TBI in Military and Veterans: Incidence, Symptoms and Resources

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Agenda

• DoD Definition of Traumatic Brain Injury, Concussion
• Concussion in the Military: Incidence
• Concussion Symptoms and Impact
• Concussion Treatment
• DVBIC: Services and Resources
DoD DEFINITION OF TRAUMATIC BRAIN INJURY (TBI) AND mTBI/CONCUSSION
TBI is a **traumatically induced structural injury** and/or physiological disruption of brain function as a result of an external force. TBI is indicated by new onset or worsening of at least one of the following clinical signs, immediately following the event:

- Any period of loss of consciousness (LOC)
- Any loss of memory for events immediately before or after the injury (PTA)
- Any alteration in mental state at the time of the injury (AOC)
- **Neurological deficits** that may or may not be transient (or permanent)
- **Intracranial lesion**

Source: VA/DoD Clinical Practice Guidelines for mTBI/Concussion, 2009
What is a Concussion?

A concussion is a head injury from a hit, blow or jolt to the head that:

- Briefly knocks you out (loss of consciousness), or
- Makes you feel dazed, like you had your bell rung (alteration of consciousness), or
- Affects your ability to remember the event (post traumatic amnesia).

Source: Acute Concussion (mTBI) Educational Brochure

Concussion is synonymous with mild traumatic brain injury (or mTBI)
Causes of Concussion

The most common causes of military concussion in both deployed and non-deployed settings include:

- Falls
- Motor vehicle crashes
- Sports and recreational activities
- Blows to the head (i.e. military training)
- Blasts
- Assault

Leading cause of TBI in the deployed setting: involvement in a vehicle blast or rollover
Severity of TBI

TBI is categorized as **closed** or **penetrating**:

- Closed TBI are further classified as **mild**, **moderate** or **severe**
- Penetrating injuries are easily identified and require immediate neurosurgery intervention.

*DVIDS Photo Source: Navy by Petty Officer 1st Class Matthew Leistikow*
### Closed TBI Severity

<table>
<thead>
<tr>
<th>Severity</th>
<th>GCS</th>
<th>AOC</th>
<th>LOC</th>
<th>PTA</th>
<th>Imaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>13-15</td>
<td>&lt;=24 hours</td>
<td>0-30 min</td>
<td>&lt;=24 hours</td>
<td>Negative</td>
</tr>
<tr>
<td>Moderate</td>
<td>9-12</td>
<td>&gt;24 hours</td>
<td>&gt;30 min to &lt; 24 hours</td>
<td>&gt;24 hours to &lt; 7 days</td>
<td>Negative or positive</td>
</tr>
<tr>
<td>Severe</td>
<td>3-8</td>
<td>&gt;24 hours</td>
<td>&gt;-24 hours</td>
<td>&gt;- 7 days</td>
<td>Negative or positive</td>
</tr>
</tbody>
</table>

Source: VA/DoD CPGs Concussion², April 2009
CONCUSSION IN THE MILITARY: INCIDENCE
An estimated 1.7 million people sustain a TBI annually in the U.S. Of them:

- 52,000 die
- 275,000 are hospitalized
- 1.365 million (80%) are treated and released from the ER
- About 75% of TBIs are mild

Source: Centers for Disease Control and Prevention (CDC)

Note: Alaska has one of the highest TBI rates in the U.S.
DoD Worldwide Numbers

- 313,816 documented TBIs since 2000
  - 82.5% were concussions
- Differences by service branch
  - Army: highest total incidence
  - Marines: highest prevalence rate
- More than 80% were diagnosed in garrison or outside combat


Photo: jber.af.mil
DoD Worldwide Numbers

DoD Numbers for Traumatic Brain Injury
Worldwide – Totals

2000-2014 (Q1 - Q3)

- Penetrating: 4,577
- Severe: 3,126
- Moderate: 25,953
- Mild: 258,816
- Not Classifiable: 21,344

Total - All Severeities: 313,816

Source: Defense Medical Surveillance System (DMSS), Theater Medical Data Store (TMDS) provided by the Armed Forces Health Surveillance Center (AFHSC)

Prepared by the Defense and Veterans Brain Injury Center (DVBIC)

Percentages do not add up to 100% due to rounding

Source: accessed 2 MAR 2015 at http://dvbic.dcoe.mil
CONCUSSION SYMPTOMS AND IMPACT
## Common Signs and Symptoms

<table>
<thead>
<tr>
<th>Physical Symptoms</th>
<th>Cognitive Symptoms</th>
<th>Behavioral / Emotional</th>
<th>Sleep Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Headaches</td>
<td>• Attention</td>
<td>• Anxiety</td>
<td>• Fatigue, loss of energy, getting tired easily</td>
</tr>
<tr>
<td>• Visual problems</td>
<td>• Memory problems</td>
<td>• Depression</td>
<td>• Difficulty falling or staying asleep</td>
</tr>
<tr>
<td>• Feeling dizzy</td>
<td>• Poor concentration</td>
<td>• Agitation</td>
<td></td>
</tr>
<tr>
<td>• Loss of balance</td>
<td>• Delayed processing speed</td>
<td>• Irritability</td>
<td></td>
</tr>
<tr>
<td>• Hearing difficulty</td>
<td>• Difficulty finding words</td>
<td>• Impulsivity</td>
<td></td>
</tr>
<tr>
<td>• Tinnitus</td>
<td>• Impaired judgment</td>
<td>• Aggression</td>
<td></td>
</tr>
<tr>
<td>• Sensitivity to light and/or noise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Nausea and/or vomiting</td>
<td></td>
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</tbody>
</table>
# Impact of Concussion

<table>
<thead>
<tr>
<th>Manifestation</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to sleep at night</td>
<td>Decreased marksmanship performance</td>
</tr>
<tr>
<td>Decreased energy</td>
<td>Decreased situational awareness</td>
</tr>
<tr>
<td>Slower reaction time</td>
<td>Difficulty performing quickly under time pressures</td>
</tr>
<tr>
<td>Difficulty negotiating uneven or moving surfaces or terrain</td>
<td>Difficulty multitasking</td>
</tr>
<tr>
<td>Easily distracted</td>
<td>- Ex: piloting a vessel while listening to instructions over a radio</td>
</tr>
<tr>
<td>Difficulty processing multiple sources of information</td>
<td>Performance difficulties can affect self-esteem and confidence</td>
</tr>
<tr>
<td>Interpersonal problems</td>
<td>Fear of performing in certain operational environments</td>
</tr>
</tbody>
</table>
Impact of Multiple Concussions

• Symptoms may be more severe with each additional concussion
  – May take longer to resolve

• Persistent symptoms may lead to:
  – Reduced work performance
  – Behavioral or emotional problems
  – Relationship problems

TBI and Co-Occurring Conditions

• PTSD
• Pain
• Substance Use Disorder
• Depression
• Anxiety
• Suicidality

Photo: accessed 2 DEC 2013 at www.jber.af.mil
Overlapping Symptoms

Possible Symptoms of PTSD
- flashbacks
- nightmares
- self-destructive behavior
- fearfulness
- startled easily
- guilty feelings
- on high alert

Possible Symptoms of Concussion
- sleep problems
- trouble with memory and attention
- depression
- anxiety
- fatigue
- irritability
- headaches
- dizziness/balance problems
- nausea
- sensitivity to light and sound
- vision changes
- appetite changes
- mood changes
The vast majority of concussion patients:

- Recover **within a week**, with a small percentage (~15%) taking longer
- Improve with no lasting symptoms and require little to no intervention

- Recovery is different for each person
- Symptoms typically improve within hours and resolve completely within days to weeks.
- A minority of patients take three months to year(s) for various reasons (prior head injuries, comorbid conditions, other injuries, etc.)

Early detection  Early treatment  Maximizes chances for recovery

Source: Acute Concussion (mTBI) Educational Brochure
CONCUSSION TREATMENT
Goals of Treatment

• Clinician perspective
  • Minimize the impact of secondary effects
  • Improve quality of life during recovery
  • Reduce disability

• Patient & family perspective
  • Relief of troubling symptoms
  • Return to baseline function

Photo: U.S. Army
Treatment: Key Tenets

• **Rest**: essential in allowing proper physical and mental healing following a concussion.

• **Education**: important to provide information on symptoms, management, and expected outcomes.

• **Expectation of recovery**: critical to provide reassurance that most patients fully recover from concussion.

Photo courtesy: DefenseImagery.mil
Patient Education

- Actively review appropriate standardized educational brochure with service member or veteran

- Educational brochures and other resources available at http://dvbic.dcoe.mil

>1 month post injury
Progressive Return to Activity Following mTBI Clinical Recommendation

- Gives providers and patients a practical “how to” manual for concussion recovery
- Guidance for primary care managers in deployed and non-deployed settings for progressive return to activity following a concussion/mild TBI
- Offers a standardized approach for service members who remain symptomatic after sustaining a concussion/mTBI
- Identifies recommended criteria for referral to the rehabilitation provider for daily monitored return to activity process
- The first clinical tool to define “rest”

Available to order at http://dvbic.dcoe.mil
# Stages of Progressive Activity

<table>
<thead>
<tr>
<th>Rehabilitation Stages</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Rest</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Light Routine Activity</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Light Occupation-oriented Activity</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Moderate Activity</td>
</tr>
<tr>
<td>Stage 5</td>
<td>Intensive Activity</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Unrestricted Activity</td>
</tr>
</tbody>
</table>
Reintegration

- Most communities have military health, psychological health, family support and other services for warriors, veterans and their families.

- The following organizations/sites may be helpful during reintegration:
  - DVBIC Recovery Support Specialists (RSS)
  - DCoE Outreach Center
  - Military OneSource
  - InTransition
  - AfterDeployment.org
  - Alaska Brain Injury Network
  - NAMI

Photo courtesy: Military OneSource
DEFENSE AND VETERANS BRAIN INJURY CENTER (DVBIC) RESOURCES
About DVBIC

Established by Congress in 1992 to:

- Track and evaluate head injury survivors
- Ensure appropriate treatment and rehabilitation
- Study treatment outcomes
- Counsel family members

Mission: to serve active-duty military and veterans with TBI and their family members through state-of-the-science clinical care, innovative clinical research initiatives and educational programs, and support for force health protection services

Three mission-essential components:

- Research
- Clinical Affairs
- Education
DCoE Organizational Structure

U. S. Army Medical Research and Materiel Command (MRMC)
DVBIC Sites and TBI RSP and REC Regions
Services Near You

• JBER mTBI Clinic
• TBI Recovery Support Program
• Further training for your unit or department
• Free TBI resources for providers, service members, veterans and family
- **Patients**: Active Duty, Activated Guard or Reserves, Veterans eligible for MTF services, dependents > 16 yrs.

- **Services**
  - Medical evaluation by a Physician or Midlevel Provider
  - Nurse Case Management
  - Recovery Support Program
  - Cognitive Rehabilitation
  - Vestibular (balance) Rehabilitation
  - Occupational Therapy, Speech Therapy
  - Behavioral Health/Counseling
  - Education resources for Command, Line Leaders, Units, Individual Service Members, Families, and Providers (statewide)
  - Neuropsychological testing
  - Pain Management
  - Acupuncture, Restorative Yoga, Massage chairs

*Photo: accessed 14 JAN 2013 at www.jber.af.mil*
TBI Recovery Support Program

This program offers TBI expertise, resources and support to the military and veterans’ communities and facilitates connections across the entire continuum of recovery and spectrum of care.

A nationwide network of Recovery Support Specialists assists clients as they negotiate through complex systems of care, return to duty or transition to civilian life.

Eligibility: Service members (including National Guard and Reservists) or veterans who have sustained a TBI, their family members or caregivers

The Recovery Support Program provides:
• Support, education, advocacy, and advice
• Tracking of symptoms and monitoring of treatment compliance and outcomes
• Connection to TBI and psychological health services
• Up to 24 months of follow-up care
• For providers: information and access to TBI research, training and educational resources

For referrals and more information: http://dvbic.dcoe.mil/tbi-recovery-support-program
Mild Traumatic Brain Injury Pocket Guide (CONUS) and Mobile Application

Quick reference resource on treatment and management of mTBI including:

- Evidence-based recommendations
- ICD-9 coding guidance
- Clinical recommendations for cognitive rehabilitation
- Clinical recommendations on assessing ability to drive safely
- Patient education materials
- Clinical tools and resources

Available to download or order at http://dvbic.dcoe.mil
TBI Clinical Support Tools

- Management of Sleep Disturbances Following Concussion/Mild Traumatic Brain Injury
  - Clinical recommendation and companion support tool
  - Training guide
  - Fact sheet
  - Guides primary care managers in the assessment and management of common sleep disorders

Available to order at http://dvbic.dcoe.mil
• Additional Clinical Recommendations available at [http://dvbic.dcoe.mil](http://dvbic.dcoe.mil):
  
  – Neuroimaging
  – Dizziness
  – Visual Dysfunction
  – Endocrine Dysfunction

  – Next Clinical Recommendation due out 2015: Post-traumatic Headaches
TBI Case Management Resources

• Telehealth and Technology Web Resource Locator Website
  – Compiled information from government and community resources
  – Psychological health and TBI
  – In support of service members, veterans and their families
  – http://ttwrl.dcoe.mil

• Military TBI Case Management Quarterly Newsletter
  • Information and resources for those caring for service members with TBI and their families
  • Identifies and shares best practices across the military community
TBI Products for Service Members, Families

- “Back to School: Guide to Academic Success After Traumatic Brain Injury”
- Patient – Family educational flyers
  - Symptom specific
  - Improving Memory, Sleep, Mood, etc.
- Family Needs line of educational brochures
  - Addressing Family Needs
  - Talking with Children about TBI
  - Taking Care of Yourself while Taking Care of Others
- Family Caregiver Curriculum
  - Moderate to Severe TBI

Available to download or order at http://dvbic.dcoe.mil
Educational Series

**DCoE Webinar Series**
Webinars discuss psychological health and TBI clinical care. They are free and open to the public.

http://dcoe.mil

**TBI Web-based Case Studies**
Series of 12 modules utilizing actual patient vignettes to assist health care professionals to understand mild TBI. Includes screening, diagnosis and management of symptoms in the non-deployed setting.

Photo courtesy: DVIDS
Helpful Websites

- dvbic.dcoe.mil
- dcoe.mil
- afterdeployment.org
Contact Info

• For more information, training or materials:
  – Patty Raymond Turner, MPH, Regional Education Coordinator (Alaska)
  – 907-580-4081
  – patricia.raymond.1.ctr@us.af.mil

• Recovery Support Program:
  – Renee Reardon, CCRN
    • Recovery Support Specialist
    • 907-580-0230

• Clinical questions:
  – JBER mTBI Clinic
  – 580-0014

• DCoE’s 24/7 Outreach Line: 1-866-966-1020
Questions?

Photo: accessed 30 MAR 2015 at USCG D17 Facebook page
DCoE Clinical Recommendation
September 2012
Assessment and Management of Dizziness Associated with Mild Traumatic Brain Injury

Support Tools for Providers
Dix-Hallpike testing videos
www.youtube.com/watch?v=vRpwf2mI3SU
www.youtube.com/watch?v=ttgaqpIv_wM&feature=fvwrel

References


DCoE Clinical Recommendation

January 2013

Visual Dysfunction Following Mild Traumatic Brain Injury

Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury

Vision Center of Excellence

Defense and Veterans Brain Injury Center

References


DCoE Clinical Recommendation
August 2012
Indications and Conditions for Neuroendocrine Dysfunction Screening Post Traumatic Brain Injury

References

DCoE Clinical Recommendation
June 2014
Management of Sleep Disturbances Following Concussion/Mild Traumatic Brain Injury: Guidance for Primary Care Management in Deployed and Non-Deployed Settings

References
DCoE Clinical Recommendation
July 2013
Neuroimaging following Mild Traumatic Brain Injury in the Non-Deployed Setting

References

DCoE Clinical Recommendation
January 2014
Progressive Return to Activity Following Acute Concussion/Mild Traumatic Brain Injury: Guidance for the Primary Care Manager in Deployed and Non-deployed Settings
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