

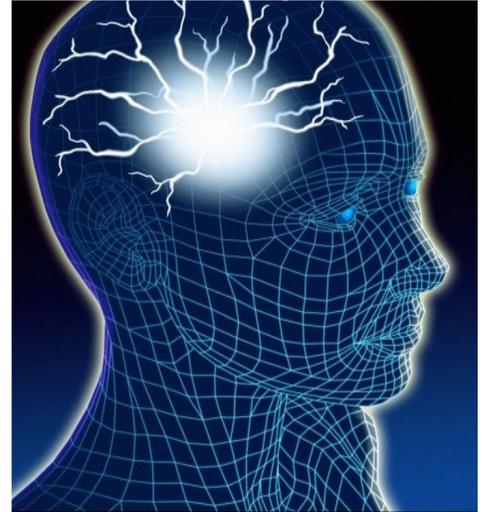
Concussions – New Hope for Recovery

A Review of Recent Evidence of Cellular Injury and New Treatment Options

By Dr. George B. Roth, BSc, DC, ND, CMRP

In the July-August 2010 issue of Discover magazine, Carl Zimmer published an article which outlines the cellular and molecular consequences of head injuries. According to Mr. Zimmer, recent evidence suggests that “a blow to the head can change the neural architecture of the brain from elastic to brittle, with devastating consequences₁.”

Head injuries (Traumatic Brain Injury or TBI) can lead to the neurological consequences associated with brain injury, such as cognitive deficit including memory loss, learning disorders and dementia, visual impairment, hearing loss, tinnitus, sleep disorders, headache, vertigo, seizures, depression and many other conditions affecting work performance and overall quality of life. The costs to society, both medically and economically, are enormous.



Research: Evidence of Cellular Damage

TBI has been the subject of an ongoing study by Douglas Smith, MD, director of the Center for Brain Injury and Repair at the University of Pennsylvania. He and his team of researchers have discovered how even mild brain injury can cause subtle damage to the molecular structure of brain cells. Utilizing an ingenious method by which the effects of mild brain injury can be examined in great detail in a laboratory setting, Smith has been able to reproduce the effects of mild trauma. In these experiments, brain cell cultures (“miniature brains”) are exposed to gentle puffs of air. This recreates the effect of a mechanical injury to the cells.

Nerve cells, like many other forms of tissue, are remarkably elastic, and can recover easily from most of these types of “injuries”. However, when the puffs of air are delivered in a more sudden and forceful manner, the cells developed more significant and permanent structural changes at the level of the microtubular structure of the cell. The cumulative effects over time, lead to tissue swelling, axonal damage and eventual death of the nerve cell. These experimental insights may provide an explanation for the some of the more serious effects of TBI, which medical researchers refer to as *diffuse axonal injury*. Recent evidence also suggests that anterior pituitary dysfunction after traumatic brain injury (TBI) is common₃.

Treatment Options: New Hope

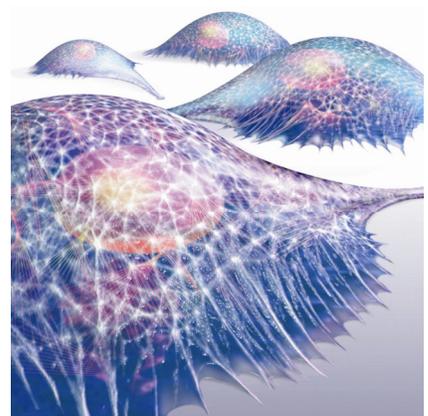
Despite the immensely important insights into the effects of TBI, most researchers and clinicians agree on one fact: there is nothing that can currently be done to reverse the effects of brain injury. Other than managing the effects of TBI through occupational retraining, family counseling and providing guidelines for assessment, medicine has very little to offer the sufferer of this devastating condition. Recently however, clinical evidence is pointing to new hope for recovery from the effects of certain types of traumatic brain injury.

Matrix Repatterning, a gentle form of structural therapy developed by the author, is based on the restoration of cellular structure and elasticity through the use of specifically targeted manual treatment, which releases mechanical tension at the cellular level by stimulating piezo-electric current⁴. Matrix Repatterning has been recognized as an effective form of therapy by several leading investigators, including Norman Doidge and Mark Tommerdahl¹⁰. It has been utilized in sports medicine, and is currently in use with several professional sports organizations and with Olympic athletes in Canada and Great Britain.

Certified Matrix Repatterning Practitioners (chiropractors, physiotherapists, massage therapists, and various other medical specialists) treat a variety of structural conditions, including back, neck, shoulder, hip and knee pain, headache (including migraine), carpal tunnel syndrome, gatro-esophageal reflux (GERD), snoring and sleep apnea, and TMJ syndrome among others. In addition, patients who have undergone Matrix Repatterning treatment have achieved improvements in other areas of the body affected by traumatic injury, including cardiac and hepatic function, as determined by supportive hematologic evidence. Recently, clinical evidence is suggesting that Matrix Repatterning treatment for head injury, results in measurable neurological and cognitive improvement subsequent to TBI.

A New Understanding of the Mechanism of Injury

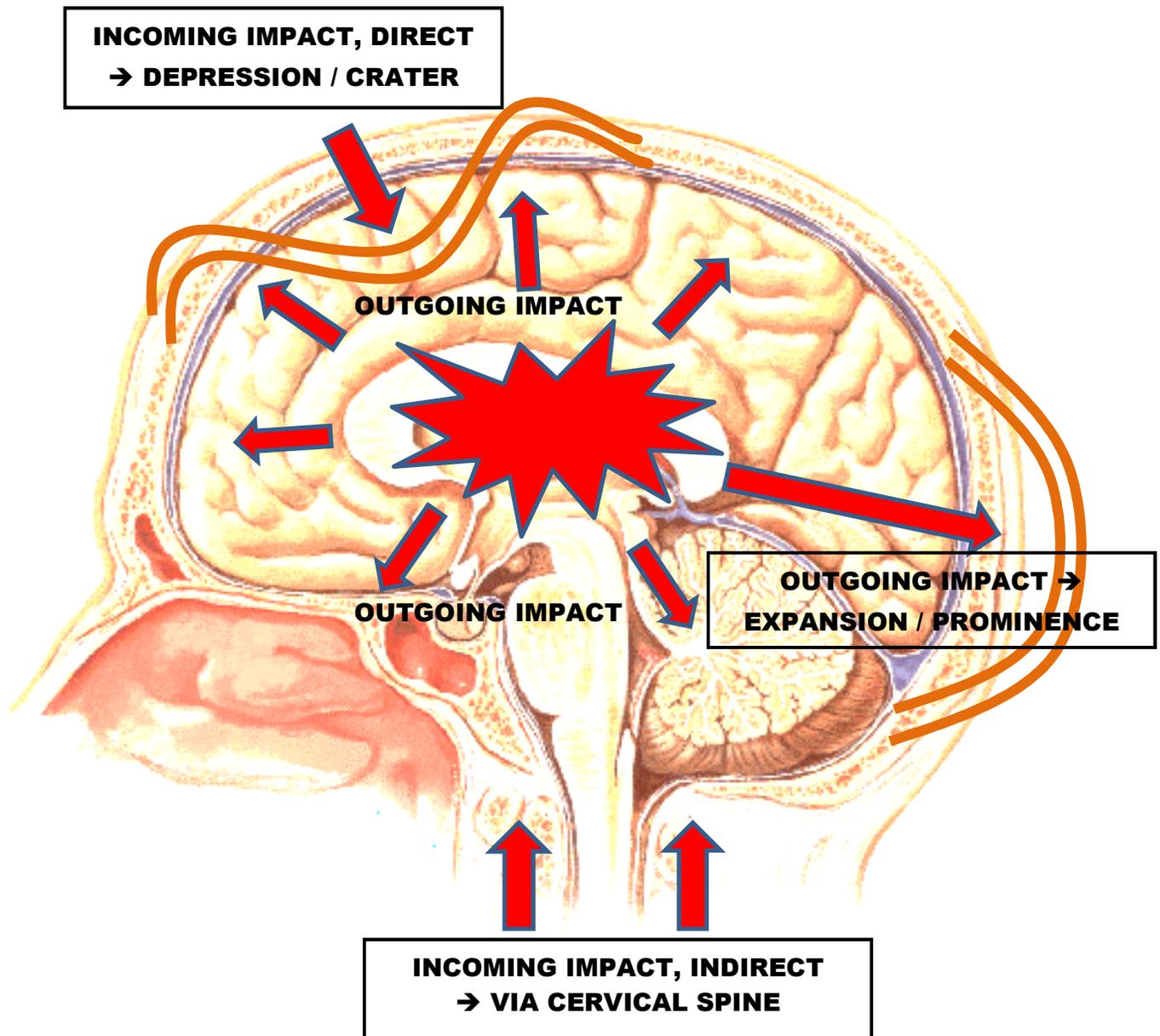
Matrix Repatterning assessment and treatment is based on the alteration of the electrical properties of tissue, as a result of common strain and impact injuries. It is based on the properties of the cytoskeleton, as elucidated by researchers such as Donald Ingber, Gerald Pollack and Stephen Levin^{7, 8, 9}. Impact injury, for example, is thought to be more easily absorbed by the more dense fluid-filled structures, such as internal organs and the cranium (head and brain), as well as osseous structures (bone)⁹. Therefore, many of the symptoms associated with the soft tissues, such as muscles, fascia and joints, may in fact be influenced by these deeper, denser structures. Recent evidence is demonstrating that cellular injury leads to electromechanical changes causing inflammation and enlargement of internal organs and bone, leading to mechanical stress on the more superficial structures, which produce symptoms. Matrix Repatterning is usually directed to the deeper structures (bone and the deep



Cytoskeleton

fascia associated with the internal organs), which are considered to be the source of many of clinical presentations previously thought to reside in the superficial structures alone.

TBI often involves direct injury to the head or indirect injury by way of spinal trauma. Head injury affects the bony plates of the skull, as well as the fluid compartment surrounding the brain itself. Matrix Repatterning has demonstrated clinical effectiveness in restoring the structural and mechanical properties of the body, including the spine and the skull, leading to a profound and lasting normalization of structure and function. As practitioners involved in the treatment of traumatic brain injury, it is imperative that we address all of the structural and neurological implications in the clinical management of this common condition. The diagram below is a postulated mechanism for the effects of cranial trauma:

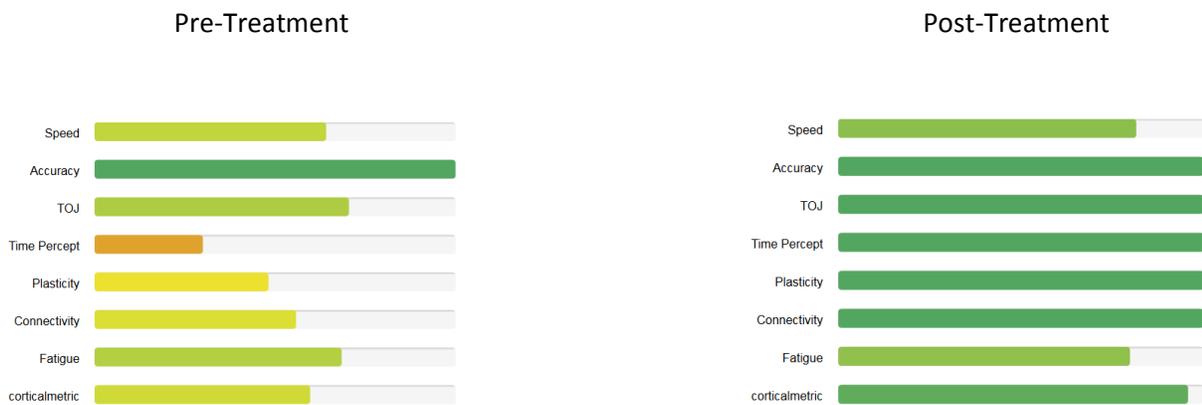


Preliminary Results with Matrix Repatterning Using Neurosensory Feedback Device (Brain Gauge):

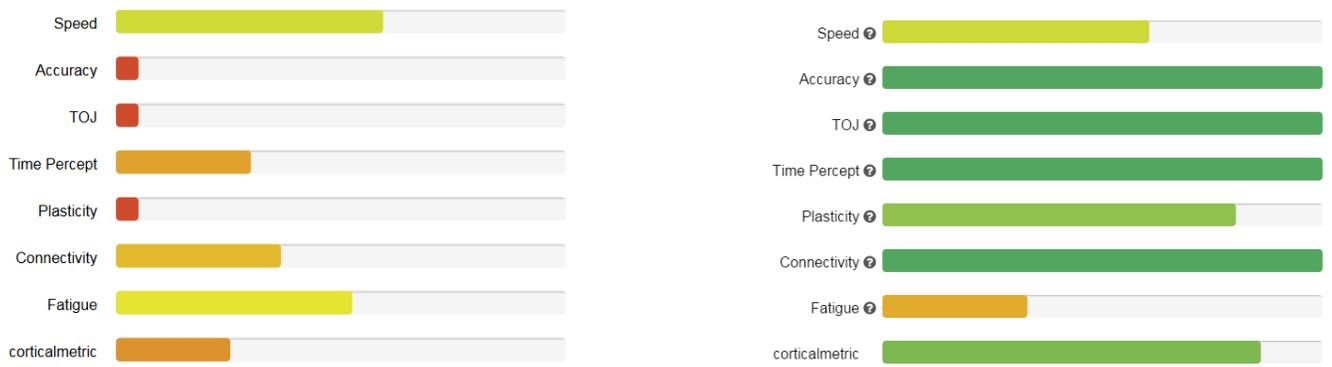
The *Brain Gauge*, developed by Drs. Mark Tommerdahl and Robert Dennis from the Department of Biomedical Engineering at the University of North Carolina, Chapel Hill, is a scientific breakthrough, which uses the sense of touch to understand brain function. The Brain Gauge is the world’s first high precision tactile biofeedback interface. It takes multiple measures of neural network connectivity and simplifies the results into a simple performance standard that can be easily tracked over time. Since 2015, over 100 cases of mTBI have been followed through the use of this device by Dr. Roth.

Brain Gauge (Cortical Metrics) Preliminary Results:

0000-ca40 (11/13/15 to 11/14/15; one treatment)

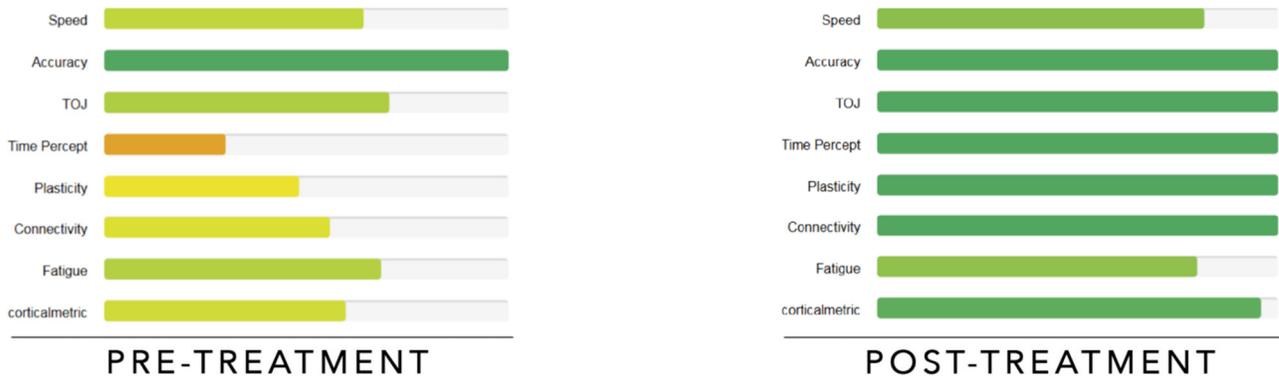


(10/16 to 11/5) 4 treatments



This contribution has been acknowledged in this recent report:

Improvements in Brain Gauge performance parallel mTBI recovery



Dr. George Roth has consistently provided reports that demonstrate patient improvement in **corticalmetrics** post-treatment.

A 40 year old patient suffered direct left parietal head trauma from a motor vehicle collision, and 8 months post-trauma, the patient continued to suffer from cognitive, visual, and vestibular disorders. Patient was also sensitive to light and noise, reported neck pain, and was unable to continue in her post-graduate program. The patient had sustained one previous concussion in 2005.

Cortical Metrics tests showed diminished function in multiple metrics. After a single treatment using Matrix Repatterning focusing on C1-C3 and the occipital, temporal, parietal, and sphenoid regions, the patient reported improved cognitive function and reduced sensitivity to light and noise. Cortical Metrics results from one day post-treatment demonstrate greatly improved function in all areas. Objective findings post treatment also revealed improvements in visual tracking and pupillary response and a disappearance of the Babinski response. The patient was able to return to their graduate program.

Acknowledgment: Thanks to Dr. George Roth for his contribution.

Dr. Mark Tommerdahl

Recognized by Brain Injury Author & Researcher

Dr. Norman Doidge, the author of two best-selling books on the use of leading-edge technologies to overcome the effects of brain injury, discusses the benefits of Matrix Repatterning in his recently published book, *The Brain's Way of Healing* (Penguin, 2016)⁶. He undertook to interview patients who had received this form of treatment, as well as learning the technique first hand as a student in the professional training program. His

conclusion is that that Matrix should often be considered as a first intervention in cases of head trauma and that his hope is that it be available in hospital emergency departments.

Conclusions:

Patients from all walks of life, from professional athletes to medical professionals, and young children, have experienced significant levels of improvement in functional capacity, the reduction of pain, as well as relief from many of the consequences of traumatic brain injury. Further research to determine the potential of Matrix Repatterning is being actively pursued.

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