What is TBI and How Does it Occur?

- A Traumatic Brain Injury (TBI) may arise from direct or indirect force to the head that temporarily or permanently disrupts brain function. This can be caused by a direct blow to the head (e.g., boxing, a baseball bat, motor vehicle crash (MVC)), an indirect force (whiplash sitting in a car hit from the rear), a penetrating injury (fragmentation from blast/explosion), or blast/explosive pressure wave (explosion alone without other injuries). TBI can range from a mild injury that can be transient and difficult to detect, to a severe brain injury that causes profound coma or perhaps death.
- Little is known about how blast related brain injury is similar or different from those brain injuries sustained via acceleration/deceleration mechanisms such as a motor vehicle crash. Robust research programs are examining this issue aggressively to find answers that will help us to better care for service members and veterans with TBI.
- TBI is Usually Categorized Based on Injury Severity:

Severity Rating for TBI

Traumatic Brain Injury Description

Severity	GCS	AOC	LOC	PTA
Mild	13-15	≤ 24 hrs	0-30 min	≤ 24 hrs
Moderate	9-12	> 24 hrs	> 30min < 24 hrs	> 24hrs < 7 days
Severe	3-8	> 24hrs	≥ 24 hrs	≥ 7 days

GCS - Glasgow Coma Score **AOC - Alteration of consciousness**

LOC - Loss of consciousness **PTA - Post-traumatic amnesia**

- MILD TBI is more difficult to diagnose both in civilian life and on the military battlefield. Mild TBI, otherwise known as concussion, can occur on the sports field and can range in recovery patterns from mild enough that a person can go back into the game after a short rest, to being out for the rest of the game or even season.
  - With mild TBI patients, full recovery can be within minutes to hours; a small percentage have symptoms that may persist months or years.
  - Symptoms of mild TBI include headache, dizziness, nausea/vomiting, trouble concentrating, memory problems, irritability.

- MODERATE TBI is defined as a Glasgow Coma Scale (GCS) score between 9 – 12 and is a population of patients which fall between the mild and severity spectrum. Moderate TBI patients have the most variability in the clinical presentation picture. Some will require intensive care unit hospitalization and some will not be hospitalized at all. Patients with moderate TBI have positive neuro imaging findings and may or may not require neurosurgical intervention. The range of symptoms are quite broad and may include casualties with no residual symptoms or those who require TBI rehabilitation.
    - ❖ There is usually loss of consciousness, from an hour to a day; there can be confusion for days to weeks; and mental or physical deficits that can last months or be permanent.
    - ❖ The vast majority of these Service members are identified and evaluated at theater-level medical facilities, and are evacuated back to the United States for further evaluation and care.
- SEVERE TBI usually results from a significant closed head injury, as in an automobile accident or most open or penetrating injuries, where there may be considerable residual deficits of brain function.
    - ❖ Casualties with severe TBI may never return to normal, though this can be difficult to predict.
    - ❖ There is an aggressive initial treatment program in theater, with neurosurgical expertise.

How is TBI diagnosed?

DoD is implementing an exposure screening program for all Service members returning from theater -- exposures to events that carry a risk of TBI will trigger further evaluation by the screening health care provider and possibly yield a referral to a specialist. This will complement the screening program begun by the VA and we will ensure sharing of this data across the Departments.

How is TBI treated and What Outcomes Can be Expected?

- Through clinical care practice, patient care coordination; provider, patient and family education; emerging medical technologies that enhance TBI care.
- Clinical care practice may include treatment of symptoms, rest /recovery strategies, an educational intervention and rehabilitation to optimize function.
- The brain has a remarkable way to adjust after injury. Each brain injury and its recovery are different. Brain injury rehabilitation assists in reaching maximum levels of independence.
- Care strategies are based on the severity of brain injury. The more severe brain injuries may require comprehensive, transdisciplinary approaches to care. Physical therapy, occupational therapy and speech language therapy are all examples of the type of services that may need to be incorporated into a rehabilitative care program for a TBI patient.

Helping Your Patients:

- In recovering from TBI, tips and advice to the patient include: getting plenty of sleep; keeping a daily journal; returning to normal activities gradually; avoiding high-risk activities that could lead to another brain injury; following doctors' directions; not drinking alcoholic beverages; being patient.
- If it's harder to remember things, advise your patient to write things down.
- If they lose important items, putting those items in the same place each time is helpful; possibly recording in a personal planner where important documents, phone numbers, etc., are placed.
- If easily distracted or having difficulty concentrating, they should try doing only one thing at a time in a quiet, non-distracting environment.
- Patients should be told to take all of their prescribed medication.
- They should consult with family and their superior officer prior to making important decisions.

Background:

- America's Armed Forces in Iraq and Afghanistan have sustained repeated attacks from weapons such as rocket propelled grenades, improvised explosive devices and land mines. Service Members suffering brain injuries from these devices require specialized care from providers experienced in treating Traumatic Brain Injury. Since 1992, the Defense and Veterans Brain Injury Center (DVBIC at www.dvbic.org) has provided leading edge care, conducted clinical research and offered education programs on TBI to active duty, reserve and national guard components, veterans and their families.
- Brain injuries are a major area of focus for DVBIC, which operates at seven military treatment facilities, four polytrauma rehabilitation centers in the Department of Veterans Affairs (VA) and two civilian treatment sites.
- DoD has established a national center called the Defense Center of Excellence (DCoE) for Psychological Health and TBI. The DCoE is a collaborative program integrating military prevention and protection, family and community outreach and support, clinical care, and research expertise from across the federal and private sectors.
    - Core components of the DCoE network include DVBIC; the Center for Deployment Psychology (CDP); the Deployment Health Clinical Center (DHCC); the Center for the Study of Traumatic Stress (CSTS); and the National Intrepid Center of Excellence (NICoE).
- DoD and the VA are working together everyday to:
    - Increase the number of mental health providers working with our Wounded Warriors and personnel returning from OIF/OEF
    - Improve access to psychological health care

- Jointly train together to meet the needs of Service personnel and veterans with psychological health and TBI issues.

VA Polytrauma Centers:

- The polytrauma centers reflect VA's commitment to care for the men and women who have served in uniform. A reality of combat is that some return with loss of limbs, traumatic brain injuries and other severe injuries. The VA recognizes that it must provide specialized care for military service members and veterans who sustain multiple and severe injuries.
- The VA designated four regional Traumatic Brain Injury Lead Rehabilitation Centers as Polytrauma Centers:
  - Minneapolis Polytrauma Center (VA Midwest Health Care Network) in Minneapolis, MN
  - Palo Alto Polytrauma Rehabilitation Center (VA Palo Alto Health Care System) in Palo Alto, CA
  - Richmond Polytrauma Rehabilitation Center (VA Mid-Atlantic Health Care Network) in Richmond, VA
  - James A. Haley Veterans Hospital Polytrauma Rehabilitation Center (VA Sunshine Healthcare Network) in Tampa, FL

These centers offer unique and highly recognized specialized rehabilitation, bringing experts together to provide innovative, personalized treatment to help the injured Service member or veteran achieve optimal function and independence within a community.

Patients treated at these facilities may have a serious TBI alone or in combination with amputation, blindness or other visual impairment, complex orthopedic injuries, auditory disorders and mental health concerns.

Additonal Information:

- Toll Free for information: 1-800-870-9244
- Web site: www.DVBIC.org

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