### Traumatic Brain Injury in Military Personnel and Veterans: Concussion

**What We Know**

› A concussion, also known as a mild traumatic brain injury (mTBI), is a structural injury to the brain caused by blunt trauma, acceleration or deceleration forces acting on the brain, penetration by a foreign body, or exposure to a blast. The primary causes of mTBI in a military setting are blasts, fragments, bullets, falls, and motor vehicle accidents. It is now the most common injury suffered by military service members who have served in Iraq or Afghanistan (11-15,21).

- The Defense and Veterans Brain Injury Center (DVBIC) of the U.S. Department of Defense (DOD) classifies TBIs as one of three levels of severity: concussion/mild, moderate, or severe. Severity is determined using several factors: length of time that confusion or disorientation was present (i.e., mental status), length of time that consciousness was altered or lost, length of time that memory was lost, and results of brain imaging (9).

- Other methods of determining severity might include use of the Glasgow Coma Score (a widely used measure of the state of consciousness that uses eye, verbal, and motor responsiveness to establish a score between 3 and 15) (15) or the *International Statistical Classification of Diseases and Related Health Problems*, 10th edition (ICD-10-CM), coding system (7,9).

- A concussion results in one or more of the following: (1-11)
  - Temporary confusion, disorientation, or a change in consciousness
  - Memory dysfunction immediately after the injury
  - Loss of consciousness for less than 30 minutes
  - Any observed signs or symptoms of neurological or neuropsychological problems (e.g., headache, dizziness, fatigue, trouble concentrating, irritability)
  - Changes in white matter structure of the brain (26).

› Concussions are a common injury among military personnel and can have lasting effects (8,14,15,16,27).

- The DVBIC reported that military personnel worldwide experienced 22,672 TBIs during 2015, with 18,686 (82.4%) classified as mTBI (8). A high proportion of military personnel experience repeated concussions (16).

- Researchers in a DOD study found that 20% of service members studied had a repeat concussion within 2 weeks of the first concussion and 87% had a repeat concussion within 3 months of the first concussion. In comparison, among professional football players who were studied only 4% experienced a repeated concussion within 2 weeks and 20% had another concussion within 3 months (16).

› Common symptoms of concussions include headache, nausea, balance problems, dizziness, vision problems, light and noise sensitivity, feeling sluggish or fatigued, trouble concentrating, memory problems, changes in sleep patterns, and insomnia (15,28,29).

- Researchers have found that concussions may cause not only structural changes in the brain as a result of the impact but also metabolic changes (15,29).
Individuals who experience metabolic imbalance as a result of a concussion may be at risk for second-impact syndrome, in which a subsequent concussion, even if the subsequent concussion presents as a minor injury, may result in death.

Trauma that occurs to the pituitary gland as a result of mTBI can create ongoing, persistent symptoms that mimic the immediate aftereffects of a TBI.

Some individuals experience post-concussion syndrome (PCS), TBI symptoms that continue for weeks or months instead of resolving in a few days as is typical. PCS may be found in returning military personnel and veterans; frequently it co-occurs with posttraumatic stress disorder (PTSD).

According to one model, PCS is more likely to develop after mTBI among individuals with predisposing factors (e.g., anxiety, depression, negative life experiences, negative attitude) who have limited social support and who have a negative cognitive, behavioral, or emotional state that perpetuates the predisposing factors. When the perpetuating factors interact with pre-existing conditions and a poor social environment, there is a higher risk for PCS.

Military personnel and veterans who have experienced brain injury due to blast exposure are at increased risk of age-associated neurodegenerative disease compared to service members who have not been exposed to military blast forces.

Individuals who have experienced a concussion are at increased risk for mental health disorders.

Social workers working with military or veteran populations should screen clients for mTBIs since they are a contributing factor in mental health problems.

Early identification of concussions in active-duty military personnel is crucial in order to provide appropriate medical care and prevent personnel from returning to duty prematurely. The brain has an increased vulnerability to a second concussion within 10 days of the primary concussion.

There are three opportunities for screening for concussions: during deployment after the injury event, upon return from deployment, or when a veteran enters the VA healthcare system after leaving active-duty status.

The DOD requires all military personnel involved in a “potentially concussive event” to be medically evaluated if they answer yes to their commander on any of the items on the Injury/Evaluation/Distance (I.E.D.) Checklist. The affected service member is also supposed to complete the Military Acute Concussion Evaluation (MACE).

– The MACE is not intended to diagnose a concussion but is a screening tool that can trigger a more thorough evaluation to determine diagnosis.

– Service members who have experienced a first concussion are supposed to rest for at least 24 hours and not return to duty during that time. Those who receive a second concussion within 12 months are supposed to wait 7 days after symptoms resolve before returning to duty. If three or more concussions happen within 12 months, the service member is supposed to remain off duty until a recurrent concussion evaluation is completed.

– The recurrent concussion evaluation consists of a comprehensive neurological evaluation, neuroimaging, a neurophysiological assessment, a functional assessment, and a duty-status determination.

– Active-duty personnel who are returning from deployment are supposed to be screened with either a variation of the Brief Traumatic Brain Injury Screen (BTBIS) or the Automated Neuropsychological Assessment Metrics (ANAM). Both of these instruments have been shown to have questionable validity and reliability when used at any time other than shortly after the event, however.

– The ANAM has been shown to be a successful diagnostic tool for concussions if utilized within 72 hours of an injury.

– Veterans who are entering the VA system and who began service after September 11, 2001, are supposed to be screened for TBI with a four-question screening tool; if the result is positive the veteran is referred for a more comprehensive evaluation.

Occupational therapist have recently started to promote a performance-based assessment of concussion-related deficits called the Assessment of Military Multitasking Performance (AMMP) and are gathering data to determine if the AMMP is a valid and reliable tool. This assessment consists of six individual tasks designed to assess concussion-related deficits.

– Participants are given thorough instructions and a written list of the tasks to be performed. They are also required to visit four areas (e.g., a bulletin board, supply closet) to complete certain tasks (e.g., assemble a footstool out of PVC pipe, report the number of empty rooms in service members’ living quarters, locate a service member’s room using a map).

– The goal of this type of assessment is to aid occupational therapists in screening for and characterizing concussion-related deficits in order to construct individualized treatment plans for their military clients.

Underreporting of mTBIs by military personnel is common. The reasons for this may have roots in the military culture.
Service members may minimize symptoms to avoid longer evaluations, to stay with their units, and to facilitate a quicker return to duty or return home\(^{(29)}\)

The emphasis in the military on perseverance, self-sacrifice, and stoicism, and the fact that concussion is an “invisible” injury, may lessen the acceptance of reporting mTBI\(^{(4,29)}\).

There is no curative course of treatment for concussions, only symptom management. Early detection, evaluation, and management of a concussion and its symptoms are paramount to protect the individual while he or she is vulnerable to further injury or experiencing the negative effects of a concussion. Social workers need to understand the effects of concussion and assess their impact on clients’ mental health and quality of life\(^{(15,17)}\).

Treatment for concussions consists of symptom management, supervised rest, and adequate recovery time\(^{(17)}\).

The social worker should educate the client on the need to follow the treatment plan in the acute post-concussion phase.

Preventing further injury should be emphasized; a premature return to duty may worsen existing symptoms\(^{(15)}\).

Individuals with persistent symptoms may benefit from pharmacological treatment (e.g., sleep medications, preventive headache medications, medications for dizziness)\(^{(15)}\).

**What We Can Do**

Develop an awareness of your own cultural values, beliefs, and biases and develop knowledge about the histories, traditions, and values of your clients. Adopt treatment methodologies that reflect the cultural needs of the client\(^{(2,13,20)}\).

Learn about concussions in military personnel so you can accurately assess your client's personal characteristics and health/mental health education needs; share this information with your colleagues.

Social workers should practice with awareness of and adherence to the National Association of Social Workers (NASW) Code of Ethics core values of service, social justice, dignity and worth of the person, importance of human relationships, integrity, and competence; and become knowledgeable of the NASW ethical standards as they apply to mTBI in military personnel and veterans and practice accordingly\(^{(19,20)}\).

Create a safe, therapeutic environment to encourage military personnel and veterans you are working with to disclose any mTBIs in order to receive the proper assistance and reduce risk for further concussions.

Screen any military service member or veteran with an mTBI for the common co-existing conditions of anxiety, depression, substance use, and sleep disorders\(^{(18)}\).

Utilize the biopsychosocialspiritual assessment to fully analyze and address the symptoms and negative life impact the mTBI potentially is having on the client. Utilize this assessment information to develop a comprehensive treatment plan.

Social workers should prioritize treating the identified problem and symptoms over trying to determine conclusively if the issues stem from a concussion\(^{(29)}\).

Ensure that any service member or veteran with a positive TBI screen is referred to the appropriate services and TBI management programs.

Advocate for continued education for providers and military personnel on the risks of early return to duty when an mTBI has occurred\(^{(18)}\).

In order to more competently serve military personnel, civilian social workers should:

- Obtain appropriate education and training about military culture, military and governmental systems of care, issues affecting military and veteran populations, and appropriate policy and practice interventions.
- Develop a comprehensive directory of resources and programs available to military service members, veterans, and their families, including the local VA, food pantries, emergency shelters, and low-cost medical clinics, as needed.
- Collaborate with military systems to provide continuity of care.

Advocate for continued research on concussions in the military.

Provide military personnel with a list of online resources:

- Defense and Veterans Brain Injury Center (DVBIC), http://dvbic.dcoe.mil/tbi-military
- Real Warriors Campaign, http://www.realwarriors.net/
## Coding Matrix

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<thead>
<tr>
<th>M</th>
<th>Published meta-analysis</th>
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<tbody>
<tr>
<td>SR</td>
<td>Published systematic or integrative literature review</td>
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<tr>
<td>RCT</td>
<td>Published research (randomized controlled trial)</td>
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<tr>
<td>R</td>
<td>Published research (not randomized controlled trial)</td>
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<tr>
<td>C</td>
<td>Case histories, case studies</td>
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<tr>
<td>G</td>
<td>Published guidelines</td>
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<tr>
<td>RV</td>
<td>Published review of the literature</td>
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<tr>
<td>RU</td>
<td>Published research utilization report</td>
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<tr>
<td>QI</td>
<td>Published quality improvement report</td>
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<tr>
<td>L</td>
<td>Legislation</td>
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<tr>
<td>PGR</td>
<td>Published government report</td>
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<tr>
<td>PFR</td>
<td>Published funded report</td>
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<tr>
<td>PP</td>
<td>Policies, procedures, protocols</td>
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<tr>
<td>X</td>
<td>Practice exemplars, stories, opinions</td>
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<tr>
<td>GI</td>
<td>General or background information/texts/reports</td>
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<tr>
<td>U</td>
<td>Unpublished research, reviews, poster presentations or other such materials</td>
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<tr>
<td>CP</td>
<td>Conference proceedings, abstracts, presentation</td>
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## References
