues ranging from depression to Alzheimer's disease. As a result of the emergence of new clinical trials and awareness campaigns for the brain-gut connection, Americans seem to be investing increasingly in health supplements. But how can you figure out which nutritional changes are the best fit for you? After all, each body is unique and, while the best and most personalized source of advice will undoubtedly come directly from medical professionals, several key nutritional changes have proven to show direct benefits for the brain.

Primarily, the universal mental health crisis can be combated with nutritional improvements. A key weapon is the Mediterranean diet, which is centered on an increased consumption of whole grains, vegetables, fish, and nuts. It limits the consumption of red meats and encourages the replacement of butter with olive oil. But what does this have to do with your brain? The Mediterranean diet is rich in magnesium, which is extremely effective in reducing anxiety. According to Mary Fristrad, a professor of psychiatry, eating a plant-based diet will also reduce inflammation in the brain. Brain inflammation slows down communication between neurons and is generally accompanied by brain fog and depression. Of course, disorders like depression are more likely to provoke "lazy" or unhealthy food choices, which, in turn, can worsen mental conditions. A gradual, self-paced implementation of a Mediterranean-style diet can put an end to this cycle. Antidepressants are known to be effective in reducing brain inflammation, but are often accompanied by adverse side effects and extensive medical bills, so the Mediterranean diet alternative is definitely worth a try. Refer to Harvard Health Publishing's "A practical guide to the Mediterranean diet" for detailed guidance on implementing this diet into your lifestyle.

Vitamins and supplements also play a large role in improving nutrition. Before adding any of these supplements to your diet, consult with your doctor to ensure your safety. A natural supplement that is effective in promoting positive moods is S-adenosyl-L-methionine (SAMe). According to Harvard Medical School, SAMe boosts the effectiveness of mood-regulating neurotransmitters and hormonal balancing systems. As a natural antidepressant that is already present in our bodies, SAMe does not generally have side effects as long as it is not taken alongside another antidepressant medication. If you are interested in the prevention of or combat with memory-related illnesses, vitamin B may be right for you. Vitamin B serves as a universal dietary supplement that helps break down homocysteine, an amino acid associated with a greater risk of Alzheimer's disease and dementia, according to Harvard Medical School. These supplements are brain food that are cheaper and potentially healthier alternatives to brain illness medications that are most often accompanied by adverse side effects.

The next time you consider implementing changes to your diet, be sure to take into account how these changes impact your brain. While diet changes and supplements cannot replace professional care, they are a preventive measure and can be personalized to cater to your brain's needs.

Aanika Parikh *is a junior in high school who is very passionate about health care and the medical sciences. She is also interested in combating public health inequities and plans to pursue a career as a medical doctor in the future. As an avid writer, Aanika uses her skills to advocate for health-related improvements.*

BY IAN HEBEISEN

WARRIOR MOM: *The Power of Persistence*

In September 2012, celebrity nutrition and fitness expert JJ Virgin answered a phone call that no parent should ever receive. Her 16-year-old son, Grant, had been the victim of a hit and run car accident that left him with incredibly severe injuries.

At the hospital, JJ found Grant in a coma with several bone fractures, diffused axonal injuries, and a torn aorta. Doctors informed JJ that her son's chances of survival were slim to none. They needed to perform surgery to fix the torn aorta and prevent rupturing, but the hospital where they were was not equipped to handle such a procedure. Doctors doubted Grant would survive either an airlift or the surgery.

But JJ refused to let her son die without trying everything first. "I thought, *Is it possible, like the teeniest, littlest fraction of hope that he could make it?* Any parent would say — I'll choose that," said JJ. And lo and behold, Grant survived both the airlift to another hospital and the surgery.

The victory ended up being short-lived. Grant's neurosurgeons could not confirm whether Grant would ever wake up again. Again, JJ refused to give up hope. "I just made that decision standing there in the hospital, that I was going to do whatever was in my power … to help him get to be 110%."

Grant did eventually wake up, but not in the way shown in movies. "He woke up, looked to the side, and started to move the one arm that was free," said JJ. "Everything else was cast, and he just moved it back and forth all day long."

They remained in the hospital for two and a half months, and then moved to a rehab hospital for an additional two months. During this time, JJ and her husband had to reteach Grant some of the most basic things,. for example: his name, how to use a toothbrush, how to get dressed, and how to use the bathroom. "It was like having a really big 150-pound baby."

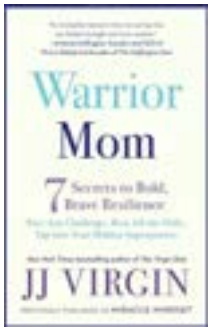
In addition, Grant's emotions ran rampant. He became violently angry and suicidal to a point where he needed to be restrained with a guard posted outside his door. Survivors of traumatic brain injuries may experience an increase in suicidal ideation, and 30% are more likely to go through with it.

Despite all the challenges, JJ continued looking after her son, not giving up hope that he could improve. "Sometimes I get to that point where you're like, 'Is this as good as it's going to get?' And I wouldn't let myself stay there," said JJ. "I just kept saying what's 110% of the next step?"

Over time, Grant started to improve with the help of a speech therapist.He also attended a program designed to strengthen his physicality and motor skills. He regained his memory and his awareness, and even taught himself hydroponics. "We've really had to kind of make the therapy together," said JJ. "I feel like this is a forgotten group of people, that there really aren't the resources, the places to go."

At one point, they sent Grant to a facility in Utah that specializes in cases like his own. Now, he is capable of living on his own, but JJ's biggest concern for her son is loneliness. "Loneliness is one of the worst things we are suffering in this country."

JJ spoke about her time as a caregiver on the Faces of TBI podcast, and offered some advice to other caregivers who might be struggling with their newfound roles. "That person that you love is still in there, and you can't let that go," said JJ. She encourages looking for triggers and warning signs that may indicate your loved one might be getting overloaded, or that a certain treatment is not working.



In addition to caring for your loved one, JJ reminds caregivers to take care of themselves too. "If you're a caretaker, make sure you're taking care of yourself because this is a challenging thing."

JJ's memoir, *Warrior Mom: 7 Secrets to Bold, Brave Resilience*, is available online and in bookstores.

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.*

You can listen to this episode of Faces of TBI on iTunes or wherever you listen to podcasts.

BY JAMES A. HEUER, PA

NUTRITION & TBI

After a Traumatic Brain Injury, metabolic changes affect the brain's recovery. It is not uncommon for inflammation, changes in energy, gastrointestinal tract function, and insulin resistance to occur within a TBI patient's brain. It is crucial for the victim of a TBI to treat with enteral nutrition, meaning the nutrition passes through the intestines, within a 48-hour time period after the injury occurred to prevent such changes from worsening.

Glutamine has been proven to shorten the span of time spent in the hospital after brain injury, reduce the chance of muscle tissue loss, and decrease the infection rate. The essential neuroprotective benefits the brain needs to heal are found in vitamins D and E, niacin, zinc, and magnesium. Fatty acids help reduce inflammation, promote brain cell survival, and help the brain recover overall.

Having a high-fat diet and being overweight can make the effects of a TBI more prevalent, so it is necessary to stick to a healthy diet of balanced meals. A healthy diet is the key to increasing your brain's potential after a traumatic brain injury.

Along with a healthy diet, doctors advise avoiding alcohol when you are recovering with a TBI for the first couple of years. And if you choose to drink, then doctors suggest moderation to avoid further injury .

The following vitamins are an essential key to brain health:

- **Vitamin B-1:** *helps metabolize glucose (the primary energy source) and also promotes growth and muscle tone. Vitamin B1 is found in grain products, pork, nuts, seeds.*
- **Vitamin B-12:** *protects our nerve cells and maintains an outer coating referred to as the myelin sheath on the cells. If you are B-12 deficient, nerve damage and impaired brain function can occur. Vitamin B-12 is found in milk, meat, and eggs.*
- **Folic acid:** *reduces the risk of heart disease and stroke as well as prevents blood build- up. Folic acid is found in broccoli, peas, wheat, and asparagus.*
- **Vitamin B:** *lowers the risk of mental symptoms such as irritability, trouble sleeping, and emotional instability. Vitamin B is found in grains, meat, and fish.*
- **Vitamin A:** *provides protection against infection, aids in bone and teeth formation, helps smooth skin, and promotes growth and repair of body tissue. Vitamin A is found in eggs, orange and yellow vegetables and fruit, and cod liver oil.*
- **Vitamin E:** *supplies oxygen to the brain, slows down the aging process, provides nutrition for cells, and prevents blood clots. Vitamin E is found in plant oil and leafy green vegetables such as spinach.*
- **Vitamin B-6:** *helps with the metabolism of carbs and fats, maintenance of healthy skin, and support for the nervous system. Vitamin B-6 is found in pork, poultry, peanuts, oats, and bananas.*

The damage that occurs after or as a result of an initial TBI creates secondary brain damage. A more recent option to aid TBI victims is Nutritional Therapy, which is used to alleviate the outcomes from the brain damage. Nutritional Therapy can help TBI patients get the nutrients they need in a conveniently-planned way. Nutritional Therapy often starts in the hospital through an IV of vital nutrients, typically within 24 hours after the TBI occurred. If an IV is not needed, the next step is to address any nutritional deficits through supplements or a specialized diet plan. Nutritional therapists can map your personalized plan and best way to access the supplements.

A brain injury alters the balance of ions and chemicals in the brain. The imbalance that occurs creates free radicals (unstable molecules) that inflame the brain tissue and cause decreased blood flow and even more destruction of neurons. Within a nutritional therapy program, the brain can get the extra energy it needs to heal itself.

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

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SLEEP

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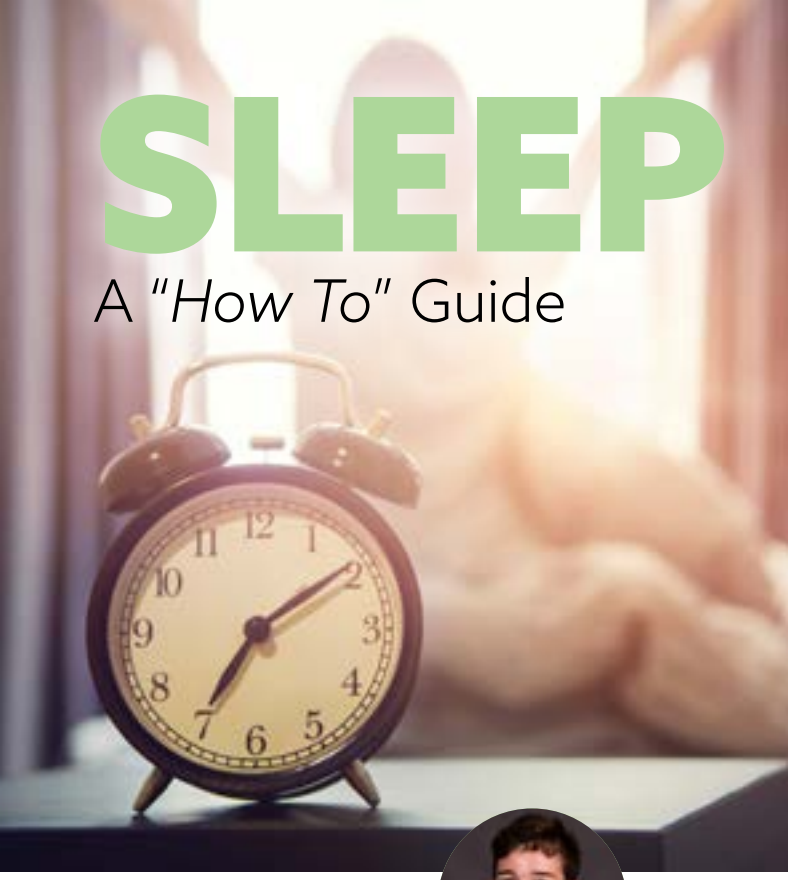


BY STEPHANIE MOON, MS, OTRL, CBIS

Sleep is the foundation for everything we do. It gives us energy, creates routine, and provides our brains and bodies with time to heal. I'm not here to argue the importance of sleep. If you're reading this, you may already know why you need to sleep—it's the how part. Do you sleep too much? Do you sleep too little? If you're looking to improve your sleep habits, there are three main things to consider: your daytime habits, your bedtime habits, and your sleep environment.

Daytime Habits

Sleep isn't just about what you do before you go to bed. Structuring your day can have a big impact on how well you sleep at night.

- *Spend time outside and/or in the sunshine when possible. Ensuring that daytime actually looks like daytime helps create a natural routine for your body's sleep-wake cycle to follow.*
- *Exercise regularly (but not within four hours of bedtime). If you don't have an exercise routine, start small, and then build up over time. Even 5-10 minutes can make a difference. My favorite way to exercise every morning is to dance around the house while listening to music before anyone else wakes up. Find what motivates you!*
- *Wake up at the same time every day and go to bed at the same time every day. Human bodies crave routine.*
- *Decrease the amount of time spent sleeping during the day. If you do nap (yes, I nap too), set a timer to ensure you don't sleep for more than 20-30 minutes. It takes time to learn the skill of "power napping," but it is a valuable tool.*
- *Limit the amount of liquids you drink before bed — but only if the thing that's keeping you up at night is frequent trips to the bathroom. Going to the bathroom "just in case" before bed can be detrimental to bladder health over time.*
- *Avoid caffeine after lunch. Sources of caffeine include: coffee, tea, soda, and (unfortunately) chocolate.*
- *Do not smoke, especially before bedtime. The nicotine found in cigarettes acts as a stimulant.*
- *Do not eat food within two hours of bedtime. It can be more difficult to sleep with a full stomach.*

Bedtime Habits

What do you usually do to get ready for bed each evening?

- *Follow a relaxing bedtime routine. Some suggestions include: taking a warm bath, listening to relaxing music, or completing gentle stretches.*
- *Avoid stress before bed. Harder than it sounds, right? Try to set healthy boundaries by avoiding stressful activities before bed. Instead, set aside time during the day for tasks like paying bills, studying, etc. when possible.*
- *Do not take your worries to bed. Another one that sounds easier than it is. Consider writing your worries down in a notebook or make a to-do list of what you need to accomplish tomorrow, and then give yourself the night to rest. Sometimes putting your thoughts down on paper helps get them out of your head.*
- *…But I'm still not asleep! If you've been lying in bed for 30 minutes or more, get out of bed and do a relaxing activity. Find an enjoyable podcast or listen to music. Afterwards, go back to bed and try to sleep again. The goal is to retrain your brain that bed = sleep.*

Sleep Environment

Consider how your bedroom is set up while reviewing these tips:

- *Avoid bright lights before bed and block out extra noise. Similar to how your body should be experiencing a sunny daytime environment each day, your body should also experience a darker and quieter environment at night to promote a healthy sleep-wake cycle. It is ok to sleep with ambient background noise (such as a fan) to block out more disruptive sounds.*
- *Avoid screen time before bed and while in bed. This includes tablets, cell phones, and television, as all of these are stimulating to both your eyes*

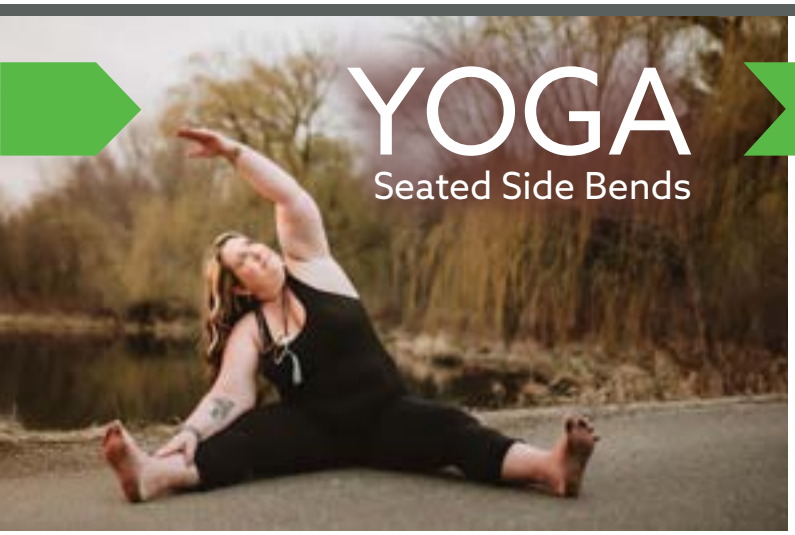
and your brain. If you have a television in your bedroom, considering removing the temptation.

- *Reserve the bed for sleep and intimacy. Train your brain to remember that your bed is a restful place, and set aside another part of your home to do work.*
- *Keep the room you sleep in at a cool, comfortable temperature. If it's summer, this may mean opening a window or paying a little extra to turn on the air conditioner overnight.*

Additional Steps

Be sure to write down which strategies you've tried and their level of effectiveness. If you've tried using all these sleep strategies for two to three weeks and are still not getting enough quality sleep each night, consider asking your physician for a referral to a sleep specialist. Sleep specialists can rule out other health problems and offer even more recommendations.

Stephanie Moon is *an Occupational Therapist and Certified Brain Injury Specialist at Origami Rehabilitation in Mason, MI. Origami is a 501(c)(3) nonprofit organization. Origami provides comprehensive rehabilitation for children, adolescents, and adults with neurological, developmental, mental health, and orthopedic conditions through their residential and outpatient programs. With their compassionate and innovative services, Origami creates opportunities and transforms lives. Learn more about Origami's programs and services online at* ***www.origamirehab.org***



YOGA

Seated Side Bends

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.

Side bends help balance your entire body. They lengthen the abdominal muscles while improving flexibility of the spine. They also lengthen the muscles between the ribs and pelvis, including parts of the lower back. They open up the rib cage, improving mobility and expansion of the lungs — which makes breathing easier in all situations. They can help reverse the tightness from sitting all day.

Other benefits include aiding in digestion and increasing metabolism. Side bends can also relieve respiratory issues such as asthma, allergies, and colds.

Instructions:

1. *Begin in a comfortable seated position, either on the floor or in a chair, with arms relaxed at your sides.*
2. *Reach your left arm straight up overhead.*
3. *Slowly lean your torso to the right as you inhale, allowing your right hand/arm to rest wherever feels comfortable.*
4. *Slightly revolve your chest towards the ceiling as you breathe into the right side of your body.*
5. *Slowly lower your left arm back down as you exhale.*
6. *Repeat the pose on the other side.*

Adjustments and modifications:

- *If you are really tight in the midsection, this can be a challenging pose. Lean only as far as feels comfortable, knowing that any bend, no matter how small, is beneficial.*
- *Never strain or force yourself beyond your current ability.*
- *If you experience low blood pressure or dizziness, you may wish to avoid bending beyond your heart level (inversion).*

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

CITRINE
for Solar Plexus Power

HEALTHY LIVING

BY KRISTEN BROWN

When stress or life changes set in, they can take a toll on your body, mind, and spirit. One area that stress hits hard is your abdomen, which is the home to your solar plexus chakra, as well as the physical organs and processes of digestion. Stress impacting these areas can shut down our confidence energy and cause disruptions in our normal digestive habits. These may seem like unrelated challenges, but because they are both directly influenced by imbalances in the energetic flow in the solar plexus abdominal area, they are actually quite intimately connected.

A powerful stone for activating and aligning this highly sensitive part of our body is Citrine. It works its magic in the solar plexus in many ways.

Here are three powerful benefits of Citrine:

1. **Boosts Confidence:** *When placed on or near the solar plexus (the area right below the rib cage), this stone can unblock energy flow to give you the boost of power you need when you're feeling stuck, scared, or anxious.*

2. **Aids Digestion:** *Keeping a Citrine crystal nearby when you eat can give your brain the reminder it needs to appreciate and savor your food while also soothing the digestive tract so that food is processed easily.*

3. **Strengthens Food Tolerance:** *When you have dietary restrictions, food intolerances or allergies, or are on an elimination or special diet, Citrine can help you stay on track by both giving you the strength you need to stick to the plan AND powering up your digestive tract to process the foods you CAN eat most effectively.*

Keep Citrine with you in the kitchen when preparing food to remind you of the nutritional benefit of food, in your pocket when you need a boost of confidence, or in your purse when you're eating at home or at a restaurant to help ease digestion. Citrine is a little stone with big powers!

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:

HEALTHY LIVING

BY AMY ZELLMER, EDITOR-IN-CHIEF

Oregano and *Oregano Vitality*

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-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.

Oregano

Oregano gets its name from the Greek words oros and ganos, which combined mean "joy of the mountains." It's no surprise that oregano has a Greek name, as it's believed to have origins in Greece and in the mountains of the Mediterranean. This hardy, bushy plant can grow to around 30 inches tall, and it sprouts purple flowers. Oregano is part of the mint family, and its essential oil is steam distilled from the leaves. Varieties of oregano can be found all over the world.

As an herb, oregano shines in Italian and Mediterranean cuisine, but as an essential oil, it has a wealth of benefits and uses outside the kitchen. Oregano essential oil's

Continued …

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warm, herbaceous scent is excellent at purifying the air when diffused with oils such as peppermint. It includes the naturally-occurring constituents carvacrol, beta-caryophyllene, and thymol. Additionally, it helps purify the air when diffused.

- *Diffuse Oregano at home to create a comforting environment.*
- *Diffuse it with peppermint throughout your work space to help purify strong odors.*

Oregano Vitality™

Oregano Vitality™ essential oil does more than provide your meals with a depth of flavor; it may also support a healthy lifestyle when taken as a dietary supplement.* Oregano Vitality makes flavoring savory dishes simple. With a distinctive, herbaceous flavor, it is an indispensable addition to Mediterranean and Mexican cuisines, though it can enhance the flavors in many of your favorite recipes, from grilled chicken to roasted vegetables. While the potent flavor of Oregano Vitality makes it a delicious addition to dishes when used sparingly on its own, because of its powerful antioxidant* properties, it makes a great daily supplement. Be sure to use a carrier oil such as V-6™ Vegetable Oil Complex or olive oil to dilute this powerful oil when taking it internally.

- *Add Oregano Vitality in small amounts to various dishes for extra flavoring, particularly in Mexican and Mediterranean dishes.*
- *Put 1 drop of Oregano Vitality and 1 drop of V-6 oil in a veggie capsule and take it as a dietary supplement daily to help support a healthy immune system.**
- *Add a drop to a green smoothie to help cleanse the digestive system.**

CAUTIONS: Keep out of reach of children. If you are pregnant, nursing, taking medication, or have a medical condition, consult a health professional prior to use.

**These statements have not been evaluated by the Food and Drug Administration. Young Living products are not intended to diagnose, treat, cure, or prevent any disease.*

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

SMOKED SALMON, FETA & ASPARAGUS OMELET

BY AMY ZELLMER, EDITOR-IN-CHIEF

HEALTHY LIVING

What you need:

- *4 oz. (125g) asparagus*
- *1 tsp. coconut oil*
- *3 large eggs*
- *5 tbsp. (70ml) milk, plant or dairy*
- *2 oz. (60g) smoked salmon, cut into pieces*
- *¼ cup (30g) feta cheese (or brie, camembert), cubed*
- *4-5 cherry tomatoes, halved*
- *dill, to serve*

Instructions:

1. *Wash the asparagus, break off the hard ends and discard (they will break themselves in the right place). Cut the softer stalks diagonally to about ½ cm pieces.*
2. *Boil in lightly salted water for about 2 minutes, then strain and set aside.*
3. *In a bowl, whisk eggs with the milk, salt and pepper. Add asparagus, salmon and cubed cheese, mix everything well.*
4. *Heat the oven to 350°F (180°C). Heat the oil in a pan (diameter of approx. 24cm) over medium heat, and pour in the egg mixture. Rearrange the toppings if necessary. Top with the halved cherry tomatoes (cut end up).*
5. *Cover the pan with a lid and cook until the mass is set for about 5 minutes. Then place in the oven (without cover), and cook for another 6-10 minutes, until the mass sets.*
6. *To serve, sprinkle with fresh dill and season with freshly ground black pepper.*

Pro Tip:

The length of time in the oven will depend on the size of pan and thickness of the egg mixture.

SERVES: 2

***Prep:** 10 mins — **Cook:** 15 mins*

NUTRITION PER SERVING:

302 kcal — 21g Fats — 6g Carbs

Motorcycles, Helmets, **TBIs**, and the Law

BY JEFFREY M. HELLER, ESQ.

To wear … or not wear … a helmet, that is the question. The answer to that question is easy: wear one. But in the eyes of the law, are the question and answer always as easy?

Everyone knows that every state in America requires children to wear helmets when riding a bicycle. And the reasoning is simple: children are more prone to falling and suffering injury. They also cannot easily avoid errant, negligent drivers who may hit the children while riding on sidewalks or crosswalks. The worst possible injury is a head injury; therefore, requiring children to wear helmets can prevent or reduce head injuries.

But what about the law with adults and helmets on motorcycles?

U.S. states, *in general*, do not require adults to wear helmets on motorcycles. The law believes adults are more capable of making decisions for their own safety. The law also believes adults are more capable of realizing the consequences of their actions. If they want to take the risk of riding without a helmet, so be it. But then the question becomes, if a non-helmet wearing motorcyclist is hit by a negligent driver, and the motorcyclist suffers a traumatic brain injury, who is to blame for the brain injury?

Every state in the country has laws related to contributory and/or comparative negligence.

Contributory negligence means how responsible is the injured person for their own injuries? For example, if a car backs out of a driveway in front of an oncoming car and a crash happens, is the oncoming car responsible for not avoiding the crash? Did the oncoming car driver have time to perceive the other car backing out of the driveway? Was the oncoming car driver speeding? Was the oncoming car driver on their cellphone? All of these different actions are used to determine whether the injured person is partially responsible for their own injuries.

Along those same lines, ***comparative negligence*** means to what degree are they responsible? In some states, if a person is just 1% responsible for an accident, they are responsible for *all* the injuries that occurred. In other states, if a person is partly responsible for an accident, then their outcome is reduced by their amount of responsibility. For example, in the scenario above with the car backing out of a driveway, if a jury finds the oncoming car driver 50% responsible, then their jury verdict is reduced by 50%. In other states, if a party making an injury claim is 50% or more responsible for their own injuries, they get nothing. This happens all the time across the country.

In a motorcycle accident where the rider is not wearing a helmet and suffers a head injury, the defense will certainly be that the rider is responsible for all of their head injuries. To put it differently, because they were not wearing a helmet, they are 100% contributorily negligent for their head injuries.

If this situation happens to you, do not worry. Hiring a lawyer who specializes in traumatic brain injury and motorcycle crashes will help you avoid being blamed for your injuries. Some of the counter arguments are: (1) there are likely no laws in your state that require you to wear a helmet, so you were not violating the law; (2) a significant

What to do after a motorcycle crash:

- *Call 911*
- *Seek medical attention*
- *Take photographs of your bike and all clothing you were wearing at the time of the crash*
- *Call a lawyer who can immediately have a crash reconstruction performed*
- *If you have any continuing symptoms, make sure your doctors are aware*

number of brain injuries are caused by coup contrecoup, which occurs when the brain strikes the inside of the skull as it bounces back and forth after a blow (which helmets do not prevent); (3) helmets do not guarantee a lack of head injury, they even say so on the helmet itself, so while it may be a preventative measure, your type of injuries would not have been avoided with a helmet; and (4) if the other driver was not negligent, this accident would not have happened in the first place.

No matter what happens during an accident, make sure to call a lawyer who specializes in traumatic brain injury and motorcycle crashes as soon as practical after an accident to make sure you do not risk being found responsible for your own injuries. In the meantime, enjoy the ride.

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 motorcycle crashes. Mr. Heller firmly believes in the right to trial by jury and has tried more than 25 cases to a jury verdict. His past five jury verdicts have resulted in more than $3 million in damages for his clients. 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. He can be reached at 216.621.2300.*

The Dirty Dozen and Clean Fifteen

BY AMY ZELLMER, EDITOR-IN-CHIEF

This handy guide helps you avoid the "Dirty Dozen," the non-organic fruits and vegetables that are highest in pesticide residues, and choose non-organic items from the "Clean Fifteen" list.

DIRTY DOZEN:
only buy organic

These foods tested positive for a number of different pesticide residues and contained higher concentrations of pesticides than other produce.

- *strawberries*
- *spinach*
- *nectarines*
- *apples*
- *grapes*
- *peaches*
- *pears*
- *cherries*
- *tomatoes*
- *celery*
- *potatoes*
- *sweet bell peppers*
- *hot peppers*

CLEAN FIFTEEN:
can buy non-organic

Relatively few pesticides were detected on these foods, and tests found low total concentrations of pesticide residues.

- *avocados*
- *sweet corn*
- *pineapples*
- *cabbages*
- *onions*
- *sweet peas frozen*
- *papayas*
- *asparagus*
- *mangoes*
- *eggplant*
- *honeydew melons*
- *kiwis*
- *cantaloupes*
- *cauliflower*
- *broccoli*

NOTE: all information and facts were taken from the EWG's 2018 Shoppers Guide to Pesticides in Produce. For references and further reading please go to ***www.ewg.org***

A Pursuit of *Happiness*, *Sadness*, or *Any Emotions*

BY IAN HEBEISEN

When discussing changes in her life after receiving her traumatic brain injury, my mom mentions all sorts of physical symptoms: vision problems, nerve spasms, the whole nine yards. One of the most dramatic changes she describes is her lack of emotions.

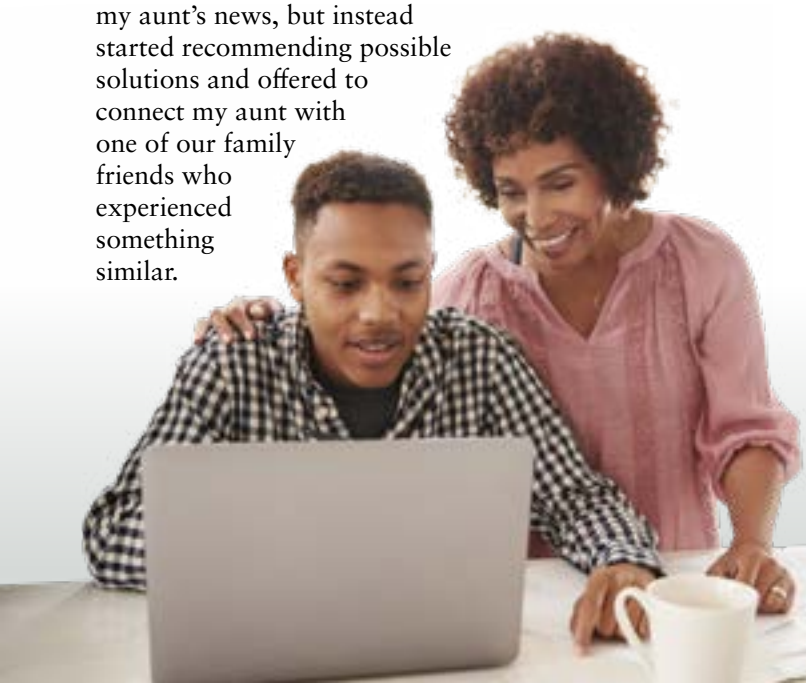
My girlfriend and I recently adopted two cats, and during our search we found many pictures and videos of potential pets. While other people gushed over each photo, my mom stared blankly. The pictures didn't spark any form of elation or admiration. We commented on her reaction, and she shrugged, saying, "I'm sorry, I don't feel anything. It's just a picture of a cat."

Thus began our conversation on emotions. Following the car accident that gave my mom her TBI, her emotional spectrum sort of plateaued. She wouldn't express joy during happier moments, or remorse during sad moments. Be it happy or sad, she's simply flat. When I asked her if she felt anything during emotional conversations and situations, she said, "I really don't. Nothing registers a response like that. Sometimes I'll feel emotions when I look back on certain events, but it's rarely in the moment."

One example of this happened in February of last year. My grandpa (her father-in-law) passed away, and despite being surrounded by grieving people, my mom still felt very neutral. "It was frustrating to not experience the same sadness as the people around me. I knew I should be sad, but I was just flat."

It appears my mom's brain swapped emotional responses for thoughts without emotion behind them. Her brain goes into problem-solving mode instead of engaging in empathetic conversations, which used to come to her easily.

Recently, one of our relatives (my aunt, my mom's sister) revealed she had been diagnosed with breast cancer and needed to go in for chemotherapy and surgery. My mom described her own response as "very factual and matter-of-fact." She didn't express any sadness upon hearing my aunt's news, but instead started recommending possible solutions and offered to connect my aunt with one of our family friends who experienced something similar.



I asked my mom if she found it difficult to connect to other people, and she replied, "I don't know if it's harder for me to relate to people, or if it's harder for people to relate to me." She explained my aunt felt hurt by my mom's blunt response to her news. "She thought I didn't care because I didn't express emotion," she said. "That can be really hard. It's not that I don't care; it's that my brain has changed. And people don't always get that."

This can create rifts in her relationships. The truth is, this affects others more than it affects my mom. They perceive my mom as apathetic, but it's not that she doesn't care. This lack of emotion is simply her new reality.

My mom has accepted this matter-of-fact response to life events. It's the new way she addresses situations in life. "I don't feel anything because I'm only seeing the event as it is – that's life, it is what it is."

When dealing with a TBI, it's easy to get frustrated with your loved one due to behavioral changes, including emotional responses. But they're still the same person. They're just perceiving the world around them differently. It's important to exercise patience and empathy, regardless of how "flat" they may seem. Things might seem hard for you, but I promise you it's much harder for them.

"When dealing with a TBI, it's easy to get frustrated with your loved one due to behavioral changes, including emotional responses. But they're still the same person. They're just perceiving the world around them differently."

Additionally, you never know what the future holds. As you try different therapies and treatments, their emotional plateau might start turning into a hill once again. While my mom comes off as emotionally checked out most of the time, she has moments of emotion that occasionally shine through. A few days ago, we showed my mom a video of our recently-adopted cats playing with a box. Our kitten had flipped the box over herself and was shuffling about like a hermit crab. And lo and behold, we got a smile and a laugh from my mom.

Hold on to hope, keep being patient, and maintain empathy. It'll help you as you traverse the tricky road of caring for someone with a TBI.

Ian Hebeisen *is a writer based in Minneapolis, Minnesota. Graduating in May 2020 with a degree in English Literature with a Writing Emphasis, Ian writes comics, poetry, and scripts. He is currently an intern for The Brain Health Magazine and aims to work in the comic publishing industry. In his spare time, Ian plays Dungeons & Dragons, board games, and bass guitar.*

LIFE LESSONS LEARNED *FROM A* TBI

AMY ZELLMER, EDITOR-IN-CHIEF

At the moment I am writing this, the world is slowly beginning to shift back to a sense of normalcy. As vaccination efforts are in full-swing, and folks are able to start seeing friends and loved ones again, I feel the collective sigh of relief in the Universe.

It has been a stressful year and a half for everyone, but for brain injury survivors it has been particularly challenging. As I said before, we are used to isolation — but it has always been on our own terms. When we went into lockdown across the country, we had no choice in the matter. We were forced to stay home and away from those we typically hang out with.

> **"It has been a stressful year and a half for everyone, but for brain injury survivors it has been particularly challenging."**

As many of you know, I am a caregiver to my parents, who are in their mid-eighties. My mom is actively going through chemotherapy and therefore was considered very high risk. This made my decision to self-isolate from my friends a bit easier, but it doesn't mean it was "easy."

I had my share of dark days and feelings of depression.

I feel some of the tension melting off my shoulders now as all three of us are fully vaccinated and can start to ease back into a sense of normalcy. It has been hard on my mom — not being able to go to lunch with her lady friends every month, and the same holds true for me.

Moral of the story:

This hasn't been easy on *anyone* … I encourage you to give yourself a pat on the back and a high-five for making it this far without completely losing your sanity.

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