A Multimodal, Regenerative Approach to Traumatic Brain Injury

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JPNI – Broomfield, CO

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Disclosure

The content of this presentation has been peer reviewed for fair balance and evidence based medicine.
Learning Objectives

Define

Define the clinical, biochemical and metabolic effects from TBI

Identify

Identify mainstream and alternative treatments for TBI

Understand

Understand the regenerative model of TBI treatment
Clinical Symptoms from TBI

**Physical**
- Headache
- Fatigue
- Sleep disorders
- Vertigo or dizziness
- Tinnitus or hyperacusis
- Photosensitivity
- Anomia
- Reduced tolerance to psychotropic medications
- Disorientation
- Loss of mobility
- Seizures
- Loss of smell

**Cognitive**
- Memory decline / loss
- Slow reaction time
- Inability to pay attention
- Executive dysfunction
- Slow learning
- Interrupted speech
- Difficulty understanding
- Unable to concentrate
- Confusion
- Difficulty communicating thoughts
- Unable to plan, reason, problem-solve

**Psychological**
- Irritability
- Easy frustration
- Tension
- Anxiety
- Affective lability
- Personality changes
- Disinhibition
- Apathy
- Suspiciousness
- Suicidality
- Depression
- PTSD
Biochemical and Physiological Responses from TBI

- Disproportional proinflammatory cytokine production and release
- Increased counterregulatory hormones work against the action of insulin
- Hypermetabolic and catabolic states
- Severely impaired nitrogen homeostasis
- Oxidative Stress
Oxidative Stress From TBI

- Impairs cerebral vascular function
- Impairs circulation
- Impairs the energy metabolism
- Damages mitochondria and DNA
What Happens Metabolically with a TBI?

“The brain is in a metabolic crisis with concussion... potassium ion from inside the cell going extracellularly, calcium ions going intracellularly, neurotransmitters widely released in a chaotic manner.

It takes energy to pump that potassium back, put the neurotransmitters back on so the cell can function.”

Dr Robert Cantu, MD, 2013
What Happens Metabolically with a TBI?

An Energy Crisis
Mainstream Treatments

- Occupational and physical rehabilitation
- Speech therapy
- Pharmaceutical drugs
- Cognitive maintenance exercises
- Patients simply cope with their condition
• Do not seek to regenerate but rather simply treat symptoms

• Do not combine regenerative treatments in a multimodal manner in order to maximize patient benefit
Which of the following are symptoms of a traumatic brain injury?

A. Headache
B. Insomnia
C. Mood changes
D. Cognitive and memory impairment
E. Sound and light sensitivity
F. All of the above
What is the most significant pathophysiologic reason why many TBI patients fail to recover?

A. Inflammation
B. Oxidative stress
C. Impaired nitrogen homeostasis
D. Impaired energy metabolism ("The brain is in a metabolic crisis.")
A Multimodal, Regenerative Approach to TBI

It is hypothesized that the practical, effective combination of multiple regenerative TBI therapies can produce synergistic benefits to the patient that exceed the use of one particular TBI treatment.
A Multimodal, Regenerative Approach to TBI

I. Hyperbaric Oxygen Therapy

II. Intranasal Therapies

III. IV Nutrition

IV. Cranial Osteopathy

V. Ketogenic Diet and MCT Oil
Hyperbaric Oxygen Therapy (HBOT) for TBI
Hyperbaric Oxygen Therapy (HBOT)

- Allows the body to absorb about 10-15 times its normal supply of oxygen
- Stimulates the growth of tissue, bone and blood vessels, and reduces inflammation

Thom, et al., 2006
Volume rendered Brain SPECT perfusion maps of a 51-year-old woman suffering from mTBI that had occurred 2 years prior to inclusion in the study.
• Induces neuroplasticity
• Increases tissue oxygenation
• Generates new capillary networks
• Restores blood supply
• Increases stem cells in the blood
Question 3

How does hyperbaric oxygen help TBI patients?

A. HBOT reduces neuroplasticity
B. HBOT causes vasodilation
C. HBOT increases tissue perfusion with new capillary growth
D. HBOT creates oxidative stress
• 2 hours of HBOT triples the patients own circulating stem cells

• 20 sessions of HBOT increases circulating stem cells to 8 fold (800%)

Thom, et al., 2006
Mean CD34+ population in blood of humans before and after HBOT treatments.

Data are the fraction of CD34+ cells within the gated population using leukocytes obtained from 26 patients before and after their 1st, 10th, and 20th HBO2 treatment.

Thom, et al., 2006
“[Hyperbaric oxygen therapy] is the safest way clinically to increase stem cell circulation, far safer than any of the pharmaceutical options.”

STEPHEN THOM, MD, PH.D. (2006)
Intranasal Therapies (Insulin, PRP, and Stem Cells) for TBI
Journey Through the Nose

- Through the olfactory nerves
- Bypasses the blood-brain barrier
- Into the CSF within 10 minutes
Solid arrows represent the paths of migration of cells into the brain, dashed arrows reflect possible hypothetical routes of cell delivery.
Intranasal Insulin for TBI

- Improves brain ATP production
- Decreases CSF cortisol
- Improves neuronal viability in the hippocampus
- Increases the expression of anti-inflammatory microglia
- Reduces beta-amyloid and tau protein deposition
Improved neuronal viability in the hippocampus of the insulin treated rats.

Intranasal insulin increases the expression of anti-inflammatory microglia in the hippocampus.

Brabazon, Khayrullina, Frey, & Byrnes, 2014
Intranasal insulin has the following effects:

A. Increases ATP production and utilization
B. Decreases gliosis
C. Decreases cortisol
D. Reduces amyloid and tau protein deposition
E. All of the above
Platelet Rich Plasma (PRP)

- Autologous plasma contains growth factors and cytokines to aid the injured brain:
  - VEGF, EGF increases angiogenesis
  - PDGF, TGF-p enhance collagen growth
  - IGF-1 stimulates protein synthesis
Platelet Rich Plasma (PRP)

The infusion of concentrated platelets results in an exponential increase in numerous growth factors at the sight of infusion.

Plasma cytokines control inflammatory mediators cox1, cox2 and guide stem cells to areas of injury.
Intranasal Platelet Rich Plasma (PRP) for TBI

• “Basic fibroblast growth factor infusion enhances injury-induced cell proliferation in the dentate gyrus and improves cognitive function in rats following fluid percussive injury.”

• “Other studies have found that infusion of S100β or VEGF can also enhance neurogenesis in the hippocampus and improve the functional recovery of animals following TBI.”
Peripheral Blood Based Adult Stem Cells

- Recently discovered in peripheral blood
- PLURIPOTENT adult stem cells
- Behave like embryonic stem cells
- Give rise to all the cell types
- Long lifespan
- Work in combination with PRP
Intranasal Peripheral Blood Stem Cells for TBI

- Have regenerative and reparative properties
- Adult stem cells from BMA have been used to treat ischemic brain damage by reducing gray and white matter loss (Danielyan, et al., 2014).
- Downregulate neuroinflammatory cytokines
IN glutathione has been used to reduce oxidative stress and enhance cellular detoxification in Parkinson’s disease patients (Mischley, et al., 2016).

IN methylcobalamin has been shown to improve QEEG Theta activity in ADHD and autism patients (Kurtz, 2008).
Intravenous Nutrition for TBI

Part III
IV Nutrition for TBI

- PRP
- Adult peripheral blood stem cells
- NAD+
- Myer’s cocktail with potassium, magnesium, calcium, B-complex, B5, B6, and B12, ascorbate, and glutathione
Part IV

Cranial Osteopathy for TBI
• Manual manipulation of the cranial bones and membranes to allow the cerebral spinal fluid to flow properly

• The central nervous system, including the brain and spinal cord, has a subtle, rhythmic pulsation
• This rhythmic pulsation can be blocked in brain injuries - impedes CSF and blood flow

• Effective at treating vertigo and headaches associated with TBIs
- Time shift between peaks of TCD and B-Imp is determined by the replacement of some portion of CSF out from (or into) zone of B-Imp electrodes.

- This time interval represents the mobility of CSF inside the cranium during the pulse cycle.

Moskalenko, Frymann, Kravchenko, & Weinstein, 2003
TBI patients have:
A. Reduced mobility of the CSF
B. Increased mobility of the CSF
C. Complete loss of CSF
D. No change in mobility of the CSF
Part V
MCT Oils and the Ketogenic Diet for TBI
Ketogenic Diet for TBI

High-fat

Low-carbohydrate

Adequate-protein
Ketogenic Diet for TBI

**DO NOT EAT**
- Grains – wheat, corn, rice, cereal, etc.
- Sugar – honey, agave, maple syrup, etc.
- Fruit – apples, bananas, oranges, etc.
- Tubers – potato, yams, etc.

**DO EAT**
- Meats (organic, pasture-raised, sustainable)
- Above ground vegetables and leafy greens
- High fat dairy
- Nuts and seeds
- Avocado and berries
- Other fats – avocado oil, coconut oil, grass-fed ghee, high-fat salad dressing, saturated fats, etc.
Which burns more evenly?

Glucose/Carbohydrates = Kindling

Ketones/Fats = Logs
Ketones are like diesel fuel (Glucose is like gasoline)

- Diesel fuel has a higher flash point than gasoline
- Harder to oxidize – Less flammable (excitable)
  - The brain works like a diesel engine
  - Burns more efficiently – lasts longer
What else do ketones do?

- Increases Neuroprotection
- Increases GABA
- Decreases Glutamate
- Decreases Oxidative Stress
- Decreases Depression, Fear, Anxiety
- Increases Calming
- Increased GABA synthesis
- Decreased glutamate release by competitive inhibition of vesicular glutamate transporters.
- Decreased reactive oxygen species production from glutamate exposure

McNally & Hartman, 2012
Neuroprotective Actions of the Ketogenic Diet

- Upregulates energy metabolism genes
- Stimulates of mitochondrial biogenesis
- Promotes synthesis of ATP
- Limits glutamate toxicity
- Anticonvulsant effects of ketone bodies on the brain
The TBI Therapy Protocol
TBI Therapy HBOT Protocol

Medical Grade HBOT

10 - 20
before and after
treatment

Home HBOT Chamber

5 - 7 days/wk
1 month before
treatment

5 - 7 days/wk
2 - 9 months after
treatment
## TBI Therapy 3-Day Program

| Day 1:          | Consultation  
|                | IV therapy    
|                | Cranial osteopathy 
|                | HBOT          |
| Day 2:          | HBOT          
|                | IV PRP + Nutrition 
|                | IN PRP + Insulin |
| Day 3:          | IV pluripotent stem cells (VESLs) from the blood + NAD 
|                | IN pluripotent stem cells (VESLs) from the blood 
|                | HBOT          |
Case Report 1: 46 year-old male, severe TBI from MVA

<table>
<thead>
<tr>
<th>Before Treatment:</th>
<th>After Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Memory loss</td>
<td>• “Memory download”</td>
</tr>
<tr>
<td>• Depression and anxiety</td>
<td>• “An awakening”</td>
</tr>
<tr>
<td>• Emotionally unstable</td>
<td>• Mood and personality improvements</td>
</tr>
<tr>
<td>• Headaches daily</td>
<td>• Improvements intellectually, physiologically, and psychologically</td>
</tr>
<tr>
<td>• Inability to carry on conversation</td>
<td>• Improved ability to read</td>
</tr>
<tr>
<td>• Inability to do math or read</td>
<td>• Able to turn on lights /electronics</td>
</tr>
<tr>
<td>• Light and sound sensitivity</td>
<td>• Able to drive</td>
</tr>
<tr>
<td>• Could not drive</td>
<td>• Sleep normalized</td>
</tr>
<tr>
<td>• Insomnia</td>
<td></td>
</tr>
</tbody>
</table>
“It was like a stream of information had been let loose... I felt for the first time in a year that I had some clarity. I was excited and able to read more than 2-3 sentences without triggering a migraine... The ability to think and plan returned.”
Case Report 2: 30 year-old female, mild TBI from fall

<table>
<thead>
<tr>
<th>Before Treatment:</th>
<th>After Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Insomnia</td>
<td>• Able to travel and work</td>
</tr>
<tr>
<td>• Mood swings</td>
<td>• Light and sound sensitivity</td>
</tr>
<tr>
<td>• Depression</td>
<td>decreased</td>
</tr>
<tr>
<td>• Unable to work</td>
<td>• Improved mood</td>
</tr>
<tr>
<td>• Head pressure</td>
<td>• Less fatigued</td>
</tr>
<tr>
<td>• Sound and light sensitivity</td>
<td>• Relief from anxiety</td>
</tr>
</tbody>
</table>
“I felt well enough that I started saying yes again. TBI Therapy has turned me into a TBI THRIVER, not just a survivor. I’m happy. I enjoy life again, can travel and am doing work in the world that’s more aligned with myself than ever.”
Case Report 3: 48 year-old female, mild TBI from multiple concussions

<table>
<thead>
<tr>
<th>Before Treatment:</th>
<th>After Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Anger</td>
<td>- Calm</td>
</tr>
<tr>
<td>- Depression</td>
<td>- No longer “reactive” and irritable</td>
</tr>
<tr>
<td>- Suicidal ideation</td>
<td>- Confident</td>
</tr>
<tr>
<td>- Anosmia</td>
<td>- No thoughts of suicide</td>
</tr>
<tr>
<td>- Extreme mental fatigue</td>
<td>- Feeling of less inflammation</td>
</tr>
<tr>
<td>- PTSD</td>
<td>- Improved memory</td>
</tr>
<tr>
<td></td>
<td>- Improved sense of smell</td>
</tr>
</tbody>
</table>
TBI Therapy: 
Case Report 3

“The results for me have been are nothing short of MIRACULOUS! Popeye may have his spinach but I have stem cells and PRP! Yes, my brain is strong!”
**Boone Report**

**Session Number (Created Date):** 1 (5/20/2019)

**Patient Original Title Age:** 49 yrs

**Reason for Visit:** Performance Cognitive Evaluation

**Follow-up Change Hrs. Sleep Since Meal:** No N/A 7-9 | 1-3

**Target Ranges:** Calculated for ages 50-54 yrs.

**See Appendix for explanations of metrics and symbols shown on this page.**

<table>
<thead>
<tr>
<th>Performance Assessments</th>
<th>Session 1 (5/20/2019)</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Reaction Time</td>
<td>236 (±32) ms</td>
<td>332–402 ms</td>
</tr>
<tr>
<td>Trail Making Test A</td>
<td>N/A</td>
<td>35–51 sec</td>
</tr>
<tr>
<td>Trail Making Test B</td>
<td>N/A</td>
<td>59–103 sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evoked Potentials</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio P300 Delay</td>
<td>260 ms</td>
<td>288–336 ms</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td>±12%</td>
<td></td>
</tr>
<tr>
<td>Audio P300 Voltage</td>
<td>16.7 μV</td>
<td>9–19 μV</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td>±24%</td>
<td></td>
</tr>
<tr>
<td>Boone Brain Age</td>
<td>23 yrs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State (Power)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ Eyes Closed Theta/Alpha</td>
<td>0.7</td>
<td>0.1–1.6</td>
</tr>
<tr>
<td>F3/F4 Eyes Closed Alpha</td>
<td>1.2</td>
<td>0.9–1.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Front-Back (F-P) Coherence in Theta and Alpha Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left (Theta</td>
</tr>
<tr>
<td>Mid (Theta</td>
</tr>
<tr>
<td>Right (Theta</td>
</tr>
</tbody>
</table>

**Maximum P300 Test Depth (μV) — Range: 240–500 ms**

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**Boone Report**

**Session Number (Created Date):** 1 (6/27/2019)

**Patient Original Title Age:** 49 yrs

**Reason for Visit:** Performance Cognitive Evaluation

**Follow-up Change Hrs. Sleep Since Meal:** N/A N/A 4-6 | < 1

**See Appendix for explanations of metrics and symbols shown on this page.**

<table>
<thead>
<tr>
<th>Performance Assessments</th>
<th>Session 1 (6/27/2019)</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Reaction Time</td>
<td>237 (±59) ms</td>
<td>251–362 ms</td>
</tr>
<tr>
<td>Trail Making Test A</td>
<td>N/A</td>
<td>45–77 sec</td>
</tr>
<tr>
<td>Trail Making Test B</td>
<td>N/A</td>
<td>46–89 sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evoked Potentials</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio P300 Delay</td>
<td>272 ms</td>
<td>264–343 ms</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td>±12%</td>
<td></td>
</tr>
<tr>
<td>Audio P300 Voltage</td>
<td>18.0 μV</td>
<td>7–18 μV</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td>±24%</td>
<td></td>
</tr>
<tr>
<td>Boone Brain Age</td>
<td>20 yrs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State (Power)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ Eyes Closed Theta/Alpha</td>
<td>0.7</td>
<td>0.8–1.6</td>
</tr>
<tr>
<td>F3/F4 Eyes Closed Alpha</td>
<td>1.0</td>
<td>0.9–1.1</td>
</tr>
</tbody>
</table>

**Front-Back (F-P) Coherence in Theta and Alpha Bands**

| Left (Theta | Alpha) | 0.32 | 0.16 | ≥ 0.35 | ≥ 0.4 |
| Mid (Theta | Alpha) | 0.39 | 0.25 | ≥ 0.35 | ≥ 0.4 |
| Right (Theta | Alpha) | 0.20 | 0.11 | ≥ 0.35 | ≥ 0.4 |

**Maximum P300 Test Depth (μV) — Range: 240–500 ms**
Largest depth between 240-500 msec are reported. P300s typically occur between 240 and 450 msec. Probable depth and latency of true P300 is indicated on Ist page of report. *Indicates possible artifact during late P300.

Black dotted lines at 300 msec post stimulus.
Case Report 4: 36 year-old male vet – bomb tech

<table>
<thead>
<tr>
<th>Before Treatment:</th>
<th>After Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Headache</td>
<td>• No headaches</td>
</tr>
<tr>
<td>• Insomnia</td>
<td>• Improved sleep</td>
</tr>
<tr>
<td>• Suicide ideation</td>
<td>• No suicidal thoughts</td>
</tr>
<tr>
<td>• PTSD</td>
<td>• More energy</td>
</tr>
<tr>
<td>• Depression</td>
<td>• Able to exercise</td>
</tr>
<tr>
<td>• Fatigue</td>
<td>• Less pain</td>
</tr>
<tr>
<td>• Chronic pain</td>
<td></td>
</tr>
</tbody>
</table>
## WAVI Wellness Basic Report

**Session Number**
- **Session 1**: 7/1/2019
- **Session 2**: 8/26/2019

**Patient Original Title**
- 36 yrs Baseline

**Change Hrs, Sleep Since Meal**
- N/A

---

### Screening Scores

<table>
<thead>
<tr>
<th>Metric</th>
<th>Session 1 (7/1/2019)</th>
<th>Session 2 (8/26/2019)</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton Anxiety Rating Scale (HAM-A)</td>
<td>N/A</td>
<td>N/A</td>
<td>≤ 17</td>
</tr>
<tr>
<td>Patient Health Questionnaire (PHQ-9)</td>
<td>N/A</td>
<td>N/A</td>
<td>&lt; 5</td>
</tr>
</tbody>
</table>

### Performance Assessments

<table>
<thead>
<tr>
<th>Test</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Reaction Time</td>
<td>249 (+42) ms</td>
<td>247 (+27) ms</td>
<td>252–363 ms</td>
</tr>
<tr>
<td>Trail Making Test A</td>
<td>N/A</td>
<td>52 sec</td>
<td>38–64 sec</td>
</tr>
<tr>
<td>Trail Making Test B</td>
<td>N/A</td>
<td>57 sec</td>
<td>43–83 sec</td>
</tr>
</tbody>
</table>

### Evoked Potentials

<table>
<thead>
<tr>
<th>Test</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio P300 Delay</td>
<td>288 ms</td>
<td>292 ms</td>
<td>250–324 ms</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td></td>
<td>4 ms</td>
<td>±11 ms</td>
</tr>
<tr>
<td>Audio P300 Voltage</td>
<td></td>
<td>17.0 μV</td>
<td>8–21 μV</td>
</tr>
<tr>
<td>Test/Retest Change</td>
<td></td>
<td>2 μV</td>
<td>±2 μV</td>
</tr>
</tbody>
</table>

### State

<table>
<thead>
<tr>
<th>Condition</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ Eyes Closed Theta/Beta (Power)</td>
<td>5.0</td>
<td>4.0</td>
<td>0.9–2.1</td>
</tr>
<tr>
<td>P3/F4 Eyes Closed Alpha (Magnitude)</td>
<td>1.2</td>
<td>1.2</td>
<td>0.9–1.1</td>
</tr>
</tbody>
</table>

### Peak Frequency (7.0–13.0 Hz)

<table>
<thead>
<tr>
<th>Localization/Region</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Target Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal</td>
<td>? 7.0 Hz</td>
<td>7.0 Hz</td>
<td>9.0–11.0 Hz</td>
</tr>
<tr>
<td>Central-Parietal</td>
<td>? 7.0 Hz</td>
<td>7.0 Hz</td>
<td>9.0–11.0 Hz</td>
</tr>
<tr>
<td>Occipital</td>
<td>? 7.0 Hz</td>
<td>? 9.5 Hz</td>
<td>9.0–11.0 Hz</td>
</tr>
</tbody>
</table>

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**Maximum P300 Test Depth (μV)** — Range: 240–500 ms — Topo scale referenced to Session 2

**SYNC BLINKS REPORTED IF MAXIMUM DEPTH OF FP1 or FP2 > 20 μV. SYNC BLINKS AFFECT FRONTAL DEPTH VALUES.**

---

**Session 1**

**Session 2**

---

**MAX CP μV**

- **17**

---

**MIN μV**

- **5**
Largest depths between 240-500 msec are reported. P300s typically occur between 240 and 450 msec. Probable depth and latency of true P300 is indicated on 1st page of report.

*Indicates possible artifact during late P300.

Black dotted lines at 300 msec post stimulus.
Out of 100 patients treated, nearly every patient reports:

More mental clarity
Improved memory
Improved executive function/decision making
More stable emotions and less stress
Better ability to cope with pain
More physical and mental energy
Out of 100 patients treated, some patients report:

- Less sound and light sensitivity
- Improved eyesight
- Improved sleep and libido
- Improved motor function
  (ability to open a clenched fist, ability to walk)
- Less muscle spasticity
Conclusion: The Multimodal, Regenerative Approach is a Superior Way to Treat TBI

The practical, effective combination of multiple regenerative TBI therapies can produce synergistic benefits to the patient superior to mainstream TBI or single modality TBI treatments.
Pilot Study with Invictus Project and TBI Therapy

- 10 veterans
- Tested with WAVi and DTI at baseline
- 20 Pre-treatment HBOT
- TBI Therapy intranasal and IV PRP-PBSC (Platelet rich plasma-peripheral blood stem cell) and IV nutrient/cranial therapy/light therapy protocol in 24 h period
- 20 Post-treatment HBOT with 10 days intranasal insulin
- Functional qEEG with WAVI post TBI Therapy protocol at 1, 2 months, 4 months, 6 months
- DTI at 6 months
- Quality of Life testing at baseline, 2 months, 4 months, 6 months

Contact invictusproject.org for more information
"Right now, there are a countless number of combat veterans struggling not to take the loaded gun sitting on their nightstand and put it into their mouth. I know this because on Christmas Day 2014, after returning from my second tour in Afghanistan, I was that guy. If it weren’t for the people closest to me who wouldn’t allow me to quit on myself I wouldn’t be here.”

Sam Peterson, Co-Founder & CEO of Invictus
“After tours to Iraq and Afghanistan, I was exposed to blasts that ultimately lead to multiple TBIs. Easy, everyday tasks became a challenge through the migraines, and I found myself not being able to recall what I was doing or where I was going while driving.

I was told this was the quality of life I should get used to. I was prescribed medication after medication with no improvement.... The quickest way to remove the threat was to put a gun in my mouth and make all the pain go away. I credit my son with saving my life, because had he not cried at that very moment, I may not be here to share my story and serve others like us.”

Jeffrey Haugland, COO of Invictus


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