

THE BRAIN HEALTH

MAGAZINE

Living Your Best Life After Brain Injury | Nov/Dec 2019

Neurosurgeon
LEADS THE WAY
in Eye Tracking Diagnosis
for Concussion

**VISUAL
VERTIGO**

The Concussion
PARADIGM

THE
VISION
ISSUE

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A New TBI Journey

Amy Zellmer | Editor-in-Chief

Welcome to the inaugural issue of *The Brain Health Magazine*. I am truly excited to have you here.

I saw a need in the brain injury community for a resource on how to live your best life after brain injury — whether that meant doctors, providers, diets, exercises, or just some old-fashioned inspiration.

The transition into living your “new normal” can be challenging, but it doesn’t mean that you have to stop enjoying life. Your new life might not be what you had envisioned for yourself, but it’s time to stop looking in the rear-view mirror of life and move forward into the new you. You might just surprise yourself at how well you’ll adapt!

***Stop looking backwards ...
you’ve already been there.***

In the past five plus years I have come a loooong way in my recovery. I credit most of it to finding Dr. Schmoe; however, I have to take a lot of credit — for forcing myself to put on my big girl panties and do what I had to do to get better. I had to take my health into my own hands, and advocate for myself. I was then given the opportunity to advocate for the millions of others who are struggling with doctors who just don’t understand, or those who don’t even *want* to understand brain injury.

From this incredible journey, a magazine is born.

This first issue is special to me for many reasons, but not the least because the theme is “vision.” If you’ve followed my journey at all, you know that my vision issues were one of the biggest obstacles after my brain injury. Doctors kept telling me my eyes were “fine” and that my dizziness couldn’t possibly be coming from my eyes. It took me two and a half years to find Dr. Schmoe at The Functional Neurology Center, but it was absolutely life changing for me. Dr. Schmoe brought my dizzy, balance, and visual problems from a 9/10 to a 2/10 in just a week. From there, other symptoms began melting away.

As I said earlier, I want this magazine to be a resource, a beacon of light to help a survivor know that she or he is not alone, and that there is ALWAYS hope ... no matter how far out you are from your injury.

Without further ado, I hope you get as much love and support out of this magazine as we have put into it.

Peace & Glitter,

A handwritten signature in black ink, appearing to read 'Amy', with a stylized, cursive script.



The Peripheral Vision Challenge



BY KELLIE POKRIFKA

Have you noticed how bothersome our peripheral vision becomes after brain injury? Anything out of the corner of our eyes suddenly sets off our TBI symptoms. Why is that?

After brain injury, our body tends to get stuck on sympathetic firing, or fight-or-flight mode. We know this as the mode designed to help us fend off attackers and flee for our safety back in our caveman days. Any kind of fright can set off this system — preparing us to fight. Our blood rushes away from any systems like digestion or sleep that are not immediately necessary

for fleeing the scene. Our pupils dilate, our heart rate escalates, and our anxiety kicks in to get us out of danger.

Okay, but how is this connected to peripheral vision? Dr. Deborah Zelinsky compares this situation to seeing a mouse. If you see a mouse directly in front of you, you are likely to be startled, but not quite as much as you are if you see it out of the corner of your eye, and then lose track of it. Where did it go? What do you do? Should you try to find it and attack, or run away?

After brain injury, our brains start reacting to any motion in our peripherals *as if they are mice*. We get

the same panic from any movement. Our body feels like we do not have control over any of these things that are *not in our direct line of sight*.

Ask yourself:

- ✓ Why does this suddenly occur so frequently after brain injury?
- ✓ Should we not react like this with healthy brains, too?

After brain injury, or any sort of physical or even emotional trauma, the body tends to experience overdrive in the sympathetic firing. Our body knows we are hurt — but does not know whether the danger has officially receded. We start to experience dysautonomia — a dysfunction of the normal regulation between sympathetic (fight or flight) and parasympathetic (rest and digest.) We are constantly running on sympathetic firing, which is not sustainable. We become “wired and tired” — and our fighting resources are still being cranked up, but they have been in continuous use for so long that we are now exhausted. Yes, we are anxious and restless, but we are also completely exhausted.

The less we can regulate this system, the more likely it is that anything can trigger it. Our peripheral vision is not a trigger when our body is cool and in charge. Now that the system is so overworked and high-strung, anything out of the corner of our eyes sounds the alarms as being a threat.

"Just like learning any new skill, the more we practice, the better we get."



















But, wait a minute. This seems counterproductive to healing. It is! Just like learning any new skill, the more we practice, the better we get. Unfortunately, this skill is now overreacting to benign stimuli. And we are becoming great at it! Obviously, we need to break this cycle. We need to rewire our brains to relax. How can we do this?

- You should consult with your doctor about all the therapies available. Meditation, Cognitive Behavioral Therapy, deep breathing, vagal nerve stimulation, and neuro-feedback are a few examples.
- Basically we need to try anything that will help rebalance our autonomic nervous system.
- Anything which helps with this task will free up enormous amounts of energy to help heal any other lingering symptom of brain injury.
- If we set our body up to heal, it will often do the rest!

So with that, deep breath in, deep breath out. 🌿

Kellie is a TBI survivor and works as an intermediary between the experts and the patients with brain injuries.

AWARENESS RIBBON GUIDE

 TBI	 Migraine
 ABI	 Epilepsy
 Stroke	 Hydrocephalus
 Brain Tumor	 Encephalitis
 Brain Cancer	 Domestic Violence
 Aneurysm	 Suicide
 CTE	 Mental Health
 POTS/ Dysautonomia	 Military
 PTSD	 Aphasia

THE CONCUSSION PARADIGM



BY VERNON WILLIAMS, MD

There is so much about the concussion process that isn't yet fully understood by science. How can one athlete seemingly return to "normal" hours after what looks like a knockout blow to the head during a big game, while another takes weeks to fully recover from what seemed to only be a slight "ding" during practice?

Though I am pleased to say we're no longer in the traumatic brain injury "Dark Ages," there is still so much research yet to be done — and information to be learned from it about how individuals recover from concussive trauma. This can understandably create confusion among a public that often hears of the serious health implications of concussion and wants concrete answers about how to best minimize the life-altering consequences that can be associated with concussions for some people.

One thing we do know to be true today is that not all people are the same with how their brains and neurological processes recover from traumatic brain injuries, even the mild ones.

With concussion such a hot and controversial topic in the news media, especially as it relates to professional athletics (namely NFL football players), I had the opportunity recently to provide some sports neurology perspective in an interview with a major newspaper.

The story focused on the return-to-play of an athlete who had suffered a concussion a few days earlier, only to sustain another hours after being cleared to play by an independent neurologist. It is understandable that the public at large gasps in alarm when an athlete suffers a second concussion shortly after having been cleared to return to play post-concussion. They point to that "other" professional athlete (insert name of any high-profile athlete who has sustained a concussion here), and cite his or her two- or three-week hiatus from sport after just one concussion. *They think the medical team should have known better.* The truth however is that this isn't intentional medical negligence or putting the players' lives at risk simply for the chance to win the next game. It really has to do with how each person, individually and regardless of their status, recovers from a concussion.

What we know to be true about professional football players is this: it is clinically believed that there is some increased risk of chronic or long-term neurological impairment after repeated concussions, sometimes after only one. But what that risk looks like 20, 30 or 40 years down the road, we really don't know. Because we don't have a one-size-fits-all roadmap to concussion risk or recovery, we do the best we can with the proven tools we have. That includes expert neurological evaluation, management and monitoring — and we make individual recommendations based on the results of each of these encounters, not necessarily on the collective number of concussions sustained over an arbitrary period of time.

And while it is true that we may not yet know EVERYTHING there is to know about concussion's effects on the brain, it doesn't mean we know NOTHING. Quite the contrary, actually. Neurological researchers today are making incredible inroads when it comes to how we evaluate and treat traumatic brain

injuries that were nothing more than a mere “hunch” a decade or so ago. While we have a ways to go, we are heading in the right direction. The more collaboration we neurologists can do, while simultaneously educating our patients and the public accurately and effectively, the better equipped we all will be in the future to diagnose, treat and hopefully one day prevent concussions.

Changing Concussion Recovery Paradigm:

Until very recently, the widespread recommendation by the medical community to patients who had suffered a concussion was simple and straightforward: rest, rest, and more rest. The trauma that the brain sustains during a concussion can be from linear forces (like when the brain is forcefully pushed up against the hard ridges and walls of the skull), or from rotational forces (like when a boxer’s neck twists violently after an opponent lands a hook to the jaw). Yet another example involves the wave of energy from an IED blast experienced by a soldier in combat. Any of these mechanisms can leave the sufferer with a wide range of side effects such as headaches, dizziness, confusion, and fatigue. Typically, with appropriate treatment and rest, these symptoms subside over a period of a few days to a few weeks, and most young athletes will recover from a concussion with no residual problems.

The previous guidelines for concussion rehabilitation stated that young athletes should refrain from all physical activity until all the lingering symptoms were resolved. This type of treatment is referred to as “cocooning” when all forms of exercise and brain stimulation are halted, including reading, watching television or using smartphones, engaging in lengthy conversations, and even exposure to the visual stimulation of light. This type of all-encompassing brain rest historically made sense. Concussion was known to involve a “metabolic mismatch,” which involved a reduction in blood flow to the brain at exactly the time more energy was needed for healing. As more was learned about physiologic mechanisms, it was realized that there were other contributors to the “energy deficit.” And people generally felt lousy in the early stages after a concussion.

The logical conclusion was that the brain needed rest in order to heal. And if some rest was good ... more

should be better. But new guidelines are flipping the well-known script and encouraging most young athletes to start being physically active as soon as a few days after having the concussion.

So What Gives on the Guideline Retool?

Well, new research has shown that the brain actually likes activation and stimulation. Early evidence indicates that the brain actually benefits from and recovers faster with physical activity and movement post-concussion, and that prolonged rest time may even delay healing and recovery. Of course, as with any brain injury recovery plan, management must be individualized, and return-to-play guidelines strictly followed. There is still no return to full play or competition until all symptoms have

“Early evidence indicates that the brain actually benefits from and recovers faster with physical activity and movement post-concussion.”



resolved, a step-wise and monitored return to play has been successfully achieved, and official clearance has been provided. And even the early cognitive and physical activity must be carefully monitored to ensure that it is, in fact, helping and not hurting the patient. But the current trend of early activation is based on evidence that a) activation seems to be beneficial and b) cocooning may actually be harmful.

After a concussion, the acute post-injury period (initial 24-72 hours) should consist of rest and symptom monitoring in most situations. Even this recommended period of rest should not involve complete cessation of all activity. The more appropriate goal is to reduce exposure to physical or cognitive exertion, and refrain or discontinue activities that worsen symptoms. When those kinds of restrictions are relaxed, and gentle, cautious return to physical activity is allowed, for obvious reasons it does not mean jumping right back into football or baseball practice or engaging in any contact sports. Rather, we want to see young athletes begin with a very low-range physical activity such as taking a slow walk around the neighborhood, or pedaling on a stationary bike; *any low-impact, low-risk physical movement that will encourage healthy blood flow and circulation to the brain and body.*


The key with early activity is to take note when feeling any significant worsening or return of symptoms, such as visual changes, nausea, dizziness, or headache. The goal is to limit activity to that which doesn't cause symptoms, and be aware of symptom threshold. Daily exercise that provides enough movement to promote healing, but not enough stress to exacerbate symptoms, is the "sweet spot" athletes are urged to maintain for the remainder of the healing process until the concussion symptoms disappear completely.

Important: Since every patient has a unique physical anatomy and chemistry as well as unique recovery needs, the amount of time each patient should engage in daily exercise after a concussion will vary, and finding that personal threshold is imperative to healing without re-injury.

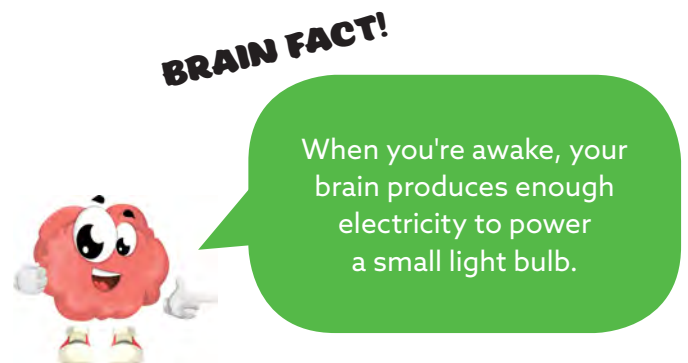
In addition to the physical benefit, when returning to activity sooner was studied, it produced noticeable positive effects on emotion, mood and general well-being for the person who suffered the concussion. In retrospect, it makes perfect sense. Imagine a young athlete who is used to being out with friends, active playing sports, which allowed him the associated adrenaline and endorphin release. Then require that

athlete to stay in bed with the lights out and no real activity for days on end, restricted from cell phone interaction with friends, and forbid to have any form of digital entertainment requiring the use of a screen — and what do you get? Much higher rates of depressed mood, fixation on symptoms, worry, and anxiety. Letting the athlete return to a more "normal life" faster contributes to less emotional side effects post-concussion, which can also assist in a faster recovery from symptoms.

One aspect of healing that should not be rushed is accommodations associated with school, work, and cognitive activity. It's important to be aware of the anxieties and difficulties often encountered when heading back to class or participating in any intense learning activities. The cognitive side effects from a concussion — such as memory loss or problems with concentration — can linger longer than the physical symptoms in some cases. Partnership with a neurologist is highly recommended to continue monitoring that avenue of healing. On the plus side, physical activity may also help to lessen the severity of those cognitive issues.

Rest after a traumatic brain injury such as a concussion is necessary, and "shutting down" for the first few days can be vital to recovery. But prolonged bed rest is a thing of the past. The brain likes activation. For the best recovery, rest time must be balanced with stimulation and activation. Consult with a neurologist after any head injury (no matter how mild), and together he/she can help develop the most efficient treatment plan for you or a loved one's specific needs to get your player back to health and back into the game. 

Vernon Williams, MD is a board-certified sports neurologist and founding director of the Center for Sports Neurology and Pain Medicine at Cedars-Sinai Kerlan-Jobe Institute in Los Angeles, California.





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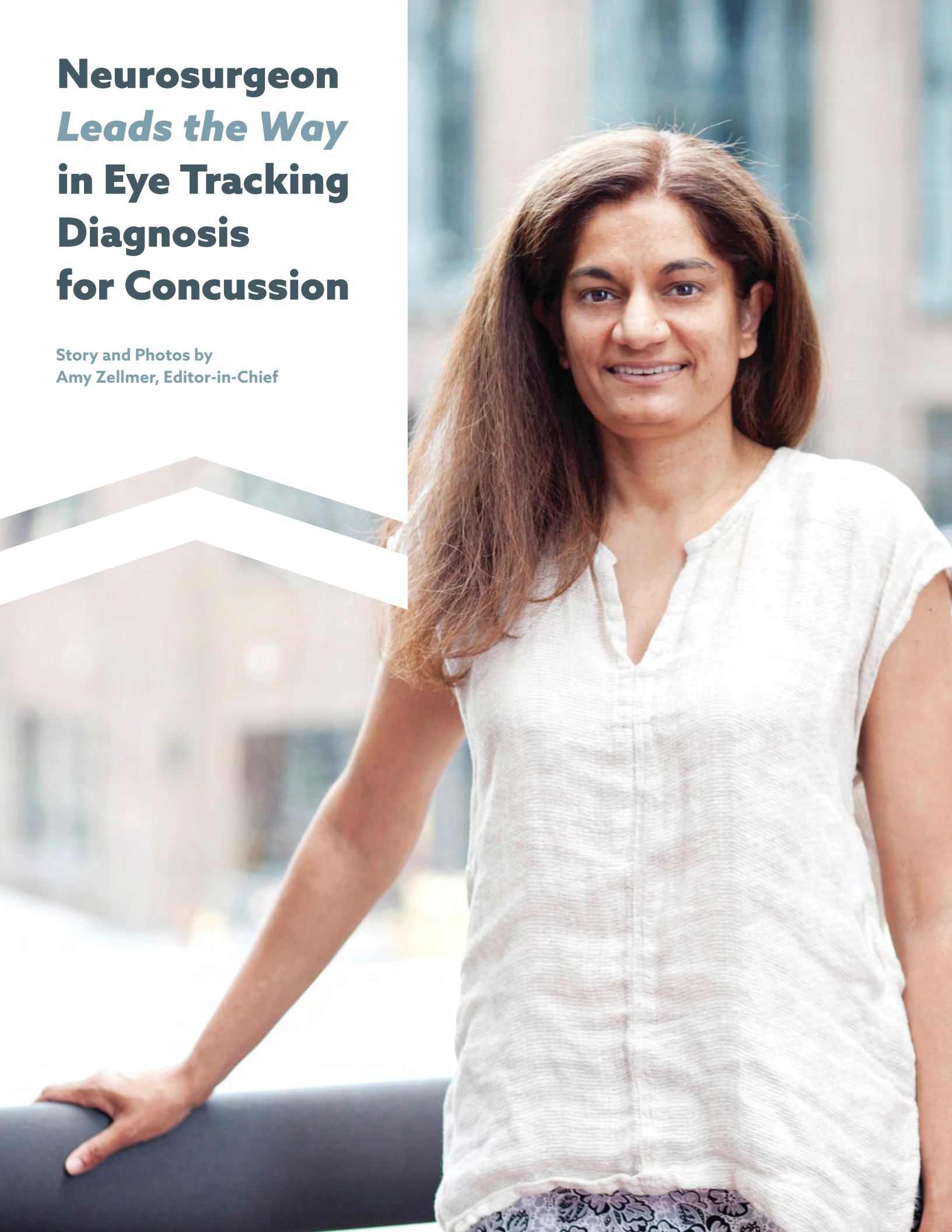
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Neurosurgeon *Leads the Way* in Eye Tracking Diagnosis for Concussion

Story and Photos by
Amy Zellmer, Editor-in-Chief



From the age of six, Dr. Uzma Samadani, MD, Ph.D, knew she wanted to be a doctor. "The earliest thing I knew I wanted to be was a doctor. I have no regrets, there is no other career I would pick if I had to do it again. I wanted to be able to help people."

It was during her first day of rotation on neurosurgery in her third year of medical school that she knew she wanted to become a neurosurgeon. "The opportunity to make a real difference in someone's life is huge. This is a career where my intervention could dramatically improve someone's outcome." She added, "The favorite part of my job is seeing my patients do well."

She is currently an attending neurosurgeon at the VA Medical Center in Minneapolis and Centracare Hospital in St. Cloud, Minnesota. She is also associate professor of bioinformatics and computational biology in the school of engineering at the University of Minnesota. Additionally she runs the Neurotrauma Research Lab that is based at the University of Minnesota but has space at both the VA and Centracare.

Dr. Samadani's quest into eye tracking was rather serendipitous.

While she was assistant professor in neurosurgery at NYU, she and her team were doing a clinical trial to improve outcomes in very severe brain injury. They originally wanted to use fMRI as an outcome measure; however, the FDA was concerned it might be dangerous to put minimally conscious or persistently vegetative patients into an MRI machine for prolonged periods when they could not communicate.

They were forced to think about other outcome measures they could use, which led them to develop an eye tracking method that was different from prior techniques: it assesses passive movement while someone watches television or a film clip rather than requiring them to actively follow instructions, such as follow a dot. The difference between their method and older methods was that they were assessing the capacity of the brain to control eye movements, rather than just figuring out what people choose to look at.

The technology works by having a patient watch a music video or short film clip that plays inside a small square that moves around a screen. The patient follows the video while the device measures eye coordination. The device is attached to the computer so that a patient doesn't have to wear it on his or her head. "We

have found that the last thing a brain-injured person wants to do is wear goggles or other heavy devices when they don't feel well," said Dr. Samadani.

When Dr. Samadani's team developed their device, they wanted to make sure that a patient who wasn't able to follow instructions would still be capable of using it. "Essentially we are testing brain stem function, which occurs involuntarily — meaning you don't have to think about it," stated Samadani.

Historically, measuring eye tracking has been done by having a patient look in a direction (up, down, left, right), but that assumes a certain amount of function and doesn't always catch dysfunction.

Eventually Dr. Samadani discovered that their equipment could ultimately detect differences in the left and right eye movements. The test does not need a baseline since 98% of people's eyes move together.

Beginning in 2012 they realized that they could detect swelling in the brain and disruption of pathways involved in the control of eye movements. They are able to see eye-tracking changes within minutes of someone hitting their head.

In one study funded by the National Space and Biomedical Research Institute, they were able to show that eye tracking detects elevated intracranial pressure — which is relevant to astronauts in outer space. The study had 23 patients who were being monitored for intracranial pressure for clinical reasons, including bleeding in the brain and increased pressure due to tumor or stroke. Elevated intracranial pressure is also one of the problems that can be seen after a brain injury or concussion so the findings of this study were relevant not only to astronauts but also to earthlings.

According to scientific papers on the topic, 90% of people who seek attention for their concussion/brain injury have eye-tracking problems. Dr. Samadani's team hopes that this device will help patients receive proper care right away. "We are using eye tracking to classify the nature of brain injury so that they can find out what's wrong with you and treat you appropriately," said Dr. Samadani.

Dr. Samadani explained that a concussion can disrupt eye movements in at least two ways: by causing elevated intracranial pressure, and by physiological disruption of neurologic pathways — with some patients having both.

"What we do is measure pupil position over time, comparing the position to each other and to a normative database. This allows us to see if they have abnormal

eye movement, and that movement tells us about brain function. Eye movements can tell us a lot, for example, about whether you have elevated pressure, divergence dysfunction, accommodation disorder, or disconjugacy. It can tell us different characteristics associated with abnormal brain function."

Without objective measures, there is no way to really know if a patient has suffered a concussion. Eye tracking is one objective measure. Others are serum markers, MRI, quantitative EEG, and pupillometry. If you can combine these, you can figure out what's wrong with a patient. If doctors are able to classify the injury, they can treat accordingly.

Dr. Samadani likens it to going to the ER with chest pain — the doctor wouldn't do just one test. "They wouldn't say — Okay, we are doing only a chest X-ray ... they would also do an EKG, ECHO, blood testing, or whatever else it takes to get to a diagnosis. We need to take brain injury as seriously as we take injuries to the heart, lungs, kidney or liver," said Dr. Samadani.

A lack of basic understanding in the medical field

Because brain injury has historically had very few objective measures, it is a difficult topic to teach in medical schools. Relatively few physicians specialize in the management of brain injury, and medical schools don't have many required lectures about brain injury, if any at all.

Most doctors will graduate from medical school without ever having been involved in the care of a brain-injured patient. Unless they do residency in neurosurgery, there's no requirement to treat brain injury. Most pediatric, primary care, and neurology residents have no requirements for studying brain injury during their residency, yet these specialties see 80% of all people with brain injuries. Only 8% of pediatricians feel comfortable treating patients with complex post-concussion syndrome.

Dr. Samadani explains that a thorough bedside exam used to include the assessment of eye movements, however, with the advent of modern imaging technology, for most doctors this practice is less rigorous and reliable. "We no longer have the expertise to do the detailed eye exams that were performed by doctors in the 1950s and 60s before the invention of CT scanning, which is unfortunate for our patients. The ER decides whether to admit a patient based on imaging


"If we could measure brain function like we do with kidney or heart function, we'd be so much better off. We need to take the brain seriously as an organ."

... yet many patients have a brain injury with a normal CT scan. The worst thing you can do is ignore the problem and think that it doesn't exist. This can lead to chronicity and make it harder to address."

She then stated that we need a whole different type of setting for these patients to go to. The emergency room is set up to triage patients and decide whether they need to see a neurosurgeon, admit for observation, or be sent home. It is not designed to classify and treat subtle aspects of brain injury. Many insurance companies still think patients with concussion should be tried on bed rest before seeing a brain injury doctor. The healthcare system is currently failing people with brain injury.

Eye tracking has the potential to be a powerful diagnostic for detecting brain injury. Dr. Samadani said, "If we could measure brain function like we do with kidney or heart function, we'd be so much better off. We need to take the brain seriously as an organ ... we wouldn't tell a patient with 50% heart function that they're just imagining it! Yet we tell people with brain injury that 'it's all in their head.' Eye tracking is the first step in changing this mentality."

About Oculogica

Oculogica, Inc. is an eye tracking-based neuro-diagnostic company founded in 2013 by Dr. Uzma Samadani. In 2015 Dr. Rosina Samadani, Ph.D., was named the CEO. The company has developed the EyeBOX, the first non-invasive, baseline-free aid in diagnosis to help physicians objectively evaluate patients with suspected concussions. The EyeBOX is a 4-minute test appropriate for ages 5 to 67 years and is currently the only device cleared for aiding in the diagnosis of concussion. 

5 Amazing Benefits of Clear Quartz



BY KRISTEN BROWN

You're walking along the beach or lakeshore and a stone catches your eye. This is no accident. Rocks, crystals, gems, fossils and shells may seem lifeless, but these members of the mineral kingdom are some of the most energetically powerful things on our planet. When you feel attracted to a crystal or rock in nature or at a crystal shop, there is likely something in your own body and mind that is resonating with the molecular and energetic structure of that stone.

Minerals have a very stable atomic pattern that repeats and builds in an identical sequence until the mineral is formed. This structure also emits a very stable energetic frequency that has the power to influence other energies around it. This is called entrainment. Therefore when you hold a crystal or see a stone that you want to pick up, the chances are good that its energy "zapped" yours — and you need what it has to offer.

Whether you think crystal healing is a hippie voodoo thing or not, the science and a whole lot of proof is there if you open your mind to it. If that's still too much for you, then perhaps just appreciating the colors, shapes, and beauty of each unique stone can help you feel even a moment of positive energy.

Here are five amazing benefits of Clear Quartz.

1 Quartz is all around us from timepieces to lasers to jewelry. It conducts energy, which is why it's powerful to have around you, whether you wear it on your body, carry it in your pocket, or have it sitting near you at work or at home. Notice the clarity it brings when in meetings or at home.

2 Quartz is a great stone to use for meditation. It will help thoughts flow more peacefully and clearly because it is a gentle yet powerful crystal. You can either hold it in your hand or use it as a focal point to view while you meditate.

3 Quartz is made of silicon and oxygen, which are two of the most abundant elements on the planet. This means it can help you align with your goals so they fit into the grand scheme of the Universe. Bring a chunk of Clear Quartz with you everywhere you go to stay focused and clear.

4 Quartz is great for bringing clarity when you're overwhelmed, confused, or need guidance. Hold it in your hand while you reflect and see what insights show up. It can also help you focus a big vision so



having it around when you brainstorm or daydream is a powerful way to feel the effects of Clear Quartz.

5 Quartz will help amplify any other healing work you are doing and multiply the power of any other crystals you are using. Wearing it during yoga, having it nearby when you are getting a massage, and carrying it with you during any body/mind/spirit modalities can create a stronger experience.

Clear Quartz can be purchased from crystal and metaphysical shops and online. However choosing a stone at a shop is much more fun and powerful because you can see, touch, and feel the “zap” of the crystals and experience how their energy impacts yours. And stock up because Clear Quartz and crystals of all types make great gifts that can be customized for the recipient’s healing/energy needs or simply given for their beauty. 🌿

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. Learn more at www.namaSync.com.

BRAIN JOKE!

Q: What is a sleeping brain's favorite musical group?

A: R.E.M.



Yoga: Star Pose

AMY ZELLMER, EDITOR-IN-CHIEF | HEALTHY LIVING

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 so that anyone can be accommodated.

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

Star Pose (Utthita Tadasana) is one of the basic building blocks in yoga, and is a powerful pose as it engages almost every muscle in your body. It can also be easily modified. Star Pose strengthens and lengthens the body in all directions at once, and helps align the spine, which improves posture and can reduce back and shoulder pain. It opens the chest and underarms, which allows you to be more open to feelings of love and happiness.

Instructions:

- 1 Stand with your feet wide apart and arms out to the side.
- 2 Press your weight into your feet, squeeze your thighs, tuck your tailbone, and feel your legs strong, solid, and rooted into the floor.
- 3 Reach through the fingertips, broaden across your collarbones, and press your shoulder blades toward the back ribs.
- 4 Inhale, elongate the neck, and press the crown of the head up towards the sky, look straight ahead

with your chin parallel to the floor (remember to relax your shoulders down).

5 Inhale deeply into your belly and chest; exhale while pressing into your feet, fingers, and crown. Feel your body expand out in all 5 directions. Keep breathing and hold for 3-5 breaths.

6 To release, bend one knee and step feet together while bringing your arms down to your sides.

Modifications:

- To make the pose more challenging, you can raise your arms higher (see photo).
- For a challenge, close your eyes while in the pose.
- If you have poor balance, you may do the pose against a wall for support.
- For stability, you can bring your feet closer together, and/or place your hands on your hips.
- You may also do the pose seated in a chair or lying on the floor.

If you are interested in learning more about yoga, check out www.loveyourbrain.com and their yoga programs throughout the US at partner studios, which are completely free to brain injury survivors and caregivers. 🌿



Essential Oils: Peppermint and Peppermint Vitality

AMY ZELLMER, EDITOR-IN-CHIEF | HEALTHY LIVING

Essential oils are a complementary tool that can help you achieve a healthy lifestyle. They are easy to use, smell great, and you can use them in a variety of ways.

Please know that all oils are not created equally.

Young Living is the only brand I personally trust, as I know they have complete control over their product from seed to seal. Oils sold at health food stores can be misleading. Without FDA regulation, they may state they are 100% therapeutic grade oils ... but you must be sure to look closely at the labels. If the ingredients list anything other than the plant stated, or if it says things like "external use only," "for aromatic use only," and "dilute properly," these are red flags that the oil inside that bottle are not 100%, and likely they have been cut with other oils, synthetics, or chemicals.

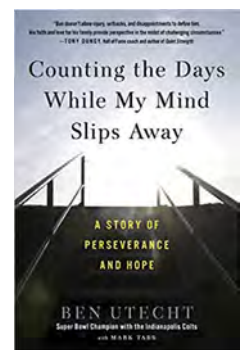
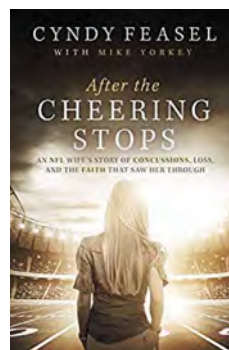
Peppermint Vitality: The refreshing flavor of peppermint is welcome on the hottest summer days and the coldest winter nights. Beyond being a brisk addition to your drinking water during workouts or to herbal tea on a cool evening, peppermint vitality can also support healthy digestive functions and gastrointestinal comfort. This versatile oil can also be used in baked goods, beverages, and even entrees. Taken daily, this powerful essential oil can support your overall digestive function.

Peppermint: Peppermint can be used in a diffuser to create a stimulating, focused atmosphere for daily tasks. You can apply it topically to create a cool, tingling sensation on the skin, which can be soothing after hard physical activity.

Applied to the neck, temples, or scalp, it can minimize head discomfort and tension. Used in conjunction with Arnica gel (found at most co-ops and drug stores), it can be rubbed into sore spots to alleviate muscle discomfort.

I never leave home without peppermint. I keep it in my purse, workbag, and suitcase at all times! 🌿

SUGGESTED READING



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Nutrition and Eye Health

HEALTHY LIVING



BY SIERRA FAWN GUAY,
MS, RDN, LDN

Our eyes are complex organs that are responsible for communicating messages between the external world and our brains. Changes in eye function are common after brain injury. Nutrition plays an essential role in promoting eye health. The foods that we eat provide the nutrients that our eyes need for optimal functioning and longevity, which is of particular importance when a brain injury exists.

Eating for optimal eye health means eating fresh, whole foods and staying adequately hydrated. It is necessary to eat a wide variety of foods in order to obtain all of the macronutrients (proteins, carbohydrates, and fats) and micronutrients (vitamins and minerals) that we need to achieve and maintain good health.

The following nutrients are most important for good eye health:

- *Lutein* and *zeaxanthin* are carotenoids found in yellow, orange and red plants; leafy green vegetables; and egg yolks. These nutrients are taken into the macula of the eye and may reduce the risk of age-related macular degeneration.
- *Omega 3 fatty acids* are found in fatty fish, algae, walnuts, and flaxseeds. These nutrients are important for brain health and neurological function, and may prevent age-related vision loss.
- *Vitamin A* is made by our bodies from certain carotenoids such as beta carotene. Vitamin A helps promote good vision, and improves our ability to see at night and adjust to lower levels of light.
- *Vitamins C and E* serve as antioxidants and protect

our eyes from oxidative damage. Additionally, vitamin E may help improve neuroplasticity.

- *Zinc* is found in meat, seafood, eggs, and some whole grains. This nutrient helps create melanin to protect our eyes. Adequate zinc intake may also reduce the risk of age-related macular degeneration.

Certain foods may worsen eye health, and should be consumed in limited amounts (if at all). These foods include alcohol (which may compete for valuable nutrients needed by the eyes), excessive caffeine, added sugars, and salt. Processed foods (mostly found in packages) tend to be high in added sugars and salts and low in vitamins and minerals.

Quick nutrition tips to optimize eye health:

- Eat a wide variety of fruits and vegetables. Eat as many as you can manage.
- Drink at least eight cups of water a day. Drink more water if you sweat or if your urine is dark yellow.
- Eat whole eggs (versus only the egg whites). Egg yolks are full of vitamins and minerals, including lutein, zeaxanthin, and zinc.
- Read nutrition labels. Choose foods that are lower in sugar and sodium (salt).
- Carotenoids (bright yellow, orange or red plant pigments) are best absorbed when eaten with fat. This can be done in many ways. For example, you might roast yellow squash with olive oil or eat fatty fish with a side of leafy greens. Among other nutrients, you'll be eating lutein and zeaxanthin (Romaine lettuce), omega 3 fatty acids (walnuts), beta carotene (carrots), vitamin C (parsley), vitamin E (walnuts), and zinc (chickpeas).

You might also try the Chickpea Stuffed Lettuce Wraps featured to the right! [!\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

Sierra is a registered dietitian who works with brain injury survivors in Greenville, North Carolina.

CHICKPEA STUFFED LETTUCE WRAPS

Ingredients:

1 15 ounce can of chickpeas (drained, rinsed, and lightly mashed)
2 large carrots (washed and shredded)
1/3 cup walnuts (chopped)
3 tbsp. Greek yogurt
1 tsp. Dijon mustard
1 tbsp. honey
2 scallions (washed and chopped)
1/4 cup fresh parsley (washed and chopped)
Salt, pepper, and your favorite spices to taste
Romaine lettuce (leaves separated and washed)

Instructions:

Mix ingredients (except for lettuce). Stuff lettuce with mixture. Enjoy!



Understanding CBD's Many Possible Benefits

SPONSOR SPOTLIGHT



BY DEAN FOOR & JEFF BALLARD

Imagine where your day could take you if you felt your best — mentally, emotionally, and physically. What adventures would you go on? How would you connect with your loved ones? What goals could you accomplish in your career or personal life?

Entangled Biome's mission is to empower your overall wellness through CBD-rich products that are handcrafted with certified-organic ingredients. They believe in giving you the tools to take charge of your health journey so you can make the most of every moment.


So what exactly is CBD, and how can it benefit you? Cannabidiol (as it's officially known) is a cannabinoid, one of several naturally found in the cannabis plant. Unlike THC, the CBD cannabinoid is non-intoxicating, which means it does not get you high. Instead, it has an abundance of therapeutic properties. CBD can provide physical relief from inflammation, stiff joints, irritated skin, sore muscles, migraines, and more. It can also impact anxiety and conditions like PTSD and panic disorder.

Depending on your needs, you might benefit from CBD in a salve, bath bomb, or tincture.

Entangled Biome derives their CBD from hemp as opposed to marijuana: Hemp has a high concentration of CBD and less than .3% THC. Because it is organically grown in Oregon, their Full Spectrum Hemp Oil is free of chemicals, pesticides, and heavy metals.

What's Full Spectrum Hemp Oil? It indicates that they use the entire hemp plant in their pursuit of CBD. Cannabis is extracted for its manifold cannabinoids and terpenes, which have been proven to work synergistically to provide many health benefits. By working with the whole plant, it gives you access to the full potential of hemp.

Users have reported amazing results using CBD-rich products. Seniors have experienced significant pain relief, long-term psoriasis patients see a reduction in their symptoms, and migraine sufferers can stop taking their daily over-the-counter analgesics. Also, they have experienced increased energy, boosted immunity, and reduced anxiety. Even dogs have benefited from CBD organic treats!

SPECIAL OFFER: If you're interested in changing your life through CBD, their experts are available to guide you. It's a journey you'll be glad you started. Receive 15% off your first order with code: 15tbitribe2019 www.entangledbiome.com 

Dean Foor is the director and extraction specialist at Entangled Biome. Jeff Ballard is the operations manager and branding specialist. They are located in Eugene, OR.

Vision Injuries Post-Car Crash



BY JAMES A. HEUER, P.A.

On February 28, 1998, my wife and I were involved in a motor vehicle collision. We were waiting at a stoplight on the way home from a dinner. There was a car in front of us so we could not turn right on red. A driver exiting the freeway crashed into the car behind us, knocking it into our car.

As a result of the crash, I sustained a traumatic brain injury. For the next year my life was dramatically changed. Both my personal relationships, and my ability to do my job as a lawyer were all affected by my TBI.

Fortunately, after consultation with my neurologist, his treatment, and the passage of time, the symptoms of my TBI went away and I was able to return back to normal.

After that incident over 20 years ago, I have had

a keen interest in making sure that my clients get properly diagnosed with a TBI and get the treatment they need to cope and/or live with the symptoms until they are fully healed.

Many people sustain a TBI without the loss of consciousness. We ask every client that comes to our office *if they lost consciousness* so that we can ascertain whether or not they need treatment for a TBI.

There are many problems related to a TBI. In this article we are going to discuss vision and eye injuries. In future articles we will discuss the different aspects of traumatic brain injuries, the diagnosis and treatment, and how these injuries affect an insurance company's evaluation of a recovery for damages.

Automobile accidents can result in serious injuries to the eyes. In closed-head injuries, also referred to as traumatic brain injuries (TBI), a multitude of symptoms and side effects can occur such as:

- Blurred or double vision
- Photosensitivity (light/sunlight/glare)
- Loss of or reduction in one's field of vision
- Problems with comprehension and/or reduced attention/concentration
- Headaches associated with visual tasks
- Memory problems
- Focus and depth perception especially without blurring

Other serious eye injuries that are extremely serious and require immediate medical attention are as follows:

- **Optic Nerve Damage:** Optic nerve damage is any kind of injury or damage to the optic nerve. Head injuries have the potential to cause increased pressure within the skull, which in turn may put pressure on the optic nerve. This pressure can cut



Are you living with a TBI caused by someone else's mistake?

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off blood circulation and lead to vision distortion, vision loss, and/or blindness.

- **Retinal Detachment:** This happens when the retina, a thin layer of tissue lining the inside of the back of the eye, separates from the tissue around it. This issue can potentially cause permanent blindness.
- **Vitreous Hemorrhage:** Vitreous hemorrhage is blood in the vitreous. The vitreous is the clear, jellylike substance in the center of the eyeball. Head injuries can cause blood vessels in the eye to bleed into the vitreous.
- **Convergence Insufficiency:** Convergence insufficiency is the inability to point both of one's eyes at a near target (such as printed text) for a sustained period of time. One's eyes must be able to sustain a posture of turning our eyes inwards (convergence) for the duration of any close-up task that one completes (balancing a checkbook, completing computer work, reading a magazine, etc.). People with convergence insufficiency are unable to sustain this posture while looking at things nearby. Symptoms and severity of symptoms of convergence insufficiency vary greatly; however, most commonly people with this diagnosis are often unable to sustain comfortable and clear vision while reading after a short period of time (5-15 minutes). Symptoms include blurring of words while reading, double or shadowed vision while reading, headaches, eye fatigue, loss of place when reading, and sometime frank avoidance of all near activities.
- **Oculomotor Dysfunction/Saccadic Dysfunction:** Saccadic dysfunction refers to deficit with eye tracking or eye movement. Patients with this diagnosis struggle with the planning and execution of eye movements used to look at stationary objects. 🧐

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



THE BRAIN HEALTH
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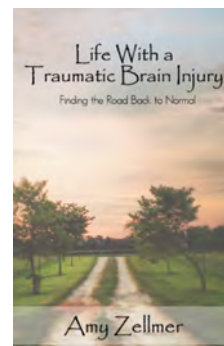
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"Amy's book not only offers insight and details on brain injuries, but it also sheds light on an often overlooked and misunderstood issue. As a traumatic brain injury survivor, it gives me hope that one day the traumatic brain injury community will finally get recognition."

— Ali Wallace, Miss Oregon 2015 & TBI survivor

**Want to learn more about Amy's journey?
Purchase her books on Amazon!**

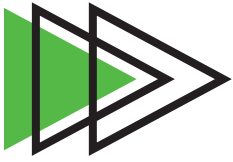


BRAIN JOKE!



Q: What works even after
it's fired?

A: A neuron.



3 Eye Movement Problems That Predict Post-Concussion Syndrome



BY JONATHAN CHUNG, DC

When most people think about eye problems, they are going to think about problems like blurriness, near-sightedness, or double vision. However, there are different problems that affect the eyes without affecting normal vision, and one of the ways that these problems can be seen is by looking at eye movements. While faulty eye movements might not affect normal vision, the way they malfunction can give doctors a sensitive window into the functioning of the brain during a concussion evaluation.

Here are 3 of the most common eye movements that are affected in patients with post-concussion syndrome:

1 Saccades — Saccades are eye movements that move your eyes quickly from one target to another. Patients with post-concussion syndrome will have saccades that take longer to react to new targets and take longer to switch between targets.

Testing saccades can be made to assess the brain's cognitive processes through a test called anti-saccades. During anti-saccade testing you intentionally move your eyes away from a new target. It requires your brain to inhibit a reflex to move your eyes towards a new stimuli, and move your eyes to an imaginary spot in the opposite visual field. Anti-saccades are very sensitive to brain injury in the frontal lobe.

2 Smooth Pursuits — Smooth pursuits are the movements your eyes make when you are following a target move across your vision. This is how you follow a moving object. While it seems simple in concept, it's a pretty complex process that requires the use of multiple parts of your brain, which means this eye movement is susceptible to dysfunction after a concussion.

People with problems with this eye movement will have a feeling that their eyes are not moving fast enough, or they will feel like their eyes get pulled off target easily.

3 Convergence — This is the eye movement that you use to look at something close to your face. You might recognize this eye movement when you make a cross-eyed face. It's the only eye movement that moves your eyes in opposing directions so they also take up a lot of brain power. This eye movement is critical for looking at things up close.

People with this problem will frequently say that they are having double vision more frequently, or that their eyes and head hurt with reading or screen time.

You probably don't care if your eyes are moving perfectly or not, but you might care about how they mess with your brain. You might not care about your saccades, but it matters to the athlete who can't see an open receiver to their right side. You might not care about convergence, but you care about your ability to read pain-free. The good news is that many of these eye movement problems can be rehabilitated when addressed by a practitioner with experience in eye movement therapies like a vision therapist, vestibular therapist, or a functional neurologist. 🧡

Dr. Chung is an upper cervical chiropractor with a focus on traumatic head injuries who is located in Wellington, Florida.

VISUAL VERTIGO: IT'S A REAL THING!



BY JEREMY SCHMOIE, DC, DACNB

Many of our patients seek help, hope, and answers for lingering post-concussion symptoms. These injuries may have occurred during sporting events, car accidents, falls, blast injuries or various other modes of trauma. Not only do these injuries lead to chronic dizziness, vertigo, visual symptoms, headaches, and balance issues, but they also affect limbic regions in the brain causing anxiety, depression, startle responses/fear and apathy.

In this article, I am going to touch on some aspects that I see every day in our clinic, and hopefully make some sense of these complex post-concussion symptoms.

It is not uncommon for the patients that I see to have been told by other providers that their sensations of dizziness and vertigo are *from anxiety and depression*.

They are also told that their exam was completely normal, and there is no sign of BPPV. However, people that have experienced a brain injury have multiple sensory hubs and circuits that are affected. This means that it isn't as simple as stating that the person has BPPV or peripheral vestibular disorder. It is the complex integration of the sensory hubs and circuits that are affected with TBI.

Furthermore, your balance may even be normal when we do a platform posture analysis, even though you are extremely dizzy throughout the day mostly noted with complex visual environments. After visual stimulation you may feel lightheaded, off balance, stiffness in your cervical spine, head pressure, shaky on the inside and/or anxiety. Your energy levels seem to tank out of nowhere, leading to extreme fatigue and brain fog. You need to eat in order to keep your blood sugar steady — or else you know it's a downward spiral that there is no coming back from. All of these scenarios could be due to the fact that you are experiencing visual vertigo.

Anxiety kicks in at night due to the stimulation you experienced during the day. Now you are experiencing restless and sleepless nights. People that you talk to suggest that you work out because they heard that "working out is great for concussion recovery." In your mind, you are thinking, "Yeah, right, there is no way I am going to be able to muster up enough energy to do anything productive. Let alone if my heart rate increases there is no telling when it will come back down. Do these advice-givers realize that any sort of activity will cause me to not be able to sleep — and the anxiety kicks in more."

The anxiety about the sleepless nights and overstimulation keeps piling up until finally you crash. It might be 3–4 days later before you are able to get a good night of sleep. This cycle perpetuates for weeks, months, and sometimes years. You are thinking:

- When is this going to end? Is it ever going to end?
- Who is going to help me? I have seen everyone, and they say I am fine. My family must think I am going insane. How much longer are they going to put up with me?
- How am I ever going to be able to go to college?
- How can I take care of my children?

The list goes on and on in your mind until finally your system crashes, leaving you completely in a fog.

These are all common scenarios I hear every day at The Functional Neurology Center where we specialize in post-concussion rehab. And I have had to learn all this from compiling information from multiple specialties, making clinical observations – and treating a lot of suffering patients. For the most part, training for treating concussions is in post-graduate education.

Okay, back to the neurology! Many of these patients are suffering from visually induced vertigo post concussion. Examination would be simpler if only one type of force occurred during trauma; however, multiple different types of forces can occur. Some common ones are linear translation with acceleration and rotation leading to torsion. These forces lead to changes in different sensory-motor hubs and circuits of the brain. Due to the complexity of the visual system and its use of all regions of the brain, you will have visually mediated reflexes affected with almost all TBI's. Clinically you may see changes in fixation, pursuits, saccades, OKN reflexes, along with combined head-eye motion. These patients may develop vertiginous symptoms when exposed to visually challenging environments. There are changes in the central projections from the cerebellum into the vestibular nuclei, NPH, oculomotor nuclei, superior colliculus and basal ganglia. Any inaccurate feedback from the eye muscles themselves can cause an unstable visual perception, which does not match with what the feedback from your muscles are telling you. This can even be from a muscle in lower extremity, upper extremity, lumbar paraspinal muscles, thoracic paraspinal muscles, or even your cervical-occipital region. Any of which lead to a sensory error with an impaired ability to have appropriate top-down corollary discharge and efferent (directing outward) copy mechanisms in the cerebellum.

Next thing you know a little bird flies into your field of view, which you perceive as a postural threat. This is because your eyes were not in the center of the globe – potentially due to the square wave jerk you had from loss of superior collicular activation of Omnipause neurons. Omnipause neurons inhibit saccadic burst neurons. Due to the loss of inhibition from the omnipause neurons, you may be experiencing saccadic intrusions, and this affects your ability to know where your head and neck are in space. You can develop cervicogenic headaches, changes in feedback from muscle spindles in the cervical spine that further aggravates the situation.

Your head/neck may feel like it's going to explode after a trivial visual stimulus.

- ✓ If your head feels like it is full with pressure exploding from the inside out, there is usually underlying dysautonomia.
- ✓ If your head feels like it is being compressed from the outside in, there is usually a biomechanics cause.

Think about the scenario above and imagine how anxiety-provoking it would be if that were happening to you all day, every day. The cycle of pain, anxiety, fatigue, dizziness, over-stimulation and other symptoms could continue until you find the right provider who can make sense of what is going on with you.

Not only are the central vestibular connections affected, but also the integration between numerous other circuits. These circuits are the cervical spine afferents, vestibular nuclei, vestibular autonomic, spino-oculomotor connections, trigeminal-oculomotor proprioceptive feedback, vagal-autonomic, brain-gut connections and higher order processing above the thalamus.

When you really break it down, the brainstem connections that go up into the cortex and also down into the cord become affected. The midline regions of the cerebellum and the integration of your spinal stability become dysfunctional as well. This leads to instability in your midline musculature that allows you to stabilize your body as you move your center of pressure. All of this contributes to your symptoms of





"We can improve function in our patients with post-concussion symptoms by performing specific combinations of head and eye movements."

headaches, neck pain, spinal instability, stiffness, gait changes, head pressure, dizziness, vertigo and light-headed sensations. Don't forget that many of the limbic regions of the brain are midline, and also get affected. The midline regions of your brain got rung out like a wet towel. You look fine on the outside, but on the inside the major hubs are not communicating with each other. This means that you are unable to navigate your world effectively, along with being unaware of where your body is in space. This leads to difficulty performing tasks such as running, walking, and even breathing!

One mechanism that I see affected in the vast majority of my post-concussion patients is breathing. The breathing mechanics become dysfunctional from changes in central pattern generators in the brainstem. The centers that reflexively allow you to expand your ribs and get oxygen can be injured in TBI. Your brain needs oxygen in order to function optimally and to heal. This could be one reason that people chose to go to clinics with hyperbaric oxygen to help them recover.

A lot of the rehab we perform at my clinic is around getting optimal autonomic function, improved breathing mechanics and oxygenation. The reason behind this may be attributable to the fact that the region of the brainstem that allows you to know where you are in space is right next to the autonomic region in the pontomedullary reticular formation.

For example, if you develop hypoxia to your cerebellum, you could experience down-beating

nystagmus, increased gain of your VOR, or tonic deviations of the eyes upward from vestibular disinhibition. This means that your cerebellum and its purkinje neurons are not able to modulate the vestibular nuclei, which leads to centrally mediated vestibular dysfunction from dysautonomia caused by your brain injury.

Many of the patients we see develop POTS and dysautonomia with visual/vestibular symptoms post concussion. These types of issues do not always fit into the main vestibular dysfunctions like BPPV, Meniere's, Vestibular Migraine, Vestibular Neuritis, Phobic Postural Vertigo or MdDs. Traumatic Brain Injury-induced vestibular, visual and proprioceptive dysfunction is quite complex and doesn't follow textbook protocol as each person is biochemically unique and may present with previous underlying co-morbidities. This is why in addition to neuro-rehabilitation, our clinic believes it is important to address your nutrition and run comprehensive lab work. We also address underlying brain-based inflammation and microglia priming with non-invasive low-level cranial laser. By addressing inflammation and providing the brain with optimal nutrition and fatty acids, this allows our neuro-rehabilitation to build plasticity.

The autonomic system may become dysregulated from trauma. If this occurs, one may see a decrease in venous return along with pooling of blood in the pelvis and legs due to improper vasoconstriction and dilation. This may lead to the feeling of light-headedness, syncope, and/or brain fog.

Due to the presentation of these symptoms mentioned above, this is why we focus on working out the legs in our patients with post-concussion symptoms. We like to create an environment that artificially activates the patient's leg muscles while they either sit or lay. We utilize Arpwave Neuro stimulation techniques along with isometric contractions to provide feedback to the brain. Once the patient becomes more stable, we move into more complex motion and eccentric/concentric leg exercises.

In our clinic we commonly assess the VOR reflex, which occurs when you move someone's head one way and their eyes move back equal and opposite to have a gain of 1. There can be increased and/or decreased gain in patients. Most of the head movements we experience in every day life are fast and unpredictable and that is why clinically subtle VOR dysfunction can be missed. Everything from a clinical standpoint

goes back to improving VOR gain, gaze stability and stabilizing autonomies.

To know where you are in space requires constant adjustments made by the body to gravitational load. There is proprioceptive feedback from external ocular muscles (EOMs). The position sense of the eyes in the orbit are used to help calculate the position of the target in your world with respect to your body. When these systems are affected, you can develop positional errors in the body such as a neck position error. These errors of the neck commonly are in the "yaw, pitch and roll" planes which are coordinated with the vestibular system centrally. Any minuscule error that is maintained from injury to the central hubs may affect the sensation of depth, position, or saccadic (eye movement) accuracy. One example is injury to the cerebellum. This can lead to sensory mismatch with an impaired ability to adapt and heal.

We can improve function in our patients with post-concussion symptoms by performing specific combinations of head and eye movements. Many of our patients have performed visual exercises prior to seeing us with success, but are still experiencing lingering symptoms. For patients that are unable to tolerate oculomotor and/or vestibular rehab, our clinic utilizes non-invasive nerve stimulation. This may make the performance of visual exercises easier.

Many patients post brain injury develop Convergence Insufficiency (CI). This can lead to symptoms such as painful eye movements, headaches, or even attentional issues. There most likely are contributions from the superior rectus during convergence in patients with convergence insufficiency. The superior rectus can provide adduction and incyclotorsion of the eyes to make up for impaired ability of the medial rectus to perform its duty. There will be more sympathetic tone needed to allow these muscles to do this job. There could be a need to use the Superior Rectus to maintain binocular focusing for clear images on gaze fixation. The EOMs are known to be fatigue resistant, but obviously so many patients experience pain, tightness and spasm post concussion that there must be fatigue. This fatigue develops with their high metabolic demand of static contraction of muscles being used in their secondary and tertiary actions to make up for convergence insufficiency.

If a patient has developed a spastic contraction of an ocular motor muscle in intorsion, their brain may adapt with a roll-plane deviation of the head or skew deviation

of the eyes leading to depth-field contamination of OKN response. This can lead to anxiety, visual motion illusion, dysautonomia and/or even headaches. These types of patients have a difficult time going into Target, the grocery store, or even malls. When driving in busy traffic these patients may experience the sensation that cars are coming into their lane.


The mismatch of the incoming proprioceptive information from the EOM's may not match perfectly with the other senses such as vestibular ocular and spino-ocular from impaired cerebellar coordination. This could lead to an increased sympathetic response that further leads to increased adrenergic tone and even dysautonomia. The EOM's become spastic in their ability to move.

The patient could have these issues:

- convergence insufficiency, spasm on convergence,
- impaired accommodation,
- gaze instability,
- changes in pursuits,
- saccadic accuracy,
- inability to tolerate motion,
- cerebellar dysfunction,
- cervical spinal dysfunction,
- central and peripheral vestibular dysfunction with nystagmus.

All of this leads up to visual illusion with the patients unable to tell you what it looks or feels like.

The patient might just say, "I don't feel normal," or they may be totally unable to explain what they are feeling, *which can be challenging as a provider.* **That is why it takes someone who can assess the complexity of all these combined symptoms and systems as part of a team of practitioners and therapists that together can help patients recover from lingering symptoms.**

My hope is that in reading this article you now have a better understanding that visual vertigo is a real thing with many components that need to be assessed. 

Dr. Jeremy Schmoie, DC, DACNB, is the founder and director of The Functional Neurology Center and works with complex neurological cases from all over the world.

Syntonics: Bringing Balance to Your Brain

ALTERNATIVE THERAPY



BY KELLY HARRIGAN

Yes, we all need a little balance in our lives. Syntonics has been around for longer than most of us have been alive. This non-invasive therapy has proven its safety, efficacy, and therapeutic value to those suffering from traumatic brain injuries and concussions, as well as other dysfunctions like lazy eye, eye turn, convergence and depth perception problems, and some learning disorders.

WHAT IS SYNTONICS? It's optometric phototherapy. In plain English, it's a light therapy for the eyes. It differs from the bright, white light people use for seasonal affective disorder (SAD) through its use of specific wavelengths of light to project into the eyes and assists the brain in its neuro-vision rehabilitation (translated: brain-eye therapy) by balancing and regulating the body and its processes.

Why would someone with TBI or post-concussive syndrome (PCS) need any form of therapy, let alone light therapy? Brain injuries often leave people with multiple lingering effects, both physical and emotional. These include: headaches or migraines, insomnia or other sleep disturbances, auditory and photosensitivity, dizziness, depression, irritability, inability to cope, and post traumatic stress disorder (PTSD). In short, the body's nervous system has anxiety.

In initial physical examinations, visual problems resulting from brain injuries are frequently overlooked, and often leave people with problems relating to:

- Focus
- Convergence
- Blurred or double vision
- Headaches associated with visual tasks
- Reading and comprehension difficulties
- Balance issues related to vision
- Photosensitivity


When identification and treatment are delayed, people are often at risk for further injury, and could continue to be unable to drive, work, or read, and feel socially and emotionally isolated as a result. Syntonics might be an effective and simple way for you to ameliorate/improve many of the physical and emotional symptoms from your head injury.

How will your doctor determine the best form of light therapy for you?

Your doctor will measure your pupillary reaction. When a light is shone into your eye, your pupil should maintain constriction for 8-10 seconds. If it is unable to hold constriction and begins to dilate, this is an indicator that your nervous system is stressed and imbalanced. Your doctor might also test to see if your visual field is restricted. A reduced visual field means it is harder for you to see around you, and this creates visual stress. They will also test your binocularity to determine if your eyes are working in sync. Sometimes, one eye could turn off, or suppress, incoming visual information, which is a negative coping strategy by your brain to control the amount of information it is receiving.

Lifestyle modifications, such as a healthy diet, as well as minimizing alcohol, caffeine, smoking, and other toxins, are recommended to maximize the effectiveness of your treatment, in addition to other visual aids and therapy.

Dr. Ray Gottlieb, dean of the of Syntonic Optometry, reports patients receiving syntonic therapy acknowledge that they have an improved mood and visual skills, better sleep and memory, and an overall improvement in general performance, and that patients who have head injuries tend to improve the most, with changes tending to be long-lasting and profound.

DISCLAIMER: Have a licensed optometrist familiar with head injuries and syntonics perform a thorough evaluation to assist you with the proper therapy for your needs. 

Kelly is a single mum, veteran, TBI survivor with a girl child and a frenchie, oolong tea in hand and humor on hand, who lives in Annapolis, Maryland.

BRAIN FACT!



Your brain weighs about three pounds.

Life Lessons Learned from a TBI

AMY ZELLMER, EDITOR-IN-CHIEF



Throughout the course of my TBI journey I have learned numerous lessons that perhaps I never would have learned otherwise. While some people may look at their TBI as the worst thing to ever happen to them (or their loved one), I choose to consider it a *blessing that keeps on giving*.

One of the lessons I have learned is that a hidden or invisible disability is challenging for others to accept, and to believe you “actually” have a major health issue.

In the early days after my TBI, I was told things like: “It’s just a concussion, get over it,” or “It’s been six weeks, I don’t understand why you’re not back to work yet,” or “It’s not like you have cancer or something.”

Those words came from people I thought were true friends, friends that would be the first ones to bring me soup when I was sick. Apparently, a concussion doesn’t count as being sick ... as friends provided better care and showed more concern when I had a minor surgery or the flu.

While I have always considered myself an empathetic person, I have come to have way more empathy for anyone who is struggling ... whether it’s with illness, injury, mental health, or from plain ol’ daily life challenges.

I remember having days where I considered buying and using a cane so that someone might hold the door for me at the grocery store, as then it took ten times more energy for me to carry a bag of groceries than it did prior to my TBI. I would often require a nap — before I could even begin to put the bags away after carrying them in from my car.

Now I will go out of my way to hold the door for people, as you never know what kind of day they are having or what sort of “invisible-ness” they are dealing with.

The moral of the story: have empathy, be compassionate, and never assume you know the full story ... everyone is going through his or her own personal struggles — and a warm smile or holding the door open might truly make his or her entire month! 🧡

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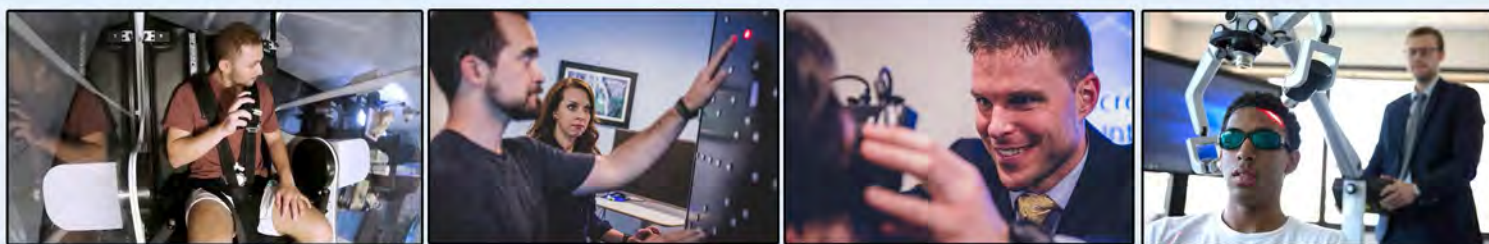
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