ABOUT TRAUMATIC BRAIN INJURY

• Traumatic brain injury (TBI) can happen from a blow or jolt to the head, or from an object penetrating the brain. When the brain is injured, the person who has been injured may experience a change in consciousness that can range from becoming disoriented and confused to slipping into a coma. The person may also have a loss of memory for the time immediately before or after the event that caused the injury. Not all injuries to the head result in a TBI, however.

• TBI can involve symptoms ranging from headaches, irritability, and sleep disorders to memory problems, slower thinking, and depression. These symptoms often lead to long-term mental and physical health problems that hurt Veterans’ employment and family relationships, and their reintegration into their communities.

• The severity of a TBI is determined at the time of the injury and is based on the length of the loss of consciousness, the length of either memory loss or disorientation, and how responsive the individual was after the injury.

• Most TBI injuries are considered mild, but even mild cases can involve serious long-term effects on areas such as thinking ability, memory, mood, and focus. Other symptoms may include headaches, vision, and hearing problems.

• While most people with mild TBI have symptoms that resolve within hours, days, or weeks, a minority may experience persistent symptoms that last for several months or longer. Treatment typically includes a mix of cognitive, physical, speech, and occupational therapy, along with medication to control specific symptoms such as headaches or anxiety.

VA RESEARCH ON TRAUMATIC BRAIN INJURY: OVERVIEW

• Among the goals of VA researchers working in this field are to shed light on brain changes in TBI, improve screening methods and refine tools for diagnosing the condition, and develop ways to treat brain injury or limit its severity when it first occurs.

• Researchers are also designing improved methods to assess the effectiveness of treatments, and learning the best ways to help family members cope with the effects of TBI and support their loved ones.

• VA’s Translational Research Center for TBI and Stress Disorders (TRACTS) conducts studies to understand the complex changes in the brain, thinking, and psychological well-being that result from TBI and posttraumatic stress disorder (PTSD). These studies will lead to more understanding and better treatment options for returning Veterans with TBI and PTSD.

• The department’s Brain Rehabilitation Resource Center, at the Malcolm Randall VA Medical Center in Gainesville, Florida, develops and tests treatments to improve or restore motor, cognition, and emotional impairments that have been caused by brain disease or injury.

• At the Michael E. DeBakey VA Medical Center in Houston, the department has established a Traumatic Brain Injury Center of Excellence focusing on mild TBI.

SELECTED MILESTONES AND MAJOR EVENTS

2013 – Funded, along with the Department of Defense (DoD), two consortia to improve treatment for PTSD and mild TBI as part of the National Research Action Plan

2013 – Learned that, in mice, an artificial communication link inserted in the brain can restore functions lost as a result of TBI

2015 – Found that the blame and anger associated with the grief of caring for a
lived one with a TBI may be related to inflammation

2015 – Learned that Veterans who were near to bomb blasts in Iraq and Afghanistan appear to experience faster brain aging

2016 – Identified the cerebellum as particularly vulnerable to repeated blast exposures

RECENT STUDIES: SELECTED HIGHLIGHTS

• The cerebellum is particularly vulnerable to repeated blast exposures, according to researchers with the VA Puget Sound Health Care System and the University of Washington. The investigators looked at brain scans from Veterans who had experienced an average of 21 mild TBIs each as a result of explosions. The more blasts they were exposed to, the more they showed lower levels of glucose metabolism, a marker of brain activity, in the cerebellum. The cerebellum is the area of the brain that coordinates and regulates muscle activity. (Science Translational Medicine, Jan. 13, 2016)

• Veterans who were near bomb blasts in Iraq and Afghanistan appear to experience faster brain aging. Researchers from TRACTS conducted specially designed brain imaging on Veterans who had been within 100 feet of bomb blasts. They found that even in blasts that did not necessarily lead to concussion, those exposed showed brain aging in images designed to detect the “leakiness” and fraying of the white matter in the brain. Consequences of this brain aging in Veterans near bomb blasts could be increased rehabilitation time and an earlier need for health care for aging issues such as dementia. (Brain, August 2015)

• Veterans with a combination of depression, PTSD, and military-related TBI had the greatest difficulties of all Iraq and Afghanistan Veterans in getting around, communicating and getting along with others, self-care, and accomplishing other daily tasks. According to TRACTS researchers, many Iraq and Afghanistan Veterans require highly integrative treatment approaches, and their health problems need to be dealt with in a comprehensive and coordinated manner. (Journal of Traumatic Stress, February 2015)

For more information on VA studies on traumatic brain injury and other key topics relating to Veterans’ health, please visit www.research.va.gov/topics

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