

## Hyperbaric Oxygen Therapy for TBI/Concussion/PTSD: Nation's Expert sees "*Dawn of a New Day*"

Dr. George Wolf presented evidence at the American Professional Wound Care Association that Hyperbaric Oxygen Therapy (HBOT) shows positive results when treating traumatic brain injury. His presentation reinforces data in published research in 2015 and again in 2017 stating that "Hyperbaric oxygen therapy for mild traumatic brain injury and PTSD should be considered a legitimate adjunct therapy...."

*"Both groups showed improvement in scores.  
[This is a] theme for results from all DoD pilot studies thus far."*

*If there is a 1 percent chance that the treatment works,  
a rational decision maker would try it—there is a potential gain  
and no potential loss." Agency for Healthcare Research and Quality (AHRQ)  
[Data for ten years show positive results far more than 1%]*

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Continuing the accumulation of positive data, Dr. George Wolf, the US Government's premier HBOT expert, reported recently that "***[HBOT] for mild [TBI] and PTSD should be considered a legitimate adjunct therapy,***" despite continuing DOD/VA/Army efforts to delegitimize the therapy. <http://bit.ly/2x8WDiT> The Agency for Healthcare Research and Quality (AHRQ) discerns that "the case against HBOT is based on the reasoning that, because HBOT may be harmful, it must be held to the highest standard of proof." Wolf and AHRQ agree: "the standard of proof of HBOT efficacy should be lowered." HBOT is both safe and effective in use for TBI and PTSD. HBOT has perhaps the best safety record in the history of FDA-approved devices.

Another premier HBOT researcher, Dr. Lindell Weaver, recently concluded his BIMA study on the use of HBOT for PTSD with 71 patients. His conclusions continued the uninterrupted positive results from all USG studies: ***“By 13 weeks, HBO2 improved post-concussive and PTSD symptoms, cognitive processing speed, sleep quality, and vestibular symptoms, most dramatically in those with PTSD.”***

Data from research at Joint Base San Antonio-Lackland TX published in 2012 conclusively showed that 50 patients with mild traumatic brain injury (mTBI) gained significant improvement when administered Hyperbaric Oxygen Therapy (HBOT) at different pressures. Further ***“both groups improved more than would be expected greater than 6 months after mTBI.”*** Despite worldwide protest at DOD/VA/Army Conclusions in the paper that tried to attribute success to a placebo effect, <http://bit.ly/2h98Ny7> DOD/VA/Army conducted many more procedurally-flawed studies that attempted to “put the last nail in the coffin of HBOT.” Coincidentally, as with the first study, all the data in subsequent worldwide studies showed significant medical improvements in patients who entered HBOT chambers. <http://bit.ly/2wwbBLw>

Dr. Wolf and USAF colleagues published a paper in 2015 reanalyzing the data in the cornerstone DOD/VA/Army study. <http://bit.ly/2faBldN> They concluded: ***“This pilot study demonstrated no obvious harm [and] both groups showed improvement in scores and thus a benefit.*** Subgroup analysis of cognitive changes and [test] results regarding PTSD demonstrated a relative risk of improvement . . . . There is a potential gain and no potential loss. The VA/Clinical Practice Guidelines define a “B evidence rating” as “a recommendation that clinicians provide (the service) to eligible patients. ***At least fair evidence was found that the intervention improves health outcomes and concludes that benefits outweigh harm*** [emphasis added] Hyperbaric oxygen therapy for mild traumatic brain injury and PTSD should be considered a legitimate adjunct therapy if future studies demonstrate similar findings or show comparable improvement to standard-of-care or research-related treatment modalities.” [NOTE: subsequent worldwide studies already published and those underway show comparable improvements, including USG-sponsored studies.]

At the recently concluded International conference ***HBOT2017***, researchers showed evidence that further validated the safety and efficacy of HBOT for TBI/PTSD/Concussion. <http://bit.ly/2x4tWUf> The consensus was that ***“Scientific literature strongly supports the use of HBOT at 1.5 ATA for acute severe traumatic brain injury.”*** The nation’s HBOT expert on acute concussions in sports showed years of evidence-based clinical results. <http://bit.ly/2jwdUwI> Facing a crisis of more than three million concussions in the US every year, Dr. Daphne Denham, MD has been working with athletes to treat acute concussions as quickly as possible to get in front of the concussion cascade. This downward cycle of cell death and cellular and neuronal disruption can be treated instead of merely managed according to the “watchful waiting” Concussion Protocol. 98% of her patients [51 out of 52] with acute concussion [ten days or fewer from traumatic event] completely resolved her/his symptoms in less than five treatments [average of 2.4 treatments per concussion]. <https://tinyurl.com/ybldktqn> Unsurprisingly, most sports medicine doctors, trainers and neurologists recommended against the treatment, despite growing evidence of success.

Other research at the conference explained Mechanisms of Action at work in the use of HBOT. While billions of dollars have been and continue to be spent on diagnosing and managing symptoms of TBI/Concussion/PTSD, precious few dollars are devoted to treating and healing. <http://bit.ly/2fq1y4T> It is well known to those who study brain physiology following brain trauma that a myriad of negative effects can occur: fractures, brain contusion, bleeding, shear, stretch,

compression, tearing, inflammation, edema, reduced blood flow, reduced oxygen/hypoxia, excitatory amino acids, free radical damage, lipid peroxidation, vasospasm, hyperglycemia, and cell death. Expecting that all this damage will abate with rest and “the tincture of time” is a fantasy. True, symptoms may abate within days or weeks. It is often said that all the symptoms stemming from such damage to a main body organ will resolve themselves in 80-90% of the injuries. Yet nothing has been done using the Concussion Protocol and various interventions by DOD/VA/Army medicine to address the wound to the brain. <https://tinyurl.com/y8vb8qwr>

Within the last decade, researchers inside and outside the government are producing data showing that the use of Hyperbaric Oxygen addresses directly this wounding. HBOT works on the negative cascade of damage and degeneration both in the acute phase of wound stabilization and in the acute and chronic phases of wound healing. Published research articulates the known benefits of using HBOT for wound healing:

- Decreasing levels of inflammatory biochemicals
- Increased oxygenation to functioning mitochondria
- Increases in blood flow independent of new blood vessel formation
- Angiogenesis: growth of new blood vessels in the acute and chronic phases
- Up-regulation of key antioxidant enzymes and decreasing oxidative stress
- Increased production of new mitochondria (the energy factories of the cells)
- Neurogenesis: (growth of new neuronal tissue and remyelination during and after the treatments are completed)
- Bypassing functionally impaired hemoglobin molecules, the result of abnormal porphyrin production, thereby allowing increased delivery of oxygen directly to cells
- Improvement in immune and autoimmune system disorder
- Direct production of stem cells in the brain
- Increases in the production of stem cells in the bone marrow with transfer to the Central Nervous System, making them available for brain wound healing and growth of new brain cells, neuronic tissue, and repair of white and grey matter.

Solid anecdotal evidence is accumulated daily within the veteran community proving that HBOT works: in excess of 2,400 brain-injured service members and citizens attest to its safety and efficacy. Cf. <https://youtu.be/N-CkR5shqEM> And the professional athlete community of users continues to grow. See: <http://www.hypertc.com/athletes.cfm>

Doctors Wright and Figueroa summarize the current body of knowledge: "**There is sufficient evidence for the safety and preliminary efficacy data from clinical studies to support the use of HBOT in mild traumatic brain injury/persistent post concussive syndrome (mTBI/PPCS). The reported positive outcomes and the durability of those outcomes has been demonstrated at 6 months post HBOT treatment. Given the current policy by Tricare and the VA to allow physicians to prescribe drugs or therapies in an off-label manner for mTBI/PPCS management and reimburse for the treatment, it is past time that HBOT be given the same opportunity. This is now an issue of policy modification and reimbursement, not an issue of scientific proof or preliminary clinical efficacy.**" <http://bit.ly/2xEZS79>