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Mild Traumatic Brain Injury & Co-Occurring Disorders: Scope of the Problem

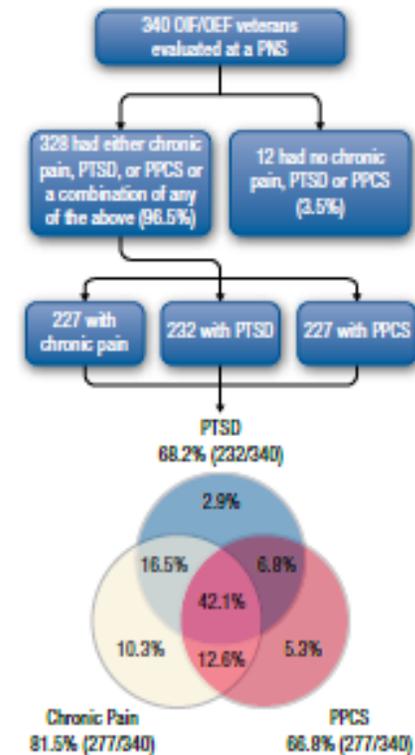
Alison N. Cernich, Ph.D., ABPP-Cn
Acting Veterans Affairs Senior Liaison for
Traumatic Brain Injury
Defense Centers of Excellence for Psychological
Health & Traumatic Brain Injury

POC: Alison N. Cernich, Ph.D., ABPP-Cn
Alison.Cernich@va.gov
301-295-3428



Mild Traumatic Brain Injury (mTBI) & Co-Occurring Disorders

- The vast majority of patients who present to the clinic with a diagnosis of mild traumatic brain injury (mTBI) do not often present with mTBI alone.
- Of the veterans presenting to a polytrauma network site in Lew's study (2009), 81.5 percent had more than one diagnosis and 42.1 percent had three co-occurring diagnosis, including pain, post-traumatic stress disorder (PTSD), and post-concussion syndromes.
- In another study by Ruff and colleagues (2008), approximately 66 percent of veterans presenting with headache and TBI symptoms had cognitive deficits on examination, more severe and frequent headaches, more reports of pain, higher rates of PTSD, and impaired sleep with nightmares.
- Veterans with positive TBI screens are more likely to have a diagnosis of PTSD, depression, and substance abuse disorder.
- Given these preliminary findings, there is a need to consider how to approach the service member or veteran with mTBI and co-occurring psychological health difficulties. The objective of this portion of the presentation is to define the scope of the problem by reviewing the current literature on each of the diagnoses covered in the new mTBI and co-occurring disorders toolkit.



The polytrauma clinical trial: Distribution of patients with chronic pain, posttraumatic stress disorder (PTSD), and persistent post-concussive symptoms (PPCS) in a sample of 340 Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) veterans evaluated at Department of Veterans Affairs Boston Polytrauma Network Site (PNS).

Low et al., Prevalence of chronic pain, posttraumatic stress disorder and persistent post-concussive symptoms in OIF/OEF veterans. Polytrauma clinical trial. JRRD, 2009, 46(6), 697-702.

Mild Traumatic Brain Injury: Background

- Mild traumatic brain injury is commonly reported in the military population with approximately 202,281 incident diagnoses in service members since 2000.
- The Department of Veterans Affairs define mTBI as a traumatically-induced, structural injury and/or physiological disruption of brain function, as a result of an external force that is indicated by new onset or worsening of at least one of the following clinical signs, immediately following the event:
 - Loss of consciousness
 - Alteration of consciousness
 - Post-traumatic amnesia
 - Neurologic deficits that may not be transient
 - Intracranial lesion
- The resolution of symptoms is generally rapid in the civilian literature with many individuals resolving all symptoms within three months.
- Both the civilian and military literature provide evidence that the greater the burden of co-occurring disorders, the higher the likelihood that symptoms will persist following mTBI.

Symptom Overlap

- Somatic, behavioral, or cognitive symptoms often follow mTBI.
- The neuropsychiatric symptoms that follow the injury can overlap with other conditions, even when presenting as a singular condition.
- However, assigning a definitive etiology to these symptoms remains challenging on a case-by-case basis.
- The conditions included in the current toolkit frequently co-occur with mTBI or features of these conditions may be present following mTBI.

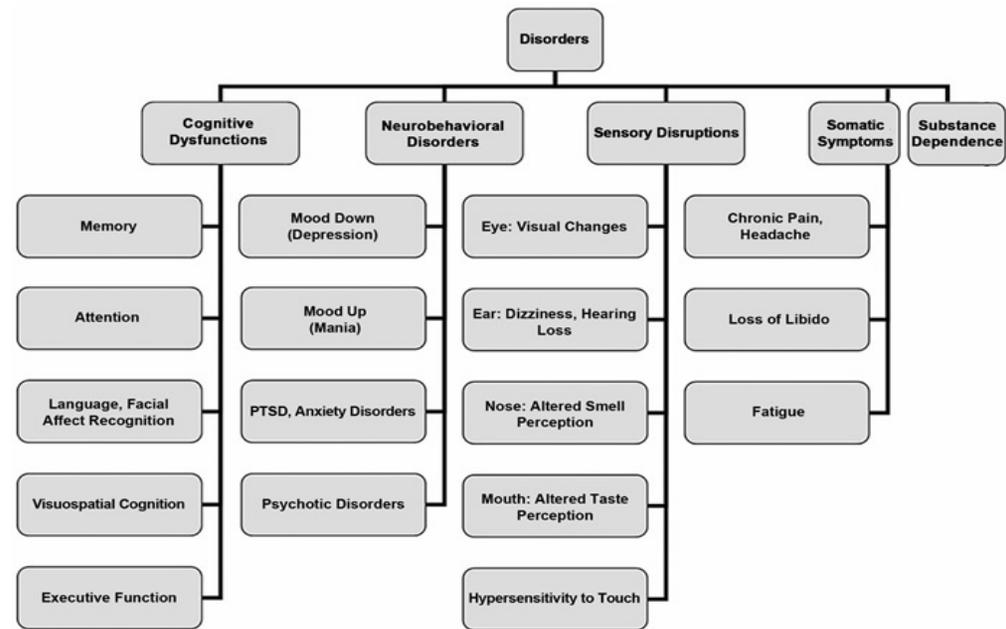
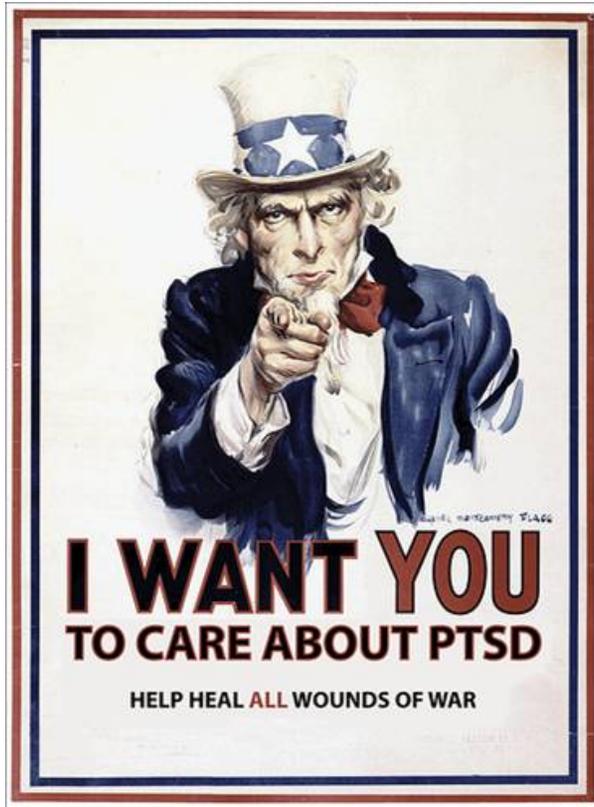


Figure 1. Clusters of neuropsychiatric symptoms of traumatic brain injury. PTSD = posttraumatic stress disorder.

Halbauer et al., 2009

Post-traumatic stress disorder and mTBI



Ilona Meagher/Flickr

- Individuals who serve in combat are at a high risk for the development of PTSD.
- A recent systematic review of the evidence found that for those with probable mTBI the frequency of co-morbid probable PTSD was 33-39 percent (Carlson et al., 2010).
- The presence of PTSD complicates the diagnosis of mTBI post-injury, as many of the complaints overlap (irritability, depressive symptoms, cognitive difficulties).
- Recent studies of individuals who have persistent symptoms following a mTBI suggest that the presence of PTSD may prolong the duration of symptoms and potentially exacerbate the severity of those symptoms (Brenner et al., 2010).
- Furthermore, PTSD can exacerbate other conditions often reported post-deployment, including pain and headache because of its effects on sleep and the perception of pain.
- Even without the diagnosis of PTSD, high levels of combat stress are associated with a three to eight-fold increase in the rate of reporting of post-concussive symptoms (Cooper et al., 2011).

Depression and mTBI

- Depression is frequently noted in individuals with chronic post-concussion syndrome (Hesdorffer et al, 2009).
- Individuals with mTBI who experience depression post-injury report more symptoms and more severe symptoms than those mTBI patients without depression (Lange et al., 2010).
- This can extend to the perception of other problems, including cognitive problems in individuals with mTBI, with individuals with depression, anxiety and PTSD reporting more problems with cognitive function than other groups (Spencer et al., 2010).
- Depression after mTBI is linked to abnormal imaging results, older age at time of injury, and higher levels of depressive symptoms in the week following injury (Bay, 2009).



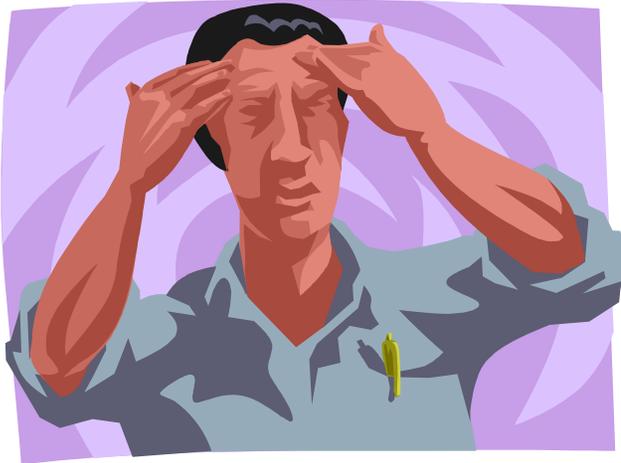
Retrieved from: veteranstoday.com

Pain and mTBI

- A recent meta-analysis that considered veteran populations separately found a 43.1 percent pain prevalence rate (95 percent CI, 39.9 percent - 46.3 percent; Nampiarampil, 2008).
- Though that study found that brain injury has an independent relationship with chronic pain over and above other diagnoses (i.e., PTSD or depression), other reports have demonstrated the contribution of PTSD, insomnia, fatigue, and depression to reports of pain severity (Dobschka et al., 2008).
- In addition, many veterans from the OEF/OIF/OND conflicts present with other injuries, such as amputations, orthopedic injuries, or chronic use injuries, that may have occurred separately from their mTBI. In a population who have multiple injuries, the prevalence of pain reports is generally higher and the pain is rated as more severe in civilian studies (Meerding et al., 2004).

Headache and mTBI

- Headache is the most frequently cited, persistent symptom following mTBI and is often the most disruptive to the individual's functional ability.
- Approximately 90 percent of individuals experience headache following a mTBI (Lew et al., 2006) and they generally develop within seven days of the injury. One third to one-half of individuals with mTBI still report headaches five years after injury (Dobscha et al., 2008).
- Headache origin does not follow only from impact to the head but can arise from trauma to the head or neck including: cervical spinal column, spinal cord, neck musculature (International Headache Society, 2004) .



- Early symptoms of headaches, dizziness, or nausea in the immediate period (e.g., in the Emergency Department) after mTBI have been associated with sustained post-concussion symptoms months after injury (Chamelian & Feinstein, 2004; de Kruijk et al., 2002).

Substance Use Disorder & mTBI



- In general, alcohol and substance use rates decline following brain injury. For example, in a civilian study at a Level I trauma center, the prevalence of substance use disorders went from 41 percent pre-injury to 21 percent post-injury (Whelan-Goodinson et al., 2009).
- In a recently published study of active-duty soldiers with mTBI, there was a slightly higher rate of alcohol abuse in individuals with a comorbid mTBI diagnosis compared to other injuries (6.9 percent v 4.4 percent). However, when other factors were controlled in a multivariate analysis, the relationship was not as strong (Heltemes et al., 2011).
- In civilian brain injury studies, there is an increased risk for increased alcohol or substance use in the presence of a co-occurring mood disorder (Jorge et al., 2005).
- What places an individual with mTBI at potential risk for the development of substance use problems are the cognitive and emotional deficits following the injury, in combination with the presence of poor psychosocial adjustment and coping skills (Graham & Cardon, 2008).

The Challenge

- None of the conditions previously discussed exist in a vacuum.
- Many of the individuals who present to a clinic with these conditions often have a range of psychosocial stressors that need to be considered by the clinician in a post-deployment setting.
 - Job changes, loss, or stresses
 - Home or family discord or stress
 - Difficulties re-adjusting to civilian life and community roles
 - Financial stresses or difficulties
- The challenge for the clinician is to determine appropriate treatment that serves to improve the function of the individual service member or veteran while ensuring appropriate and parsimonious treatment of the symptoms reported.

