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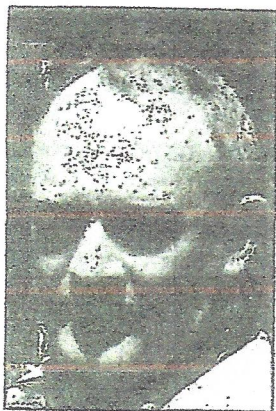
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# Naval Aviation

Tech Advances but People Still Matter

# Hyperbaric Oxygen Therapy: Treatment for Brain Injuries Hiding in Plain Sight

By Robert L. Beckman, PhD



**H**yperbaric Oxygen Therapy [HBOT] is an FDA approved medical treatment which enhances the body's natural healing process by inhalation of 100% oxygen in a chamber where the atmospheric pressure is increased. It

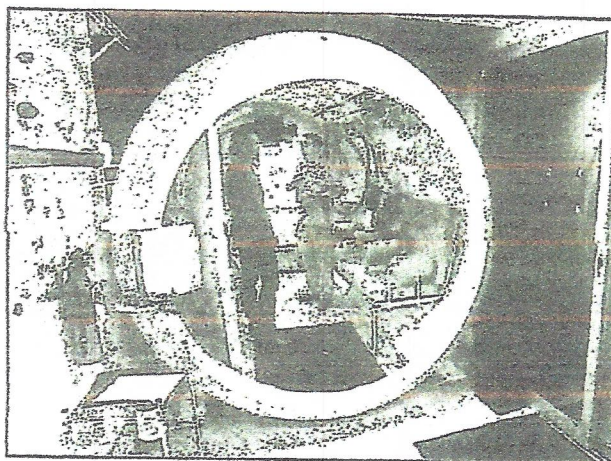
has been employed for decades to treat a variety of conditions but is particularly useful in the fields of neurology and wound care. The treatment process is safe, painless, and has few side effects. For decades HBOT has been used "off-label" to help treat and heal Traumatic Brain Injury (TBI) and Post Traumatic Stress Disorder (PTSD). The suicide epidemic and the spotlight on concussions is bringing HBOT to the forefront as a ready-to-use complementary treatment for the invisible wounds of war. There are over 1,000 chambers in clinics, hospitals, and military and research centers across America today.

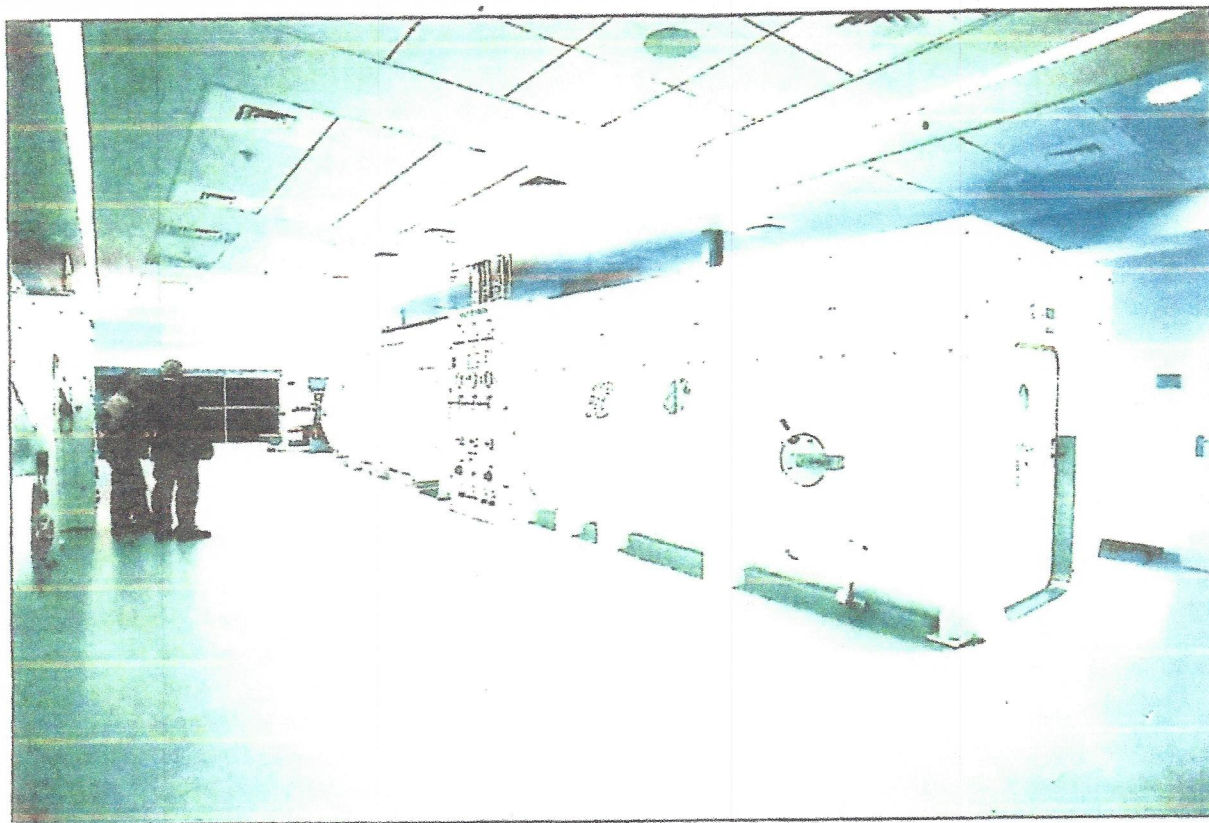
**The Crisis.** Traumatic brain injury (TBI) is a leading cause of death and disability in the United States. DOD has reported that mental illness is the leading cause of hospitalization for active-duty troops. Today the military population faces a suicide rate of 22 per day with another 44 failed attempts daily. We all know something has to be done, and soon.

**Early Efforts with HBOT.** The Navy wrote the book on hyperbaric oxygen. For over 77 years oxygen has been used to reverse decompression sickness (the "bends") and injury caused by a lack of oxygen. O<sub>2</sub> is used in over 5,769 cellular processes; HBOT activates 8,101 genes, resulting in down-regulation of inflammatory processes, up-regulating growth and repair processes and

restarting stunned cellular metabolism. Research around the world shows that HBOT activates stem cells 8X normal, heals wounds that have not healed, and repairs neural pathways. HBOT is already approved by the FDA for 13 indications, three of which are for non-healing wounds and three more which are for various types of acute and chronic brain injury. Along with healing the bends these include carbon monoxide poisoning, arterial gas embolism to the brain, and acute blindness from central retinal artery occlusion. No other drug or therapy is already approved by the FDA for treating neurological injury and no other non-hormonal treatment other than HBOT is FDA-approved for repairing and regenerating human tissue.

**How does HBOT work?** The patient spends about one hour per session in a hyperbaric chamber, breathing pure oxygen under pressure which saturates the body's tissues with 10-15 times more oxygen than tissue can hold at sea level. Oxygen can then reach the damaged areas that may have lacked blood supply or be dormant. The first dose restarts the body's cellular energy supply, causing cells to demand oxygen. Repeated doses stimulate new blood supply and neural pathway recovery. This essentially rebuilds the brain. Most patients experience rapid recovery of normal sleep





patterns, relief from photophobia and headaches, and restored cognitive and neurological functioning without surgery or more drugs. This can be accomplished in as little as 5 days with 10 treatments. Most service members can reduce their prescribed drug intake to nearly zero after 40 treatments. Approximately 50% of young war veterans are positively helped after 40 treatments, with the number climbing to 80% at 80 treatments. It is possible to help rebuild a brain in 150 days with 80 1.5 ata (7.35 psi) HBOT treatments.

Army medicine has shown that HBOT is both safe and effective. Using a majority of Marines in their five studies, the Army reports that "[HBOT] offered statistical and in some measures clinically significant improvement over local routine TBI care." Also: "... total scores for [both HBOT] groups revealed significant improvement over the course of the study ...." Expert outside consultants declared that "[HBOT] is a healing environment." Nevertheless, DOD and the VA still will not allow its use. And insurance companies will not insure treatment with HBOT until the

FDA rules.

**So what is being done?** HBOT has many practitioners around the world. Dr. Eddie Zant and Col. James Wright USAF (ret.) Special Operations Command have treated over 25 concussed (TBI) SpecOps patients for lingering concussion symptoms, including a US Army Brig General concussed in Afghanistan by an IED explosion. All were months -- some, years' -- post-concussion and still experiencing severe post concussion symptoms. Symptoms in these patients included cognitive impairment, loss of memory, headaches, depression, fatigue, and worse. All improved enough to return to duty, work or school.

Former SEAL Kraig Dorner owns and operates an HBOT clinic in San Diego. Kraig is a retired SEAL Chief Petty Officer (SOC) at Naval Special Warfare Group One (NSWG-1) Training Detachment (TRADET). His clinic is part of a nationwide effort involving dozens of civilian clinics to provide treatment and healing to veterans and others with TBI/PTSD. Kraig has been treating SEALs, professional athletes and civilians with TBI

and numerous other neurologic afflictions for over a decade, and with tremendous success. Groups like the Semper Fi Foundation, the Independence Fund, Mercy Medical Airlift and many other civilian sponsors have helped provide HBOT treatment pro bono.

Former Marine and Oklahoma legislator John Bennett spearheaded passage of the Oklahoma Veterans Traumatic Brain Injury Treatment and Recovery Act of 2014 which guarantees HBOT treatment to any OK veteran. He did this after he personally benefited and regained a superior quality of life from HBOT.

Israeli scientists in a 2013 controlled study reported positive results using HBOT to treat 56 mild TBI patients 1-5 years after injury with prolonged postconcussion syndrome (PCS). SPECT imaging revealed elevated brain activity in good agreement with the cognitive improvements. They concluded that HBOT can induce neuroplasticity leading to repair of chronically impaired brain functions and improved quality of life in mTBI patients with prolonged PCS at late chronic stage. Patients uniformly got significantly better.

**What does it cost?** Most treatments to veterans are provided pro bono or at reduced rates of \$100-200 per dive; a 40-dive sequence is less than \$10,000 and is not insured. But treating and healing brain injured is already saving millions, projected to exceed billions. Taxpayers currently pick up yearly costs approaching \$60,000 per veteran when HBOT is not available at any cost. Using a very conservative estimate of only 200,000 brain-injured veterans, the cost to society every year is over \$12 Billion. It has been calculated that the probable cost-to-society just on the basis on disability expenses and of lost tax revenues only (not including the collateral costs of homelessness, broken families, incarceration, suicide, etc.), will be \$ 288.7 Billion over 50 years to continue with the status quo, where safe and effective treatments are denied. With HBOT treatments, again, being conservative, we can say that the cost to treat and heal those 200,000 veterans will be \$5 Billion [this is not factoring in economies of scale that can be realized when volume will drive the costs down

enormously.] Simply put, for less than 1.7% of the status quo costs, HBOT could be employed to treat and help in the healing of hundreds of thousands of the wounded and injured with a safe therapy that thus far has enabled approximately 80% of those treated to regain a quality of life denied them by withholding HBOT treatment.

**What if I know someone who could benefit from HBOT?** A National Call Center can connect a brain injured veteran to HBOT services in the US: (800) 288-9328. Web sites that contain much more on the science and the success are: [www.hbot.com](http://www.hbot.com) and [www.treatnow.org](http://www.treatnow.org). Donations are always welcome.

*Robert L. Beckman, PhD, is a former USAF KC-135 pilot and a Vietnam Veteran. He taught at the Naval Academy and builds Knowledge Management systems for the DOD and IC. For over six years he and a small group of change agents have been working pro bono to treat and help heal veterans and citizens with TBI/PTSD. He is a charter member of the Foundation for the Study of Inflammatory Disease and TreatNow.org. He lives in Arlington, Va., and consults at the international, federal, state and local levels on healing brain injuries and reversing the service member suicide epidemic.*

