Academy of Integrative Pain Management

Integrative Pain Management for Optimal Patient Care

The Pain Practitioner

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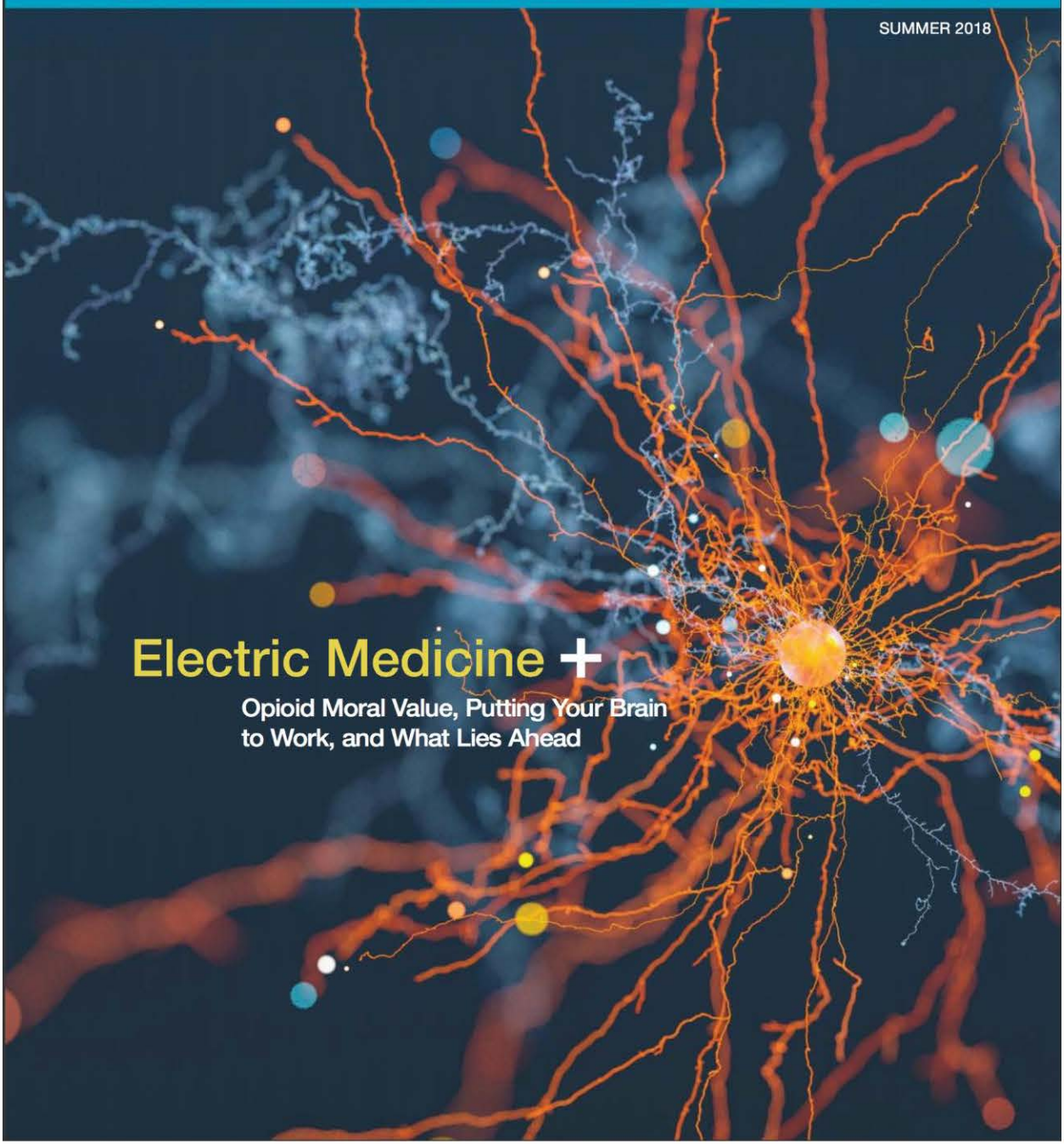

Electric Medicine +

Opioid Moral Value, Putting Your Brain to Work, and What Lies Ahead

Putting Your Brain to Work on Your Pain

By Robert Rosen, MD, FAAO, MBA

THERE CONTINUES TO BE A RISING OPIOID PROBLEM IN the US without a clear solution in sight. The Centers for Disease Control and Prevention (CDC) has reported emergency department visits for opioid overdoses rose 30% in all parts of the US from July 2016 through September 2017(1). People who overdose are more likely to overdose again.

There is a much better, safer alternative for pain management. Micro current neurofeedback (MCN) is a safe, proven alternative for pain management that can have a significant impact by helping people get control of their lives again (2).

The concept behind IASIS Technologies MCN is to allow the brain to rebalance and optimize itself, which allows the body to properly heal. This is accomplished by applying low-intensity pulses using transcranial electrical stimulation (LIP-tES) with electroencephalography (EEG) monitoring delivered through three small sensors/leads placed at up to 19 specific locations on the head and neck that correlate to specific symptoms. There is a ground lead, an active lead, and a reference lead. These sensors/leads perform two functions. The first is to detect and monitor brainwaves sending the resulting electronic signals to a computer and a specialized EEG processor.

The second function is to deliver feedback to the brain via a 3 Pico watt micro current signal, which is a fraction of a cell phone signal. This low power feedback frequency correlates with the dominant brainwave frequency and the resulting brainwaves are reflected in the EEG monitor. The MCN system uses the EEG input to determine the treatment frequency. If there is normal beta brainwave there is no responding pulse. If beta brainwaves are abnormal, the pulse is sent to the brain 1 Hz higher than the corresponding brainwave to guide it back down to the normal range. The desired outcome is a balanced brainwave state to allow the brain and nervous system to regulate itself.

Allowing the brain to reorganize itself and shift from its formerly fixed patterns, MCN is like rebooting a computer. The body responds by developing new neural pathways, increasing neuroplasticity. It literally allows the brain and nervous system's chemical imbalances to self-regulate. The nervous system recalibrates and stabilizes, giving the individual the ability to be more resilient, responsive, and grounded. MCN has been utilized effectively for numerous applications, including, but not limited to:

- Fatigue and pain conditions, including fibromyalgia, chronic fatigue, chronic pain, neuroinflammatory states (e.g., microglial activation), electromotive force (EMF) sensitivities, and oppositional defiant disorders.
- Addictions, including those to alcohol, prescription medications, nicotine/cigarettes, and recreational substances (cocaine, marijuana, etc.).
- Anxiety, including symptoms of panic attacks, generalized anxiety, impulse control, irritability, emotional outbursts, or wide emotional fluctuations.
- Post traumatic stress disorder (PTSD) symptoms, including hypervigilance, restlessness, and sleeping problems.
- Depression, including bipolar conditions, flat emotions, social withdrawal, feelings of helplessness, deep sadness, loss of energy, lack of motivation, and loss of sense of humor.
- Head trauma, including those with mild/moderate traumatic

brain injury (TBI), concussions, chronic traumatic encephalopathy (CTE), blast injuries, strokes, cranial surgeries, and seizures.

- Cognitive dysfunction, including ADD/ADHD, some learning disabilities, brain fog, cognitive deficits from stroke, and poor memory.
- Obsessiveness, including compulsions, OCD, Tourette's syndrome, and some aspects of autistic spectrum disorders.

All the conditions mentioned above have a common denominator: the brain is "frozen" or "stuck" in a dysfunctional pattern. Unlike other neurofeedback, MCN does not attempt to train or shock the brain by using set frequencies or higher current. Instead MCN balances the brain allowing it to reorganize itself and release from frozen, stuck patterns. This is why medications are often unable to satisfactorily address the above conditions. Medications generally address specific symptoms and will not help the brain achieve its natural state of flexibility, self-regulation, and focus.

TRAUMATIC BRAIN INJURY CASE STUDY

The success of MCN on trauma and PTSD attracted the attention of the military. This was accomplished by a pilot study funded by IASIS, of "Patient Zero" whom we will refer to as Greg. Greg is a Marine Master Gunnery Sergeant, with a distinguished 30-year career in the Marine Corps, scoring 120 on both the General Technical and General Electrical testing, putting him in the top 1% of military entrants. The majority of Greg's career was spent with the Marine Corp's most elite teams, Recon/Force Recon and Special Operations Forces. He was deployed overseas 10 times with seven combat operations in the Middle East.

During his close encounter combat experience, Greg suffered two major concussive injuries. The first occurred when an armored Humvee he was riding in ran over an improvised explosive device (IED) lifting the vehicle in the air and flipping it over backwards, throwing Greg first into the roof of the vehicle then impacting the ground causing fractured vertebrae and broken bones in his left foot, ruptured eardrums in addition to giving him a concussion. This produced weeks of persistent headaches and ringing ears. The second episode occurred when he was struck by shrapnel from a hand grenade that detonated very close to his covered position. The blast caused his helmet to be blown off his head, again causing ringing in his ears for days following the explosion.

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These two incidents combined with the grueling physical demands and micro trauma of his Elite Marine Corps assignments had left a legacy of pain and lost mental acuity. With three decades of Special Operations Forces and close encounter combat experience, and two Purple Hearts to show for it, Greg returned home with severe migraine headaches and extreme depression from his traumatic brain injuries.

Retiring from the Marines in 2007, Greg began seeing both a psychiatrist and a psychologist at the VA hospital in San Diego. He was also enrolled in a VA-sponsored brain study that was conducted by University of California at San Diego (UCSD) Medical School. The study determined that Greg had experienced a traumatic brain injury (TBI) and was told that he would most likely never regain the mental capabilities he had once possessed.

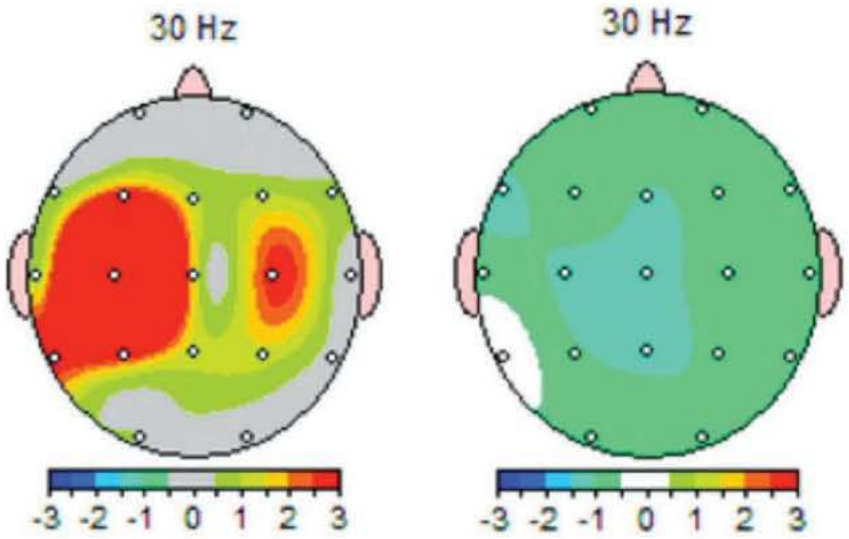
In Greg's opinion both the psychiatrist and psychologist had helped reduce symptoms of PTSD but there was no evidence that the TBI was ever going to get better. As a result of the TBI, his speech, attention span, and other areas were severely impaired and impacted. Additionally, Greg was prescribed one prescription after another. Five years of narcotic and psychotropic drug prescriptions did not resolve Greg's issues and he continued to struggle with PTSD, migraines, and anger issues.

In 2012 IASIS Technologies, Inc. (IASIS) approached UCSD and asked them to conduct a single subject pilot study for MCN using Greg as "Patient Zero" that IASIS would sponsor. Greg had a migraine when IASIS administered his first MCN treatment and felt it disappear within the first minute of treatment. Greg's reaction to MCN was nothing short of incredible. He was able to discontinue his prescription medications after his first treatment and could feel himself regaining his prior acuity and energy. Greg had a total of 10 treatments over a three-week period as part of the pilot study guidelines. MCN had in his own words "given him his life back."

IASIS used quantitative electroencephalography (qEEG) mapping as a primary diagnostic test of brain function, which measures the electrical patterns present on the surface of the scalp (see Figure 1).

Greg's qEEG results before treatment clearly showed the results of TBI with very little in the normal brainwave activity range. Within 2 standard deviations from the norm on either side is considered normal brain activity. In Greg's "before" qEEG mapping you can see the excessive activity of his brain that was depicted in red. The red corresponded to the location where Greg's migraine was concentrated. Greg's "after" qEEG six

FIGURE 1: BEFORE AND AFTER EEGs.



The individual brain maps (Hz) use colors to represent the Z scores at the 19 reference points, with the nose on the top. A Z score is a metric, which represents how similar a score is to the "normal population" as defined by the Neuroguide Database. Z scores represent Standard Deviations (SD) from the norm and span from -3 to +3. A Z score of 0 represents the norm and is color-coded in these set of maps as the color "grey" and or "white."

weeks later, had changed dramatically showing balanced brain activity, validating the changes that Greg had experienced.

FURTHER RESEARCH

Greg's results prompted the University of California, San Diego (UCSD) School of Medicine to conduct their own study on veterans with PTSD (3). The results documented, via magnetoencephalography (MEG) neuroimaging, showed significantly improved neural functions in all the participants with mild traumatic brain injuries. At the baseline MEG exam, all participants had abnormal slow-waves. In the follow-up MEG exam, the participants showed significantly reduced abnormal slow-waves with an average reduction of 53.6 ± 24.6% in slow-wave total score. The participants also showed significant reduction of pain catastrophizing scale (PCS) scores after MCN treatments, with an average reduction of 52.76 ± 26.4% in PCS total score.

The results were reported in the September 29, 2017, issue of ScienceDaily(4). The Veterans Administration in San Diego is now following up this study by conducting a double-blind clinical trial that began October 2017. This clinical trial at UCSD will measure the progress of hundreds of veterans who will receive treatments to care for PTSD symptoms.

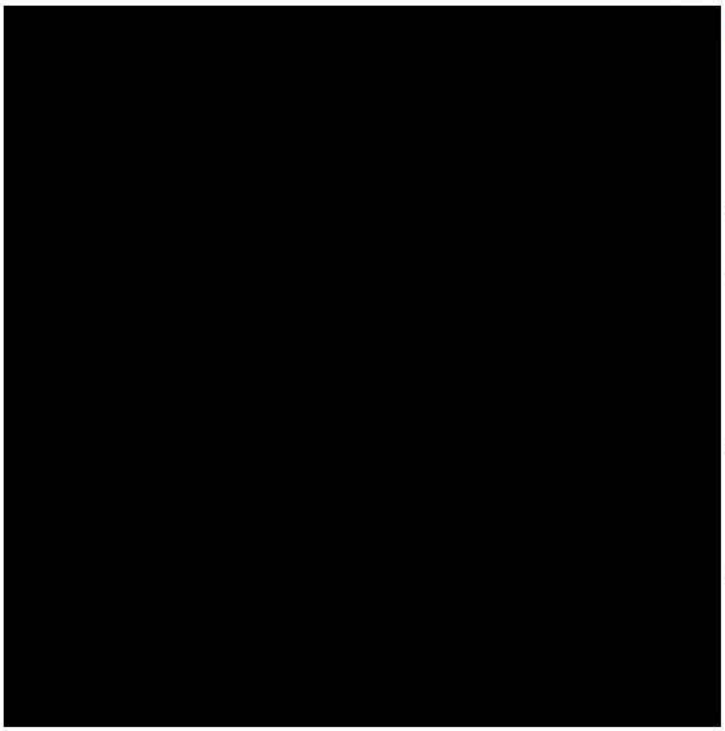
PTSD and TBI are everyday concerns for a large number of veterans in the US. The UCSD trial will provide empirical data to support the efficacy of a drug-free alternative. The Veterans Administration reports that roughly 22 veterans die by suicide every day (5). That number exceeds the national average by 28%.

From Greg's firsthand experience with MCN, he is actively supporting, recruiting, and seeing to the delivery of MCN to as many veterans as possible. This is what clinical trial designers call a twofer—treating patients in real time while the trial is being run. Because MCN is a totally safe treatment there is no risk of adverse effects.

There are currently a number of integrative and functional medical centers offering MCN treatments in the US seeing similar results across the whole spectrum of symptoms. It is estimated that 40%-60% of addiction is tied to genetics. For this reason, NeuroGen in San Diego is designing a validation study, uniting the EpigeneticsRx genetic methylation panel with MCN to study the impact on gene expression. This study will help provide empirical data further supporting organic solutions to chronic ailments.

The impact of these studies will extend beyond reducing the current opioid addiction epidemic and use of psychotropic drugs. The positive financial impact to the US health system could be significant. Greg alone represents a saving to the VA of over $3,000 per month. ■

Robert S. Rosen, MD, FAAO, MBA, is the acting medical director of IASIS MCN. Dr. Rosen is a board certified Ophthalmologist. He earned a medical degree from the University of Michigan, and an MBA from Pepperdine University. His extensive clinical and corporate experience includes working as medical director for Pearl Visioncare and he is the founder of Pearl Vision Foundation, which provides vision care services to 9,000,000 people worldwide. To learn more about the study feel free to contact the author Dr. Robert Rosen at rsrosenmbamd@yahoo.com.



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