



Novel Combination of Physical, Physiological and Psychological Therapies simultaneously applied for the treatment of TBI / CTE / PTSD

Problem Statement

Traumatic brain injury (TBI), chronic traumatic encephalopathy (CTE) and resulting Post Traumatic Stress Disorder (PTSD) are brain injuries that demonstrate themselves in MVAs, contact sports and military service. The results of these are, in the worst cases, catastrophic and, in best cases, difficult for the individuals and their families. Importantly these horrific disorders are poorly understood by practitioners.

Program Summary

Currently, there exists no single remedy to cure TBI and CTE; indeed, the most widely known intervention is simply prevention. However, significant scholarly and clinical advances including hyperbaric oxygen therapy, (Pappalardo et al. 2020, Stoller 2011, Eve et al. 2016, Biggs et al. 2021) have shown considerable evidence for beneficial effects of this treatment for TBI and CTE. Thus, our aim in this program is to **proactively address maladies with hyperbaric oxygen therapy and as many adjunctive therapies combined as reasonably needed in a condensed session of high intensity healing and inflammation reduction to improve lives.**

Therapies

- Hormone modulation therapy / Prep
- Hyperbaric oxygen therapy (HBO)
- Physical therapy (PT)
- Cognitive behavioral therapy (CBT)
- Neurofeedback therapy
- Computer based brain training
- BrainTap meditation
- Structural energetic therapy (SET)
- Complete health & life coaching
- Ice Bath therapy

Participant Commitment

- Eliminate alcohol and tobacco use for the length of study
- Limit caffeine intake to no more than two cups of coffee daily
- Consume a minimum of one gallon of water per day
- Adhere to a sleep schedule of 8 hours each night
- Walk three miles (6500 steps) twice a week

Pre and Post Program Requirements

- Full medical history/ Physical Exam
- Prescriptions for proposed therapies
- WAVi EEG
- Sleep workup / sleep aids issued
- Order peptides (as needed)
- Evidenced based assessments both before and after treatment to determine levels of depression, anxiety, trauma, stress and burnout and assess improvement.

Program Logistics

Step	Dates	Goals
Intake	~ 10-14 days prior	Program kick off gathering intake
Treatment	28 calendar days	Schedule and plan adherence.
Debrief	One week afterwards	Exit interviews, next steps and secure final scans

This methodology capitalizes on the synergistic effect of natural, hands on and non-chemical solutions for head injuries, applied simultaneously over a 28-day period to stimulate and solidify the habit of your body relearning how to make the chemicals required to regenerate brain tissue and improve overall brain function and health.

Intensive Outpatient Program - Weekly Schedule

Weekdays ~ 6+ hours of therapy per day
Exceptions can be made, please discuss with team

	Monday	Tuesday	Wednesday	Thursday	Friday
30 min					
30 min	HBO	HBO	HBO	HBO	HBO
30 min					
30 min	Computer	Computer	Computer	Computer	Computer
30 min	Brain Tap	Brain Tap	Brain Tap	Brain Tap	Brain Tap
30 min	CBT	SET	Ice Bath	CBT	Physical Th
30 min	CBT	SET	Life Coach	CBT	Physical Th
30 min	Neurofeedback	SET	Life Coach	Neurofeedback	Neurofeedback
30 min	Neurofeedback	SET	Life Coach	Neurofeedback	Neurofeedback
30 min					
30 min	HBO	HBO	HBO	HBO	HBO
30 min					

Journal (2x per day)

Sample questions:

AM

- Amount of sleep?
- Quality of sleep?
- Workout?
- Stress level?
- Amount of water drank yesterday?

PM

- What was good about today?
- What was bad about today?
- Something you learned today?
- Whom were you impressed by / grateful for today?
- What could we do better?

Providers:

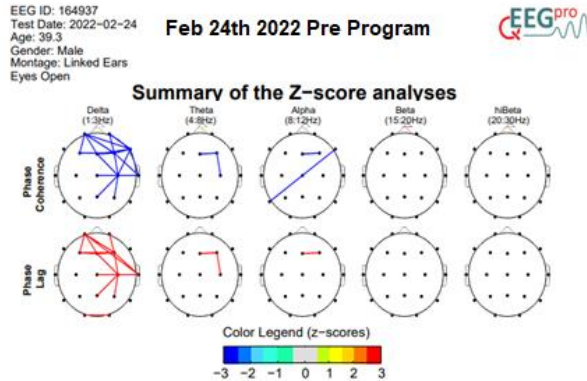
Hyperbaric Oxygen	HBO (BID) 2 per day	Ph.D. HBO Expert
Cognitive Based Therapy	CBT	Ph.D. Trauma Therapy
Structural Energetic Therapy	SET	Trained Therapist
Complete Health & Coaching	Life Coach	MD Compensatory strategies for TBIs
Physical Therapy Exercise Science	Physical	DPT Physical Therapist movement
Neurofeedback Therapy	Neurofeedback	Ph.D.
Intake exam / physicals / modulate hormones and peptides	Preparation phase	MD / Ph.D.



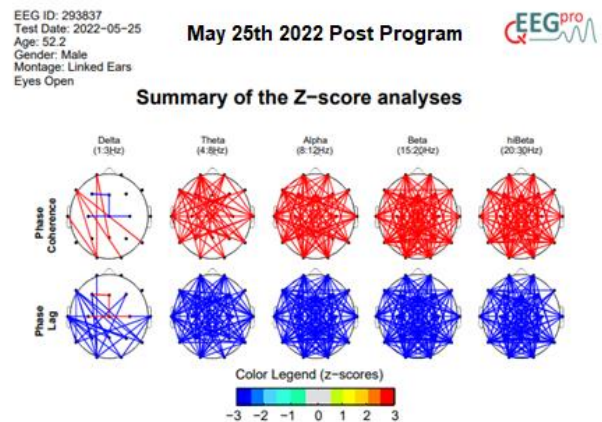
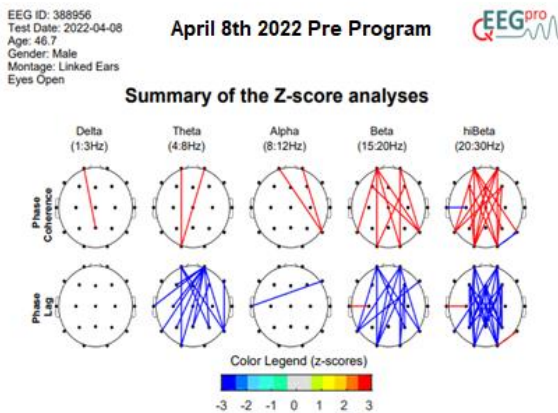
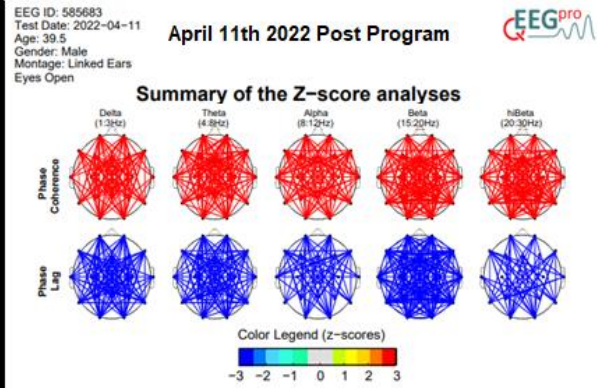
Measures of Effectiveness:

While individual results will vary our initial results are impressive. Anecdotally our participants and their loved ones have made statements such as; “I have my husband back”, “I feel like I can think again” and “Thank you, you saved my life”. Subjectively we have observed increases in cerebral blood flow as well as six orders of magnitude increases in coherence and decreases in lag time in the brains of our participants.

PRE PROGRAM DATA



POST PROGRAM DATA



Following are psychological testing results before and after as well as brain scans of areas with significant improvement in brain wave activity. While the number of patients is very small at this point the results are exceptionally promising.



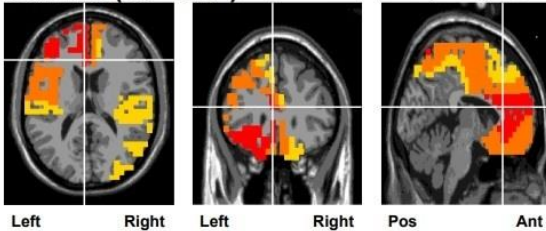
Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Composite Memory	89	83	13	Yes			X		
Verbal Memory	43	71	3	Yes				X	
Visual Memory	46	103	58	Yes		X			
Reaction Time*	703	95	37	Yes		X			

Psychological Profile testing BEFORE treatment

Patient Profile	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Patient Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Composite Memory	99	104	61	Yes		X			
Verbal Memory	54	106	66	Yes		X			
Visual Memory	45	100	50	Yes		X			
Executive Function	67	131	98	Yes	X				

Psychological Profile testing AFTER treatment

Gamma (35-45Hz) Z-score: 2.7, Frequency: 35 Hz



Brain Area:

Limbic Lobe
Anterior Cingulate
Brodmann area 24

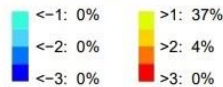
Function:

Regulating Blood Pressure and Heart Rate
Reward Anticipation
Decision-Making
Empathy
Impulse Control
Emotion
Error Detection and Conflict Monitoring
Registering Physical Pain

Possible Symptoms of Defect:

Abulia and Amotivational Syndromes
Inability to Detect Errors
Difficulty Resolving Conflict
Emotional Instability
Inattention
Schizophrenia
Hyperactivity (R)
Easily Distracted
Impulsive
Compulsive Thoughts or Behaviors
Concentration Problems
Short-Term Memory Problems
Low Motivation
Depressed

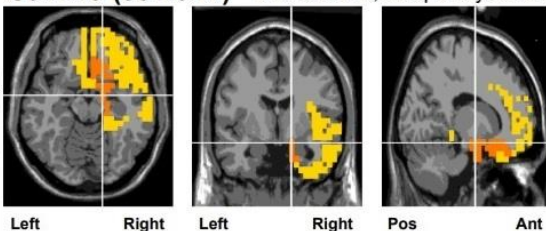
Percentage Deviant Voxels Gamma (35-45Hz)



Online information:
https://en.wikipedia.org/wiki/Brodmann_area_24
www.fmricsulting.com/brodmann/BA24.html

BEFORE Treatment

Gamma (35-45Hz) Z-score: 2.1, Frequency: 35 Hz



Brain Area:

Limbic Lobe
Parahippocampal Gyrus
Brodmann area 28

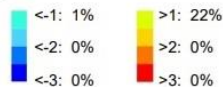
Function:

Memory
Recognition

Symptoms of Defect:

Facial Recognition Problems
Auditory Agnosia

Percentage Deviant Voxels Gamma (35-45Hz)



Online information:
https://en.wikipedia.org/wiki/Brodmann_area_28
www.fmricsulting.com/brodmann/BA28.html

AFTER Treatment



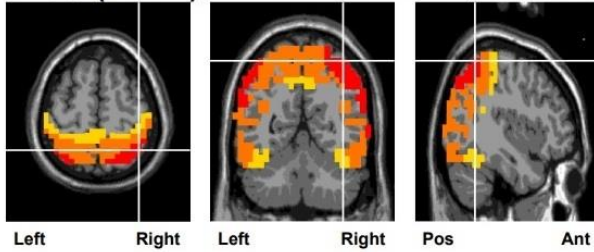
Undersea Oxygen Clinic

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<https://underseaoxygenclinic.com/>

Theta (4-7Hz)

Z-score: 2.7, Frequency: 4 Hz



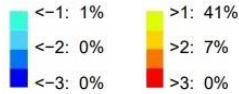
Brain Area:
 Parietal Lobe
 Inferior Parietal Lobule
 Brodmann area 40

Function:
 Somatosensory

Possible Symptoms of Defect:

- Fibromyalgia
- Migraines
- Slow Reading
- Difficulty with Social Cues (R)
- Dyscalcula
- Dyslexia (L)
- Agnosia (R)
- Denial (R)
- Letter Perception Problems (L)
- Insensitive to Others' Emotional Expressions (R)
- Receptive Language Problems (L)
- Facial Recognition Problems
- Spacial Orientation Problems (R)
- Poor Social Skills (R)

Percentage Deviant Voxels Theta (4-7Hz)

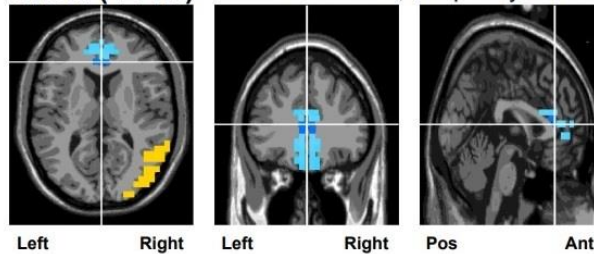


Online information:
https://en.wikipedia.org/wiki/Brodmann_area_40
www.fmriconsulting.com/brodmann/BA40.html

BEFORE Treatment

Theta (4-7Hz)

Z-score: -2, Frequency: 4 Hz



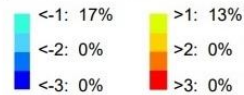
Brain Area:
 Limbic Lobe
 Anterior Cingulate
 Brodmann area 24

Function:
 Regulating Blood Pressure and Heart Rate
 Reward Anticipation
 Decision-Making
 Empathy
 Impulse Control
 Emotion
 Error Detection and
 Conflict Monitoring
 Registering Physical Pain

Symptoms of Defect:

- Abulia and Amotivational Syndromes
- Inability to Detect Errors
- Difficulty Resolving Conflict
- Emotional Instability
- Inattention
- Schizophrenia
- Hyperactivity (R)
- Easily Distracted
- Impulsive
- Compulsive Thoughts or Behaviors
- Concentration Problems
- Short-Term Memory Problems
- Low Motivation
- Depressed

Percentage Deviant Voxels Theta (4-7Hz)



Online information:
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AFTER Treatment



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References:

- Pappalardo, Irene, et al. "Is "delayed" hyperbaric therapy effective for "delayed" encephalopathy after carbon monoxide intoxication?." *Eneurologicalsci* 18 (2020).
- Stoller, Kenneth P. "Hyperbaric oxygen therapy (1.5 ATA) in treating sports related TBI/CTE: two case reports." *Medical gas research* 1.1 (2011): 1-6.
- Eve, David J., et al. "Hyperbaric oxygen therapy as a potential treatment for post-traumatic stress disorder associated with traumatic brain injury." *Neuropsychiatric disease and treatment* 12 (2016): 2689.
- Biggs, Adam T., Hugh M. Dainer, and Lanny F. Littlejohn. "Effect sizes for symptomatic and cognitive improvements in traumatic brain injury following hyperbaric oxygen therapy." *Journal of applied physiology* 130.5 (2021): 1594-1603.
- Peterson, Kim, et al. "Evidence brief: Hyperbaric Oxygen Therapy (HBOT) for traumatic brain injury and/or post-traumatic stress disorder." *VA Evidence Synthesis Program Evidence Briefs [Internet]* (2018).
- Figueroa, Xavier A., and James K. Wright. "Hyperbaric oxygen: B-level evidence in mild traumatic brain injury clinical trials." *Neurology* 87.13 (2016): 1400-1406.
- Hu, Qin, et al. "Hyperbaric oxygen therapy for traumatic brain injury: bench-to-bedside." *Medical gas research* 6.2 (2016): 102.
- Boussi-Gross, Rahav, et al. "Hyperbaric oxygen therapy can improve post concussion syndrome years after mild traumatic brain injury-randomized prospective trial." *PLoS one* 8.11 (2013): e79995.
- Tal, Sigal, et al. "Hyperbaric oxygen may induce angiogenesis in patients suffering from prolonged post-concussion syndrome due to traumatic brain injury." *Restorative neurology and neuroscience* 33.6 (2015): 943-951.
- Hadanny, A., et al. "Hyperbaric oxygen can induce neuroplasticity and improve cognitive functions of patients suffering from anoxic brain damage." *Restorative neurology and neuroscience* 33.4 (2015): 471-486.
- Lumba-Brown, Angela, et al. "Concussion guidelines step 2: evidence for subtype classification." *Neurosurgery* 86.1 (2020): 2-13.

