THE BRAIN HEALTH MAGAZINE

THIS PROFESSIONAL SPEAKER & AUCTIONEER

Couldn't Talk Her Way Out of Brain Injury Symptoms

PROPRIOCEPTION: A Mind-Body Connection

The 'SIXTH SENSE'

That Helps Us Navigate the World

THE PROPRIOCEPTION ISSUE

Living Your Best Life After Brain Injury | Nov/Dec 2022

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FROM THE EDITOR

It's hard to believe we are already quickly approaching winter. The leaves have fallen, there is a chill in the air, and — depending on where you live — you may already have experienced your first dusting of snow.

With changing seasons comes holidays, family gatherings, and other situations that may make us feel uncomfortable and overstimulated.

An understanding of our proprioception — the ability for our body to know where we are in space — can help us avoid some of the stressors these events can cause.

In the pages of this magazine you will read about proprioception: what it is, how it works, what it does for us, and how we can help improve it.

The biggest game-changer for me was (no surprise here) YOGA. If you've followed my journey for any length of time, you know how much credit I give yoga in helping me in my recovery.

There is a huge misconception out there that you have to be bendy and flexible to practice yoga, which simply isn't true. Even on my worst days, I would come to my mat and find solace. Yoga helps us gain mobility, strength, endurance — and proprioception.

You can do yoga in a chair if you battle mobility or balance issues, or if you can't stand or come to the floor. The chair is an amazing prop often underutilized in yoga — but not in MY classes!

As you browse through this issue, give yoga some thought and consideration, especially if you struggle with proprioception or vestibular issues.

Amy Z.

AMY ZELLMER, EDITOR-IN-CHIEF
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EYE-EAR CONNECTION

Plays Major Role in Proprioception

*Without That '***INTERNAL SENSE***,' Everyday Activities Are Difficult After Brain Injury*

BY DEBORAH ZELINSKY, O.D.

Vestibular "information is integrated with proprioceptive and other sensory inputs to generate our sense of motion," say authors of a recent study published in a 2021 issue of *Current Opinion in Physiology*. This explains why patients with vestibular sensory loss or other vestibular impairments find everyday activities like walking to be difficult. "Even small head movements can produce postural and perceptual instability," they state. In fact, among scientists and health professionals, a new term for this type of problem is "Triple P" — Persistent Postural-Perceptual Dizziness.

"Visual processing involves a complex network of communication signals between the central nervous system (which includes the retina, brain, and spinal cord) and other circuitry, such as the emotional, motor, and sensory systems and thinking processes."

The scientists' description of how the proprioceptive and vestibular systems "work together" to help us navigate and move through our environment is not surprising. In fact, Jana Vaskovic, MD, the author of a 2022 online article on the vestibular system, defines it as a "somatosensory portion of the nervous system," providing us "with the

awareness of the spatial position of our head and body (proprioception) and self-motion (kinesthesia)."

So, why is an optometrist talking about the vestibular system, a structural labyrinth located in the inner ear? Because eye movements link at a reflex level to head movements!

When head injury occurs or neurological disorders like Parkinson's and Alzheimer's disease develop, communication between neuron signals often gets disrupted. This disruption may then disturb the integration of these neurons with other body proprioceptors involving touch, sensation, pressure, and movement.

Proprioception: an "Internal Sense"

Experts often call proprioception an "internal sense." Mechanosensory neurons found within muscles, ligaments, tendons, and joints, proprioceptors transmit information to the central nervous system, and in turn activate feedback loops. These feedback loops allow the body to move without conscious attention. At the same time, they communicate with proprioceptor-like neurons in other sensory systems, including the ears and eyes. The integrated function and coordination of these neurons stabilize posture and prompt body movement. The proprioceptors help with balance, stair climbing, and core posture control, thereby lessening clumsiness.

The Mind-Eye Institute studies the retina's critical role in integrating various sensory maps, including eye-ear coordination, to process visual space and achieve proper spatial awareness. This synchronization of perceived auditory and visual space with proprioceptors optimizes performance. For instance, people may be scared of walking on stairs or through doorways, or picking up objects. These actions require subconscious planning of the amount of energy to exert. If the eyes send signals indicating something is going to be heavy, a person readies his or her arms to lift in a manner much different than when anticipating picking up a small box of feathers.

Visual processing involves a complex network of communication signals between the central nervous system (which includes the retina, brain, and spinal cord) and other circuitry, such as the emotional, motor, and sensory systems and thinking processes.

How Retinal Stimulation Affects the Brain

The Mind-Eye Institute team uses therapeutic lenses, filters, and other optometric interventions to stimulate the retina by changing the way light passes through it and affecting how the brain reacts to information about the environment. Our sensory systems are like musicians in an orchestra. Each musician may be highly skilled in a specific instrument, but without a conductor synchronizing what they play, the result is simply noise — not music.

Brain injury and neurological disorders, like Alzheimer's disease, disrupt sensory circuitry and mapping of space. When either central or peripheral eyesight fail to interact appropriately and/or inputs from eyes and ears fall out of synchronization, patients often become confused about their environment. This confusion can create a narrowed perception and awareness of surroundings, inappropriate reactions and responses, and difficulties with decision-making skills, as well as learning and memory.

"Our sensory systems are like musicians in an orchestra. Each musician may be highly skilled in a specific instrument, but without a conductor synchronizing what they play, the result is simply noise — not music."

The Mind-Eye Institute developed and designed the internationally recognized and patented Z-Bell Test™ to evaluate a patient's overall integration of retinal processing with awareness of auditory space — basically, the stability of the eye-ear connection. During the auditory portion of the test, a patient reaches out, with eyes closed, and tries touching a ringing bell. If the patient cannot do so, a Mind-Eye optometrist determines the optimal combination of lenses to place in front of the patient's closed eyelids allowing the patient to find the bell immediately without conscious effort. Light still passes through the eyelids and activates parts of the brain not used for eyesight. With eyes closed, patients must visualize surrounding space in order to locate the bell. The optometrist repeats this with the visual portion of the testing.

Auditory localization and visual localization must match in order to lessen overall effort and sensory confusion and achieve proprioception. Brain-injured stroke patients, for example, often struggle with gaze stability. Hampered vestibulo-ocular reflex (VOR) function reduces dynamic visual acuity and causes balance issues. Imagine having to stare at your feet in an effort to maintain balance; you would not be able to process surrounding space easily or navigate and plan movements.

The Vestibulo-Ocular Reflex

Although not part of proprioception, the vestibulo-ocular reflex (VOR) plays a significant role in balance,

Continued …

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providing an important feedback pathway between eyes and inner ears. The VOR helps further prevent falls by providing head and postural stability because of the ongoing interaction among tactile, auditory, and proprioceptive sensory inputs.

Scientists writing in a recently published book, *Neuroanatomy, Vestibulo-ocular Reflex*, state "this reflex keeps us steady and balanced even though our eyes and head are continuously moving when we perform most actions." When moving the head, "eye muscles are triggered instantly to create an eye movement opposite to that of our head movement at the exact same speed to readjust the visual world." That adjustment, "in turn, stabilizes our retinal image by keeping the eye still in space and focused on an object, despite the head motion."

"Although not part of proprioception, the vestibulo-ocular reflex (VOR) plays a significant role in balance, providing an important feedback pathway between eyes and inner ears."

Head injury can destabilize posture and balance by affecting this interactive VOR pathway. In the *Encyclopedia of Behavioral Neuroscience* (2010), authors write that the "VOR uses information from the vestibular labyrinth of the inner ear to generate eye movements that stabilize gaze during head movements. Without the VOR, when walking down the street, it [would be] impossible [for a person] to read signs or even recognize faces." VOR disturbances resulting from disease or brain injury can cause vertigo, spatial disorientation, and balance issues. Persons also may experience temporary impairment of proprioceptive neurons because of exhaustion, mental disorders like depression, vitamin and hormonal deficiencies, and cytotoxic factors, such as chemotherapy.

"[S]timulation of the eye's retina using light can affect [a patient's] listening, posture, and balance. And, of course, proprioception conducts those parts of the "orchestra" and keeps them in sync."

Why the Interest in the Vestibular System

Back again to the question of why an optometrist might be so interested in the vestibular system. As Mind-Eye patients frequently indicate, stimulation of the eye's retina using light can affect their listening, posture, and balance. And, of course, proprioception conducts those parts of the "orchestra" and keeps them in sync.

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.*

THE BODY AS A WHOLE

BY IAN HEBEISEN

CAREGIVER CORNER

Over the years, my mom has undergone various treatments to battle her brain injury. She tried everything from physical therapy to vocational rehab to help reclaim her life, each aiding to some degree. Yet throughout her therapies, her progress fluctuated. At times, when one aspect of her injury improved, another worsened.

Early on, we began to notice certain tremors and ticks that would arise. Most notably, her face would contort into a large, involuntary frown — something we dubbed as "porging," after the aliens from the Star Wars franchise. Other random contractions began to crop up as well. "Adjustments to my back set off tremors in my arms or legs," said mom.

She adds, "Every therapy I have ever done triggers a reaction somewhere else in my body. It is why I originally spent 18 months in vision therapy, and why I was not able to make progress in physical therapy." For example, right now she's partaking in a type of vision therapy that's causing her jaw to clench. "It's causing contractions in my jaw, but my ability to communicate has improved. I keep doing it because I know it's helping."

Since she's dealt with these symptoms for so long, they've just become another part of life. "When you live with it every day, you lose sight of it," said mom. "It's hard for me to recall all the ways that I've improved because I deal with it all the time."

There are a couple of important takeaways from my mom's experience. First, her unexpected ailments demonstrate the true interconnectivity of the nervous system. When one part of her brain overloads, the excess stimuli get pushed onto another part, triggering her nerves and causing the contortions. Or, if a nerve in one part of the body flares up, it can cause similar problems in a different part. It's all part of the same system, and seeking help can mean treating every part of the body.

Second, the random contractions show that the treatments are actually doing their job. When undergoing a treatment or therapy after brain injury, you work on repairing and rebuilding neuropathways. It's grueling work, and when reconstructing these pathways, the brain will sometimes trigger other parts of the body in the process.

"It's like when a toddler throws a temper tantrum," said mom. "My brain doesn't like doing something new, so it throws a fit, and I flare up for a couple of weeks. As the neuropathways build and the body adapts, they calm down." Taking a look at these patterns, we can see how holistic brain injury recovery can truly be. If stimuli in one part of the body can trigger a reaction in another part, we should be examining and treating the nervous system in its entirety.

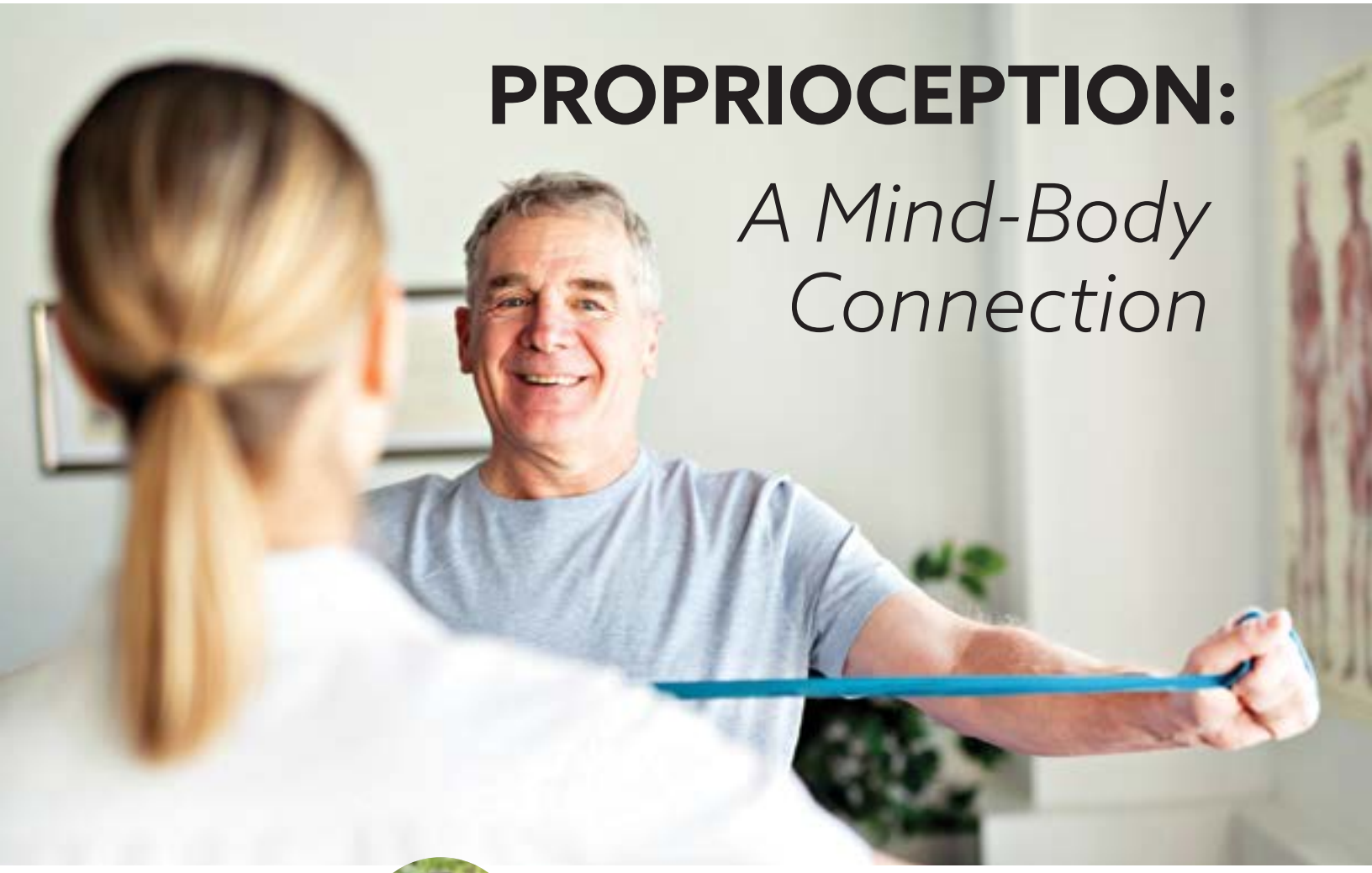
Keep an open mind about you when it comes to seeking treatment. If the science is right, a treatment targeting one part of the mind or body could actually help improve a multitude of ailments. With no two brain injuries being the same, you never know what might work for you.

For caregivers, remember to pay attention to the symptoms your loved one experiences. Take note of any new flare ups that arise, and potentially cross-reference those with past ailments and treatments. Be empathetic to their symptoms – it isn't easy to experience such difficult side effects when undergoing treatment. Your listening ear and encouragement will play an important role in your loved one's recovery journey.

Ian Hebeisen *is a writer based in the Twin Cities. Graduating in 2020 with a degree in Literature with a Writing Emphasis, Ian spends his time writing for The Brain Health Magazine and JUVEN Press. He also writes comics, zines, short stories, and poetry. He lives with his partner and two cats, and enjoys playing board games and reading.*

PROPRIOCEPTION:

A Mind-Body Connection



BY DR KASSIE KAAS, DC

Proprioception, also referred to as kinesthesia, is defined as your ability to sense your movement or body position. That internal awareness helps you determine if you are standing, seated, in motion, or experiencing a gravitational force even with your eyes closed.

Millions of special receptors located in joints, tendons, skin and muscles help proprioception. These receptors keep in constant contact with the brain, transmitting messages which get processed along with messages from the visual and vestibular systems to create an accurate assessment of where the body is in relationship to its surroundings, self, and active motion. This complex procedure gives us the ability to move safely and accurately through our environment without much forethought or planning. It is how we are able to accomplish everything from navigating a dark room, to eating, to sprinting around a baseball diamond.

To illustrate what proprioception is and to test your abilities, try the following:

- *Close your eyes and touch the tip of your nose with your right forefinger, repeat with your left.*
- *With your eyes closed, touch the center of your left knee with your right pinky finger.*
- *Try to walk in a straight line, heel to toe, without losing your balance.*
- *Place your feet together and stand for 30 seconds with your eyes closed.*
- *Try standing on one foot at a time for 30 seconds.*

How did you do? These challenges demonstrate your body's ability to correctly perceive where it is in space, maintain balance, and move appropriately. Breakdowns in proprioceptive ability can lead to uncoordinated or clumsy movements, balance issues, slowed speed of movements or reaction times, frequent falls, muscle imbalances, and poor

postural control. Pain signals can be unregulated causing numbness, tingling, burning, and other painful sensations in otherwise healthy limbs or parts of the body.

Discrepancies in how the brain perceives the body can lead to changes in movement and the development of detrimental muscular compensation patterns. This can lead to chronic low back pain, neck stiffness, and joints or muscle groups often feeling tight or sore. Good proprioception leads to proper biomechanics when moving and less joint and muscle pain, as well as reduced potential for injuries.

Certain conditions can negatively impact proprioception. These include:

- *Brain injury/concussion*
- *Peripheral neuropathy*
- *Arthritis*
- *Neurodegenerative disorders like Parkinson's disease, ALS, or Huntington's disease*
- *Multiple Sclerosis*
- *Stroke*
- *Physical trauma to the body*
- *Joint replacement surgeries*
- *Issues with the spinal cord or disc herniation*

Age-related changes can also happen to the nerves, muscles, joints, and brain, which can cause loss of proprioceptive function. As people age, sometimes their walking speed will decrease. Fine motor skills can become quite diminished; they might rely heavily on armrests to rise out of a chair, and going up and down stairs can be difficult. These might be considered common age-related changes, but they should not be considered normal. These alterations in movement often signify declining proprioception and can increase a person's fall risk dramatically.

These changes can be countered by specifically stimulating the body to drive proprioceptive feedback to the brain. Physical modalities including core and balance exercises help enhance the brain-body connection. Yoga and Tai chi are two excellent activities which encourage participants to slow down and focus on body placement and movement awareness.

Thermal, tactile and electrical interventions are incredibly useful in promoting the proprioceptive feedback system. Hot packs, ice baths, vibration, chiropractic adjustments, and electrical stimulation can all be used on different parts of the body to drive sensory information into the system and help the brain have better awareness and connection.

When repeating interventions, the brain undergoes neuroplasticity and improves or repairs damaged or underperforming neural pathways. Repetition allows efficient, advantageous pathways to form and reinforce, improving accurate proprioception and motor movement. As the saying coined by neuropsychologist Donald Hebb goes, "neurons that fire together, wire together."

In addition to proprioception abilities, it is important to also be assessed for visual and vestibular system dysfunctions. All systems must give correct, cohesive information for optimal function. It is often common in acquired brain injuries such as concussions for multiple systems to be malfunctioning. This can compound symptoms and may cause individuals to feel like they are spinning or floating, trigger nausea, and impair their overall sense of self. It may even impact the autonomic nervous system, causing symptoms of Postural Orthostatic Tachycardia Syndrome (POTS).

"Breakdowns in proprioceptive ability can lead to uncoordinated or clumsy movements, balance issues, slowed speed of movements or reaction times, frequent falls, muscle imbalances, and poor postural control."

A thorough examination will determine which different pathways over or under function, which systems provide inaccurate information for the brain to decipher, and how the body currently compensates. Targeted therapies and interventions such as those previously listed can help the brain and body to reorganize and better interpret incoming stimuli. Once all systems are properly calibrated and able to correctly process the information, optimal outputs can take place. This can greatly reduce associated symptoms and return patients to a recovered state of function.

A skillful exam and appropriate interventions have the potential to improve outcomes regardless of the age of the patient or length of time with dysfunction. The human brain and body are capable of amazing achievements in healing when correctly assessed and cared for.

Dr. Kassie Kaas, DC *earned her Bachelor of Science from the University of Minnesota-Duluth in Biochemistry and Molecular Biology. She went on to earn her Doctorate of Chiropractic from Northwestern Health Sciences University. She has completed additional training in Functional Neurology and Functional Medicine and is a Bredesen Protocol Certified Practitioner. Her primary focuses of care include brain injury rehabilitation, helping patients balance their hormones throughout life's transitions, and creating effective and comprehensive care plans for those suffering with cognitive decline, dementia, and Alzheimer's disease.*

THIS PROFESSIONAL SPEAKER & AUCTIONEER

Couldn't Talk Her Way Out of

BRAIN INJURY SYMPTOMS

She kept her brain injury a secret ... until she couldn't.

BY ED ROTH

Letitia Frye will be the first to tell you she doesn't sugar coat anything. But she did try to hide a few things, namely the ocular and physical limitations her brain injury caused her at work and home.

West Coast-born, East-Coast raised, Letitia doesn't have a 9-5 desk job or a typical life. Her professional life involves jetting around the country, working for celebrities, foundations, and some of the biggest nonprofits. She even caused an international stir in 2018 when she locked lips with actor Johnny Depp in an Instagram photo. However, hiding her fatigue and severe changes in vision, including seeing entire crowds upside down, became a new full time job. Turns out no matter how impressive your gift of gab, you can't talk your way out of the symptoms of a brain injury.

As an actress, model, and auctioneer, Letitia Frye was used to putting on a public persona. She knew how to look the part she played and convince others she was the real deal. Unabashedly proud of her Type A personality, she felt confident about overcoming any obstacle through hard work, determination, and chutzpah.

However, behind the scenes, her life was anything but rainbows and unicorns. Her wealthy husband battled addiction issues for years, and when they eventually divorced, she found herself a single 37-year-old mother of two, with deep financial problems.

So, Letitia did what she does best — she fought back. Six years later, she hit the top of her auctioneer game; Alice Cooper called her America's Auctiontainer ™. Her single-mindedness led to specializing in fundraising for nonprofit organizations. She was riding high, making a difference in other people's lives, and raising two terrific kids.

That all changed on Thanksgiving morning, 2014.

An avid runner, she went out for a quick 3-mile jog near her home in North Scottsdale before boarding a flight to California with her kids. As she stepped into a crosswalk, two cars came barreling toward her at about 60 MPH. Coming from the other direction was a young driver who briefly looked down, then up, to avoid the other cars. In the blink of an eye and the quick swerve of a steering wheel, the driver hit Letitia and sent her flying.

"[After her TBI], hiding her fatigue and severe changes in vision, including seeing entire crowds upside down, became a new full time job."

While on the ground and semi-conscious, she saw and heard bits and pieces of everything around her. A split second of being upside down on the windshield looking at the driver. A random high-pitched noise. A screaming woman with her dog. Her shoes on the ground.

She sat up and apologized to the young man driving the car that hit her, then felt a gelatin-type substance oozing from the back of her head. A moment later, she passed out.

In what she can only describe as a near-death experience, the grown woman living in Arizona transformed into a four-year-old girl on a family farm in Pennsylvania on a beautiful summer day, her once-favorite childhood summer escape. The bright light filled with love beckoned, but the sounds of people and trucks called for her to return. In a flash, "like being pushed back into a birthing canal," she

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returned to Earth against her wishes. Now, the only sound was a muffled Charlie Brown's teacher-like "wah wah wah."

At the hospital, she recalled a seven-foot-tall EMT imploring her to stay conscious and remember three things: Brian, green ball, 15. He said he would return later and she needed to remember those three things. Using her technique to remember details on stage, she recalled how at age 15, she dated a boy named Brian and attended Greens Farms Academy …. Brian, green ball, 15. She would never forget.

Letitia suffered a blow to the cerebellum and didn't realize the doctors needed to shave the back of her head to staple the wound. Anesthesia couldn't be used; instead, they gave her a towel to bite. In her mind, she kept thinking: Brian, green ball, 15. This kept her from drifting away. The EMT did return later when everyone left. All alone in the room with him, he asked her to repeat the three things. Letitia said, "Brian, green ball, 15." The EMT smiled and said, "You are going to be just fine," then left.

She had left for her jog without her phone or ID and therefore had been found as a Jane Doe. Although her family eventually found out and came to her side in the hospital, she felt frustrated, cut off from her family, and worried about her children she left home, so she checked out after 15 hours against medical advice. She was completely unaware of just how much support she would need in the coming weeks.

In shock, heavily medicated, and still reeling from the head injury, Letitia believed all was well, even calling the hospital to thank the enormously tall EMT for being so supportive. They told her no EMT there matched her description, leaving Letitia wondering if he was even real or just in her mind. To this day, she believes her subconscious survival skills saved her life.

Letitia continued to play the brave survivor, with mixed results. Although she holds no memory of it, she returned to the stage eight days later, with staples still holding her shaved head together. Her hairdresser created a strategic combover with some well-placed taped extensions, and several days later shared a concert stage with Alice Cooper. She continued at this pace, performing in her trademark high fashion dresses and 4-inch heels, determined not to let any competition move into her space.

At home it was a different story — she would walk into walls as she struggled to see and hear, due to the loss of sight in her right eye and tinnitus.

While she admits a total disregard for her health, Letitia was hell-bent on keeping her business afloat. She built it from the ground up after breaking the glass ceiling in the male-dominated auctioneering profession. Desperate to hang on to the life she built, she feared losing her two young children: trudging through parental duties like school drop-offs had been second nature before the accident.

However, she was failing to provide her body the time it needed to heal. A few months later at a Super Bowl event, she suffered a seizure on stage and knew some things had to change. "It turns out leaving the hospital with my head shaved was the easy part of this journey," Letitia would reflect.

Over the next seven years, Letitia worked to address the symptoms of brain injury that she could and accept the quirks from the brain injury that she couldn't. Her brain injury awakened her from her all-too-typical life, whether she liked it or not. Fighting to move forward, Letitia focused on the things that mattered, like her family, and continued to heal by setting small goals, such as tolerating fluorescent lights to make it through her son's eye doctor appointment.

Meanwhile, she battled extreme vertigo, which fooled her brain into thinking audiences were upside down while faces and carpets melted. Some of her post-brain injury

symptoms gave her a newfound empathy. "Whenever I raise money for a nonprofit, I always make sure that I understand their programs," Letitia said. "I work for many programs that serve veterans. Until I had my brain injury, I never understood why those with brain injury and PTSD found something like a trip to Walmart almost impossible. Then I had a brain injury and began to understand sensory overload on a whole new level."

> **"Until I had my brain injury, I never understood why those with brain injury and PTSD found something like a trip to Walmart almost impossible. Then I had a brain injury and began to understand sensory overload on a whole new level."**

The hospital discharged Letitia without any referral for community support to her local Brain Injury Alliance or Brain Injury Association. Searching on her own, she found an ocular therapist who concluded her eyes weren't tracking with her brain.

To combat this two-second disconnect and her growing depression, she was fitted with prism lenses and began undergoing brain mapping. As a result, she reconfigured her approach to life, and became more patient with herself; not an easy task for someone so focused on achievement.

Letitia learned the importance of understanding the root cause and not just the symptoms. She also became familiar with something all too common in the brain injury community. Because she "looked just fine," her laundry list of post-brain injury ailments often went dismissed by medical professionals.

> **"[Letitia] became familiar with something all too common in the brain injury community. Because she 'looked just fine,' her laundry list of post-brain injury ailments often went dismissed by medical professionals."**

Years after her recovery, Letitia became acquainted with the Arizona chapter of the Brain Injury Alliance when her good friend asked her to help with an auction for the gala supporting outreach and services in the brain injury community. The news that such an organization existed stunned Letitia. While getting familiar with the programs and resources of the Brain Injury Alliance, she was invited to join the virtual women's brain injury survivor support group, She Shed.

"Seeing the support that exists took me back to the early days of my recovery. I saw myself in those women who were fighting so hard," Letitia said. "I wish I had known that things like this were here. We really need to do more to bring awareness to these community-level programs that are a cornerstone for recovery."

Brain Health Magazine Editorial Board Member Carrie Collins-Fadell feels strongly that we are at a tipping point when it comes to the discussion on brain injury, emphasizing the need to encourage, celebrate, and elevate recovery stories like Letitia's. "This woman's experience spotlights so many things that are misunderstood or hidden about brain injury.

> **"We really need to do more to bring awareness to these community-level programs that are a cornerstone for recovery."**

"One is the fear of losing your entire life, including your career and family. Another is that recovery is a journey and not usually wrapped in a bow and completed within a few weeks. Finally, there's the ping-pong nightmare many survivors who 'look just fine' can experience as they bump around looking for treatments and try to explain vast and evolving symptomology to professionals."

As for Letitia, "The last three years, I have gained the awareness that my brain injury woke me up. I will no longer be asleep in my life."

Ed Roth *is a Scottsdale based media consultant, branding expert, and writer.*

FROM CONCUSSION TO COMPETITION

How **AVIV CLINICS** *Helped Get this Teen Soccer Star Back in the Game*

BY MOHAMMED ELAMIR, MD, FACP, AVIV CLINICS PHYSICIAN

When 14-year-old Linden Perry came to Aviv Clinics, we asked about her expectations of our program. "I just want to be me," she answered. It's a response we hear frequently at Aviv Clinics, where our unique, comprehensive medical program helps people improve their brain function. Whether they struggle with mild cognitive decline, post-stroke conditions, traumatic brain injuries, post-concussion syndrome, long COVID, or other challenges, our clients all want to feel like themselves again.

For Linden, "being me" meant returning to the prototypical All-American girl she had always been. A straight-A student, Linden enrolled in honors and advanced-placement classes at Station Camp High School in Nashville. She was also a star basketball and soccer player, playing on school teams and travel squads. Linden's outgoing personality, positive attitude, and confidence earned the admiration of her classmates and teammates alike.

However, her world abruptly came crashing down at a routine after-school basketball practice.

During a November scrimmage, a teammate accidentally tripped Linden, causing her to fall and hit her head. Within moments, Linden knew something wasn't right as troubling symptoms appeared immediately. She felt sensitivity to light and sound. She lost her sense of balance. She experienced double vision and eye seizures.

Those symptoms never subsided in the coming days and weeks. Diagnosed with post-concussion syndrome, Linden's intense symptoms wreaked havoc on her quality of life. She had trouble concentrating in school. She missed classes and assignments. Her grades began slipping, and she could no longer play sports.

Desperate for help, Linden and her mother Carissa visited countless Nashville doctors. At one point, Linden saw a neurologist, an ophthalmologist, a chiropractor, and a neuro-ophthalmologist while also undergoing vestibular rehabilitation, occupational therapy, and vision therapy. Despite often having multiple appointments in a single day, none of Linden's providers could offer any answers, and her improvements were minimal and often fleeting.

"Each one basically told me there was nothing they could do," Linden told us. "They also said I should just accept my new normal."

"Whether they struggle with mild cognitive decline, post-stroke conditions, traumatic brain injuries, post-concussion syndrome, long COVID, or other challenges, our clients all want to feel like themselves again."

Carissa refused to accept that. With the help of a family friend, she reached out to Ramon Foster, a former offensive lineman with the Pittsburgh Steelers who also lived in Nashville. Ramon recommended they contact Dr. Joseph Maroon, the team neurosurgeon for the Pittsburgh Steelers. Dr. Maroon is also a board-certified clinical professor of neurological surgery at the University of Pittsburgh School of Medicine.

Dr. Maroon, who had been through the Aviv Medical Program himself, told the Perrys about Aviv Clinics, and his personal experience with the innovative, holistic program.

Carissa heeded his advice and investigated Aviv as a treatment option. She told us that as soon as they stepped into our 30,000 square-foot central Florida clinic, they knew they'd made the right choice.

"Our comprehensive, team-oriented approach ensures clients, like Linden, achieve optimal cognitive and physical results from their tailored program."

"The first day, her doctors had already mapped out every single appointment Linden was going to have for the next 12 weeks," Carissa says. "Then, they told us specific therapies that they would introduce when Linden reached a certain point in the program."

Throughout Linden's three-month program, she worked with me as well as a nutritional coach, a physical therapist, a neuropsychologist, and a physiologist. Her personalized treatment plan also included Aviv's specialized hyperbaric oxygen therapy (HBOT) protocol. While inside our one-of-a-kind multiplace hyperbaric suite, Linden completed brain exercises focused on improving her memory, reaction time, attention, information processing speed, and more.

Why HBOT? Scientists at Tel Aviv University and the Shamir Medical Center in Israel conducted numerous peer-reviewed clinical studies on the effects of HBOT on the long-term symptoms of concussions and traumatic brain injuries. In each study, patients receiving the HBOT treatment protocol showed significant improvement in cognitive function.

The improvements from HBOT include:

- *Memory*
- *Attention*
- *Executive function*
- *Information processing speed*
- *Visual-spatial processing; and*
- *Motor skills.*

Aviv's HBOT protocol mirrors the conventions used in these studies.

Although HBOT tends to earn the headlines, each part of the Aviv Medical Program is essential to our clients'

Continued …

... continued from previous page.

improvement. Our comprehensive, team-oriented approach ensures clients, like Linden, achieve optimal cognitive and physical results from their tailored program.

Linden, who took online courses during her three-month treatment program, began to notice cognitive improvements within one month.

"I would come to Aviv Clinics every day, then I'd go to the rental home and spend five hours doing schoolwork online," Linden tells us. "In the beginning, I'd have to stop my schoolwork because of eye seizures, migraine headaches, or fatigue. Then I started noticing gradual improvement. In my science class alone, I submitted 152 graded assignments in nine and a half weeks."

Each Aviv Clinics client is thoroughly evaluated both before and after their treatment program. The initial three-day assessment includes advanced brain imaging and physical, cognitive, and neurological tests. Once this assessment is complete, our clinical team creates a custom-tailored program for each client. At the conclusion of treatment, we repeat the same tests to measure improvement and make recommendations for ongoing progress.

"The initial three-day assessment includes advanced brain imaging and physical, cognitive, and neurological tests. Once this assessment is complete, our clinical team creates a custom-tailored program for each client."

Linden completed the program on May 31 of this year and aced her final assessment. Her rate of progress from beginning to end was remarkable. Not only did her cognitive ability improve, but so did her strength, agility, balance, confidence, and energy.

"By the end, I had returned to my normal processing speed," she says. "I could complete a 100-question exam in 25 minutes."

Post-concussion syndrome is one of many conditions we treat at Aviv Clinics, using our multidisciplinary Aviv Medical Program.

Our treatment has also been shown to be an effective option for symptoms of:

- *Stroke*
- *Long COVID cognitive symptoms*
- *Traumatic brain injury*
- *Mild cognitive impairment*
- *Age-related cognitive decline*
- *Post-traumatic stress disorder*
- *Lyme disease*
- *Fibromyalgia*

Now back in school, Linden joined her team on the soccer pitch at a national competition just days after leaving our clinic. Most importantly, Linden's wish came true: she gets to be herself again. For Carissa, she gets her daughter back.

CONTACT AVIV CLINICS: ***p:*** 888-393-2848 ***e:*** info@aviv-clinics.com ***w:*** https://aviv-clinics.com

Our Children Are Our Legacy:
Ensuring a Daughter's Success

BY IAN HEBEISEN

PODCAST HIGHLIGHT

Twenty years ago, Mike Lang returned home to find his house empty — not unusual, since he knew his wife Kelly and their two daughters were at a ballet rehearsal. Upon checking the answering machine, however, Mike learned that they never made it to their destination. "The message was from our friend Kristen," said Mike. "She says that my girls were in a car accident. I was expecting that she would say, 'everyone's okay.' But she never said that."

While Kelly drove their daughters Olivia (3) and Hannah (5) to rehearsal, a car struck them from behind. The cars linked together, crossing three lanes of traffic and hitting two other vehicles before crashing into the guardrail. "The next memory I have is all auditory," said Kelly. "I have no visual memory."

"I soon realized there was something wrong with Olivia, who was sitting directly behind me," said Kelly. All three of them got shipped to the local hospital. Upon waking up in the ER, it was explained that the hospital lacked a unit for pediatric trauma, and Olivia needed to be transferred. In her fuzzy state, Kelly provided a friend's phone number, allowing the hospital to contact Mike through them.

"We both entered the pediatric intensive care unit at pretty much the same time," said Kelly. They found their daughter in a coma, later learning that she had to be resuscitated at the site of the accident. "Everything moved in slow motion," recalled Mike. "I felt a little bit of relief to see that she was breathing. But then I realized that wasn't her, that was the respirator doing all the work."

After about a week, the hospital removed the respirator and began to slowly wean Olivia off of the calming medication. She became agitated at times during this process – a commonality among victims of brain injury. Doctors feared Olivia would start pulling out tubes if they agitated her too much.

Olivia came to ten days after the accident. She started inpatient rehab, and recovered remarkably fast — treatment expected to take six to nine months lasted only two weeks. "We really pushed the facility because we wanted her home," said Kelly.

Kelly found getting information on her own condition challenging. "I was told I had a CT scan. They said 'you'll probably need physical therapy eventually.' One of the social workers in the hospital accused me of being in shock," said Kelly. "My injury wasn't fully diagnosed until practically two months after. I was really lucky because my primary care doctor referred me immediately toward neuropsychologists for testing."

Thus began the traumatic brain injury journey of mother and daughter. They focused their energy on ensuring success for their daughter. "A three-year-old obviously is not going to be able to advocate for herself," said Mike. "That really energized us to make sure that she was getting all the speech therapy, all the occupational therapy, all the physical therapy."

The next great challenge Olivia faced was starting school. Since she never experienced behavioral issues, some teachers overlooked her needs, thinking she didn't need extra attention. "I would meet with the teachers every year before school started and explained what to expect," said Kelly. "Almost every year, they came back to me afterwards and said I was spot on."

Kids bullied Olivia for her struggles to keep up with conversations. She would be pulled from class to earn extra help with reading and math, but in time, she started to fight the attention. After much back and forth between Mike and Kelly, the parents told their daughter about her brain injury for the first time around age 10. "That was a devastating conversation for all three of us," said Kelly.

In the years since then, Olivia and Kelly have found ways to live with their brain injuries. Olivia took up music therapy, and both became involved in advocacy groups to raise awareness and bring aid to other TBI survivors. Now, Kelly serves on the advisory council of both the Brain Injury Association of America and the Virginia Brain Injury Advisory Council.

Together, Kelly and Mike co-authored the book *The Miracle Child: Traumatic Brain Injury and Me*, released on August 15th. "Raising awareness is huge," said Mike. "There is no textbook out there that is going to definitively describe the symptoms, the characteristics of a person afflicted with a brain injury. Everyone is going to be treated differently." Recounting their experiences as caretakers and survivors, the book can be found at Barnes & Noble, Amazon, and independent bookstores.

To learn more about Kelly, Mike, and their book, visit www.themiraclechild.org. To listen to the whole conversation, check out the Voices of TBI podcast on Apple Podcasts or wherever you find your podcasts.

Ian Hebeisen *is a writer based in the Twin Cities. Graduating in 2020 with a degree in Literature with a Writing Emphasis, Ian spends his time writing for The Brain Health Magazine and JUVEN Press. He also writes comics, zines, short stories, and poetry. He lives with his partner and two cats, and enjoys playing board games and reading.*

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

Proprioception and TBI

BY JAMES HEUER, PA

LEGAL CORNER

Proprioception, simplified, is disturbed balance. Proprioception is how a person knows the position of the body, the location of their legs or arms, and how their head is held. It is the awareness of where the body is, and it is learned throughout a person's lifespan. As muscles strengthen, they also gain proprioception. Think of a baby when they first learn to hold up their heads. It starts out a wobbly action, and strengthens over time, continuing to be refined.

"Proprioception is how a person knows the position of the body, the location of their legs or arms, and how their head is held. It is the awareness of where the body is, and it is learned throughout a person's lifespan."

Issues with proprioception can lead to balance problems, difficulty walking and sitting, poor posture, and trouble climbing stairs or walking on uneven surfaces.

Located in the inner ear, the proprioceptive system consists of information from sensory neurons. The inner ear controls motion and orientation. The stretch receptors located in the muscles and joint-supporting-ligaments control stance.

Movements become an automatic ability as a sense organ. It is important for the motor and balance of the body. Movements continue to be refined as skills and abilities increase, although aging can cause issues to arise. Balance and coordination impairment can prevent proper walking and other movements. This is referred to as cerebellar ataxia. A crucial factor that needs to be treated, this condition creates disability and risk of falls.

That being said, post traumatic brain injury can cause a high risk of falling due to poor balance. This risk can lead to more serious injuries such as broken bones. Daily activities such as self-care tasks including bathing, getting dressed, and using the restroom may be affected. With proprioception issues, one may be unable to work or drive.

Along with balance and motion, vision and visual perception may be disturbed. I discuss with my clients any visual concerns they may be experiencing. I recommend they seek out an ophthalmologist for a comprehensive eye exam to assess for any ocular injuries.

"[After a TBI] daily activities such as self-care tasks including bathing, getting dressed, and using the restroom may be affected. With proprioception issues, one may be unable to work or drive."

Whether the TBI was due to a car accident, a fall, or any other head trauma, as an attorney, I recommend an assessment by a licensed healthcare professional to address my client's symptoms. These professionals include but are not limited to physicians, physiatrists for rehabilitation, neurologists, and physical therapists.

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

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

James A. Heuer
Attorney

HF Heuer Fischer, P.A.

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Jonathan Fischer
Attorney

The Heuer Fischer team of lawyers and nurses have over 80 years of combined experience helping victims of a TBI.

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YOGA: *Camel Pose*

BY 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, be able to balance, or even be able to stand up. The beauty of yoga is every pose can be modified to accommodate anyone.

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

Camel Pose (Ustrasana) is a heart-opening backbend that helps energize.

It helps counteract the effects of sitting at a computer/phone all day, and helps to open up the heart chakra. Known to help relieve low back pain, it can help build confidence and empowerment, and improves posture.

Camel Pose stretches your abdomen, chest, shoulder, hip flexors, and quadriceps. It also strengthens your back muscles, hamstrings, and glutes.

Instructions:

1. *Begin on your knees with your legs hip distance apart. Keeping your hips over your knees, squeeze your thighs energetically towards each other.*
2. *Inhale as you engage your belly, lift your sternum, and draw your elbows back behind you.*
3. *While keeping your chest raised and core engaged, pull your shoulders back as you drop your hands towards your heels.*
4. *Press the heels of your hands into the heels of your feet.*
5. *Gently allow the head and neck to extend backward and gaze at the tip of your nose.*
6. *Breathe in this pose for 30-60 seconds.*
7. *To exit, bring your chin to your chest and hands to your hips. Engage your belly and use your hands to support your low back as you slowly come back up to your knees.*

Modifications:

- *Use a block next to your feet if you can not get all the way to your feet.*
- *You may wish to put a blanket under your knees for comfort.*
- *If doing chair yoga, bring your arms behind you in the chair and stretch your sternum to the sky.*

Join me for monthly yoga classes via zoom for only $10 a month: ***www.patreon.com/amyzellmer***

SMOKY QUARTZ

for Balance & Grounding

BY KRISTEN BROWN

Owning your place and space in the world takes a powerful mindset. Whether it's navigating terrain physically or navigating situations mentally and emotionally, you will always find opportunities to see and feel where you're at in the moment. One simple way to bring more awareness to your body, mind, and spirit is to tap into the good energy of Smoky Quartz. This power stone brings grounding and balance when used regularly for awareness and healing.

Here are three powerful benefits of using Smoky Quartz:

1. **Balance:** *Tuck a piece of Smoky Quartz into your pocket or undergarments to feel the physical sensation of balance AND energize mental balance too.*
2. **Grounding:** *Hold a piece of Smoky Quartz in each hand during meditation to experience a deep sense of connection with the earth and universe.*
3. **Healing:** *Smoky Quartz can be used in the bath or during yoga to bring a sense of peace and vitality to your body, mind, and spirit.*

Everyday, use Smoky Quartz in your daily activities AND as a powerful focus during rituals, meditation, and yoga. It will help you to feel more balanced in your body and grounded in all areas of your life.

Want more info on crystals and energy healing? Connect with Kristen at: ***KristenBrownPresents.com***

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

Joy *ESSENTIAL OIL*

BY AMY ZELLMER, EDITOR-IN-CHIEF

A complementary tool that can help you achieve a healthy lifestyle, essential oils are easy to use and smell great, with a variety of uses.

All oils are not created equal. I personally only trust the Young Living brand because I know they maintain 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 plants, 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.

Joy Essential Oil Blend

Joy™ essential oil blend features an exotic combination of floral and citrus essential oils, including Ylang Ylang, Geranium, Jasmine, Palmarosa, Rose, Bergamot, Lemon, and Tangerine, to enhance the frequency of self-love and bring joy to your heart.

To create Joy's unique and lovely scent, oils such as Bergamot, Ylang Ylang, Geranium, and Rose combine to make the perfect floral and citrusy aroma. Many of these oils hold a rich history: Bergamot is rumored to have been taken to Italy by way of the Canary Islands by Christopher Columbus. Rose has been praised for its fragrance and other qualities since ancient Greek and Roman times. With such powerful oils, it's no surprise Joy remains a member favorite.

- **Bergamot:** *Has a calming aroma*
- **Geranium:** *Helps release negative emotions*
- **Rose:** *Creates a sense of balance and elevates the mind*
- **Ylang Ylang:** *Inspires a romantic aromatic atmosphere*

FEATURES & BENEFITS

- *Inspires romance with its pampering, spa-like aroma*
- *Creates a joyful and happy aromatic experience when applied to wrists or heart*
- *Can be worn as a perfume or cologne*

SUGGESTED USES

- *Apply Joy to your wrists and the back of your neck before going out for a fresh and natural floral perfume.*
- *Diffuse Joy to fill your space with its uplifting, joyful aroma.*
- *Place 2–3 drops on a damp cloth and throw it in the dryer to help freshen your laundry.*
- *Put a few drops in a warm bath for a spa-like experience and to feel feminine.*
- *Diffuse 8–20 drops to create an atmosphere of happiness throughout your home.*

DIRECTIONS

- **Topical:** *Apply 2–4 drops directly to desired area. Dilution not required, except for the most sensitive skin. Use as needed.*
- **Aromatic:** *Diffuse up to 1 hour 3 times daily.*

*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.

MEXICAN FRIED RICE

HEALTHY LIVING **BY AMY ZELLMER, EDITOR-IN-CHIEF**

WHAT YOU NEED:

- *7 oz. (300g) chicken breast*
- *2 cloves garlic, crushed*
- *a scant ½ cup (100g) rice*
- *2 tbsp. coconut oil*
- *½ red onion, chopped*
- *1 red pepper, diced*
- *⅜ cup (100g) sweetcorn, drained*
- *½ cup (100g) red kidney beans, drained*
- *1 tomato, peeled, chopped*
- *1 avocado, stone removed, flesh diced*
- *1 tbsp. lime*
- *½ chili pepper, chopped*
- *handful coriander, chopped*

SPICES:

- *1 tsp. dried oregano*
- *1 tsp. paprika*
- *1 tsp. ground cumin*
- *½ tsp. chili flakes*

DIRECTIONS:

1. *Chop the chicken into cubes. Season with salt, pepper, spices and crushed garlic.*
2. *Cook the rice according to the instructions on the packaging, drain, and transfer onto a plate to cool.*
3. *Heat the oil in the pan over medium-high heat, and fry the chicken for about 3-4 minutes. Add in the chopped onion and diced peppers and continue to cook for another 3-4 minutes.*
4. *Next, add the drained sweetcorn, beans, and the cooked rice. Mix well and cook for another 2 minutes.*
5. *Remove from the heat, add the peeled and diced tomato, then mix.*
6. *To serve, divide the rice between plates, top with avocado, drizzle with lime juice, and sprinkle with chopped chili and coriander.*

PRO TIP: To easily peel the tomato, pour boiling water over it for about 1 min. The skin will then easily come off.

Serves: 4 **Prep:** 10 mins **Cook:** 25-30 mins **Nutrition per serving:** 360 kcal 16g Fats 32g Carbs 24g Protein

PROPRIOCEPTION:

The 'Sixth Sense' That Helps Us Navigate the World

BY DR. CLAYTON SHIU, L. AC. PHD

Close your eyes and take a step. How do you know where your left foot, then your right foot, should go? What controls how you place your foot down onto the ground? How can you tell where your arms and legs are, where your body is in space?

Proprioception, the so-called true "sixth sense," gives us the ability to move freely without thinking, to walk without looking or consciously thinking about where our feet will go next, or even to find our nose with our eyes closed, like the test used by police on drunk drivers.

In addition to your conscious awareness of your body's position in space, proprioception relates to the unconscious processing of information from sensory receptors to the brain. This connection allows you to sense your body's location, actions, and movement, and the positions of your joints. It allows you to gauge and control the use of your muscles, and the force and effort you use.

When you move, the sensory receptors in your skin, joints, muscles, tendons, and nervous system all send detailed information to the brain. The brain processes these messages and works with the nervous, vision, and vestibular systems to serve up your perception of where your body is and how you're moving. A smooth, continuous conversation — successful proprioception — allows us to maintain our balance, control body posture, coordinate movements, and sense weight and viscosity.

When proprioception doesn't function right you might experience difficulty with balance or walking on uneven surfaces. You might feel uncoordinated or clumsy, or find you don't understand your own strength or the strength needed for different activities. Concussion, neurological diseases, stroke, arthritis, or joint replacement surgery, among other issues, can all interrupt successful proprioception.

> **"[S]uccessful proprioception allows us to maintain our balance, control body posture, coordinate movements, and sense weight and viscosity."**

Age-related changes, injuries, or even short-term stresses can also have an effect. When injured, sensory tissues can become numb or grey, like a dark zone. This happens in part due to the body's protective reflex to close off the flow of information so as not to overwhelm the brain with the effects of traumatic injuries. However, even when the body

starts to heal, this self-defense mechanism doesn't always switch off. Oftentimes, an issue with proprioception will remain unknown until a neurological exam picks it up.

I experienced this myself after injuring my shoulder in a car accident. Standing with both shoulders pinned against the wall, I found my injured shoulder acted quite different from the healthy one. I could move my healthy shoulder straight forward and then back to the wall, but when I tried this with my injured shoulder, it would go left, right, or up or down before moving forward. It felt as if my shoulder's own inner GPS could not tell it to move smoothly forward, and it kept wandering off the road.

"When proprioception doesn't function right you might experience difficulty with balance or walking on uneven surfaces. You might feel uncoordinated or clumsy, or find you don't understand your own strength or the strength needed for different activities."

Even a short-term interruption of the sensory messaging to the brain can have an effect. Have you ever sat in one position for too long, impeding circulation to your legs or feet, and experienced the "pins and needle" effect when you finally move? I do this all the time, sitting in a half-lotus position while watching a movie. When I get up, I cannot place my full weight onto my foot because my ankle joint's proprioception is incorrect and it can't center my body onto the ankle joint and foot. When healthy blood flow returns, the neural tissue begins to fire and starts recalibrating my senses and motor movements.

Therapies to improve motor function can help. Besides physical therapies such as yoga or tai chi, or other movement training, somatosensory stimulation through electric, thermal, or magnetic treatment — or acupuncture — can reset and restore healthy proprioception.

"Besides physical therapies such as yoga or tai chi, or other movement training, somatosensory stimulation through electric, thermal, or magnetic treatment — or acupuncture — can reset and restore healthy proprioception."

Healthy brain function is key. By supporting healthy blood flow in and through the brain, neurological-based acupuncture treatments such as the Nanopuncture ®, offered at the Shiu Clinic, can help keep your "sixth sense" working.

When tissue is damaged through traumatic injury, or becomes deficient in blood or other nutrient supplies, you may feel little or nothing at first. But once therapy begins to restore blood flow and to recalibrate the sensory nerves, you may feel pain, soreness, or aches. This is normal, and temporary. What you will also notice is that, through repair of the proprioceptive system, your range of motion will be improved or restored, muscle deterioration can be slowed, and the risk of future injury will be reduced.

Dr. Clayton Shiu *is at the forefront of integrating acupuncture with Western medicine for optimal patient care and powerful outcomes. He is the creator of the stroke and neurological rehabilitation system Nanopuncture®, which he teaches to acupuncturists and other medical professionals across the country. In 2019, he founded The Shiu Clinic, the first in New York City to combine neuroscience, acupuncture, and the most cutting-edge PBM technology. Dr. Shiu holds faculty positions at the Academy of Chinese Culture and Health Sciences and the American College of Traditional Chinese Medicine, teaching stroke rehabilitation courses for their doctoral programs.*

WHERE *Am I At?*

BY MICHAEL HENNES, DC, DACNB

Where am I? This seems like a simple question. In fact, if you're reading this you probably know exactly where you are, or at least you think you do. You may know the place you're in but your brain may not know where you are in that place. Deep. I'm talking about proprioception, sometimes known as the sixth sense. Proprioception, or kinesthesia, is our ability to tell where our body moves, how much force it exerts, or where our limbs rest.

This "sixth sense" is a big deal, especially when we start talking about some of the more common symptoms associated with concussions and brain injuries: headache, neck pain, blurry vision, tight muscles, and brain fog. You see, our brain NEEDS to know where our body is in relation to the things around us in order to keep us upright, oriented, and safe. If our brain ever loses track of where we are then we'll start to run into things, or knock things over.

Outwardly that makes sense. Think about a happy puppy dog with their tail whipping back and forth at the speed of sound without a care in the world. Glass of water on the table? It's on the floor now! What about our body movements we don't often think about like our posture, our eye movements, or our resting muscle tone? These things aren't as exciting but they are equally, if not more, important to our daily lives.

As I said earlier some of the most common complaints I see in my practice are a result of our bodies losing track of how to relate to the space around us. When the sensory information from our muscles and joints doesn't match the information coming from our eyes and other parts of our nervous system, our brain gets confused. Oftentimes its best action is to tighten our muscles, change our posture, or change how fast our eyes move. All of these things result in things we call symptoms.

Knowing what the problem is and even why it happens is great, but now what can we do about it? One of the superpowers your brain has is its ability to learn. Sometimes we learn new things and sometimes we relearn old skills. Our brain learns by taking in information from our body. When our brain no longer knows where our body is in the world we need to retrain it.

How we do this varies on the exact symptoms and their causes, but here are a few things you can do at home.

Meditation: Meditation and mindfulness provide a plethora of positive effects on the brain. One of those effects is the stimulation of connections between the different parts of the brain. In fact, mindfulness makes changes in the brain visible on MRI in as little as eight weeks. It includes the added benefits of promoting oxygen delivery to the brain and body and stimulating the vagus nerve, which is very important in any brain rehabilitation program.

Yoga: I love yoga for a variety of reasons. It's the perfect exercise when it comes to knowing where your body rests. Yoga combines controlled physical movement, stability, breathing mechanics, and meditation, making it the easiest way to start reprogramming your brain's connection to your body. By adding in a point of focus just beyond our reach we can also incorporate our visual focus. This is a great way to work on some of the pesky visual symptoms we mentioned above.

Sleep: Sleep seems taken for granted in today's society. If we've slept at all, we often assume we'll be fine when in reality the eight hours of sleep recommendation is just the beginning of good health. Our brains do many, MANY, things while we sleep. In the case of reconnecting our brains to our bodies, we need to sleep so our brain can learn. When it comes to learning something new our brain has two processes, plasticity and stability. Plasticity actively makes new connections, like the ones we make while meditating and doing yoga. Stability strengthens our brain's meaningful connections and removes the frivolous ones. If we have too much stability we can't learn, if we have too much plasticity we struggle to learn more – or in this case heal. Sleep promotes a perfect balance between stability and plasticity, making it one of the most important parts of any type of healing process.

Knowing where your body is in the world around you is something we often take for granted until the system breaks down. Fortunately, our body and brain is wonderfully resilient and can be taught how to work together again using some simple-to-do but hard-to-master strategies you can employ in the comfort of your own home.

Michael Hennes, DC, DACNB *is a chiropractic functional neurologist at Northwestern HealthSciences University's Sweere Clinic. He specializes in concussions, brain injuries, dizziness/vertigo, post-auto whiplash, stroke, neck/face pain, visuo-vestibular dysfunction, headaches, migraines, and sports performance.*

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