

# Abatement of PTSD/ TBI symptoms and improvement in pulmonary capacity following multi-modality protocol

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## ABSTRACT

**A 47-year-old male Army Veteran diagnosed with post-traumatic stress disorder (PTSD), traumatic brain injuries (TBI), and significant environmental contaminants exposure induced constrictive bronchiolitis participated in a 12-week study evaluating the effectiveness of a multi-modal treatment approach. The regimen included intermittent hyperoxic/hypoxic training (IHHT), red light therapy, neurofeedback, NAD+ IV infusions, and oral supplementation.**

**The study observed significant improvements in PTSD and depression scores, qEEG neurofeedback results, pulmonary capacity, and subjective client benefits, underscoring the effectiveness of short-term interventions and an IHHT-centric protocol.**

## Case Report

Chronic PTSD, unspecified focal TBI with loss of consciousness, unspecified duration - sequela, concussion with loss of consciousness, unspecified duration - sequela, occupational exposure to other air contaminants, constrictive bronchiolitis  
Symptoms: hypervigilance, insomnia, negative thought patterns and poor focus derived from PTSD/TBI symptoms. Poor cardiovascular capability due to excessive environmental contaminants exposure.

## Measurable Outcomes

- PCL-5 Assessment decreased from 39, 18 to 3 pre, mid and post-protocol respectively. *Scores below 35 represent <15% probability of PTSD.*
- PHQ-9 Assessment - decreased from 12, 4, to 0, respectively. *From moderate to minimal depression scores.*
- PSQI Sleep Assessment - mid-protocol 8, post-protocol 4. *Scores below 5 are associated with good sleep quality.*
- qEEG Brain Mapping - Mid-protocol 33% plasticity and 52% normalization and post-protocol 40% plasticity and 39% normalization. *Score over 30% plasticity and 35% normalization are considered outstanding.*
- Cognitive Emotional Checklist (CEC) - Pre to post protocol responses improved by 31%, 78%, 17%, 86%, and 53%, respectively. The CEC is a

standardized psychological test that allows a client to rate the severity of various cognitive and emotional issues

- Veteran's Physical data:
  - ↑ Skeletal muscle mass by 3 lbs
  - ↓ Percent body fat by 2.5%
  - Improved lung capacity
  - Veteran now sleeps 7-8 hours nightly
  - Veteran was able to return to running

## Subjective Outcomes

"After a short four weeks, this program has already increased my focus, energy and motivation to levels I haven't seen in years! I'm so thankful for the opportunity to be participating."

"After struggling with insomnia for several years, this program has provided me with the education, physical and mental training which resulted in restful sleep that I thought would never be possible again.."

## Discussion

This case report demonstrates the effectiveness of multi-modal treatment for the symptoms of post-traumatic stress and traumatic brain injuries over a 12-week period. This study followed a protocol focusing upon root-cause issues to include enhancing angiogenesis and neurogenesis in the brain through oxygen modalities<sup>1,2</sup>, enhancing ATP production through NAD+<sup>3</sup> and photobiomodulation<sup>4</sup>, minimizing brainwave dysregulation with qEEG neurofeedback<sup>5</sup>, and diminishing gut-brain axis neurochemical imbalances through supplementation.<sup>6-9</sup> The data derived from this regimen will significantly impact the treatment protocols of future Veterans and First Responders suffering from the effects of PTSD and TBI within this continuing program and beyond.

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**REFERENCES**

1. Tal S, Hadanny A, Sasson E, Suzin G, Efrati S. Hyperbaric Oxygen Therapy Can Induce Angiogenesis and Regeneration of Nerve Fibers in Traumatic Brain Injury Patients. *Front Hum Neurosci*. 2017 Oct 19;11:508. doi: 10.3389/fnhum.2017.00508. PMID: 29097988; PMCID: PMC5654341.
2. Bayer U, Likar R, Pinter G, et al. Intermittent hypoxic-hyperoxic training on cognitive performance in geriatric patients. *Alzheimers Dement (N Y)*. 2017;3(1):114-122. Published 2017 Feb 8. doi:10.1016/j.trci.2017.01.002
3. Radenkovic D, Reason, Verdin E. Clinical Evidence for Targeting NAD Therapeutically. *Pharmaceuticals (Basel)*. 2020;13(9):247. Published 2020 Sep 15. doi:10.3390/ph13090247
4. Hamblin MR. Photobiomodulation in the brain: low-level laser (light) therapy in neurology and neuroscience. In: Hamblin MR, ed. *Photobiomodulation in the Brain: Low-Level Laser (Light) Therapy in Neurology and Neuroscience*. Academic Press; 2019:1-630. doi:10.1016/C2017-0-02758-1.
5. Dahl MG. Neurofeedback with PTSD and traumatic brain injury (TBI). In: Kirk HW, ed. *Restoring the Brain: Neurofeedback as an Integrative Approach to Health*. Routledge; 2020:256-284. doi:10.4324/9780429275760-13.
6. Ceremuga TE, Martinson S, Washington J, et al. Effects of L-theanine on posttraumatic stress disorder induced changes in rat brain gene expression. *ScientificWorldJournal*. 2014;2014:419032. doi:10.1155/2014/419032
7. Unno K, Yamada H, Iguchi K, et al. Anti-stress Effect of Green Tea with Lowered Caffeine on Humans: A Pilot Study. *Biol Pharm Bull*. 2017;40(6):902-909. doi:10.1248/bpb.b17-00141
8. Savignac HM, Couch Y, Stratford M, et al. Prebiotic administration normalizes lipopolysaccharide (LPS)-induced anxiety and cortical 5-HT2A receptor and IL1- $\beta$  levels in male mice. *Brain Behav Immun*. 2016;52:120-131. doi:10.1016/j.bbi.2015.10.007
9. Messaoudi M, Violle N, Bisson JF, Desor D, Javelot H, Rougeot C. Beneficial psychological effects of a probiotic formulation (*Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175) in healthy human volunteers. *Gut Microbes*. 2011;2(4):256-261. doi:10.4161/gmic.2.4.16108