Current and emerging TBI and PTSD treatments

*(Reprinted from *Combat Veterans' – Stories of Small Wars and Nation Building*, Volume 3 of a three volume series available on Amazon, Kindle, and Audible.com)

by Grady T. Birdsong

I served two combat tours with the United States Marine Corps, in Vietnam, beginning in the Tet Offensive of 1968. Since returning to civilian life, I have struggled with the after-effects of post-traumatic stress, especially at the end of my civilian career. My youngest son, Shane[1], also served in the Marine Corps, on three combat tours as an infantryman in Iraq and Afghanistan. He has also had to deal with post-traumatic stress, after his enlistment.

I began writing in earnest, in retirement, as cathartic therapy for my post-traumatic stresses. I had scripted white papers, magazine articles, and manuals about telecom, data and information technology, during my working career, and, in 2012 wrote a book about my family origins.[2]

I eventually found personal catharsis, in retirement, through helping others, and started writing about other veteran's struggles. Along with Bob Fischer, a retired Marine Corps colonel, I began a new challenge focused on the veteran advocacy of traumatic brain injury (TBI) therapy and post-traumatic stress disorder (PTSD). It began after we visited a local hyperbaric oxygen therapy (HBOT) clinic that had surfaced in the Boulder, Colorado area in 2008. That newly formed clinic focused on helping Veterans with TBI's from the Middle Eastern wars. After a short while, it evolved into a 501c3 organization for treating Brain Injuries.

Fischer and I decided to serve as its veteran advocates, doing "missionary work", by assisting the non-profit program at that clinic. As part of our effort, we published *The Miracle Workers of South Boulder Road: Healing the Signature Wounds of War*[3]. It tells, in lay terms, how the clinic was set up to treat TBI's with HBOT and how a treatment process works. That program to date has treated close to 600 recently returned veterans for TBI and PTSD. Since the beginning of this advocacy and the HBOT program, many lessons have been learned.

While I was involved in this endeavor, I began crafting the story of my own Marine unit's experiences in Vietnam. In doing that, I channeled more of my post-traumatic growth energies into *To the Sound of the Guns.*[4] I felt it was my duty, as a survivor of the Tet Offensive of 1968, to tell the stories of the heroes I was with, who were killed in action while serving in Vietnam, and about the families who loved them. I also wrote this book to honor those that volunteered to serve, endured, survived and returned to their families.

Traumatic brain injuries happen frequently and are among the higher-ranking injuries recorded in the United States. According to the Centers for Disease Control and Prevention (CDC), TBIs account for 30% of all injuries ending in death. Each day, 153 people die from injuries involved with TBI.[5] Within the many effects of a brain injury are thinking impairment, aka memory loss, personality changes, sensation difficulties (e.g., vision, hearing), and emotional disorders (e.g., depression, personality) to name a few.

What qualifies as a TBI? Any blow, bump or jolt, such as whiplash, or an explosion-caused bump to the head disrupts the normal functioning of the brain. Degrees of severity are usually from mild to medium or possibly severe (i.e., unconsciousness to memory loss) conditions. Most TBIs are diagnosed as mild, commonly referred to as concussions.[6]

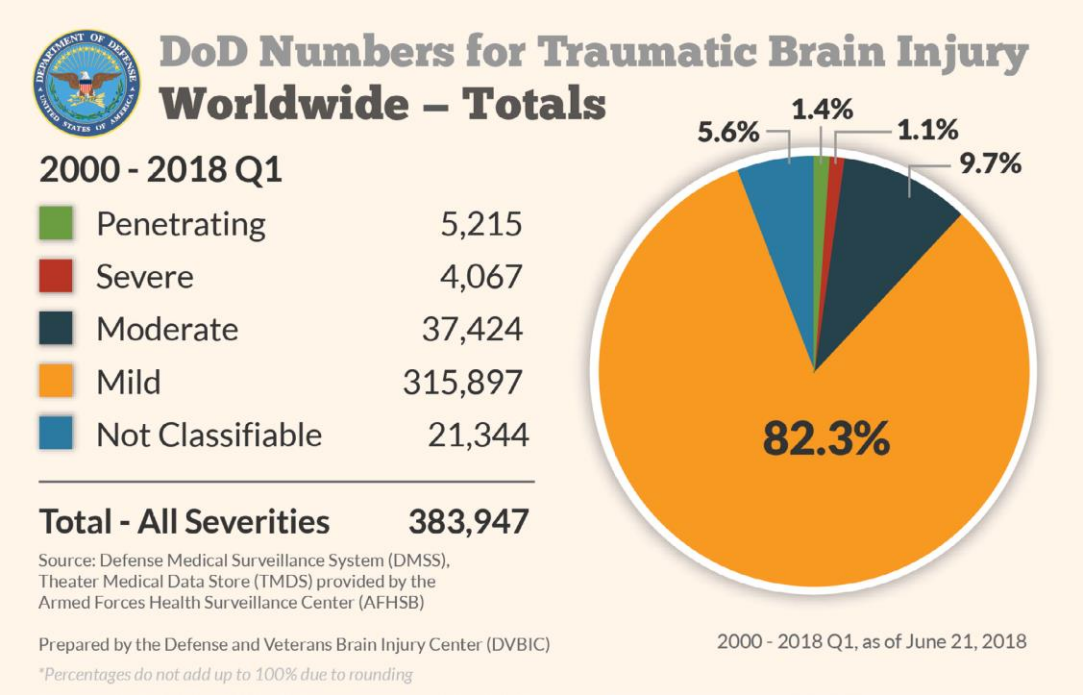
How large is this sufferance in our present-day society? In the United States alone during 2013 close to 3 million TBI-related emergency room visits, hospitalizations, and deaths occurred.[7] Falling, the most frequent cause of TBIs in 2013, affected the youngest and oldest within our civilian population. Being hit or thrown against an object was listed as the second leading cause. Motor vehicle accidents came in third of all overall causes. Therefore, it has become and is a serious health concern in society.

With the deployment of military units to the Middle East, after 11 September 2001 (aka 9/11 attacks), America started realizing new TBIs in significant numbers. Of the approximate 2.5 million, U.S. troops deployed to Afghanistan or Iraq, during the early 2000's large numbers of U.S. service-members have experienced some degree of concussions and, or, post-traumatic stress. The U.S. Department of Defense (DOD) estimated that almost 30% of all combat veterans now experience these non-visible war wounds.

Improvised Explosive Devises (IEDs), one of the more common weapons used in today's world of war, causes combatants mild to severe traumas.

According to the DOD, from 2009 through the first quarter of 2018, there were 383,947 TBIs reported, by the U.S. military worldwide. Of those, 5,215 were classified as penetrating, 4,067 as severe, 37,424 as moderate, 315,897 as mild, and 21,344 as "not classifiable".

The Defense and Veterans Brain Injury Center (DVBIC) defines TBI severity, as follows.



Penetrating TBI, or open head injury is generally characterized by a head injury in which the scalp, skull, and dura mater (the outer layer of the meninges) are penetrated.

Severe TBI is characterized by a confused or disoriented state that lasts more than twenty-four hours; or loss of consciousness for more than twenty-four hours; or memory loss for more than seven days.

Moderate TBI is characterized by a confused or disoriented state that lasts more than twenty-four hours, or loss of consciousness for up to thirty minutes, but less than twenty-four

hours; or memory loss lasting greater than twenty-four hours but less than seven days; or meets criteria for Mild TBI.

Mild/Not Classifiable TBI is characterized by a confused or disoriented state that lasts less than twenty-four hours, or loss of consciousness for up to thirty minutes, or memory loss lasting less than twenty-four hours.[8]

PTSD – Post-traumatic stress disorder estimates among current veterans differ slightly between numerous studies, however, clear evidence has been shown that this malady is prevalent, especially in those exposed to a lot of ground combat.

The 2008 Rand Study of returning military veterans from the present-day wars, shows that nearly a third suffer from PTSD or depression or had some degree of concussion while deployed. It is clear, because of the numbers, that providing care for these service members will require new approaches not only in the military branches and VA but in nation-wide healthcare. Many will not seek government care and thus will eventually flow into the U. S. health care public sector, as their population group ages.[9]

After mustering out of today's military, the transition to civilian life and dealing with PTSD can be overwhelming. Several options for treating PTSD are now available. Some are time-tested. If dealt with in the early stage, education, counseling, and medication are among the first options. The most utilized tool with results is Cognitive-behavioral therapy (CBT). CBT employed by a professional therapist can help a service member understand and change instilled beliefs, thoughts, and thinking of the trauma(s) causing stress.

In addition to cognitive behavioral therapy, eye movement desensitization and reprocessing (EMDR) is another methodology for treating PTSD. Developed by Francine Shapiro, Ph.D. in 1989, somewhat like CBT, this therapy also can provide effective outcomes. This psychotherapy can enable a person to begin healing from symptoms and emotional stress caused by past traumas. EDMR focuses on reducing distress while strengthening adopted beliefs related to the patient's trauma. Many studies show that EMDR therapy has positive results. There has been much research on EMDR therapy which is now recognized as an effective treatment by the likes of, the American Psychiatric Association, the World Health Organization and the Department of Defense. The data on EMDR is accumulating and accepted as a treatment by several insurers, yet the medical community debate for solutions continues.

New developments in treating TBI's with HBOT

The brain is uniquely structured to take minor blows, concussions, such as from a fall or being shaken, like in a minor accident. The brain mass bounces off the inside of the skull wall and in most instances is saved from injury. A more serious blast or concussion sends shockwaves through the brain mass with much intensity. Dendrites and neurons within the brain sometimes shut down or die as a result of such a severe shock. Often, these dendrites survive serious damage and go dormant until the proper medical treatment revives and restores them.

For many centuries, it has been proven that oxygen heals wounds. Oxygen has been employed for more than 100 years by the U. S. Navy to treat and heal nitrogen narcosis, or the "bends," as it is better known in the diving world. Major hospitals today employ hyperbaric chambers for many FDA-approved maladies, e.g., carbon monoxide poisoning, decompression sickness, severe anemia, necrotizing soft tissue infections, and crush injuries to name some.

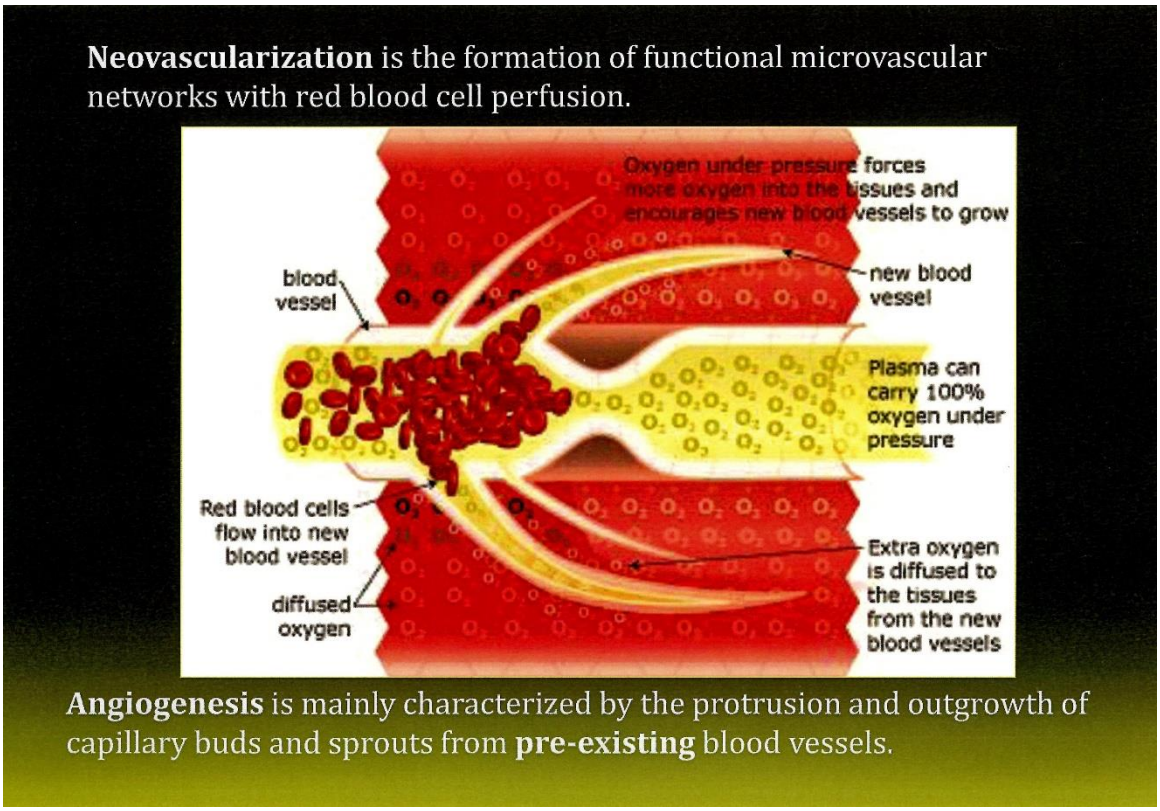
An important Israeli study documented and published in 2013 by a distinguished team of researchers from Tel-Aviv University, The Assaf Harofeh Medical Center, and the Institute of

Hyperbaric Medicine, Zerifin, Israel, tested and documented the brain's capacity to heal itself. Called neuroplasticity, it is the brain's inherent ability to overcome and eliminate injuries and tissue damage with the right stimulus, such as the brain's exposure to hyperbaric oxygen. That process heals and restores life to damaged cells. [10, 11]

An adequate supply of oxygen and nutrients is critical for all human cells and tissues. Nurturing the proliferation of the below two processes with pressurized oxygen has been found to accelerate the healing of traumatized areas in the brain. HBOT helps dispatch blood flow to deprived and damaged tissue.

Angiogenesis: The development of new blood vessels while maintaining existing blood vessels. It occurs in a healthy body for healing wounds and restoring blood flow in damaged tissues after injuries.

Neovascularization: The formation of functional microvascular networks (blood paths) in red blood cell perfusion. It differs from angiogenesis, which is characterized by the profusion and an outgrowth of capillary buds and sprouts from preexisting blood vessels. Hyperbaric oxygen stimulates both.



Each person who is treated receives a concentrated oxygen brain bath for forty hours, one hour at a time. The pressure in an HBOT chamber is around 1.5 ATA (ATA, a measure of atmospheres and stands for Atmospheres Absolute – the amount of pressure the earth's atmosphere exerts). The pressure of 1.5 ATA is about the equivalent of diving to around 17 feet below sea level. Under this pressure, more oxygen is forced into the tissue, which encourages new blood vessels to grow.

A large majority of medical doctors throughout the medical community still question the effectiveness and reliability of hyperbaric oxygen treatment for brain injuries, especially the

concussive injuries young veterans now suffer. VA hospitals have not adopted the use of HBOT treatment yet, for veterans with TBI. Instead, they prescribe dozens of medicines (off-label drugs) that are not approved by the FDA and in some cases have proven to motivate a suicidal result. There is an alarming number of veterans committing suicide every day.[12]

Treatnow.org is a coalition of specialists with a mission to "Identify and treat veterans and others suffering from Concussion/TBI/PTSD." Referenced on their website is a second, full-blown multi-center Randomized Controlled Trial (2019) ongoing which will serve as the basis of an appeal to the military, the VA and insurance companies to begin conducting/ensuring treatments that lead TBI patients back to more productive lives.

The *Treatnow.org* website explains in detail how hyperbaric oxygen therapy works. Under normal atmospheric conditions, a person will breathe air which is about 21% oxygen and 79% nitrogen. Undergoing HBOT pressure at three times the normal atmosphere, the oxygen molecules become condensed. This allows the oxygen to dissolve in body plasma 10-15 times more than normal breathing. This amplified saturation of oxygen into the body's tissues promotes: increased capillary growth, increased white blood cell activity, new tissue development, numerous physiological effects to name a few, and many more.

HBOT applied

The FDA has determined that HBOT is safe and effective. It is approved for specific already approved diagnoses. As mentioned above, HBOT is not approved for TBI's or strokes. The drug employed by this therapy is the most common found in the world…oxygen. As might be explained by a medical doctor, "There is no single drug in the United States that the FDA has approved to treat TBI's. Every single drug used is borrowed from other diagnoses, which is legitimate, legal, ethical, and considered safe. That practice of borrowing aka by the term 'off-label' is utilized all the time in many specialties."

In utilizing HBOT a doctor is obligated to write a prescription for oxygen under pressure, how much oxygen, how much pressure, how frequent the treatments and the number of treatments to be administered. The only thing the FDA controls in this situation is the oxygen. While it is safe and ethical to use drugs off-label, insurance companies sometimes don't pay for these treatments. "Safe," doesn't indicate that the drug has no side effects. It means the FDA has determined there are benefits in using a drug which outweighs the risks.[13]

Other considerations for doctors using HBOT are to screen a patient for indications, conditions that might render hyperbaric unsafe. For example, smokers, who have emphysema or potential lung cancer, or anyone who has undergone recent chest surgery can be at risk. The other concerns by doctors are in educating a patient on the chamber pressure and the effect on ears under compression or with a patient's mental concerns with chamber enclosure.

Veterans who seek treatment compared to the civilian population should be approached differently. The traumatic situations leading to concussive injuries in veterans were likely caused by the blast (IED) or motor vehicle accident and are probably associated with combat experience. Which in turn presents an often-secondary condition of PTSD. Also, the possibility that these patients have had prior multiple concussions which will make their healing even more challenging.

In treating both symptoms concurrently, the fear component could have had an impact on their symptoms and recovery. That is sometimes observed as hypervigilance in individuals and could surface as anxiety, insomnia, or irritability. There is a significant effort underway to identify

the civilian vs veteran condition differences. Integrating both HBOT and PTSD counseling should be the focus of any veteran focus.

PTSD counseling

There comes a time when a patient is progressing with hyperbaric treatments and their energy, memory, and cognitive faculties will start to come back. At that juncture, they may experience a tremendous psychological boost or an emotional crash. This is that point in time where counseling is needed and beneficial.

New techniques and thinking are now being applied to TBI treatments. It is now noted that emotional letdowns during the HBOT healing process need to be addressed. Sgt. Maj Pepe Ramirez, USMC (Ret), who helped pioneer and developed the HBOT + Counseling process at Rocky Mountain Hyperbaric Association for Brain Injuries recognized that a counselor should be there to re-establish coping skills when veterans open up about their anger, guilt, grief or anything that causes them consternation or withdrawal. In addition to counseling, a physical exercise program can add another dimension to a final goal of sound mind, body, and spirit.

EMDR (Eye Movement, Desensitization, and Reprocessing) a form of psychotherapy, which helps resolve the development of trauma-related disorders caused by distressing, traumatizing, or disturbing experiences may also be used.

You might hear from Ramirez the following: "This is all in sync with the treatments providing physical healing of the brain and body. It is easy to see that these exercises give them renewed confidence. A spirit usually follows if that warrior believes in a higher power. The former military esprit is certain to return when I motivate them to accept this new and healing life that hyperbaric treatment provides. In this way, I help them return to the confidence gained from graduating from recruit training…Basically, what happens is that it reconnects the left side of the brain hemisphere to the right, so they are working in concert."

Cadence was called in boot camp. A DI called out to his recruits left, right, left, and platoon halt! Technically, we were all doing EMDR. When they did physical training (PT), they were calling cadence. And at those moments they were really doing the eye movement, desensitization reprocessing. This is the reason that physical fitness and calling cadence is very therapeutic among these veterans.

A counselor should always be looking for new and promising PTSD therapies. And the wife and the family in a veteran's healing process should not be overlooked. Using the analogy of gears meshing and interlocking, an interrelationship between a veteran and his family (Veteran-Wife-Children) must be adopted and used if each is to understand the cognitive process that helps heal the family system. Many veterans lose the love and support of the whole family if they have no post-traumatic stress treatment or mental help.

Along with the therapeutic healing, a counselor teaches them "to be the person they once were … always continuing to be the warrior … but again assuming the responsibilities of being a warrior."[14]

Measurement tools, treatment, and patient progress

Dan Guenther, author, veteran advocate, U.S. Marine Corps' Vietnam-combat veteran, and former director of research for International Learning Systems, Inc., conducted a professional review of the Rocky Mountain Hyperbaric Association for Brain Injuries' processes and its

measurement methodology at their clinic. Based on his interviews, onsite observation, and review of relevant test data and documentation, a professional high-level map was created, showing each process step, the owner of each process step, and the expected results. Each process step is defined by the completion of a specific task or milestone.

In addition, a general overall measurement model was created, showing the integration of the measurement tools into the treatment process as they occur. All processes prescribed as a result of this study met the ISO 9000 family of quality management and standards.[15] Guenther cited two landmark HBOT studies, one guided by Dr. Paul G. Harch, M.D., and the second study conducted by a team of distinguished researchers at the Tel-Aviv University for their pioneering work and protocols that clinics now incorporate.[16] [17]

Guenther stressed in the study/review that staff interaction should be characterized by collaborative leadership and complementary practices. Staff development should align around vision and core values of safety first, availability, and affordability. Education along with coaching should occur daily on the job in real-time situations, thus building teamwork in the integration of both TBI and PSTD treatment concurrently. The key person observed by Guenther is the PTSD counselor. The PTSD counselor can spot issues in either realm. The medical director anchors the whole process, providing continuing research, diagnostic skills, and oversight of the entire process of patient healing.

The now instituted Clinic treatment plan includes both qualitative and quantitative measures to support the successes of the HBOT program.

1. Initial determination of concussion, stroke or brain damage (paperwork).
2. A veteran submits an application with DD214 or Discharge Certificate, which is reviewed. Once military service records are verified, it is approved or rejected.
3. Approved, the patient will undergo a medical examination by the Medical Director to ensure fitness/general health. Prescription is written by a doctor.
4. Prior to chamber time, a series of tests establishing physical & emotional stability of each patient.
5. The veteran meets with the PTSD counselor, who evaluates each patient for their specific degree of combat trauma while instituting an integrated cognitive and physical therapy program in parallel with chamber time. PTSD status, including regression, is continually monitored and notated.
6. The overall program calls for forty hours of hyperbaric oxygen chamber hours and twelve PTSD counseling hours. Each chamber period (aka “Dive”) is approximately one-and-a-half hours. Approximately fifteen minutes to compress (beginning the “Dive”) to the 1.5 ATA and fifteen minutes to decompress after taking an hour “brain bath” in oxygen.
7. After the fortieth treatment hour, the patient retakes the original series of quality of life evaluations and the neurocognitive tests. The results are then evaluated and then a determination as to eligibility in notated for more treatment.
8. The PTSD Counselor conducts follow-up evaluation of each veteran to determine if he or she needs further continued counseling and therapy at the local VA Clinic or Hospital.

As mentioned earlier regression (mental) can occur in a patient when HBOT begins to physically heal the brain. Common among combat veterans who suffer from both TBI and PTSD are suppressed feelings (grief-guilt-anger-withdrawal-depression-startled response-hyper vigilance)

and they sometime re-surface as the brain begins the physical healing process. Again, the PTSD counselor is key in recognizing those signs and dealing with them immediately.[18]

Veterans treated and healed by HBOT

An ardent Veteran Advocate Volunteer and supporter, Dr. Robert L. Beckman, Ph.D., of TreatNOW.org (*www.treatnow.org*) went to bat for an anonymous U. S. Marine gunnery sergeant on active duty who was suffering from serious TBI and PTSD and helped him to enroll in the Rocky Mountain HBOT program. The Gunny's commanding officer knew that he was suffering and, with the rigors of his new duty assignment in instructor duty, his career would surely be in jeopardy. The Gunny's wife tearfully requested that Rob intervene. Using donations from the *Marty Fund* (named for Martin R. Hoffman, a former secretary of the army), he did.

With thirty days' leave, the Gunny and wife traveled to the clinic for an interview, screening, and chamber oxygen prescription. The clinic staff approved his acceptance and arranged for him to receive the regular forty chamber hours. Upon learning of his timeline, they told him that they would double up the hours in the last ten days with two treatments per day. This plan had worked in the past. They wanted him to be able to return to duty within his specified leave timeline.

In every military service, a special type of warrior is trained for the rigors of specialized combat that is unique and difficult. Only a small percent of these types become Navy Seals, Special Forces, Air Force Commandos, and in the USMC, Force Reconnaissance Marines. Their small unit operations are designed to work within choreographed, dangerous and close quarter's scenarios where close-in firing and mortar-grenade concussions are common. The fact that they are subjected to more severe TBI and PTSD comes with the job and the deadly missions they perform are done secretly. The Gunny was one of those special Marines.

Completing seven combat tours in both Iraq and Afghanistan and surviving seven concussive IED blasts, the Gunny now suffered severe head pains and forever migraines along with memory loss and bouts of no sleep. He also lived with daily depression over the suicides of five team members who had suffered the same problems he did. The Gunny's dear wife worried sick over his condition was the first person who sought help through Rob Beckman's son (the son's classmate at Stanford University in California was a close friend of the Gunny's wife).

The Gunny recalled, "My Force Recon unit has literally been *hollowed out,* with so many of us carried on the official roster but non-deployable because of our serious mental and physical conditions. Many of us have TBI and PTSD. I have served in the military for fifteen years and have received several head injuries. The first two I received in Fallujah during 2004 and 2005. This was before the military even began to conduct studies on head trauma or battlefield concussions… My last severe concussion was during regular Recon training when I had a Jet Ski boating accident. That is when my symptoms got to such a point that it was affecting my personal life and my marriage.

"I was in and out of the emergency room and doctors' offices for four years and they all said and did the same thing: 'Headaches are really hard to diagnose, so here, try these pills.' At one point I was given six different medicines and I felt like I was in danger of losing my job in the Corps. In order to do my job and try to function normally, I had to stop taking the meds. So, I dealt with the painful migraines three to six times a day. At my worst point…for as long as six days, then have a short break… That is when I became seriously suicidal…

"Thanks to HBOT treatment at the clinic, I have been without any of these symptoms for weeks now and my ability to multi-task has returned. My wife calls my recovery a miracle. My

cognitive ability and thought processes have increased considerably, from about 35%, my own self-measure, to 85% today. And my mood and performance of military duties is 100%. I am no longer viewed as '*The Anger Gunny'."* [19]

Dr. Beckman, the Chief Knowledge Officer, Foundation for the Study of Inflammatory Disease, has been building and managing knowledge management systems most of his career, primarily in the intel community and the DOD. As a volunteer, he is currently helping to run the Clinical Trial researching TBI and PTSD in brain-injured warriors. Rob takes seriously, the responsibility of sustaining a national network and database of hyperbaric clinics as well as improving that platform for data collection and analysis.[20]

TreatNOW state legislative efforts

Eric Koleda, National Director, TreatNOW State Legislative Efforts and Director of HBOT4KYVETS (501c3 Non-Profit) [21] is working in conjunction with Dr. Beckman and other state advocates in updating a 2011 document, *Untreated Brain Injury: Scope, Costs and Promising New Treatment*, originally authored by Nicole Doering, Demario Dayton, and Dr. Rob Beckman. This 55-page document was designed to bring awareness to our national TBI/PTSD invisible wound epidemic and the associated cost impact.

With Dr. Beckman's support, Eric is in the process of a revision of this original document to elevate the current national cost impact at the individual, state and federal budget levels, the impact to the VA, and of treating the current TBI/PTSD symptoms with opioid and pharmaceutical drugs. The report intends to show how hyperbaric oxygen treatment is of significant impact on TBI veterans by reducing treatment cost while providing long-term sustained medical treatment improvement to veterans and patients' health while providing a safe, low cost and effective treatment option.

The data provided is intended to have a significant impact and the final report will be shared at a national and state level with legislators and key government leaders to justify migrating hyperbaric oxygen treatments as a standard of care for veteran and civilian TBI/PTSD patients.

Where is HBOT headed?

A pertinent discussion of PTSD and HBOT can be found in *Brain Health & Healing Foundation*, November 2014 with a title of "OK Doc…What Do I Really Have? PTSD vs TBI?" by Xavier Figueroa, Ph.D. and James K. Wright, M.D., Colonel USAF (Ret). Together, they make some important distinctions between TBI's and PTSD.

Dr. Figueroa is co-founder and president of the Brain Health & Healing Foundation and former director of Scientific Research at the Restorix Research Institute. He has been performing neurological clinical research since 1995.

Dr. Wright served in the United States Air Force as a flight surgeon, educator, and researcher. His most recent endeavor is as an investigator in a national, multisite clinical trial utilizing hyperbaric oxygen for TBI.

In the Figueroa and Wright article introduction, it is pointed out that PTSD and TBI have been with man throughout civilization's history. The main difference between wars then and now are modern-day increases in survival. Injuries 100 years ago almost guaranteed a person would not return to full functionality. As is pointed out, "…the injuries of the brain and of the mind are notoriously difficult to detect and to treat. The dividing line between a diagnosis of PTSD and a

concussion or TBI is hair thin and dependent on the training and temperament of the diagnosing physician. Diagnosis determines the prescribed treatment regimen and if it is wrong, that regimen can do more harm than good to the individual."

Figueroa and Wright contend that given the many complications of what we already know about TBI's and PTSD, the lack of objective clinical testing is still insufficient. Managing treatment and insurance is still in the infancy stage. In today's healthcare system, if you have no firm diagnosis, it is not easy to gain access to treatment or even have insurance cover it.

The recently updated DSM-V (Diagnostic & Statistical Manual of Mental Disorders – edition 5)[22] is looked upon by professionals as the bible for addressing psychiatric disorders and mental illnesses. This manual has most all identified mental disorders and their possible symptoms, recorded data about the disorders and treatments. TBI's, as pointed out in the manual, especially severe ones, can lead to chronic conditions which quite frequently are extremely hard to diagnose. Also, they sometimes are confused with other maladies. DSM-V now warns professionals, "Posttraumatic stress disorder (PTSD) can occur with NCD (neurocognitive disorder due to TBI) and have overlapping symptoms (e.g., difficulty concentrating, depressed mood, and aggressive behavioral disinhibition)." Figueroa and Wright point out that the medical community is slowly improving its approach to identification and analysis of the symptoms and using more care in diagnoses and prescribing treatment.[23]

Figueroa and Wright will tell you that a proper diagnosis is extremely important. "Allow for the fact (and emphasize with all medical professionals: MD, OD, ND, RN, PT, and others that perform diagnosis) that TBI and PTSD can happen at the same time. Just because the symptoms are the same as PTSD doesn't mean that TBI can be ignored…Do a proper history while diagnosing!" They summarize with the following, "…an ongoing debate within the psychiatric community rests on the assumption that PTSD and TBI are two distinct conditions. The problem comes in separating the physical damage portion from the behavioral (emotional, cognitive process) damage. Case report studies suggest that the links between physical damage and PTSD are close, but decades of training and reporting instilled in doctors maintain the idea that PTSD occurs often without a link to brain injury. It is time to reassess the link between PTSD and TBI."

Figueroa cautions that TBI also has a high association with hormones (Task Force Dagger and Geoffrey Dardia have excellent resources on hormone rebalancing).[24] Hormone imbalance is a common issue within military combat service. Hormones directly impact the decision-making process determining how you react to stress. This area within the hormone axis is not being viewed sufficiently regarding PTSD according to Dr. Figueroa. He contends that it is sometimes a dead giveaway for a TBI.

Any concussion can result in a TBI to some degree. Repetitive head trauma can result in TBI. Memory recall, headaches, insomnia, sensitivity to light, and balance issues are known results of TBI, not PTSD. Head injuries are known to develop into hormonal disorders, which can overlap with some PTSD symptoms, but can lead to changes in blood pressure regulation, sleep cycles, weight gain, and fight-or-flight responses.

It is extremely important to properly diagnose psychoactive medications for depression, anxiety, sleep, pain, and panic attacks. Some psychoactive medications can lead to suicidal thoughts, withdrawal, and mood swings. Combining psychoactive medications can result in unexpected side effects and behaviors and need to be carefully monitored.

"Checking for heavy metals is part of ensuring that a service member or veteran will be properly diagnosed and treated, analysis of heavy metal in the body is very important," reminds Dr. Figueroa. Service members spend a much greater time (especially in training) or in forward

operating base areas (burn-pits) exposed to vapors/air particles laced with heavy metal. Heavy metal toxicity can impair the effects of HBOT if steps are not taken to chelate.[25] Further, "Total reflection X-ray fluorescence (TXRF) is a method to measure heavy metals in tissue. Heavy metals can produce symptoms that can look like a TBI, but in many cases they can go undetected and can make the TBI worse, thus preventing healing."[26]

Emerging treatments

HBOT has been around for many years and is now a safe therapy with few side effects if safety standards are being followed. Many studies show that HBOT is continuing to evolve. Dr. Figueroa writes about the many treatments available and lists some of them in his Chapter, "Afterword: The Path Ahead" within *The Miracle Workers of South Boulder Road.*[27]

One of the areas of therapy, Electromagnetic pulse therapy (non-light based) utilizes direct electrical or magnetic stimulation. This therapy directs a series of magnetic pulses through injured tissue inducing tiny electrical signals to stimulate cellular repair. Established through research, tissues like blood, muscle, ligaments, bone, and cartilage respond to biophysical input. A recent study conducted by NASA found that this therapy stimulated growth and repair in animal tissues.

Many of the devices used have already been approved by the FDA. Some are frequency-based and applied to parts or the whole of the body. Some are static, non-variable, magnetic fields from magnets with fixed signal strengths (shallow penetration into the body). Three of these evolving therapy applications are low energy neuro-feedback system (LENS), magnetic resonance therapy (MRT), and transcranial magnetic stimulation (TMS). For best results in exploring these therapies, skilled medical practitioners need to guide the patient.

Light Therapy (Laser, LED, IR, NIR, and Blue) for quite a while now has been found to affect the biology of cellular structure. Clinical data is yielding very good results in the early model and pilot work. These therapies are emerging. The effects have shown an ability to improve wound healing. This industry for light-based medical technologies is growing.

A study sponsored by Cerehealth Corporation in Colorado ("Traumatic Brain Injury in Veterans and Near-Infrared Phototherapy," NCT02635516) was recently finished that looked at brain blood flow in veterans with post-concussion syndrome (PCS). The Massachusetts General Hospital is recruiting for an acute TBI clinical trial for brain-injured individuals using LED NIR Light ("Low-Level Light Therapy – LLLT with Near-Infrared Light Emitting Diodes in Patients with Moderate Traumatic Brain Injury (TBI)," NCT02233413).[28]

Dr. Figueroa also recommends the arena of electromagnetic pulse therapy (non-light-based systems). They are based in direct electrical or magnetic scalp stimulation. Low Energy Neuro-feedback System (LENS), Magnetic Resonance Therapy (MRT), and Transcranial Magnetic Stimulation (TMS) are some of the transcranial stimulation devices that have promising evidential and safety data results.[29]

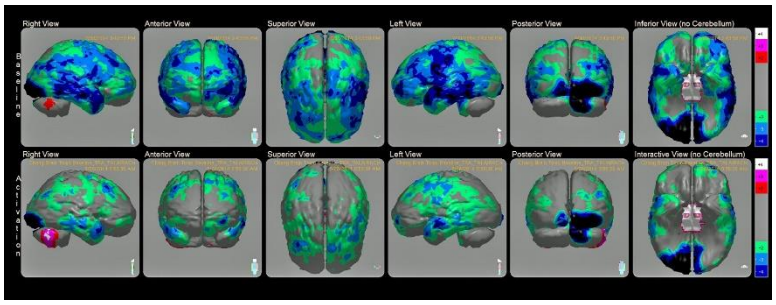
Physicians have steadily relied on past indicators –mainly patient-reported symptoms, e.g., headaches, faint-headed, sensitivity to light, etc., to diagnose concussions and the need for a scan. New methods in blood testing help doctors' determine if a TBI has occurred, by testing for heavy metal levels in the bloodstream. A quick test detects two brain proteins present in the blood soon after a blow to the head. Figueroa states, "Blood protein levels can be used in assisting a diagnosis but should complement the symptoms checklist used."

Figueroa further notes, "The use of a CT scan for a TBI diagnosis is only recommended for cases of severe TBI. MRIs,[30] especially DTI (Diffuse Tensor Imaging) methods, and SPECT

(or PET)[31] are the only methods that will be diagnostic for a TBI. A CT scan will not detect the very subtle, but real, changes to the brain."

SPECT Scan for TBI

CereScan of Littleton, Colorado provides a key metric/measurement tool in the overall HBOT therapy process with its SPECT brain imaging technology which clearly shows healing as a result of HBOT. The below example is of an actual combat veteran's brain scan being treated with HBOT at Rocky Mountain Hyperbaric Institute in 2014.



Images courtesy of CereScan, Littleton, Colorado

Top Row: Before treatment (termed, baseline) scans of an injured brain.

Bottom Row: After HBOT treatment (termed, activation) scans of treated brain

A SPECT brain imaging scan by CereScan measures blood flow to the different parts of the brain using pharmaceuticals that attach to the blood and emit gamma rays, allowing image tracking of blood flow in the various parts of the brain.

In analyzing this before and after scan (40 treatments over a two-month span), the doctor stated the following, "Overall, his… injury shows marked improvement relative to his previous scan in all lobes of the brain."

On the right-hand side is a color chart. Those colors indicate standard deviation from normal. Gray is normal and the whole gray range is normal.

Light green is 2 standard deviations below normal. The blue colors, light blue and dark blue, 3 and 4 standard deviations below normal, and a black coloring 5 below normal. On the upper side of the scale +2 through +4 and so on, standard deviations above normal.

In the before (Baseline) and after (Activation) you can visualize significant improvement in this patient's condition by the more normal color of gray.

Suicides – a growing concern

Beginning in 2001, our American military began combat operations in various Middle Eastern countries in the Global War on Terror. Now, more than three million Americans have now served. Through those commitments, TBI and PTSD became known as the "signature wounds." As a result, it has been shown and documented that an inordinately high suicide rate among those veterans has surfaced. Those statistics, especially among 18-24-year-old males and 18-29-year-old female veterans, is alarming. Comparing the suicide rate among veterans from previous wars compared to present times is difficult due to the quality and amounts of data previously collected. It is now widely notated and agreed, that suicides among veterans have risen to epidemic levels from America's current wars.[32]

Suicidal causes are extremely complex. Determining a single cause is duly perplexing. Presently, four of the foremost stimuli being focused on are, PTSD, TBI's, Loss of purpose, and Loss of belonging. These specific areas are where the American Legion recommends that immediate focus be directed.[33]

And never forget the wife and family in a Veteran's coming home and healing process. The interrelationship between the veteran and his family is essential and must be adopted/used to understand the cognitive process that helps to heal the veteran and his family unit. All the gears of the family "cogwheel" must mesh if the family is going to be successful.[34]

American Military Family

American Military Family (AMF-GY6)[35] in Colorado, a private organization, has stepped up to the plate and provides veterans and their families with assistance, whether it be emotional, physical, mental or financial, for their missing, suicidal, displaced or struggling veteran. They are one of the 501c3 organizations that help veterans and are there to aide in the road to recovery and subsequent success. Their primary goal/mission is to stop veteran suicides. They strive to engage veterans and reach out to other struggling battle buddies; to educate communities and businesses that will, in turn, educate civilians about the needs and issues facing our returning veterans and their families. They have formed a coalition of combat veterans and families who will strengthen and empower one another.

This comprehensive program entitled, American Military Family Got Your Six (AMFGY6),[36] addresses seven critical reintegration issues back into the civilian world: financial stressors, PTSD, TBI's, receipt of earned vet benefits, job reintegration, legal issues, and societal and personal relationship conflicts.

Deb Quackenbush McElhinney founder and CEO of American Military Family watched her brother and his buddies go off to war in the late sixties. They were deployed in 1968 to the war zone in Vietnam, the year of the Tet Offensive. Those turbulent times plus the anger and hatred of the country directed at those who served was unfathomable to her. It lingered heavily in her mind until January of 2005 when she started a nonprofit which would show America's support for its troops and their families. She did everything she could to understand, including meeting with veterans, military organizations and attended their meetings and social events.

In 2006, Debbie was invited to a personal meeting with Pres. George W. Bush and was recognized and honored for her service working in support of our military and their families. Since 2005 American Military Family has received over 25 certificates and plaques of recognition and appreciation for services rendered in support of our veterans, troops and their families. Daily, 22 veterans commit suicide – That is one veteran suicide every 65 minutes. Today, her sole mission and her organization's is to STOP Veteran Suicide.

In an interview with Deb, she was asked, "Are 20 or 22 veteran suicides a day a place to start?" She replied, "I think it is an understatement! I think it is more than those numbers. I don't know that we are including everyone…even all the way back to Vietnam. I think we are seeing a much higher incidence with older veterans, as they age and must deal with all their injuries, a lifetime of intrusive thoughts after coming out of Vietnam. Although, statistically, the Iraq, Afghan vets are visible at the top of the scale. I don't think people understand the urgency behind the suicides and continuous growing deaths that we are seeing, year after year."

She continues to illustrate the magnitude of this ongoing epidemic. "We noticed the downward spiral in 2012 of the young OEF/OIF kids. At the time it was shocking, now it is at an

epidemic level. It is not a one-stop-shop (coming home)…it is not just the trauma's that they faced in wartime…it is not the repeated deployments and in the cases of Vietnam, the additional trauma of coming home to your country that not only had abandoned you but had labeled you as an enemy. That kind of trauma is all but impossible to overcome. You add in all this to the kids that come home now after multiple deployments, family separations, resentment in the family from a spouse or significant other who is left alone for long periods, tending to children... Throw in that children growing up are resentful that Mom or Dad have not witnessed important milestones in their lives. Add that to coming home to a VA that has placed additional burdens on them as opposed to working with them, helping them to get the benefits they need, forestalling appointments, on and on…"

She adds, "These veterans are in pain…they have physical issues exacerbated by financial issues due to not getting their full entitlements, having to fight for their benefits. They are angry. Many did not even come back and try to get their full entitlements because they don't want to go through the mental hassle.

"We have a young fellow, seven tours right now, that has not even applied because he does not want to fight the VA. You have spousal issues that often turn into a divorce. The divorces often become child custody issues. Any one of these triggers, exacerbated by TBI's or PTSD often severe or both, what is the mystery about why we have the 20 or 22 suicides a day?

"This is the beauty of the recent discovery of Hyperbaric Oxygen Therapy (HBOT) applied to Traumatic Brain Injuries and PTSD patients! I always say to folks; it isn't a total cure but if you have a headache and a stomachache…if you go through HBOT treatment coming out with only the stomachache, and your headache is gone then you are changed and you feel greater relief. Feeling any kind of physical and emotional burden being lifted brings you to a better place of center and gets your mind in a state to say, OK, I still have issues but here is how I can solve them."

When veterans come home with physical, mental, and emotional problems and try to transition back into civilian life, they deal with everything coming at them rapid-fire, and the effect on each of them is overwhelming. Debbie concludes her assessment of HBOT treatment, "With HBOT bringing relief whether it be headache symptoms, side effects from other maladies, or language issues, or even clarity in thought process and even relief in physical ailments…any one of those things is a huge uplift for someone who's been dragged to the bottom. I am a huge proponent of Hyperbaric Oxygen Therapy and Treatment!"

Integrating TBI & PSTD treatment

What was realized in the *Healing Our Heroes* program at the Rocky Mountain Hyperbaric Association for Brain Injuries was the simple fact that, after the healing of the brain begins, sometimes as early as 1/3 of the way into the forty prescribed sessions (called "dives" in the Hyperbaric chamber), that sleep improves, migraines lessen, and memory returns with overall health on the upswing. The physical wounds begin improving with HBOT, and healing progresses. However, in most minds, Post-Traumatic Stress is still deep-seated, and its depressive nature still demands attention. It was learned in the Rocky Mountain Hyperbaric Association for Brain Injuries clinic that an integrated approach to treat both maladies, TBI and PTSD was desperately needed. Thus, began one of the first integrated TBI-PTSD programs in the country, which has documented a successful track record, complemented by its counselor, Pepe A. Ramirez.[37]

Debbie expands this process even further, "Yes, counseling, that has always been a trigger. These guys and gals don't want to talk to a counselor who has not been in their shoes. When they are in the HBOT chamber it tends to bring their issues back. When you have a combat veteran therapist there who understands them because he/she has lived through these situations themselves…identifies with the family emotional issues inside and out and is further down the road with experience…that is a plus."

She goes on to say, "An experienced counselor is in a much better position to articulate the upside of 'stay with it, it can get better and here is how you can get there if you follow me through.' "

Adding to the interview Debbie says, "This concept of counseling while undergoing HBOT is a very, very positive effect but the medical community doesn't want to apply this solution and have all kinds of technical reasons, or political reasons, whatever it might be about why this is an effective program or not… We at AMF deal with intrusive intervention. We don't do family retreats. We do our intervention by bringing likeminded time-tested combat veterans to the table. All who have struggled with repeated deployments and those re-integration issues combined with TBI and PTSD. That is our success tool!"

Debbie contends that it is magic…but it is not magic. It is humane! It is the worst hour and it is reaching out to another at their worst hour. And it is showing them by example that not only can they get back to a new normal, but the objective is to do just that as opposed to letting them flounder alone and sit there with their own thoughts, in their own sadness, in their own pain, and in their own depression and do nothing.

Gold Star Mothers

Debbie wanted very much to help Gold Star Mothers beginning in 2005. American mothers who have lost sons or daughters in service of the United States Armed Forces was originally formed in 1928 from the aftermath of WWI and now holds a congressional charter under Title 36 – 211 of the USC. She spent five years with these grieving mothers sharing the greatest tragedy anyone could ever endure.

"From this beginning experience with these mothers, I learned that you can't talk to people unless you hear what they say… If you can't understand a Gold Star Mom who loses her child to war and then have to go on with life without their child and the sacrifice they have paid; and you have less than ½ of a percent of society that has even served, how do you blend in with the other 99.5% who have no clue...so you reach out to one another in your greatest hour of sadness.

"We sat in a room and we would talk, laugh, and we would cry…and we shared the greatest sadness anyone could endure. And when you watch the healing of these mothers then you understand how to find strength and healing. You will either come out of it, whole or complete or it will decimate your life as well as the loss of your child. And there is no difference between that or a combat vet, a police officer or fireman to have gone into the brink of strife, who have the triggers, who understand the moment, and the sounds… all trigger PTSD. And if you tell that to a civilian who has never experienced it, he won't understand."

Debbie concludes, "Humanity at the worst hour reaching out to another like-minded person who has survived whatever the trauma… That is the recipe![38]

Debbie feels it is incumbent on civilians and the private sector to take on the crisis, and she has plans and a vision of building a facility to address the epidemic of suicide. She is not going to wait on the bureaucracy of the agencies to come up with solutions. She has already time-tested the

methods over the years. As she will tell you, "So when you have a place, a building like I want and am going to build, a place where people can go every day, a place that they are welcomed, where they have veteran advocates…lawyers, who can fight for veterans benefits (many of them are in legal trouble). A lawyer who can help them out of the public defender's office who do horrible jobs sometimes, driving these kids toward suicide. A lawyer truly walking them through the system and getting them out of jeopardy. That takes the legal pressure off, then you have financial, then mental, then emotional, then the physical must be dealt with…That is a comprehensive package that can meet these problems. Then if you don't know the solution, work to solve it…and finally, when you have a real solution to a problem like HBOT utilize it to the hilt!"[39]

Israeli successes with HBOT

The Israel Defense Forces (IDF) use HBOT in treating personnel for traumatic brain injuries. Around 120 patients per day are treated at *The Sagol Center for Hyperbaric Medicine and Research* in Israel. U. S. military veterans are now seeking treatment at that center since they can't get the same treatment from the VA.[40]

Daniel Rona who has fought with the IDF, as well as the U.S. military, tells in an article about Israel, "In essence, our mental attitude is that we must take care of ourselves…we treasure our soldiers, young and old. They are our only defenders…no one else will fight our battles…every concussive event will be treated with HBOT!" [41]

Thoughts on PTSD from the Vietnam War

The following writing conveys not only my thoughts but that of many Vietnam Veterans. It is from my book, *To the Sound of the Guns: 1st Battalion, 27th Marines from Hawaii to Vietnam 1966 – 1968*. Chapter 8 begins, "The Vietnam Veterans Memorial Wall quartered on the National Mall in Washington, D. C. was completed in 1982. It was born of and created by Vietnam Veterans. At first, the government had no hand in the memorial. The idea came from veterans themselves who wanted to honor the terrible price that was paid in blood by American sons. It's intent: to honor the "courage, sacrifice and devotion to duty and country" for those that served. The Vietnam Veterans Memorial is now to perpetually remain on the northwest corner of the National Mall, dignifying those who made the ultimate sacrifice in Vietnam. The Memorial has two black granite walls composed of seventy panels, on which are inscribed the names of over 58,000 men and a few women. It serves as a stark reminder of the staggering cost borne by American sons in one of America's longest wars.

The war in Southeast Asia bore one of the higher death tolls of America's wars. Now that the war has passed, those who came home think of those days in northern I Corps in vignettes: some of those thoughts are mundane, some exotic; some are filled with remembered fear and some with deep remorse…

- The beautiful flowing Ao Dais dresses of young women.
- The smell of Nuc Mam.
- The heat, dust, and humidity.
- Hard stares from villagers.
- The smell of diesel fuel.
- The sudden crack of a rifle shot, a burst of automatic rifle fire.

- The boredom.
- The cacophonous confusion of a firefight.
- The wounded.
- The dead

There is not a day that goes by that us Marines and Corpsmen don't think of some aspect of the boredom, the drudgery, and the chilling experiences of our daily existence during that war. The one thing we sincerely don't like to think about is the deaths we witnessed. Especially those that happened to comrades close to us. Fleeting thoughts such as, "What if he had lived…" intrude our daily thoughts at the most unexpected moments. "I wonder what he would be doing now were he alive." "Why did I survive?" These thoughts invade our minds often. At the time one did not have even moments to think about the dead or to even mourn for them. Sergeant Felix Salmeron, a platoon Sergeant in Alpha Company, solemnly reflects, "I didn't have time to grieve for them; I had others to think about and keep alive…I kept them moving!"

Human bonding borne of combat is part of the glue that holds a unit together. When one perishes, the survivor of that bonding process is forced to suppress bereavement and deal with the realities of the moment. Upon returning home most combatants had no one around who had served or even understood the war. Grief sometimes erupted as rage. That silent rage was carried home with many and never discussed. In others, grief manifested as withdrawal from society. In a lot of instances, grief and remembering came many years later. Men worked at careers for long hours to mute their war feelings. Some turned to drink or drugs to self-medicate the memories of combat. But everyone remembered…

Years later the dead would begin to appear and linger, looming real again. Some Marines and corpsmen literally blocked out painful experiences of loss. Those events were summarily buried and consciously denied because of the close bond. The experience of comradeship throughout our Corps is legendary amongst its participants. Loss had long-lasting effects especially if it could not be discussed within the trusted group. Some had left the battlefield and found themselves back at home within hours with no one to relate to. This was utterly perplexing for most veterans. Most of the society at the time did not understand what their psyche had experienced or the grief they had within them when they hastily arrived back in "the world." The nation and the society did not understand the war it was waging. Some people rejected these honorable men when they returned home.

The First Battalion, 27th Marines sustained extremely heavy casualties during its short deployment in the Republic of Vietnam in the aftermath of Tet (1968). The official count is 112 KIAs and close to 700 Purple Heart Medals awarded to Battalion members in the almost seven months the Battalion was deployed. The mentally wounded only God knows. The entire Regiment was significantly understrength from the beginning. It had gone ashore in the Republic of Vietnam with the bare minimum of infantry billets and began operating as a functional unit. The personal accounts of a families' grief and how they dealt with losing their loved ones are just a few of the thousands of stories that overwhelmed our nation during the Vietnam War. I wish I could tell everyone's story."[42] Not only did the Marines and Corpsmen of 1/27 come home with PTSD, but so many families in America's heartland also began their suffering from post-traumatic stress upon learning of a loved one's death in Vietnam.

One of the Battalion KIA's youngest brother had never cried about his brother's death until years later when he visited the Vietnam Veterans Memorial in Washington, D. C. "When I approached it you really couldn't see it…other than it was a large V notched out in the dirt. We had to go around the end of it to see the hundreds of names on the front side of it…and there were

more men than I had ever seen before standing in front of it…some in wheelchairs, some standing, some kneeling, some crying…a lot of them had parts of uniforms and medals on them, all there at the base of that granite wall. There were grown men bawling their eyes out. It must have been hard for the men that survived and had lived through that war. It was there that I think I finally had closure on my brother's death!"

The younger brother still has vivid memories of his beloved mother. She would frequently touch him on the shoulders and make him look into her eyes and exclaim, "Terry, don't ever do that to me…do not join the service…" She died at seventy-six years of age, a broken heart still grieving for her oldest son, Danny Lee Grimshaw, killed in Vietnam.[43]

A recent HBOT/PTSD success story

In February 2010, Sgt. Margaux Mange[44] became one of the first TBI and PTSD patients treated with the newest discoveries in HBOT practice. Little did she know that she would become a pioneer in the emerging new HBOT treatment process for TBIs.

Margaux was a high school athlete and joined the Army to play soccer. She did so for a few months, while training, at an Army base, in Germany. In 2004, she served in Iraq, with her military police unit. In 2006, while on patrol, during her second tour in Iraq, she received a massive concussion, when an IED exploded near her Humvee. The explosion thrust her head back violently against the gun turret and knocked her unconscious. When she regained consciousness and remained at the scene, for about an hour, waiting for a recovery vehicle. She saw stars, for a while, but continued to do her regular job and thought that she would recover.

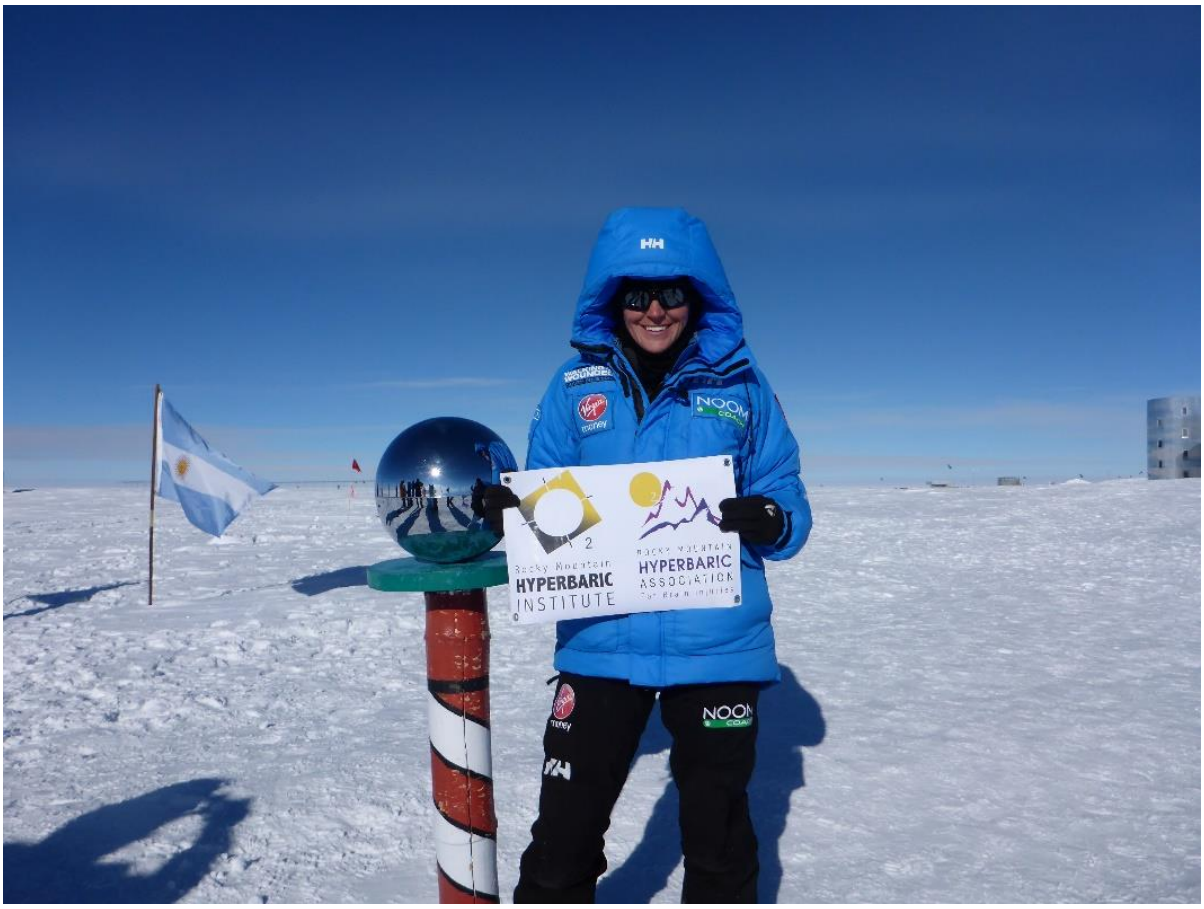
Margaux suffered another concussion, on patrol, in 2007, when an IED exploded and killed her best friend. Shortly after, she developed Bell's palsy, a paralysis or weakness of the muscles on one side of her face. She was sent back to Germany, where she received treatment, and her condition was diagnosed as more severe than originally thought.

After what seemed like endless sessions with doctors, multitudes of prescription pills, enduring atypical nerve pain, and trigeminal neuralgia along with post-traumatic stress, Margaux was sent to Fort Carson, Colorado close to where her family lived. While there, in the Warriors Transition Unit, she found Robert Alvarez, an Army representative and Marine veteran, who helped wounded warriors. He introduced her to Paul Harch, MD, the pioneer of HBOT therapy, who had a clinic at Southern Louisiana University.

In late 2009, Margaux became one of Dr. Harch's patients and completed the forty "dives" (chamber sessions) with his clinic. After those sessions, it was determined she would require many more chamber hours. Alvarez then found the HBOT clinic in Louisville, Colorado, close to her family. Now a civilian, she began another series of scheduled sessions with the Rocky Mountain Hyperbaric Association for Brain Injuries. After completing over 140 plus HBOT chamber hours between both clinics, Margaux regained normal functioning and started back to school to complete her education.

Since going through both the HBOT healing process and many hours of counseling in this program, she is not the robot that she initially thought she might become. Despite the wounds she accumulated, she now excels in mountain climbing and bicycling and has competed three times in

the Wounded Warrior games, in Colorado Springs, where she won five gold medals and three silvers.[44] In November 2013, Margaux represented America's Walking with the Wounded team, which competed with U.K. and Aussie-New Zealand teams, in the South Pole Allied Challenge.



Margaux arrives at South Pole with Rocky Mountain Hyperbaric Association for Brain Injuries logo – courtesy of Margo Mange, U.S. Army (Ret)

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23 X. Figueroa, J. Wright, *"OK, Doc…What Do I Really Have? Posttraumatic Stress Disorder Versus Traumatic Brain Injury"*, Journal of Special Operations Medicine, Vol. 15 (Edition 4/Winter 2015) pgs. 59-60.
24 X. Figueroa, J. Wright, op. cit., pgs. 63-64.
25 Chelation Therapy- n (1976): the use of a chelator (as EDTA) to bind with a metal (as lead or iron) in the body to form a chelate so that the metal loses its chemical effect (as toxicity or physiological activity). Webster's Dictionary.
26 X. Figueroa personal interview, May 2019.
27 Bob Fischer & Grady Birdsong, op. cit., pgs. 147-162.
28 Bob Fischer & Grady Birdsong, op. cit., pgs. 152-153.
29 Ibid, pgs. 152-153.
30 Magnetic Resonance Imaging (MRI) – uses a large magnet and radio waves to look at organs and structures inside the body. Useful, especially in brain and spinal cord examinations.
31 Single-photon Emission Computerized Tomography (SPECT) – nuclear imaging methodology analyzes the function of internal organs. Uses a radioactive substance and special camera to create 3-D photo images.
32 The American Legion White Paper Report on Veteran Suicide, Indianapolis, July 12, 2018.
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35 https://americanmilitaryfamily.org/
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37 Bob Fischer & Grady Birdsong, op. cit., pg. 69.
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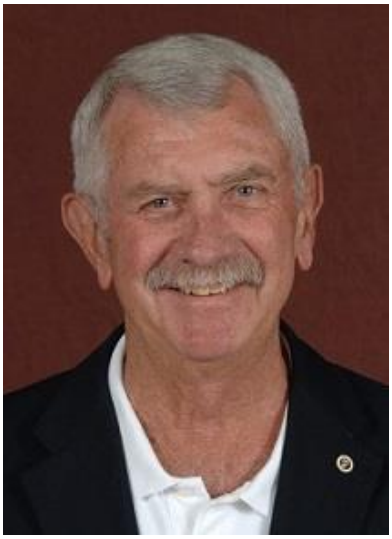
44 Margaux Mange's story is in Volume 1 of *Combat Veterans' Stories of Small Wars and Nation Building.*

Contributing writer



Grady Thane Birdsong grew up in central Kansas. He left college after two years to join the United States Marine Corps, in 1966. He had grown up hearing his uncles' stories of the World Wars I and II and the Korean War and often claimed he did not want to miss the Vietnam War.

He arrived in Vietnam at the beginning of the Tet Offensive of 1968 and saw immediate combat. He eventually extended his combat tour and served almost two more years, in the I-Corps region. His was assigned to 1st Battalion, 27th Marines, in February 1968, and later to 2nd Battalion, 9th Marines. His last assignment in I-Corps was with 3rd Marine Division, Communications Company in the heart of the North Vietnamese artillery V-Ring, at Dong Ha, just below the DMZ. That deployment ended in November 1969.

During his tour of Vietnam, Birdsong earned the Navy Presidential Unit Citation, two Navy Unit Commendations and the Navy/Marine Corps Combat Action Ribbon, while serving in six major operations of the seventeen designated campaigns of the Vietnam Conflict. In 2018, he published *To the Sound of the Guns*[1], a history of the 1st Battalion, 27th Marine Regiment, a maneuver Battalion, including their participation in the Hue City area while the Tet Offensive of 1968 raged around them. The book won multiple EVVY awards, from the Colorado Independent Publishers Association.

When he rotated home in 1969 and mustered out of the Marines, Birdsong settled in Denver, Colorado, finished college at Regis University, and began a career in the telecommunications and data technology industries. During that time, he married and raised two sons. He began work as a system engineer and was heavily involved later in transfers of technology and business development, both nationally and worldwide.

Birdsong struggled with PTSD, post-traumatic stress disorder, later in life, as a result of his Vietnam War experiences and finally went through the VA's PTSD program. He eventually teamed with Col. Bob Fischer, USMC (Ret), to be a Veteran Advocate. They advocated help for veterans with PTSD and traumatic brain injury (TBI) and raised money. They also researched and, in 2016, published *The Miracle Workers of South Boulder Road*[1], an award-winning book about traumatic brain injury (TBI) and PTSD. Both authors are acutely aware of these disabilities, as a result of their multiple tours in Vietnam.

Birdsong's first book, *A Fortunate Passage*[1], won two EVVY awards. It is about his father's parent's early life struggles, creating homes and livelihoods on the Kansas prairie, in the late 1800s and early 1900s. A great-great-grandfather had been a horse veterinarian for the Confederate Army in Georgia and his great-grandfather a country doctor. His grandfather moved to central Kansas, from Georgia in the early 1900s, where he met his future wife, who was the daughter of Volga German immigrants.

[1] Books by Grady Birdsong are available on amazon.com, Barnes & Noble & www.gradytbirdsong.com

Birdsong said, “This photo was taken on April 1968, about a klick, a kilometer, east of the Citadel in Hue City. We were just across the Perfume River, at our command post, in La Son Schoolhouse. I am on the left. I was with 1st Bn, 27th Marines H&S Company and functioned as an RTO, a radiotelephone operator, operating PRC-25 radios.

“The tank was there to support us and had been in the battle for Hue City. Its name was ‘Psychotic Reaction’, after the song back then.”