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PTSD: Brain on Fire:

A RESET Therapy (QEEG) Brain Map Analysis of an Afghanistan Combat Veteran.

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Post-traumatic stress disorder (PTSD) is considered to be initiated by exposure to trauma that may occur after experiencing or witnessing disturbing or shocking events. It may induce varied intrusion and/or avoidance symptoms, negative changes in cognition and mood, and changes in arousal and reactivity. It is estimated that within 12-months post-deployment, 2% to 31% of military personnel are suffering from the effects of PTSD.

The most prevalent forms of trauma experienced among recent-serving veterans include: having a friend wounded or killed; seeing dead or seriously injured noncombatants; witnessing an accident resulting in serious injury or death, smelling decomposing bodies; being physically impacted by an explosion; receiving an injury that does not require hospitalization; military sexual trauma (primarily women). Among U.S. civilians, the most frequent forms of trauma experienced include the following: violent death or injury to a close family member; physical or sexual assault; accident or fire; witnessing a physical or sexual assault; witnessing a natural disaster. Formal treatment guidelines recommend the use of trauma-focused intervention as first-line therapy for adults with PTSD.

The most frequently endorsed interventions involve Cognitive Behavioral Therapies (CBT) as well as Prolonged Exposure Therapy (PET). Regardless of treatment setting, it is of particular concern that a recent review (meta-analysis) of randomized controlled trials conducted primarily among civilians reported that approximately two-thirds of patients who receive PET or CPT retain their diagnosis post-treatment. (Steenkamp MM, et al, Psychotherapy for military-related PTSD, A review of randomized clinical trials. JAMA. 2015 314:489-500.) Certainly development and validation of more effective treatment approaches for PTSD must be given priority. The pressing need to intervene in reducing the **daily** suicides of 22 U.S. veterans (Department of Veterans Affairs, Suicide Data Report, 2012), simply can no longer be ignored.

A recently published Academia.edu paper by L. Richard Bruursema and me (Lindenfeld) was entitled: “Resetting the Fear Switch in PTSD: A Novel Treatment Using Acoustical Neuromodulation to Modify Memory Reconsolidation” (5/22/15). The current article is based on the **application** of the principles elucidated in the earlier referenced paper. Specifically, it was postulated that RESET Therapy (Reconsolidation Enhancement by Stimulation of Emotional Triggers) interrupts reconsolidation in the Limbic System through a neuro-modulation process thereby resulting in rapid and dramatic relief of PTSD symptoms.

We (Lindenfeld and Bruursema) further noted that recent advances in neuropsychology and brain imaging have opened new doors to our understanding of PTSD and other anxiety-related disorders. We now know that the symptoms associated with this condition closely interweave with memory circuits in the Limbic System of the brain. A working premise forthcoming from this body of research is that: *although PTSD is triggered by trauma, it is really a disease of memory. The problem isn't the trauma; it's that the trauma can't be forgotten!* We went on to speculate that: When these hyper-aroused/hyper-sensitized circuits are interrupted through an acoustically-driven neuromodulation process, they appear to 'reset' back to (or closer to) a homeostatic norm that existed prior to the trauma experience. This neural reset is evidenced by the lasting reduction or elimination of the reported symptoms. The treatment enables the brain to re-establish plasticity that became frozen through the effects of trauma.

As further noted in the previously published "Resetting the Fear Switch" article, https://www.academia.edu/12683048/Resetting_the_Fear_Switch_in_PTSD_A_Novel_Treatment_Using_Acoustical_Neuromodulation_to_Modify_Memory_Reconsolidation it was indicated that two critical objectives of RESET Therapy are common to all emerging memory and trauma based therapies. The first is to re-stimulate the reactive limbic portion of the targeted neural circuit through the patient's attentional focus. The second is to introduce a modifying stimulus: in our case a disruptive Theta-pulsed sound that interrupts the reconsolidation of the hyper-activated or sensitized memory circuit. The result is that the patient experiences rapid relief of the symptoms. We perceive that normalization of a potentiated or sensitized memory circuit takes place typically immediately or within hours following the first actual treatment session. The following case study captures the above postulation in action visually. The Brain Map of a 26-year-old combat veteran with PTSD and TBI well illustrates the points made above.

A supposition based on the **Neuronal Model of PTSD** anticipated that with RESET Therapy, reactivation of cortical circuitry will occur in the prefrontal region of the brain as well as in the speech centers (Brocha's and Werniche's) in the left hemisphere. Translated, this implies that the veteran will be much better in articulating his traumatic events after his brain has been **RESET** rather than before. Clinically, this has been the case each and every time for those who have experienced this treatment.

Most unfortunately, the Amygdala and other components of the Limbic System activates when triggered by trauma often placing vulnerable individual into a response state of chronic fight, flight or freeze. Based on the Neuronal Model, we would anticipate that Limbic System disturbance would rapidly deactivate following RESET Therapy thereby returning the veteran to pre-trauma levels. We reference this phenomena as **'turning off the fear switch'** thereby permitting the individual to experience a sense of inner calmness free of intrusive imagery and physiological reactivity.

CASE STUDY

Corporal Wade Risha served honorably in the United States Marine Corps from 2009 to 2013 spending nine months in Helmand province located in southwest Afghanistan. He did this in support of the 2010 offensive to destroy the Taliban stronghold in Marjah. His duty assignment was to serve as a vehicle operator manning the gunner's slot on a mobile armor vehicle. Following this tour, he experienced deafness in his left ear rated at a 70% disability level. As stated by reporter Billy Cox in a *Sarasota Herald-Tribune* front page major article http://veterans.heraldtribune.com/2015/11/18/silkies-hike-to-raise-awareness-of-ptsd/ dated 11/19/2015:

"He was unsure if this (deafness) was due to the chatter of his M240 or his .50 caliber; maybe it was the very first improvised explosive device that went off behind him as they rumbled through a village. 'IEDs were everywhere, highways, trails, scattered randomly off-road, in the middle of nowhere.' Additionally, during a time that his convoy was being ambushed, he fell twelve feet to the ground with a 30-pound sandbag following him. He ended up rupturing two discs, managing the pain and his PTSD with mood and pain medication.

On one occasion his convoy visited a remote U.S. combat outpost at dusk. An explosion a distance away led to his team investigating the incident. What they found was that a farmer on a tractor pulling a wagon loaded with children had unintentionally detonated an IED. He recalled that two of the kids were still alive, but he is unsure if they made it or not. A medevac unit ferried the victims away. 'There wasn't even any action'. Just weeks ago, whenever Risha saw children anywhere, the IED scene would flare up on him with its initial ferocity.

'I wasn't getting shot at or getting crazy, it was just – stuff'. Risha's eyes began to well up. 'What I saw was just an average day for a lot of guys on the ground. Compared to what they went through, I'm pretty lucky'. Risha acknowledges his emotion, but it's not like before. Risha insists the past hasn't blown him away like that since the RESET experience. Risha now posts his contact information on social media for fellow veterans who just want to talk. One guy tends to call him in the middle of the night. But at least he calls.

Over the past two years, three of Risha's marine brothers have died by their own hand. One took his own life by shooting himself. Two others overdosed on prescription medication. He served as a pallbearer at one of the funerals. Like his brothers, he brought PTSD home with him. Risha's uncle saw him begin to slide. After reading an article in the *Sarasota Herald-Tribune* on 8/23/15 about RESET Therapy, he contacted Dr. Lindenfeld about his nephew. It was a perfect fit. On the last Friday afternoon in September 2015 Wade Risha sat in a plush black leather chair in one of the MindSpa offices with Dr. George Rozelle prepping him for a QEEG Brain Map Evaluation.

Satisfied with the baseline readings, Dr. Rozelle alerts Dr. Lindenfeld to begin the RESET process. Wade, with his headset on and plugged-in, is provided with verbal instructions as an acoustical tone is introduced that is designed to resonate with circuits in the brain containing the trauma memory. Wade adjusts the volume control dials on his own to attain a relatively loud but balanced level. Then Wade is instructed to revisit a 'triggering event' as though it were actually happening before him. He is told to be in the situation completely and fully, feeling it, seeing it unfold, and thinking the thoughts he had at the time. Wade said, 'OK, so we rolled up' – at this point he is stopped and told to keep it inside of him.

Wade is clearly now fully-engaged internally in the fight-or-flight place by revisiting the atrocity that fused his memory circuits and consolidated that horrific encounter into his emotional hard-drive. Finally, taking hand-signal cues from Wade, Dr. Lindenfeld then tunes in a binaural pulse that prevents the trauma from reconsolidating back once again to its original debilitating state. As a trial to ensure that the settings were indeed resonating with the targeted trauma, the disruptor signal was run for five silent minutes. Then Wade was asked to revisit the triggering event once more. He reported having 'trouble getting there. It's kind of foggy . . . it's like there's a cloud in my way . . . it's just pieces now . . . it's really fuzzy . . . it's kind of strange . . .' At this point, the session is over.

On his return a week later, Wade was unable to recall the triggering event at any level of intensity as he did before. He is still able to remember what happened to the children in the wagon, but he is no longer an emotional hostage to the incident. He is provided with a post-treatment Brain Map; this time re-visiting the trauma experience as he had earlier.
In reviewing Wade's pre- and post-Brain Map results, color-coded patterns are present in abnormally high shades of red and orange in the pre-material consistent with swelling. There is some normative green seeping into the areas that regulate states of arousal in the post-treatment indicators. A month after his first RESET session, Wade remains upbeat, continues to sleep well and feels release from the traumas that formerly possessed him. "

PROCEDURE

QEEG (Quantitative electroencephalography) Brain Mapping is a term that describes a comprehensive assessment of brain function through computer assisted analysis of the EEG data. Nineteen surface electrodes record brain wave signals that can be viewed on a computer screen and digitally stored for later analysis. A trained professional can then visually examine the brain wave patterns, remove artifacts such as eye movement and muscle tension, remix for different views and source localization, and perform statistical analyses.

A color-coded head map is a product of this process which can give a pictorial representation of how EEG power is distributed in the brain as well as how different parts of the brain are communicating with each other. Further data base analysis permits the viewer to see how the recorded data compares to that of a normal population which is matched for age, gender and handedness. Brain waves are produced at different frequencies that have been traditionally classed into five groupings including the following: Delta, Theta, Alpha, Beta, and High Beta. These frequency bands represent different levels of arousal in the brain from low/slow (Delta) to high (High Beta). Research has found the brain map to have reliability that is equal or superior to routinely used clinical tests such as blood tests, MRI, and CAT scans.

Undergoing a QEEG Brain Map is a painless and non-invasive experience. A cap with 19 electrodes is placed on the scalp with two additional linked references placed on the earlobes. A conductive paste is inserted into 19 opening in the cap to ensure a proper connection with the scalp. Each electrodes picks up the brain electricity (EEG) in that particular region. The patient is asked to follow standard procedures such as: sit still with eyes open; sit still with eyes closed; image an emotionally disturbing event; return to a neutral perspective.

As a result of Wade's combat experiences, we were aware that our veteran sustained a left side Traumatic Brain Injury (TBI) and severe Post Traumatic Stress Disorder (PTSD). He was simultaneously monitored for Sympathetic Nervous System arousal with varied sensors used to measure respiration, heart rate, finger temperature, muscle tension, and skin response. He showed greatly elevated skin response measured at 16 µmhos at rest and 26 µmhos when tuned-in to the trauma.

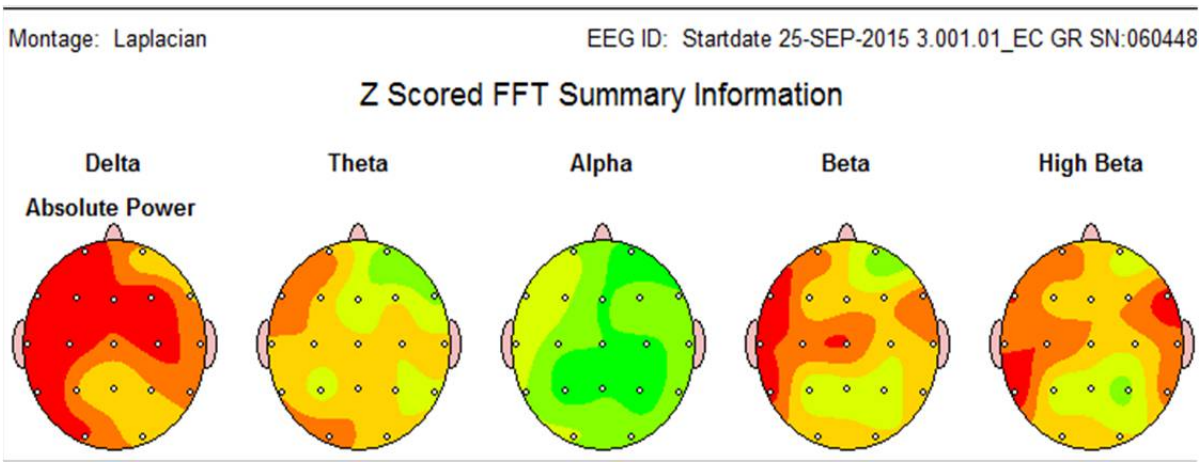
This was his most reactive arousal indicator throughout his pre- and post-assessment although his measures went as low as 9 µmhos in his post-treatment testing. This is indicative of a quieting trend. In comparison, a normal skin response is generally measured at 4 µmhos or less. EMG (muscle tension) trapezius measures were under 3.0 µv on pre and post-testing which is considered to be normative. Average finger temperature was 83° at pretest and 89° at post-test. As the individual relaxes, arteries dilate permitting an increase in blood flow meaning that 88° and above are considered to be normative.

Brain electrical activity was recorded from a 19-channel Electro-Cap, referenced to linked ears, on a Brain Master Discovery 24-E QEEG Instrument. This was done in accordance with the 10-20 International Electrode Placement System. DC Offset was reduced to less
than 30 millivolts. The sampling rate was 256 samples per second. No activation procedures were used. The raw recording was digitized for data storage and analysis and later manually edited to reduce artifact (eye movement, EMG, body movement etc.) and subjected to quantitative

spectral analysis. An eyes closed resting baseline and an eyes closed "trigger" baseline (Recalling Trauma) were collected.

The results of the spectral analysis were displayed in color-coded topographic maps, and statistical reports. The QEEG was based upon at least sixty seconds of edited raw EEG data for each testing condition. An analysis of edited raw data against the Thatcher Life Span Reference Data Base (Thatcher et al, Science 1987 Vol. 236: 1110-1113), matched for age, gender and handedness, was performed to assess functional integrity of corticocortical neural function. Data base comparisons were conducted on measures of coherence, phase, amplitude asymmetry, and relative power.

PTSD RECALL OF TRAUMA PRE-RESET THERAPY
GREEN = NORMAL, RED = EXCESSIVE



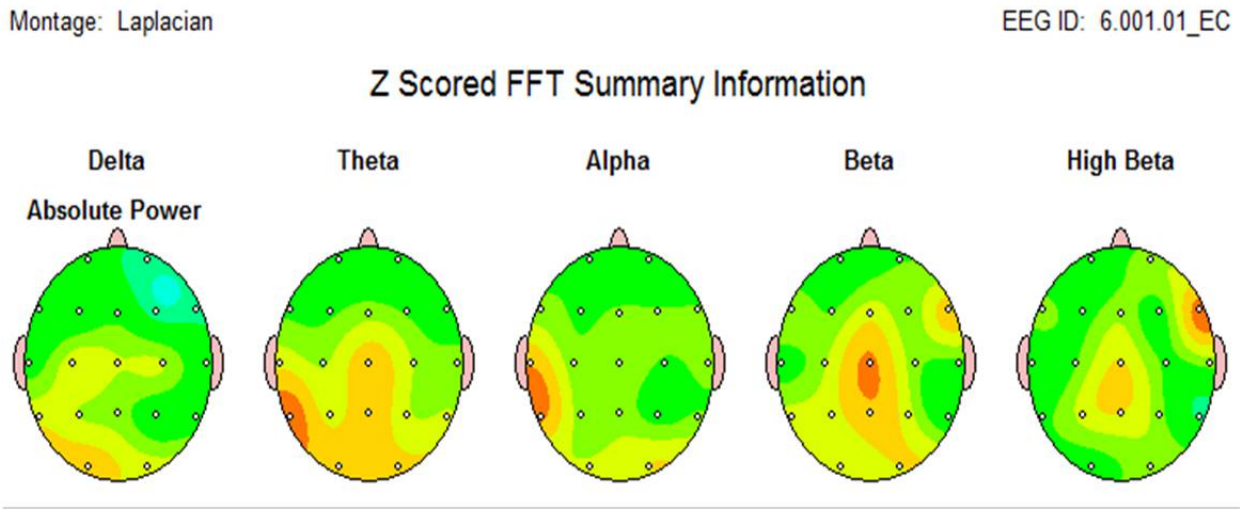
The pre-treatment Brain Map, produced while Wade was fully engaged in imagery, bodily sensations and thoughts at the time of his Afghanistan incurred traumas, revealed excessive EEG activity throughout the cortex. Aside from its startling presentation, we consider this particular pattern to be indicative of a lack of cortical control that is necessary to restrain an overly activated Limbic System that is perpetuating an Amygdala triggered chronic fight or flight response. We anticipated this occurrence within the context of the Neuronal Model of PTSD. We further expected that left frontal lobe hyper-activation in the Brocha's and Wernicke's speech region of the brain would be present; that is, associated with disruption of expressive and receptive speech. In a similar fashion, we anticipated prefrontal and frontal activation associated with disrupted executive functioning ability such as multitasking.

As noted in the pre-treatment Brain Map display using linked ears reference, Delta (1-4 Hz.) was excessively elevated in the left frontal, central, parietal and left occipital regions of the brain. No

areas were normative on the Delta display. Theta power (4-8 Hz) was greatly elevated in the left frontal temporal and parietal regions. A small area in the right frontal region was normative. Alpha was primarily normative. Beta (12-25 Hz) and high Beta (25-30 Hz) were elevated in the left temporal with a lesser amount of elevation in the right as well as in the central and occipital areas. A minimal pocket of normative material was present in the Beta displays.

Analysis of the data revealed left frontal hypo-Delta coherence and bilateral frontal Theta hyper-coherence to be present. A statistical, three-dimensional equation called the Laplacian identified the presence of excess Theta and Beta centered over the Cingulate Gyrus. Additionally, excess Theta and Alpha were found in the left posterior temporal and occipital areas. Excess left hemisphere and bi-temporal Delta and Theta were dominant. Excess bilateral Beta and high Beta were significant. A Traumatic Brain Injury Discriminant Analysis was found to be significant at the 95% probability level with a high moderate level of severity. These findings will be later comprehensively detailed through submission to a peer-reviewed journal.

RECALL OF TRAUMA POST-RESET THERAPY



The post-treatment Brain Map, above, depicts an absence of the emotionally charged response to imagery before treatment. In other words, the PTSD signature appears to be absent in the Post-RESET imagery. What is present appears to be a TBI coup, contra coup pattern with the primary site of impact in the left posterior region (Theta and Alpha display) crossing to the central region (Beta) and then extending to the right temporal area (High Beta).

As evidenced in the post-treatment Brain Map, Delta power was relatively within normal limits. Theta power was elevated primarily in the posterior region with the left higher than the right. Alpha was greater on the left. Beta and High Beta were elevated centrally. Hyper-coherence was

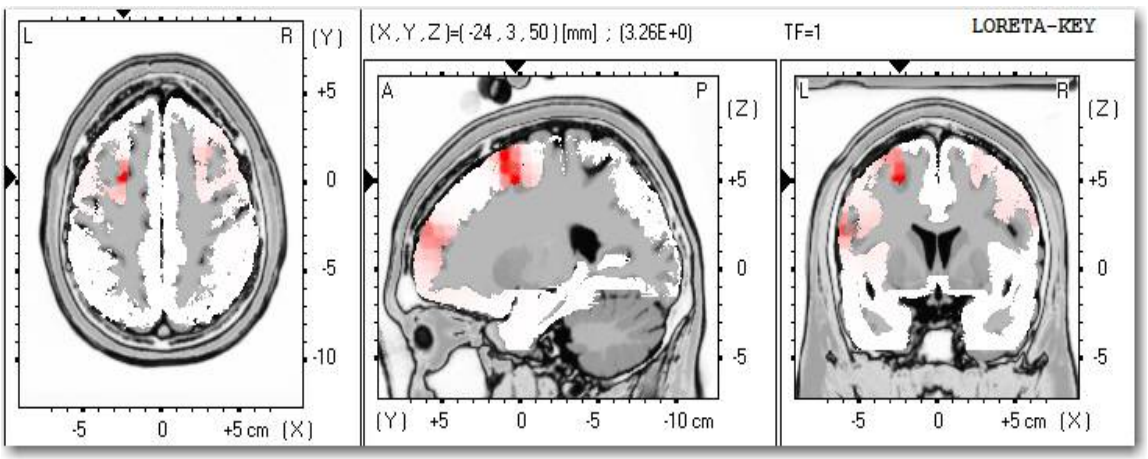
evident in Theta. Delta was relatively within normal limits with slightly elevated left occipital signs. Theta power was elevated primarily in the occipital posterior and central region with the left higher than the right. Alpha was greater in the left temporal area. Beta and high Beta were elevated centrally. Hyper-coherence was evident in Theta.

The stripping away of the emotionally charged pre-treatment Brain Map data allows us to obtain clarity with regard to Wade's underlying Traumatic Brain Injury condition. We presumed that Wade's TBI likely occurred from his 12-foot fall from a mobile armored vehicle striking his head in the left posterior region of the brain. The rapid neutralization of emotionally charged material, depicted above, now reveals a basis for TBI treatment to take place. Previously, this was not possible for this Veteran due to his engagement in daily survival needs coming from chronic flashbacks and nightmares.

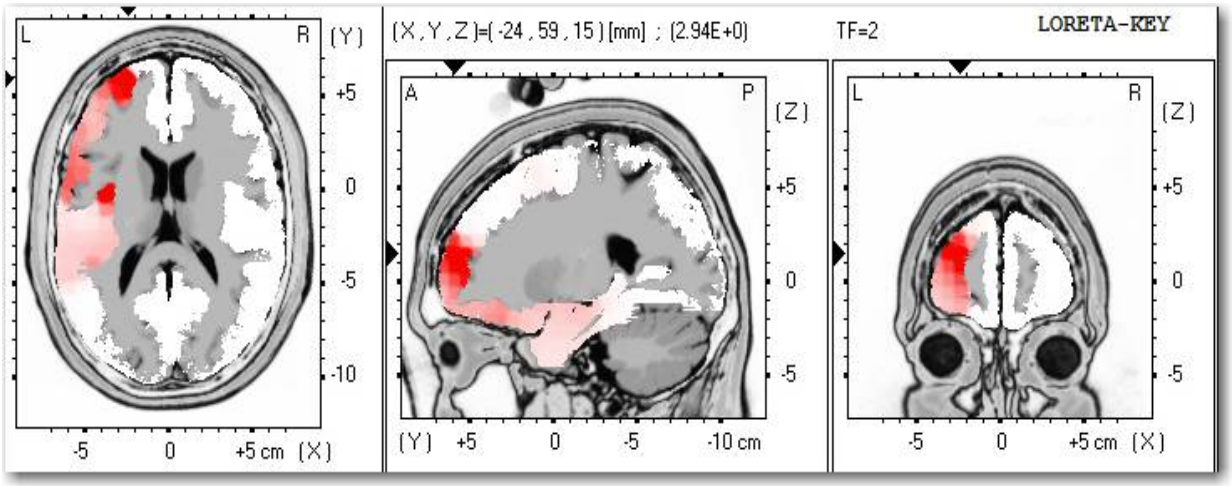
An advancement in the use of qEEG material is called LORETA, which stands for Low Resolution Brain Electromagnetic Tomography. In principle, the LORETA analysis is capable of determining the relative activity of varied regions in the brain using surface electrodes (PASCUAL-MARQUI, 1999). The EEG is a measure of electrical potential differences but the LORETA method estimates current densities at deeper cortical levels.

Thus, through the use of a standard sensor cap with advanced source-correlation software, deep brain structures become visible in the form of a 3D display. The following displays reveal the LORETA application extracted from Wade Risha's brain map material. As shown in the pre-treatment displays, below, there appears to be decreased activation in the Medial Frontal Lobe region. The Broca's Speech area appears to be 'off line'. Left frontal slowing is present that tends to be associated with depression.

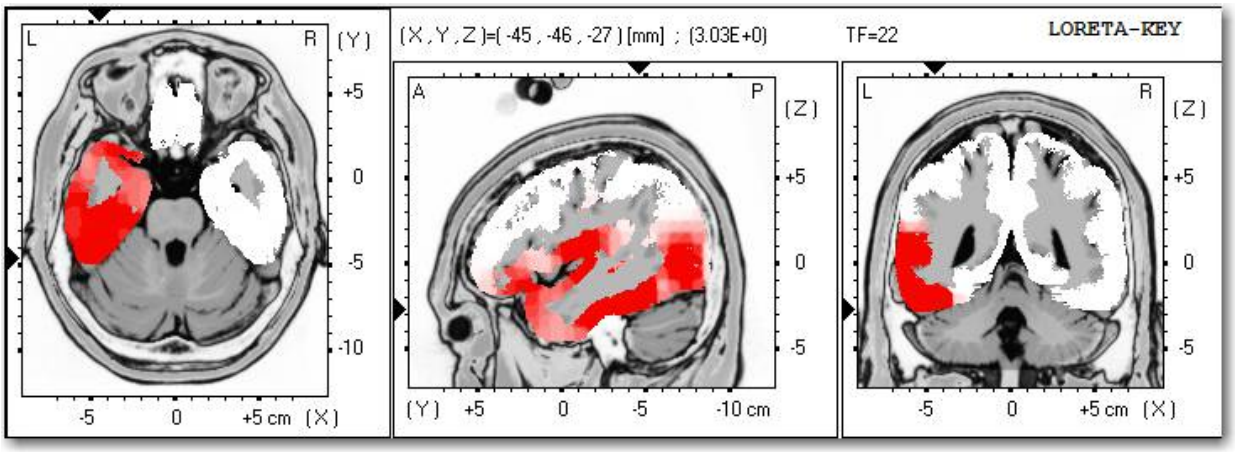
LORETA ANALYSIS: PRE RESET
THERAPY - RECALLING TRAUMA



Z=2.0. 1 Hz increase indicates de-activation. Region of interest is Medial Frontal Lobe.



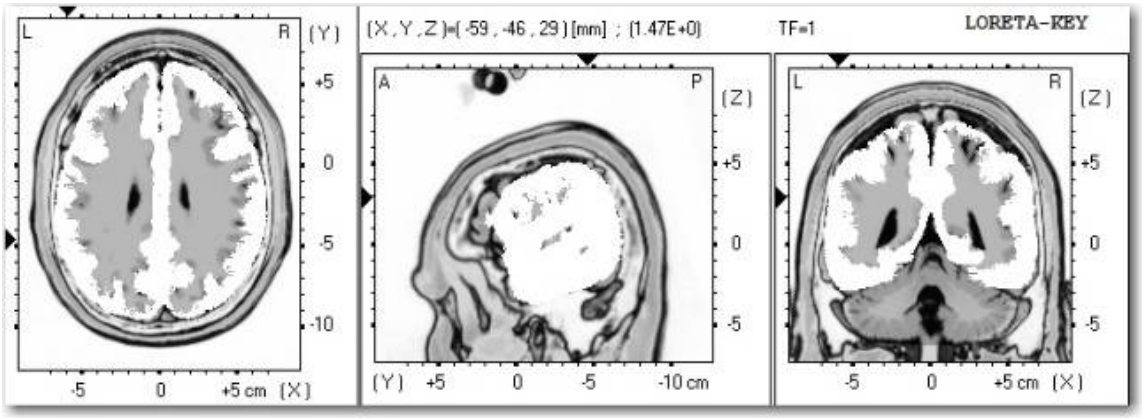
Broca's Speech area off line at 2 Hz. The display also shows left frontal slowing associated with depression. Finally, the Amygdala, Uncus, Temporal lobe, parahippocampal gyrus, fusiform gyrus is clearly activated at 22Hz.



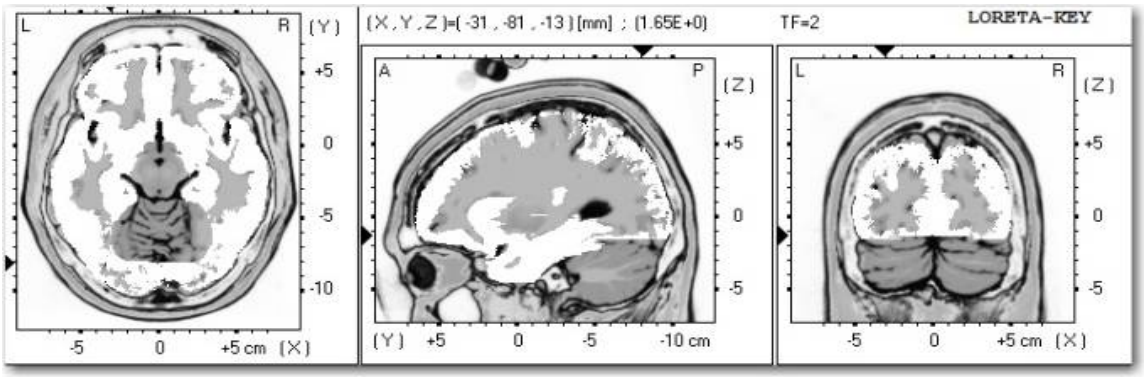
Amygdala, Uncus, Temporal lobe, parahippocampal gyrus, fusiform gyrus activated at 22Hz.

In Wade's post-treatment LORETA results, depicted below, normalization is the rule rather than the exception.

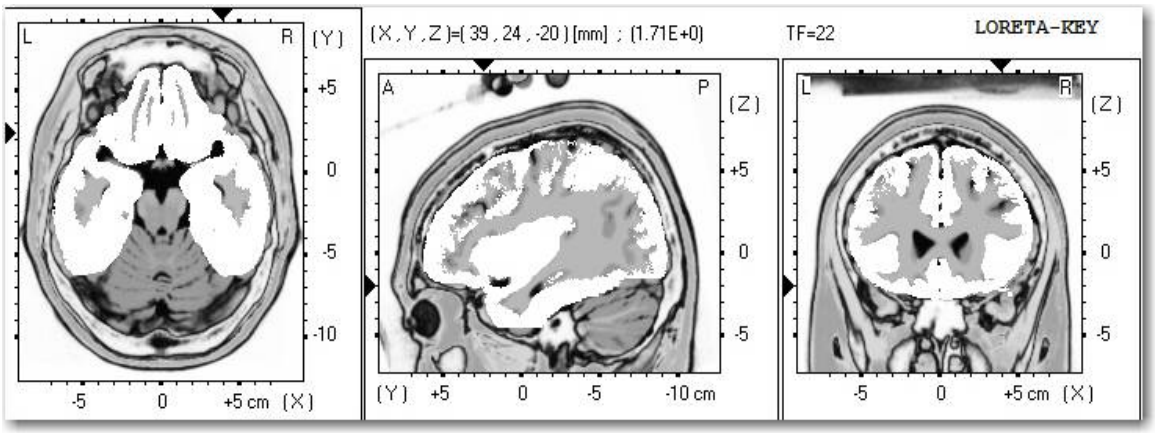
POST-RESET TREATMENT
MEDIAL FRONTAL GYRUS AT 1 HZ:
FINDINGS NOT SIGNIFICANT



BROCA'S SPEECH AREA AT 2 HZ:
FINDINGS NOT SIGNIFICANT



AMYGDALA at 22 HZ:
FINDINGS NOT SIGNIFICANT



SUMMARY: For this case study, we purposely did not solicit a detailed history prior to treatment other than to establish that there was significant combat-related PTSD and left-side Traumatic Brain Injury that occurred through military service in Afghanistan. The content of the PTSD was irrelevant to the RESET Therapy approach as we have come to consider that the nature of PTSD is that the person cannot fully recall details; tries to avoid recalling emotionally charged events; has trouble fully articulating events.

Based upon previous FMRI and QEEG studies of PTSD, we hypothesized that Brain Mapping would support the anticipated changes associated with the Neuronal Model of PTSD. For example, we postulated that the PTSD condition would include over-activation of the Limbic System, particularly the Amygdala, and under-activation of the medial frontal lobe and Broca's speech area. We also hypothesized that there would be left and right temporal focal dysregulation present primarily due to the veteran's TBI condition.

Baseline measures matched our expectations in regards to the **Neuronal Pattern of PTSD** hypotheses. We believe that silently recalling trauma events assisted to magnify the pre-treatment Brain Map findings. It is important to note that pre- and post-treatment Brain Maps were taken with exactly the same imaginal exposure to a specifically referenced trauma. Additionally, the data was taken at the same time of day. As an aside, following his first five-minute trial of RESET Therapy, Wade was able to recall events more clearly and in greater detail. As anticipated, he was able to talk about his Afghanistan experiences without emotional charge.

Post-RESET Brain Maps revealed significant normalization of the QEEG in the regions of interest pertaining to PTSD although patterns associated with Traumatic Brain Injury remained. Our plan is to address Wade's TBI issues later with a specially-designed experimental RESET Therapy protocol that will occur over a three-month period. Upon completion of this experience, additional Brain Mapping will be provided to assess further changes.

CONCLUSION: The preliminary findings from this case study provide objective evidence of real and lasting changes in the brain produced in a very short time through the use of RESET Therapy. Indeed, Wade Risha noted that his nightmares and flashbacks stopped following his first five-

minute trial that followed the initial 'tuning in' experience. Prior to his receiving a full session, he reported sleeping fully and deeply without disturbance of any kind.

While this is a single QEEG case study, we would hope to further replicate the results with a larger sample. Independent of this objective, the intervention shows tremendous promise to revolutionize the treatment of PTSD. The Neuronal Pattern of PTSD appears to be a valid prognostic indicator that captures the varied effects of the PTSD/trauma condition. Referencing the title of this article, it is visually apparent in the post-treatment EEG display that the, **'fire is out'** or, as mentioned in the previously referenced Academia.edu article, **'the fear switch has been turned off.'** The pictorial changes in the Brain Maps match this veteran's exciting subjective reports. He is now active in a positive and socialized way, engaging in activities with other veterans. Wade has taken a lead position in Sarasota, Florida, in a group called Irreverent Warriors.

He led a march of over 100 of these former and current service veterans on November 21, 2015. Wearing little besides military-olive silkie boxers, and carrying our national flag, participants shouldered 22 kilograms of backpack weight representing the 22 U.S. veterans who commit suicide each day in this country. Irreverent Warriors hike a symbolically significant 22 kilometers round-trip. Clearly, Wade has experienced a major and transformative experience, emerging from his reclusive and isolative state to that of assuming a position of local leadership in a cause in which he is deeply emotionally invested.

FUTURE OBJECTIVES: The current case study, on the one hand, lends credence to the saying that: 'one picture is worth a thousand words.' On the other hand, we yet have miles to go. For example: is it possible that the condition called 'Chronic Fatigue Syndrome' (CFS) is the equivalent to the 'PTSD Brain on Fire' imagery described earlier? Could it be that CFS is the corresponding condition wherein the brain remains in a constant state of vigilance that is incurred through a different, subtle form of traumatic input? Might underlying emotional trauma produce the brain-swelling referred to in the CFS condition?

Clearly this case study is a first step in scientifically documenting the rapid change in the EEG signature of this combat veteran that also parallels a dramatic alteration in his personality and symptom picture. Further studies are obviously warranted, given the dramatic transformation that occurred. Applying for funding through grants is an arduous and lengthy process, yet we must begin this task given the 22 U.S. veterans we are losing daily due to suicide. This figure does not take into account the untold thousands who suffer flashbacks, nightmares and distortions each and every day due to the effects of PTSD.

We seek a way to 'fast-track' research based on our Brain Map findings, yet we are also aware of built-in resistance to change in the status-quo. Advanced brain-imaging procedures such as fMRI will add yet another level of sophistication which would capture the treatment effects forthcoming from the RESET Therapy intervention. We can foresee the day when RESET is provided from start to finish within the fMRI apparatus, capturing the moment to moment alterations in brain circuitry. What an exciting day that will be!

We believe, based on past clinical results that the symptoms of Wade Risha's PTSD condition are now in a state of complete and permanent remission. However, his Traumatic Brain Injury consequences remain unchanged. We are committed to exploring the effects that RESET Therapy may have on this aspect of his functioning by initiating a home-training program over the course of a three-month period of time. Dr. Frank Lawlis graciously contributed a Bio-Acoustical Utilization Device (BAUD) unit and L. Richard Bruursema of *Insight Neurosystems* donated an enhanced headphone for this purpose.

Our veteran will be seen again to set up a TBI treatment protocol that he will use daily in his own home. The home-training component requires little active therapist involvement other than the occasional redirection necessary when the trainee becomes 'stuck.' We are quite excited about this aspect of our intervention as little work has been done with neuromodulation applied to the TBI condition. Wade has been provided with a computer-based neuropsychological screening test called the CNS Vital Signs as a pre-assessment. The following display entitled: CNS Vital Signs Report illustrates his initial scoring pattern.

CNS Vital Signs Report	**Test Date: November 02 2015 15:14:42**

Patient Profile: Wade Risha	Percentile Range				> 74	25 - 74	9 - 24	2 - 8	< 2
	Standard Score Range				> 109	90 - 109	80 - 89	70 - 79	< 70
Domain Scores	Subject Score	Standard Score	Percentile	VI**	Above	Average	Low Average	Low	Very Low
Neurocognition Index (NCI)	NA	81	10	Yes			x		
Composite Memory	93	86	18	Yes			x		
Verbal Memory	46	75	5	Yes				x	
Visual Memory	47	99	47	Yes		x			
Psychomotor Speed	182	98	45	Yes		x			
Reaction Time*	822	60	1	Yes					x
Complex Attention*	12	83	13	Yes			x		
Cognitive Flexibility	35	77	6	Yes				x	
Processing Speed	47	78	7	Yes				x	
Executive Function	36	78	7	Yes				x	
Simple Attention	36	61	1	Yes					x
Motor Speed	134	113	81	Yes	x				

Domain Dashboard: Above average domain scores indicate a standard score (SS) greater than 109 or a Percentile Rank (PR) greater than 74, indicating a high functioning test subject. Average scores range from 90-109 indicating normal function. Low Average is from 80-89 indicating a slight deficit or impairment. Below Average is from 70-79 indicating a moderate level of deficit or impairment. Very Low is a score of 70 or less indicates a deficit impairment. Reaction times are in milliseconds. An * denotes that "lower is better", otherwise higher scores are better. VI** is a Validity Indicator that denotes a guideline for representing the possibility of an invalid test or domain score.

As noted above, only one score (Motor Speed – 113) is in the Above Average range followed by two others in the Average range including: Visual Memory (99) and Psychomotor Speed (98). Nine of twelve scores indicate cognitive slippage with particular domains (Executive Functioning – 78 and Verbal Memory - 75) of particular concern.

Upon the completion of a three-month home training period, he will again receive the CNS Vital Signs as a post-measure. Additionally, another Brain Mapping procedure will be provided to explore our expectation that complete and total remission from PTSD will remain in effect. Findings from this inquiry will form the basis for another paper focusing on RESET Therapy and TBI.

SUMMARY: The title for this article, "PTSD: Brain on Fire," was derived from a spontaneous statement made by one of the authors upon first viewing the raw EEG signal produced during the initial "Recalling Trauma Stage." If this is what it feels like inside when one has PTSD, we can now understand and appreciate the lifetime of misery that someone with the condition gets to experience on a daily basis.

Yet we can now also see that within a time frame of five to twenty minutes a seemingly miraculous transformation can occur. We are very excited about this potential to assist so many of our warriors to regain the stability in their lives that they have so desperately sought. These dramatic findings clearly signal hope and the possibility of normative changes for those afflicted with the life shattering symptoms of PTSD.

An area that is critically important is that of preventing PTSD from developing in the first place. This has proven to be possible and can be accomplished through the disruption of the initial consolidation of trauma memories. An 2009 article by Dr. Arieh Shalev published in P*sychiatr Clin North Am.* 2009 Sep; 32(3): 687–704 was entitled: Memory Consolidation and Reconsolidation: Cortisone after trauma could prevent PTSD.

The author states that: "Memories are created in a series of phases in which different neurobiological mechanisms are required. In order for short-term memories to be placed in long-term storage, new protein synthesis is required. If protein synthesis is inhibited during a window about 2-4 hours after the short-term memory was encoded, consolidation into long-term memory does not occur.

Until now we have not considered the implications of using RESET Therapy to block the onset of PTSD. Imagine if you would, a treatment unit placed in a strategic setting close to the battlefield. It is theorized that a likely window of two to six hours is required for the consolidation effect to fully lock in. If an unsettling incident were to take place, the RESET protocol would be utilized to block the potential for the combat incurred trauma to be transformed into the lasting symptoms of PTSD. Looking at this potential from the civilian perspective, imagine a first responder's place of employment such as a police or fire station. Rather than accumulating the traumas experienced, sometimes on a daily basis in these heroic professions, a brief RESET session on site would block the onset of the 'fight or flight' response from ever occurring in the first place.

We have finally embarked on an exciting journey scientifically exploring an intervention based upon clinical experience that has proven itself to be solid and durable in over 100 of my (Lindenfeld's) patients to date. The Brain Map data captures for the first time the enormous relief that both veterans and civilians have reported experiencing following RESET treatment. We eagerly look forward to the next step in this process of scientifically validating what appears to be a quantum leap into the future forthcoming from this transformative intervention. Further case illustrations of the results of RESET Therapy can be read in a book soon to be available through Amazon.com entitled: PTSD SYMPTOMS REVERSED PERMANENTLY: A Revolutionary Approach Based on New Brain Science.