Traumatic Brain Injury Among North Carolina's Veterans

James Stewart Hooker, Daniel P. Moore

This article describes the difficulty of diagnosing traumatic brain injury (TBI), treatment protocols provided through the military, an alternative therapy with scientific evidence of its effectiveness in repairing injured brain tissue, challenges faced by brain-injured veterans seeking community reintegration, and state services that are available to help veterans.

North Carolina is home to a large number of active duty military personnel and approximately 800,000 retired or discharged veterans [1]. Many of these service members and their families face the challenge of obtaining care for traumatic brain injuries (TBIs) or post-traumatic stress disorder (PTSD).

Since 1992, the US Department of Defense's TBI agency has been the Defense and Veterans Brain Injury Center (DVBIC), which works to "serve active duty military, their beneficiaries, and veterans with traumatic brain injuries through state-of-the-art clinical care." DVBIC is the designated government organization for identification, diagnosis, clinical treatment, and TBI training for providers, as well as a source of references and related materials [2].

DVBIC defines a TBI as "a blow or jolt to the head that disrupts the normal function of the brain" [3]. Based on the intensity, frequency, and severity of the injury, multiple symptoms may result (see Table 1). For veterans experiencing one or more concussion(s) from a blast and/or bodily wounds, especially with accompanying unconsciousness, this injury can result in catastrophic lifetime impairment. Ross Zafonte, chair of the Department of Physical Medicine and Rehabilitation at Harvard Medical School observed that TBI is "the most complicated disease, in the most complicated organ known to man" [4].

TBI Diagnosis is Complex

DVBIC offers a 3-question TBI screening tool that, when used in connection with a clinical interview, can provide an initial assessment of whether a patient meets criteria for diagnosis of TBI [5]. In addition, clinicians may find it helpful to use diagnostic equipment such as computer-assisted tomography (CAT), magnetic resonance imaging (MRI), x-rays, and/or screening tools "that measure various areas of a person's speech, movement, memory, and thought" [6].

TBI is difficult to diagnose, especially when the patient is being evaluated in or near a combat theater. This difficulty is exacerbated by the similarity between the symptoms of PTSD and those of TBI [7]. The overlap of TBI/PTSD symptoms helps justify the discussion of both conditions. Erwin Manalo, medical director of the East Carolina University/Vidant Medical Center Brain Injury Unit, stated that he uses a battery of neuropsychological tests to assist in TBI diagnosis. He then examines these test results to assist in assessing the "level of patient dysfunction" as the starting point for treatment considerations (personal communication, November 2014). Ross Zafonte of Harvard Medical School stated, "it is more accurate to think of TBI as a disease, because its effects extend well beyond the physical injury and can unfold over long periods of time" [4].

Treating the TBI Veteran

Active duty military personnel are assessed as quickly as possible after a combat injury, once the individual has regained consciousness. In the field, it may be days or weeks after the first concussion, and multiple injuries may have occurred. For most personnel demonstrating the common symptoms of PTSD and/or TBI, the PTSD checklist (eg, PCL-5) is administered to make an initial assessment [8]. Treatment on or near the battlefield begins with a rest period away from combat. Depending on the need, doctors may have patients evacuated to the nearest hospital. Patients are often subsequently transferred to Walter Reed National Military Medical Center in Bethesda, MD to allow access to the best care available.

Treatment for TBI and PTSD is based on symptoms. As the diagnosis becomes clearer, drugs and counseling are provided for the management and mitigation of symptoms [6]. A number of symptoms are treated selectively through the use of approximately 40 different medications. Prescription of these drugs is based on the similarity between symptoms

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TABLE 1.
Symptoms and Effects of Traumatic Brain Injury

Symptoms	Effects
Physical	Patient
Headache, sleep disturbance, dizziness, balance problems, nausea and/or vomiting, fatigue, visual disturbance, photophobia, tinnitus.	• Impaired function as family member, employee, employer, and citizen.
Cognitive	• Loss of caregiver, divorce, unemployment, homelessness.
Concentration problems, gaps in memory, attention deficits, slowed mentation, aphasia.	• Hopelessness, despair, suicide.
Emotional	Federal and state government
Irritability, anxiety, depression, mood disorders.	• Lifetime and Social Security compensation benefits; each individual's benefits are estimated at $3.2 million.[a]
	• Necessary local community services to support patient status.

[a]$3.2 million is the sum of Veterans Administration and Social Security Administration disability benefits paid to a 26-year-old veteran, who receives these payments to the age of 65 years.

of TBI/PTSD and certain mental health conditions such as depression and anxiety [9]. A list of these drugs and their potential side effects can be found in testimony to a Joint Committee of Congress [10].

The types of counseling and other therapy that might be provided vary widely, but cognitive behavioral therapy has been found to be effective in those instances when the trigger for a particular symptom can be identified and a therapy action plan can be implemented to address this specific trigger (Erwin Manalo, oral communication, November 2014). In addition, DVBIC recently published new clinical recommendations for TBI [11].

Treating the Injured Brain

None of these symptom-based therapies have evidence proving their effectiveness in the treatment of the initial injury that caused TBI or PTSD. This raises many questions, including what is known about the effectiveness of current therapies and whether or not there is a treatment that can actually restore human functions lost or impaired due to TBI or PTSD.

In response to the question raised by the US Congress regarding the effectiveness of current TBI and PTSD therapies, the National Academy of Sciences published a report in the spring of 2014. The Institute of Medicine of the National Academies studied all treatments in use over the period 2010–2012. The report concluded, in part, that neither the Department of Defense (DoD) nor the Veterans Administration (VA) "knows whether its many programs and services are effective in reducing the prevalence of PTSD in service members or veterans." The report further states that "until prevention and treatment outcome data are collected, analyzed, and evaluated at all organizational levels, it will be impossible to determine the success of any of those efforts" [12].

The inability of the VA and DVBIC to effectively treat TBI and PTSD veterans has been reported nationally. An article in *TIME Magazine* cited the results of a Congressional Budget Office report that stated that, after treatment by the VA, "nearly all troops afflicted with both ailments remain under VA's care, after four years of care" [13]. Recognizing the existence of such criticism, the new secretary of the VA, Robert A. McDonald, observed, "We're in an extraordinary position. We have an opportunity to not only right wrongs, but to reframe perceptions about [the] VA by lengthening our lead in areas where we've always excelled, taking the lead in service delivery areas that are lagging, and charting new ground in emerging or evolving areas of health care."

The Academy of Sciences reported the absence of data supporting the effectiveness of present PTSD therapies [12], leaving this question unanswered for the DoD and the VA. However, recent scientific studies published in the *Journal of Neurotrauma* [14] and by the Sackler School of Medicine of Tel Aviv University [15] report that TBI subjects with post-

TABLE 2.
Community Reintegration Challenges for Veterans With Traumatic Brain Injury (TBI) or Post-Traumatic Stress Disorder (PTSD)

• Lack of or incomplete medical records transition from active duty to retired/discharged.
• TBI diagnosis complexity.
• TBI/PTSD treated as mental illness not physical brain injury.
• Tedious/untimely enrollment into VA system.
• Difficulty accessing provider after VA enrollment.
• Late receipt of VA/SSA disability compensation benefits.
• TBI/PTSD treatment protocols provide only partial resolution of functional impairments.
• Many drug protocols for mild TBI/PTSD have additional side effects.
• Many counseling protocols for mild TBI/PTSD are designed to teach patients how to live with symptoms.
• Large numbers of TBI/PTSD wounded receive "Chapter Out," resulting in lost VA benefits.[a]
• Some TBI/PTSD wounded are incarcerated, resulting in lost VA benefits.

Note. SSA, Social Security Administration; VA, Veterans Affairs.
[a]"Chapter Out" refers to Chapter 11 of military regulations, which allows a commander to discharge a service member under less than honorable conditions for certain types of behavior. This type of discharge typically results in the loss of all VA disability and medical benefits, as well as the loss of unemployment compensation.

TABLE 3.
Resources for North Carolina Veterans With Traumatic Brain Injury or Post-Traumatic Stress Disorder

	Veterans Administration	DVBIC	North Carolina Veteran Affairs	North Carolina LME/MCO	Military bases	BIANC	Social Security Administration
Diagnosis and treatment	X				X		
Provider referral service			X	X		X	
Veteran/family information		X	X	X	X	X	
Veteran/family support groups					X	X	
Provider training and education			X	X		X	
Financial benefits	X						X

Note. BIANC, Brain Injury Association of North Carolina; DVBIC, Defense and Veterans Brain Injury Center; LME, local management entity; MCO, managed care organization.
Source: This information comes from interviews and discussions with Janice White, TBI Program Manager, North Carolina Department of Health, Division of Mental Health, Developmental Disabilities and Substance Abuse; Robbie Lowe, SOC Coordinator, East Carolina Behavioral Health; Georgia Claxton, Communication Director, East Carolina Behavioral Health; and Benita Hathaway, Call Center Director, East Carolina Behavioral Health.

concussion syndrome who were treated with a regimen of hyperbaric oxygen therapy demonstrated improvement in cognitive function and quality of life. Although there is controversy about this research, these studies provide evidence to support reports from individual veterans who have experienced varying degrees of healing from this therapy.

North Carolina Veterans Face Compelling Challenges

It is extremely difficult for North Carolina veterans to access the care provided through the DoD and the VA. Table 2 lists some of the challenges families face when attempting community reintegration of a veteran with TBI or PTSD. While the challenges are substantial, there are also a number of resources available to assist families and veterans. Resources currently available in North Carolina are listed in Table 3.

Facilitating Veterans' Transition Into North Carolina Communities

Veterans facing retirement or discharge, especially those with injuries, should gain possession of their medical records before separation from service, as this can significantly enhance the quality and timeliness of care provided by the VA. In this regard, available transition services on most military bases provide in-depth information to assist families in accessing post-separation medical and community assistance.

Another resource is NC4VETS, an online guide that provides a comprehensive source of statewide resources for veterans [16]. NC4VETS provides access information for employment, health care, VA benefits, housing, education, and veterans courts, and it explains how to find the local management entity (LME) or managed care organization (MCO) in each county. Each LME/MCO provides county representation for the Division of Mental Health, Developmental Disabilities, and Substance Abuse Services of the North Carolina Department of Health and Human Services. In addition, the Brain Injury Association of North Carolina offers veteran care referral services, as well as provider education and training.

Conclusion

Veterans with TBI or PTSD are confronted with medical care that, for most, treats the symptoms of the injury but does not attempt to repair the damaged brain tissue. Treatment protocols for these catastrophic injuries as provided by the VA for PTSD and by the DVBIC for TBI offer mitigation of injury symptoms; however, these protocols do not treat the underlying injury. The result of this situation is that veterans lose hope of restoring the human functions necessary to perform as family members, employees, and citizens. This situation also requires that the states in which these men and women reside, and the federal government, provide disability compensation and other forms of community resources necessary to sustain the lives and families of these veterans. The use of hyperbaric oxygen therapy is controversial, but there is some scientific evidence that it can lead to improvements in neuroplasticity, with concomitant improvement in body and motor function, cognition, and emotional system responses. Services provided by state and local organizations, together with assistance offered by the military in conjunction with service separation, are available to help veterans understand and deal with these circumstances. NCMJ

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