

William V. Padula, O.D., Eric Ikeda, O.D., Don Fong, O.D., and Vincent Vicci, O.D.

# The need for optometric rehabilitation for our veterans who have incurred a traumatic brain injury—Senate Bill 1999/House Bill 3558

The wars in Iraq and Afghanistan are producing a higher prevalence of traumatic brain injuries (TBIs) than previous wars. Our soldiers are being exposed to improvised explosive devices (IEDs), which are the cause of increased trauma. As of January 31, 2007, the Department of Defense (DOD) reported 34,385 members of the military injured, with estimates of approximately 20% sustaining a brain injury.<sup>1</sup> Although eye injuries can and do result from bullet wounds, shrapnel, and direct trauma, the majority of injuries from Iraq and Afghanistan result from the percussive blast wave caused by the IED.<sup>2,3</sup> For many of our soldiers, the injuries sustained are not external and therefore do not present as an injury to an eye, limb, or body. Yet, the injury can be more catastrophic because it causes a brain injury.

Senators John Kerry, Barack Obama, Charles Hagel, and Peter Domenici (Senate bill 1999 [S. 1999]) as well as Representative John Boozman, O.D., and others (House bill 3558 [H.R. 3558]) developed comprehensive legislation to address the visual problems caused by TBIs as well as other ocular injuries sustained in the current conflict by developing “Centers of excellence in prevention, diagnosis, mitigation, treatment, and rehabilitation of military eye injuries, and for other purposes.” Within these newly formed “centers of excellence,” skilled optometrists and ophthalmologists will address eye injuries and “post-traumatic visual syndrome.” Doctors will pro-

vide comprehensive diagnostic care as well as work as members of a multidisciplinary rehabilitative team. To assist in identifying those soldiers who incur eye injuries, the American Optometric Association partnered with the Blinded Veterans Association to work with Congress to develop a central registry for military eye injuries.

TBIs often are severe enough to cause a permanent impairment to cognitive function, personality, and social abilities and thereby affect potential ability for work and employment. In a recent study by researchers at Harvard and Columbia universities, the cost of medical treatment for these brain-injured soldiers from the Iraq/Afghanistan war will be at least \$14 billion over the next 20 years.<sup>4</sup> Vision problems and associated symptoms are among the most common complaints after a TBI. More than 74% of all TBI patients at the Palo Alto Department of Veterans Affairs (VA) Level I Poly-Trauma care facilities have reported visual complaints; a similar portion of patients receiving Level II Poly-Trauma care also reported visual complaints (75%).<sup>5,6</sup>

The symptoms and complaints caused by TBIs are not always associated with overt ocular health issues. Upon examination, approximately 95% of patients with visual sequelae caused by TBIs have normal funduscopic findings.<sup>7</sup> Therefore, many of our soldiers and veterans with a TBI can have good ocular health and 20/20 acuity. However, visual problems are common after a TBI, and eye injuries may or may not accompany



William V. Padula, O.D.

this injury.<sup>5,8</sup> Unfortunately, the effects from unresolved visual problems from a TBI can result in an increased dependence on governmental assistance and inability to support oneself and family and, in turn, cause low self-esteem as well as other psychological issues.

Traumatic brain injuries can result in a wide variety of visual symptoms including headaches, diplopia, vertigo, asthenopia, apparent movement of print and objects, and photophobia. Common characteristics of visual problems caused by TBIs are tropias, convergence/divergence dysfunctions, accommodative dysfunctions, and oculomotor dysfunction. Research has found that these binocular difficulties often are caused by dysfunction in visual processing between the cerebral cortex and midbrain.<sup>9,10</sup> In addition,

these dysfunctions in visual processing can directly affect balance, movement, and spatial orientation. Both Senator Kerry's and Congressman Boozman's bills addressed the need to treat the problems that occur from the "post-traumatic visual syndrome."

The bills (S. 1999 and H.R. 3558) called for advanced diagnosis and rehabilitative care by optometrists within the armed services (DOD) and the VA for the soldiers and veterans who have incurred TBIs. This is important because many of the subtle vision processing problems caused by neurologic trauma can persist in patients transferred from DOD to VA medical treatment facilities. In addition, some who are injured may return to active duty or work but continue to have the effects of these injuries. These soldiers can have impaired reaction time, decision making, balance, and spatial function. While in combat, individuals with these types of vision problems can be at higher risk of further injury or might affect the safety of others. The legislation (S. 1999 and H.R. 3558) proposed to provide, in locations within military treatment centers and VA poly-trauma centers, a cooperative study on screening and diagnosis for the purposes of rehabilitative management and vision research on visual dysfunction related to TBIs.

Senator Domenici stated that "we are quickly learning that roadside bombs have long-term and wide-ranging health implications for troops in combat, including brain and vision damage. Eye injuries are some of the most common casualties in Iraq and Afghanistan, but they aren't always simple to diagnose or treat. The bill we are proposing seeks to enhance the capabilities of veterans' health facilities to improve diagnosis, treatment, and rehabilitation of returning warriors who have sustained traumatic brain injury."

S. 1999 and H.R. 3558 offer a means to immediately bring needed rehabilitation to our men and women of the armed services and our veterans who suffer from the effects of vision loss caused by TBIs or a loss of "visual acuity of 20/200 or less (editor's note: interpret that as worse) in the injured eye." In addition, "a loss of peripheral vision resulting in 20° or less of visual field in the injured eye" will be included.

As an added benefit, this new law brings attention to the millions of Americans who also have visually related difficulties resulting from TBIs. It is with hope and anticipation that S. 1999 and H.R. 3558 will be the first step toward developing legislation and expanded rehabilitative services for all Americans who have visual processing dysfunctions caused by TBIs.

## References

1. DVBIC data, Walter Reed Army Medical Center.
2. Carson Studies Brain Injuries. *Army Times* 23 Apr 2007; p 4.
3. CRS Report for Congress, United States Military Casualty Statistics: Operations Iraqi Freedom and Operation Enduring Freedom. Order Code RS 22452. August 17, 2007.
4. Grady D. Struggling back from war's once deadly wounds. *New York Times*. 22 Jan 2006.
5. Goodrich G, Kirby J, et al. Visual function in patients of a polytrauma rehabilitation center: a descriptive study. *J Rehab Res Dev* 2007;44(7):929-36.
6. Lew H, Poole J, Vanderploeg R, et al. Program development and defining characteristics of returning military in a VA Polytrauma Network Site. *J Rehab Res Dev* 2007;44(7):1027-34.
7. Sabates N, Gouce M, Farris B. Neuro ophthalmologic findings in closed head trauma. *J Clin Neuro Ophthalmol* 1991;11:273-7.
8. Gianutsos R, Glosses D, Elbaum J, et al. Visual interception in brain injured adults: multifaceted measures research. *Phys Med Rehab* 1983;64:456-61.
9. Padula W, Agyris S, Ray J. Visual evoked potentials (VEP) evaluating treatment for post trauma vision syndrome (PTVS) in patient with traumatic brain injury (TBI). *Brain Injury* 1994;8:125-33.
10. Sarno S, Erasmus L, Luppert G, et al. Electrophysiological correlates of visual impairments after traumatic brain injury. *Vision Research* 2000;21:3029-38.

## Corresponding author:

William V. Padula, O.D.

Padula Institute of Vision  
37 Soundview Road  
Guilford, Connecticut 06437

[wpadula@padulainstitute.com](mailto:wpadula@padulainstitute.com)

**Editor's note:** The enactment of H.R. 3558, authored by our colleague, Representative John Boozman, O.D., (R-Arkansas), was a top federal advocacy priority for the American Optometric Association (AOA) over the course of 2007. Throughout the year, Representative Boozman, the Blinded Veterans Association and the AOA Washington office team worked to build support for the legislation and win its inclusion in the Defense Department authorization bill (HR 4986). After overcoming initial opposition, a number of legislative obstacles, and partisan gridlock on health care issues, H.R. 4986 was approved by Congress and signed into law (Public Law 110-81) by President Bush on January 29, 2008. The AOA is closely monitoring the law's implementation by the Department of Defense and the Department of Veterans Affairs with the goal of making certain that the concerns of ODs are heard.