

Rethinking Concussion Treatment: From Passivity to Wound Healing

EXECUTIVE SUMMARY

Billions of dollars are being poured into diagnosing Concussions, Traumatic Brain Injury and PTSD. Virtually nothing is being invested in treatments that actually treat and help heal underlying wounds to the brain. Yet, treatment for Concussion/TBI/PTSD is available all over the USA. 1000+ Hyperbaric Oxygen Therapy (HBOT) clinics can provide HBOT and other proven alternative therapies to treat and help heal brain injuries caused by concussion, regardless of how or when the concussion occurred. Using oxygen-under-pressure and adjunct therapies, the TreatNOW Coalition has helped restore brain health to over 2,300 concussed patients worldwide suffering with traumatic brain injuries and post concussion symptoms, including professional athletes, active duty and retired veterans, and victims of accidents, assault, stroke and falls.

BACKGROUND

The topic of brain injury due to concussion has been exploding in the news media, particularly over the past 10 years: NFL players, military veterans and college and High School athletes are now known to suffer concussions from situations not previously known to cause concussion. Brain concussion can occur without directly striking your head against a solid structure, but simply from shaking your brain around or by proximity to an explosive force. We have become aware of the dramatic injury effects of repeated concussion. However, the cutting edge evaluation and treatment strategies have not been brought to the public. Many athletes, service members and citizens continue to suffer because they and their doctors are unaware and they have not been treated.

If you are reading this, probably you or someone you know has experienced a concussion and not fully recovered. Hyperbaric Oxygen Therapy [HBOT] promotes brain healing through mechanisms of suppressing inflammation, increasing by 20X the amount of oxygen available to injured brain cells, growth of blood vessels and new neurons, promoting stem cell mobilization, and direct cellular healing through increased oxygen delivery. Put simply, HBOT increases a wide variety of beneficial brain-healing processes and interrupts destructive processes in the destructive "Neurometabolic Cascade of Concussion" like inflammation and cell death. Researchers have an accumulation of before and after brain scans and videos demonstrating the positive healing effects of HBOT for concussion, some received decades ago.

Coincidentally, in April 2011, Army Secretary John McHugh made it official: Soldiers could get Purple Hearts for traumatic brain injuries. Hundreds of thousands of servicemembers with "invisible wounds" were finally recognized as having suffered physical damage to their brains, in addition to the psychological consequences of their physically wounded brain. What did not follow in either the Army or the NFL was the answer to the obvious question: What are we doing to heal those damaged brains?

Current Practice

Medicine struggles with treating physical injury to the brain, these "invisible wounds." Medicine is slow to change and for decades the common myth about concussions is that there is no

treatment and that most concussions heal on their own. Sadly, the standard protocol for Concussions and TBI is "watchful waiting."

It is now common knowledge that if you have suffered a loss of consciousness you have had at least a mild concussion. But even a transient change in awareness or a feeling of "having your bell rung" signals some mild brain injury; you don't need to be knocked unconscious to sustain a concussion. The new message is that an accumulation of those mild brain injuries initiates a process that can lead to short, medium and long-term damage, up to and including dementia. An estimated 15% of people who suffer a mild – moderate concussion do not return to their baseline within a year, but everyone who suffers a concussion is at risk.

[Note: It is very common for people who have had a concussion injury to have headaches. Brain injury creates neuroinflammation. Force strong enough to cause concussion may cause whiplash injury; whiplash injury creates excess muscle tension and spasm. The muscles that travel through your neck attach to your head and you may have a tension headache. Tense muscles may also contribute to pinching your occipital nerves. Thus, physical therapy is often necessary for sports concussion, another adjunct therapy to help heal the underlying damage to the brain.]

The current Concussion Protocol is passive, not active wound healing

Despite all that has been learned in the last 30 years by Hyperbaric Oxygen Treatment (HBOT) practitioners, the standard of care for concussions around the world remains "watchful waiting". Whether in the military, professional sports, emergency rooms or sports in general, medicine generally takes a passive approach to concussions, with the exception that drugs are prescribed for a myriad of accompanying symptoms. Most often, the patient recovers to a point where exercise and/or physical therapy is possible. The patient invariably regains some measure of movement, though quality of life may never be regained.

The accepted protocol for concussions is observation and rest, sometimes aided by brain scans, interviews or questionnaires and/or mental-physical tests to aid in diagnosis. There is little to no mention of any intervention to treat and heal the underlying injury to the brain, unless it has caused brain bleeding and/or excessive swelling, in which case emergency interventions and surgery may be called for. Patients are told that almost all concussions eventually resolve themselves after some time. Pain medication is recommended where warranted.

Current (passive) standard-of-care "Rehabilitation" after a significant brain injury can include such interventions as rest, physical and cognitive therapy, brain training, visual and auditory help, occupational therapy, talk therapy and preparation for return to play [in most cases] or a diminished lifestyle [10% or more of cases], typically on drugs to control pain, headaches and mood swings. It is common to hear that "70-80% or more fully recover before three months." Fully recover? Unfortunately not. Multiple concussions are additive in the context of acceleration of damage. Research all over the world, especially in the US, is showing how multiple hits to the head, whether from sports or war, can lead to degenerative brain damage, depression, dementia and/or Chronic Traumatic Encephalopathy (CTE).

Lately, a debate has broken out about whether "rest" is better than exercising as soon as possible. In few of the conversations, however, are you likely to hear a good answer to the question sometimes asked: "Why is exercise better than rest?" The incomplete answer is that the patient gets better faster. Why? Blood flow. But Why? Increased blood flow can deliver more OXYGEN to the brain and the site of the wound. If a little more oxygen is good, why not 10-20X more oxygen, coupled with suppression of swelling?

Sadly, there is almost never any mention of even basic nutrition or brain foods and supplements, much less any discussion of the one intervention that can have an immediate impact. In multiple peer-reviewed journals and articles worldwide, Hyperbaric Oxygen Therapy has been shown to help in the healing of underlying brain injury typically suffered in mild to moderate traumatic brain injuries, of which concussion is a sub-set.

Help with HBOT is available. Call for assistance. www.TreatNOW.org

Background Notes:

TreatNOW is a coalition of largely veterans working *pro bono* to help heal service members suffering from "invisible wounds" of TBI/PTSD. We are helping stanch the suicide epidemic one warrior at a time; we have been successful with thousands of brain-wounded to date. Our work with brain-injured service members unavoidably puts us in contact with brain-injured civilians and victims of all kinds of head injuries. People with concussions approach us continually with requests for help with healing. They want an end to the headaches, the sleeplessness, depression and the myriad symptoms resulting from blows to the head. Plus, they want to get back to normal. They're the unlucky ones whose concussions didn't resolve themselves with time. Sadly, too many of them don't ever hear about HBOT from their doctors, or they have heard negative comments from doctors who turn out to know next to nothing about HBOT: they weren't taught it in medical school and they have never read the worldwide science or assessed the evidence.

Time after time, in hundreds of cases where we've contacted Veteran Call Centers, Veteran Service Organizations, major orgs like VFW, IAVA, AL, VVA, DAV, Navy League, the NFL, the NHL, colleges and high schools, they all wish they could do more. Mostly the commentary focuses on academic theory, high level strategy, admonitions about "we don't know enough about the brain", and 19-point plans for cleaning up and focusing and measuring and demanding accountability. No one -- not one -- talks simply and directly about CLINICAL MEDICINE. All take the passive approach: rest and/or some exercise, and ***watchful waiting***. Many talk about "evidence-based medicine" but ignore evidence that runs counter to what they "know." And they don't tackle the simple fact: an epidemic of ANY kind demands URGENCY and treatment. Think Ebola. The epidemics of concussions and military suicides demand no less intense focus on immediacy and proactive intervention.

Former Army Secretary Marty Hoffmann insisted on accountability and the need-for-speed. "Take a risk for the veteran" he would demand. Use battlefield medicine rules -- whatever it takes, bar none, always within parameters set by the doctor. It still astonishes when people

learn how many off-label drugs and treatments the Warrior Transition Units use for palliative care -- symptom suppression, not healing. The TreatNOW Coalition has 100s of testimonials from service members subjected to traditional, passive medicine coupled with addictive and other drugs. To a person, they attest to the predilection toward: drugs, talk therapy, gadgets/apps, palliative care. Luckily, some benefit somewhat. BUT -- the overwhelming majority lose hope, get mustered out, or go on to fight with the VA until they reach a "new normal", with or without VA care, and always with an expanding list of prescription drugs. And they hunker down with a welfare check.

And "research" continues into "What is a concussion?" and "How can we tell if the patient has PTSD or TBI?" or "Is there a drug/biomarker/brain image that will tell us how hurt the patient is?" And always the search for a new magic drug that will "fix" the injury. And now a cottage industry has sprung up in mouth guards, accelerometers, softer helmets, etc. Capitalism is a good thing, but the mechanics of a 30-150G force hit can't be finessed with memory foam. [NOTE: two recent Concussion conferences were called with international participation. They were seeking "new" ideas and technologies to deal with concussions. One of their underreported findings was known years ago, published in a textbook by a medical adviser to the NFL: **"Substantial animal and human research now suggests that natural dietary supplements, vitamins and minerals, and the use of hyperbaric oxygen may be a better first-line choice for the treatment of [concussion] which has generally been underreported by both athletes and the military."**

Imagine the following: all ballplayers after a game have a ritual about how they treat their injuries/pain/aches. Physical trainers and doctors prescribe protocols for different injuries: backs, necks, joints, muscles, etc. Ice-baths, saunas, massages, electrical stimulation, analgesics, pain pills, diet, etc. And for a concussion? Never HBOT, nor other active, immediate interventions. Even cursory research could turn up what HBOT practitioners already know: expecting a severe brain injury to "heal" without treating the underlying swelling and damage to the brain tissue is a bit like throwing a dumbbell to an athlete with a broken arm -- before setting the broken bone -- and saying: "let's rehab that arm now!" An equivalent with concussions to warriors from IEDs is all the cognitive- and neuro-psych -- even language/job/physical-therapies -- all while waiting for natural healing and the "tincture of time" and palliative care to somehow heal the brain. It is not surprising that hundreds of professional athletes in all sports have purchased their own HBOT chambers for general wound healing and wellness.

Much more about our work can be found at: www.treatnow.org

For research into the role of Hyperbaric Oxygen Therapy in treating and helping heal the results of Concussion/Traumatic Brain Injury, see:

[a] Hyperbaric Oxygen Therapy Can Improve Post Concussion Syndrome Years after Mild Traumatic Brain Injury - Randomized Prospective Trial

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0079995>

[b] Hyperbaric Oxygen Induces Late Neuroplasticity in Post Stroke Patients - Randomized, Prospective Trial

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0053716>

[c] Hyperbaric oxygen may induce angiogenesis in patients suffering from prolonged post-concussion syndrome due to traumatic brain injury. *Restor Neurol Neurosci*. 2015 Oct 7.

<http://www.ncbi.nlm.nih.gov/pubmed/26484702>

[d] Hyperbaric oxygen can induce neuroplasticity and improve cognitive functions of patients suffering from anoxic brain damage. *Restorative Neurology and Neuroscience* 33 (2015) 471–486

<http://www.ncbi.nlm.nih.gov/pubmed/26409406>

[e] Reflections on the neurotherapeutic effects of hyperbaric oxygen

<http://informahealthcare.com/doi/pdf/10.1586/14737175.2014.884928>

[f] Chamber of Hopes for Brain Repair. Eshel Ben-Jacob , PhD. January, 27, 2013.

<http://www.assafh.org/sites/en/Documents/Chamber%20of%20Hopes%20for%20Brain%20Repair.pdf>

[g] Stoller KP. Hyperbaric oxygen therapy (1.5 ATA) in treating sports related TBI/CTE: two case reports. *Med Gas Res*. 2011;1(1):17. PMID: 3231948.

<http://www.medicalgasresearch.com/content/pdf/2045-9912-1-17.pdf>

[h] Paul G. Harch, Susan R. Andrews, Edward F. Fogarty, Daniel Amen, John C. Pezzullo, Juliette Lucarini, Claire Aubrey, Derek V. Taylor, Paul K. Staab, and Keith W. Van Meter. A phase I study of low-pressure hyperbaric oxygen therapy for blast-induced post-concussion syndrome and post-traumatic stress disorder. *J Neurotrauma*. 2012 Jan 1;29(1):168-85.

<http://online.liebertpub.com/doi/pdf/10.1089/neu.2011.1895>

[i] Rockswold, Rockswold, Zaun and Liu. A prospective, randomized Phase II clinical trial to evaluate the effect of combined hyperbaric and normobaric hyperoxia on cerebral metabolism, intracranial pressure, oxygen toxicity, and clinical outcome in severe traumatic brain injury. *Journal of Neurosurgery*, Jun 2013 / Vol. 118 / No. 6 / Pages 1317-1328

<http://www.ncbi.nlm.nih.gov/pubmed/23510092>

[j] Shi XY, Tang ZQ, Sun D, He XJ. Evaluation of hyperbaric oxygen treatment of neuropsychiatric disorders following traumatic brain injury. *Chin Med J (Engl)*. 2006;119(23):1978-82.

<http://www.ncbi.nlm.nih.gov/pubmed/17199942>

[k] Hardy P, Johnston KM, De Beaumont L, Montgomery DL, Lecomte JM, Soucy JP, et al. Pilot case study of the therapeutic potential of hyperbaric oxygen therapy on chronic brain injury. *J Neurol Sci*. 2007;253(1-2):94-105.

<http://www.ncbi.nlm.nih.gov/pubmed/17234213>

[l] Lin JW, Tsai JT, Lee LM, Lin CM, Hung CC, Hung KS, et al. Effect of hyperbaric oxygen on patients with traumatic brain injury. *Acta Neurochir Suppl*. 2008;101:145-9.

http://www.researchgate.net/publication/51416688_Effect_of_hyperbaric_oxygen_on_patients_with_traumatic_brain_injury_injury

[m] Wright JK, Zant E, Groom K, Schlegel RE, Gilliland K. Case report: Treatment of mild traumatic brain injury with hyperbaric oxygen. Undersea Hyperb Med. 2009; 36(6):391-9.

<http://www.echa.net/36-6%20UHM-P391-399.pdf>

[n] Harch PG, Fogarty EF, Staab PK, Van Meter K. Low pressure hyperbaric oxygen therapy and SPECT brain imaging in the treatment of blast-induced chronic traumatic brain injury (post-concussion syndrome) and post traumatic stress disorder: a case report. Cases J. 2009;2:6538.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2740054/nih.gov/pmc/articles/PMC2740054/>

[o] Sahni T, Jain M, Prasad R, Sogani SK, Singh VP. Use of hyperbaric oxygen in traumatic brain injury: Retrospective analysis of data of 20 patients treated at a tertiary care centre. Br J Neurosurg. 2011.

<http://www.ncbi.nlm.nih.gov/pubmed/22085249>

These videos are a window into HBOT treatment and healing:

VETERANS

MSGT Scott Roessler [Ranger]

<http://tinyurl.com/hf3czmw>

MAJ Ben Richards

<http://tinyurl.com/jts2jy3>

Latest Ben Richards video

<http://tinyurl.com/hd9ahcd>

CAPT Matt Smotherman / Congressman

John Bennett

<http://tinyurl.com/lvcf22r>

The Honorable Patt Maney (BG, USA)

<http://tinyurl.com/m97x4jp>

GnySgt Rotenberry

<http://tinyurl.com/gpzpxgy>

RMHI with Margaux and SGT Ramirez

<http://vimeo.com/77100044>

Anthony's personal testimony: 1st 10 dives

<https://www.youtube.com/watch?v=qisTnU3AJoE>

Healing long-term brain injuries

<http://videos.oeta.tv/video/2365281649/>

One Florida story/Dr. Eddie Zant

<http://tinyurl.com/zdyqv39>

ATHLETES

Joe Namath

<http://tinyurl.com/kflu9up>

Joe Delamielleure (Buffalo Bills)

<http://tinyurl.com/m5q8ued>

NFL player Steve Bowman

<http://tinyurl.com/oj2pggg>

Marv Fleming (Packers, Miami, Patriots)

<http://tinyurl.com/jgl5ob5>

Bill Romanowski - Broncos

<http://tinyurl.com/mb67xw8>

Sidelined: Concussions in Sports Visger

<http://vids.kvie.org/video/2318744182/>

Brian Fleury - Hockey Player

http://www.youtube.com/watch?v=A_qdoxcQui0

Professional Skateboarder

<http://www.youtube.com/watch?v=IDcthZKjWIo#t=290>

CIVILIANS

Robin Read, Stroke Patient

<http://tinyurl.com/gv2zpkI>

Curt Allen, car accident

<http://tinyurl.com/j4tqymx>

Tom with TBI from 1981

<https://youtu.be/9siaVwoLmTw>

Teenager/Impact Seizure and PCS

<https://youtu.be/4YNRZ8W4jtl>

Police Officer/Car Crash

<https://youtu.be/e6eqbXKFva4>

Brain Injury at age two

https://youtu.be/43bZ-Lp-_d8

Stroke Recovery

https://youtu.be/_XQtYz2xU8g

CONFERENCES / NEWS

How HBOT works BIALA

https://www.youtube.com/watch?v=-clYt6IBw_M

Navy League Video

<https://www.youtube.com/watch?v=9ZtJkJePVpk>

Navy League Symposium -2011

<https://youtu.be/9ZtJkJePVpk>

Oklahoma HBOT law passed

<http://videos.oeta.tv/video/2365281649/>

American Legion

<http://tinyurl.com/hcdk38s>

Patriot Clinics

<http://tinyurl.com/hlvchel>

League of Denial

<http://tinyurl.com/jxowgbv>

Cong Jones questions USMC

Commandant GEN Conway and ADM

Gary Roughead

<http://www.youtube.com/watch?v=Y9htsrek50A> [just past 4:00]