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Webinar
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Welcome

A. Kathryn Power, M.Ed.
Regional Administrator, Region I and
Senior Executive Lead on SMVF Populations
Substance Abuse and Mental Health Services Administration (SAMHSA)
Collaboration Across Federal Agencies

U.S. Department of Veterans Affairs (VA) ↔ U.S. Department of Health and Human Services (HHS) ↔ U.S. Department of Defense (DoD)

SAMHSA

Service Members, Veterans, and their Families Technical Assistance Center
SAMHSA’s SMVF TA Center

- Strengthening ongoing collaboration among military and civilian stakeholders
- Providing a centralized mechanism for cities, states, and territories to learn, connect, and share
- Increasing awareness of and access to resources and programs that strengthen behavioral health care systems for SMVF
- Supporting coordinated responses to the behavioral health needs of SMVF
- Encouraging cities, states, and territories to implement promising-, best- and evidence-based practices
Expanded and Strengthened Partnerships

- Center for Mental Health Services (CMHS)
- Center for Substance Abuse Prevention (CSAP)
- Center for Substance Abuse Treatment (CSAT)
- U.S. Department of Veterans Affairs (VA)
Webinar Objectives

• Provide an overview of the research that explores the connection between TBI and behavioral health challenges among service members and veterans
• Review risk factors related to TBI
• Identify alternative approaches to recovery
• Describe steps that providers, families, and peers can take to address interrelated health issues
• Provide suggestions, resources, and best practice approaches that peers and providers can use to support the resilience and recovery of service members and veterans who have experienced TBI and other co-occurring behavioral health disorders
To understand the connection of TBI with other behavioral health issues so we can be sure to identify, screen, treat, and support recovery appropriately.
Lisa A. Brenner, Ph.D.
Director of the Veterans Integrated Service Network (VISN) 19 Mental Illness Research, Education, and Clinical Center (MIRECC)
Professor of Psychiatry, Neurology, and Physical Medicine and Rehabilitation
University of Colorado, Anschutz School of Medicine
Traumatic Brain Injury and Negative Psychiatric Outcomes Among Veterans

Lisa A. Brenner, Ph.D.

Rocky Mountain Mental Illness, Research, Education and Clinical Center (MIRECC)
University of Colorado, Anschutz Medical Campus
Disclaimer

This presentation is based on work supported, in part, by the Department of Veterans Affairs, but does not necessarily represent the views of the Department of Veterans Affairs or the United States Government.
“I think it took awhile before I realized and then when I started thinking about things and realizing that I was going to be like this for the rest of my life, it gives me a really down feeling and it makes me think like—why should I be around like this for the rest of my life?”
Blast Injury
Combat Experiences

Images from DOD: www.defense.gov
Traumatic Brain Injury - A bolt or jolt to the head or a penetrating head injury that disrupts the function of the brain. Not all blows or jolts to the head result in a TBI. The severity of such an injury may range from “mild” (a brief change in mental status or consciousness) to “severe” (an extended period of unconsciousness or amnesia) after the injury.

A TBI can result in short- or long-term problems with independent function.
# Traumatic Brain Injury - Severity

## Table 1. Classification of TBI Severity [3]

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural imaging</td>
<td>Normal</td>
<td>Normal or abnormal</td>
<td>Normal or abnormal</td>
</tr>
<tr>
<td>Loss of Consciousness (LOC)</td>
<td>0-30 min</td>
<td>&gt;30 min and &lt;24 hours</td>
<td>&gt;24 hours</td>
</tr>
<tr>
<td>Alteration of consciousness/ mental state (AOC)*</td>
<td>up to 24 hours</td>
<td>&gt;24 hours; severity based on other criteria</td>
<td></td>
</tr>
<tr>
<td>Posttraumatic amnesia (PTA)</td>
<td>0-1 day</td>
<td>&gt;1 and &lt;7 days</td>
<td>&gt;7 days</td>
</tr>
<tr>
<td>Glasgow Coma Scale (GCS) (best available score in first 24 hours)**</td>
<td>13-15</td>
<td>9-12</td>
<td>&lt;9</td>
</tr>
</tbody>
</table>

*Alteration of mental status must be immediately related to the trauma to the head. Typical symptoms would be looking and feeling dazed and uncertain of what is happening, confusion, and difficulty thinking clearly or responding appropriately to mental status questions, and being unable to describe events immediately before or after the trauma event.

**In April 2015, the DoD released a memorandum recommending against the use of GCS scores to diagnose TBI. See the memorandum for additional information.[3]
DoD Numbers for Traumatic Brain Injury

Worldwide - Totals

2000 - 2018 Q1

- Penetrating: 5,215
- Severe: 4,067
- Moderate: 37,424
- Mild: 315,897
- Not Classifiable: 21,344

Total - All Severities: 383,947

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

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

*Percentages do not add up to 100% due to rounding

2000 - 2018 Q1, as of June 21, 2018

A total of 22.8 percent of soldiers in a BCT returning from Iraq had clinician-confirmed TBI.
Common Mild TBI Symptoms

**NOT** to be confused with the injury itself

TBI is a historical event
Common Mild TBI/Postconcussive Symptoms

- Headache
- Poor concentration
- Memory difficulty
- Irritability
- Fatigue

- Anxiety
- Dizziness
- Light sensitivity
- Sound sensitivity

Immediately post-injury 80 percent to 100 percent describe one or more symptoms.
Most individuals return to baseline functioning within a year.

Ferguson et al. 1999, Carroll et al. 2004; Levin et al. 1987
Ft. Carson: Post-Deployment Data (n = 907)

Currently Symptomatic: Onset of Symptoms (n = 844)

Epidemiology and prognosis of mild traumatic brain injury in returning soldiers
A cohort study

ABSTRACT

Objective: Mild traumatic brain injury (mTBI) concussion is common in returning service members yet limited definitive evidence exists on its prognosis.

Methods: A total of 25,290 non-medicavvally evacuated soldiers returning from Afghanistan or Iraq to 2 military bases between 2009 and 2014 were screened for mTBI. We invited a random sample to participate in the present study, oversampling those screening positive, resulting in 55.7% mTBI cases and 1,353.0 controls of whom 25% in mTBI cases and 25% in controls completed 3-month follow-up evaluations. The criterion measure of screened mTBI was the Ohio State University Traumatic Brain Injury Identification Method. Posttraumatic symptoms (PTS) were measured follow-up with the Neurobehavioral Symptom Inventory. Symptoms reported at severe or very severe level were considered clinically relevant.

Results: About half (47%) of soldiers who had sustained an mTBI during this latest deployment reported PTS at 3-month follow-up vs 25% of controls. Adjusted odds ratio 2.4 (95% CI 1.8-3.3). The most common symptoms reported were headache (32% vs 14%), forgetfulness (21% vs 11%), irritability (11% vs 8%), and hotheadedness (22% vs 15%). mTBI cases were about twice as likely as controls to report receiving rehabilitative services and far poorer overall health. Other predictors of PTS included posttraumatic stress, conduct, and opioid use. A majority of both cases and controls reported traumatic brain injury predicting this latest deployment.

Conclusions: This non-clinical population of recently deployed soldiers, a substantial proportion of those who had sustained an mTBI were symptomatic 3-months postdeployment. Future studies need to continue follow-up to measure symptom resolution.

Keywords: Mild TBI, Neurobehavioral Symptom Inventory, Injury control, mTBI, Traumatic brain injury

Table 2: Prevalence of neurobehavioral symptoms at 3 months by traumatic brain injury (TBI) status at screening interview

<table>
<thead>
<tr>
<th>TBI status at screening interview</th>
<th>Severe/very severe symptoms at 3 months</th>
<th>TBI positive cases (% n= 546)</th>
<th>TBI negative controls (% n= 1363)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe/very severe symptoms</td>
<td>25%</td>
<td>31.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Stirrup</td>
<td>20%</td>
<td>21.5%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Headaches</td>
<td>20%</td>
<td>21.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Sleep problems</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Depression</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
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<tr>
<td>Anger</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Dinner</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Appetite</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Sleep problems</td>
<td>20%</td>
<td>20.0%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Table 3: Three-month outcomes by traumatic brain injury (TBI) status at screening interview

<table>
<thead>
<tr>
<th>TBI status at baseline screening interview</th>
<th>TBI-positive cases classified by baseline PTS status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBI-negative (n = 1363)</td>
<td>TBI-positive (n = 546)</td>
</tr>
<tr>
<td>% AOR*</td>
<td>% AOR*</td>
</tr>
<tr>
<td>8.3</td>
<td>1.6</td>
</tr>
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</table>

Table 4: Three-month outcomes by traumatic brain injury (TBI) status at screening interview

<table>
<thead>
<tr>
<th>TBI status at baseline screening interview</th>
<th>TBI-positive cases classified by baseline PTS status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBI-negative (n = 1363)</td>
<td>TBI-positive (n = 546)</td>
</tr>
<tr>
<td>% AOR*</td>
<td>% AOR*</td>
</tr>
<tr>
<td>8.3</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* Adjusted odds ratio (AOR), adjusted for age, age, sex, military occupational specialties (MOS) combat, noncombat, race (white, black, Hispanic, other/unspecified), rank (E-1-4), E-5-E-7, E-8-E-9, psychiatric level, study site (Fort Carson, Fort Bragg).

**Significant interaction by study site although odds ratio not significant for either site.**

Symptoms from neurobehavioral symptom inventory are scaled from 0 to 4, with severe and very severe symptoms rated as 3 or higher. Limited to participants who completed both the baseline and 3-month screening questionnaires (n = 258, missing/failed PTS scores among TBI cases, number of missing cases for each variable of interest: total symptoms, 37; rehabilitation, 40; health, 16; work problems, 14; received rehabilitative services since last deployment ("Since your last deployment, have you received any rehabilitation (relief) for health or medical problems resulting from your service in the military?"). In general, would you say your health is... excellent/good/good/bad/average/outcome is "fair or poor". Are you better off, about the same, or worse off now than before your first deployment to theater work including employment/school/home management? outcome is worse off.


Implications: The Ohio State University Traumatic Brain Injury Identification Method is a valid tool for identifying mTBI cases. The study highlights the importance of monitoring the long-term sequelae of mTBI on returning soldiers.
Increased Rates of Mental Health Conditions in those with mTBI

1 year post injury:
- 31 percent reported psychiatric disorder
- 22 percent developed new psychiatric disorder

Most common new psychiatric disorders:
- Depression (9 percent)
- Generalized anxiety disorder (9 percent)
- Posttraumatic stress disorder (6 percent)
- Agoraphobia (6 percent)
TBI and Depression
During the first year after TBI, 297 of 559 patients (53.1 percent) met criteria for major depressive disorder (MDD) at least once. The point prevalence of MDD was highest the first month after TBI.
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**Figure Legend:**
Postinjury rate is the proportion of cases ascertained with major depressive disorder for the first time after traumatic brain injury at each assessment. The values underestimate the true rates because not all participants were assessed at each time. Error bars indicate 95 percent confidence intervals.
Minor depression is diagnosis when 2-4 symptoms of depression persist for at least 2 weeks.
“3/4 of those with MDD at year 1 experienced clinically significant symptoms at year 2”

“...for those with depression at year 1 worsening at year 2 was associated with poor social support...pre-injury mental health issues including SA”
TBI and PTSD
Attentional problems
Depression
Irritability
Anxiety
Flashbacks
Nightmares
PTSD
TBI
Dizziness
Headaches
Chronic Pain
Case Example: mTBI and PTSD

- Deployed to Iraq
- Exposed to traumatic stressor

- Sustained mild blast TBI with mTBI symptoms (headache, irritability, etc)
- Diagnosed with PTSD and receives treatment (medication)

- Return to the United States
  - Still experiencing mTBI related symptoms which seem to be getting worse

- Re-deployed to Iraq
- Suicide Attempt

- Screens negative for PTSD

- March 2004
- July 2004
- November 2004
- March 2005
- July 2005
- November 2005
- March 2006
- July 2006
Increased Rates of PTSD in those with Mild TBI

“Patients with mild TBI were twice as likely to develop PTSD [or other anxiety disorders]…”

“Mild traumatic brain injury (i.e., concussion) occurring among soldiers deployed in Iraq is strongly associated with PTSD...”
Increased Symptoms with TBI + PTSD

“In Soldiers with histories of physical injury, mTBI and PTSD were independently associated with post concussive (PC) symptom reporting. Those with both conditions were at greater risk for PC symptoms than those with either PTSD, mTBI, or neither.”
Symptom-Exposure: Any Symptoms (n = 389)

Adjusted for age, gender, education, rank, and MOS

*Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009

Total number of Soldiers (N = 1247)
Symptom-Exposure: Headache (n = 204)

- 1.00
- 2.79
- 4.26
- 5.91

Adjusted a (PR)

No mTBI & no PTSD
Had PTSD but no mTBI
Had mTBI but no PTSD
Had mTBI & PTSD

Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009

Total number of soldiers (n = 1247)
Symptom-Exposure: Dizziness (n = 51)

Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009

Total number of Soldiers (N = 1247)
Symptom-Exposure: Memory Problems (n = 154)

Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009

Total Number of Soldiers (N = 1247)
Symptom-Exposure: Balance Problems (n = 62)

Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009
Symptom-Exposure: Irritability (n = 215)

Adjusted for age, gender, education, rank, and MOS

Brenner et al., 2009
TBI and Substance Abuse
**Binge Drinking**

**Frequent Binge Drinking After Combat-Acquired Traumatic Brain Injury Among Active Duty Military Personnel With a Past Year Combat Deployment**

Rachel Sayko Adams, MPH, MA; Mary Jo Larson, PhD, MPA; John D. Corrigan, PhD; Constance M. Horgan, ScD; Thomas V. Williams, PhD

**Objective:** To determine whether combat-acquired traumatic brain injury (TBI) is associated with postdeployment frequent binge drinking among a random sample of active duty military personnel. **Participants:** Active duty military personnel who returned home within the past year from deployment to a combat theater of operations and completed a survey health assessment (N = 7155). **Methods:** Cross-sectional observational study with multivariate analysis of responses to the 2008 Department of Defense Survey of Health Related Behaviors Among Active Duty Military Personnel, an anonymous, random, population-based assessment of the armed forces. **Main Measures:** Frequent binge drinking: 5 or more drinks on the same occasion, at least once per week, in the past 30 days. TBI-AC: self-reported altered consciousness only; loss of consciousness (LOC) of less than 1 minute (TBI-LOC <1); and LOC of 1 minute or greater (TBI-LOC >1) after combat injury event. **Results:** Of active duty military personnel who had a past year combat deployment, 25.6% were frequent binge drinkers and 13.9% reported experiencing a TBI on the deployment, primarily TBI-AC (7.5%). In regression models adjusting for demographics and positive screen for posttraumatic stress disorder, active duty military personnel with TBI had increased odds of frequent binge drinking compared with those with no injury exposure or without TBI: TBI-AC (adjusted odds ratio, 1.48; 95% confidence interval, 1.18–1.84); TBI-LOC >1 (adjusted odds ratio, 1.67; 95% confidence interval, 1.00–2.79). **Conclusions:** Traumatic brain injury was significantly associated with past month frequent binge drinking after controlling for posttraumatic stress disorder, combat exposure, and other covariates. **Key words:** binge drinking, combat, deployment, military personnel, posttraumatic stress disorder, traumatic brain injury
Prescription Opioid Initiation, Correlates, and Consequences Among a Sample of OEF/OIF Military Personnel

Andrew Golub and Alex S. Bennett

Abstract

Prescription opioid (PO) misuse represents a major health risk for many service members and veterans. This paper examines the pathways to misuse among a sample of US veterans who recently returned from Iraq and Afghanistan to low-income, predominately minority sections of New York City. Recreational PO misuse was not common on deployment. Most PO misusers initiated use subsequent to PO use for pain management, an iatrogenic pathway. However, most PO users did not misuse them. Veterans that misused POs were more likely to have other reintegration problems including drug and alcohol use disorders, traumatic brain injury (TBI), unemployment, and homelessness.

Keywords: drug use disorder, minority, pain management, military personnel, veterans, reintegration, mental health
Over 90 percent of participants had a psychiatric and/or behavioral condition, with approximately half presenting with greater than 3 conditions.

Exploratory factor analysis revealed 4 clinically relevant psychiatric and behavioral factors which accounted for 76.9 percent of the variance: (a) depression, PTSD, and military mTBI (deployment trauma factor); (b) pain and sleep (somatic factor); (c) anxiety disorders, other than PTSD (anxiety factor); and (d) substance abuse or dependence (substance use factor).

Individuals with the conditions comprising the deployment trauma factor were more likely to be substantially disabled than individuals with depression and PTSD, but no military mTBI, OR = 3.52; 95 percent CI [1.09, 11.37].

Depression, PTSD, and a history of military mTBI may comprise an especially harmful combination associated with high risk for substantial disability.
TBI and Suicide - Articles in Medline (1985 to 2014)
Seminal Article - Teasdale and Engberg 2001

Individuals with concussions (n=126,114)
Individuals with cranial fracture (n=7,560)
Individuals with cerebral contusion or intracranial hemorrhage (n=11,766)

“Standardized mortality rates, stratified by sex and age, showed that the incidence of suicide among the three groups was increased relative to the general population (3.0, 2.7, 4.1 respectively).”

“The risk of suicide is constant, continuing for at least the maximum of 15 years follow-up.”
Suicide and TBI in Veterans

Individuals who received care between FY 01 and 06

Analyses included all patients with a history of TBI (n = 49,626) plus a 5 percent random sample of patients without TBI (n = 389,053)

Suicide - National Death Index (NDI) compiles death record data for all US residents from state vital statistics offices

TBI diagnoses of interest were similar to those used by Teasdale and Engberg

Challenges associated with this type of research and need for collaboration (~8 million records reviewed)
Suicide and TBI in Veterans

ICD-9 codes:
1) concussion (850), cranial fracture—fracture of vault of skull (800), fracture of base of skull (801), and other and unqualified skull fractures (803)
2) cerebral laceration and contusion (851); subarachnoid, subdural, and extradural hemorrhage after injury (852); other and unspecified intracranial hemorrhage after injury (853); and intracranial injury of other and unspecified nature (854).

Cox proportional hazards survival models for time to suicide, with time-dependent covariates, were utilized. Covariance sandwich estimators were used to adjust for the clustered nature of the data, with patients nested within VHA facilities.
<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>All</th>
<th></th>
<th>Those who died by suicide</th>
<th></th>
<th>Those who did not die by suicide</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Col%</td>
<td>N</td>
<td>Col%</td>
<td>N</td>
<td>Col%</td>
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<tr>
<td>VHA users with any TBI (combined)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>All</td>
<td>49,626</td>
<td>100</td>
<td>105</td>
<td>100</td>
<td>49,521</td>
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<td>30.48</td>
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<td>Bipolar I/II</td>
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<td>4.56</td>
<td>10</td>
<td>9.52</td>
<td>2,255</td>
<td>4.55</td>
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<td>4,464</td>
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<td>24</td>
<td>22.86</td>
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<td>8.97</td>
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<td>Other depression, no MDD</td>
<td>7,616</td>
<td>15.38</td>
<td>23</td>
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<tr>
<td>Other anxiety</td>
<td>4,326</td>
<td>8.72</td>
<td>16</td>
<td>15.24</td>
<td>4,310</td>
<td>8.7</td>
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<td>PTSD</td>
<td>4,880</td>
<td>9.83</td>
<td>23</td>
<td>21.9</td>
<td>4,887</td>
<td>9.81</td>
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<tr>
<td>Schizophrenia/schizoaffective disorder</td>
<td>2,287</td>
<td>4.61</td>
<td>6</td>
<td>5.71</td>
<td>2,281</td>
<td>4.61</td>
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<tr>
<td>VHA users with concussional/fracture</td>
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<tr>
<td>All</td>
<td>12,159</td>
<td>100</td>
<td>33</td>
<td>100</td>
<td>12,126</td>
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<td>2,087</td>
<td>17.16</td>
<td>9</td>
<td>27.27</td>
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<td>588</td>
<td>4.84</td>
<td>2</td>
<td>6.06</td>
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<td>MDD</td>
<td>1,198</td>
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<td>Other depression, no MDD</td>
<td>1,831</td>
<td>15.06</td>
<td>7</td>
<td>21.21</td>
<td>1,825</td>
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<td>Other anxiety</td>
<td>1,148</td>
<td>9.44</td>
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<td>21.21</td>
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<td>PTSD</td>
<td>1,376</td>
<td>11.32</td>
<td>7</td>
<td>21.21</td>
<td>1,369</td>
<td>11.29</td>
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<tr>
<td>Schizophrenia/schizoaffective disorder</td>
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<td>4.27</td>
<td>1</td>
<td>3.03</td>
<td>518</td>
<td>4.27</td>
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<tr>
<td>VHA users with cerebro-</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>contusion/duralamic intracranial hemorrhage</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>All</td>
<td>39,545</td>
<td>100</td>
<td>79</td>
<td>100</td>
<td>39,467</td>
<td>100</td>
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<tr>
<td>Substance abuse</td>
<td>6,728</td>
<td>17.01</td>
<td>25</td>
<td>32.05</td>
<td>6,703</td>
<td>16.98</td>
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<tr>
<td>Bipolar I/II</td>
<td>1,802</td>
<td>4.56</td>
<td>8</td>
<td>10.26</td>
<td>1,794</td>
<td>4.55</td>
</tr>
<tr>
<td>MDD</td>
<td>3,490</td>
<td>8.83</td>
<td>17</td>
<td>21.79</td>
<td>3,473</td>
<td>8.81</td>
</tr>
<tr>
<td>Other depression, no MDD</td>
<td>6,142</td>
<td>15.53</td>
<td>11</td>
<td>14.1</td>
<td>6,130</td>
<td>15.52</td>
</tr>
<tr>
<td>Other anxiety</td>
<td>3,377</td>
<td>8.54</td>
<td>11</td>
<td>14.1</td>
<td>3,366</td>
<td>8.53</td>
</tr>
<tr>
<td>PTSD</td>
<td>3,757</td>
<td>9.51</td>
<td>17</td>
<td>21.79</td>
<td>3,740</td>
<td>9.48</td>
</tr>
<tr>
<td>Schizophrenia/schizoaffective disorder</td>
<td>1,869</td>
<td>4.73</td>
<td>5</td>
<td>6.41</td>
<td>1,864</td>
<td>4.72</td>
</tr>
</tbody>
</table>
Strategies for Intervention
Universal preventive interventions take the broadest approach, targeting “the general public or a whole population that has not been identified on the basis of individual risk” (O’Connell, 2009). Universal prevention interventions might target schools, whole communities, or workplaces.

Selective preventive interventions target “individuals or a population sub-group whose risk of developing mental disorders [or substance abuse disorders] is significantly higher than average”, prior to the diagnosis of a disorder (O’Connell, 2009). Selective interventions target biological, psychological, or social risk factors that are more prominent among high-risk groups than among the wider population.

Indicated preventive interventions target “high-risk individuals who are identified as having minimal but detectable signs or symptoms foreshadowing mental, emotional, or behavioral disorder” prior to the diagnosis of a disorder (IOM, 2009). Interventions focus on the immediate risk and protective factors present in the environments surrounding individuals.
SPECIAL COMMUNICATION

Traumatic Brain Injury as a Chronic Health Condition

John D. Corrigan, PhD,a,⁎ Flora M. Hammond, MD,b,⁎

From the aDepartment of Physical Medicine and Rehabilitation, Wexner Medical Center at The Ohio State University, Columbus, OH; and bDepartment of Physical Medicine and Rehabilitation, Indiana University School of Medicine, and the Rehabilitation Hospital of Indiana, Indianapolis, IN.

Abstract
Growing evidence indicates that multiple types of brain injury, including traumatic brain injury, are dynamic conditions that continue to change years after onset. For a subset of individuals who incur these injuries, decline occurs over time and is likely due to progressive neurodegenerative processes, comorbid conditions, aging, behavioral choices, and/or psychosocial factors. Demonstration, whether directly or indirectly associated with the original brain injury, necessitates a clinical approach as a chronic health condition, including identification of risk and protective factors, protocols for early identification, evidence-based preventive and ameliorative treatment, and training in self-management. We propose that the acknowledgment of chronic brain injury will facilitate the research necessary to provide a disease management approach.

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Treatment for Depression after Traumatic Brain Injury: A Systematic Review

Jesse R. Fann, Tessa Hart, and Katherine G. Schomer

This systematic review differs from prior reviews of interventions for TBI (Alderfer et al., 2015; Warden et al., 2006), in that it systematically examines the evidence for the efficacy of both biological and psychosocial interventions on depression outcomes specifically. Although the data on the treatment of depression following TBI have grown over the past decade, the paucity of adequately powered and controlled studies, including randomized controlled trials, limits the ability to establish evidence-based treatment guidelines. Among the 27 studies meeting criteria for inclusion in this review, there were only two evidence class I studies and four evidence class II studies. Only two of the class I or II studies included depression as an inclusion criterion for study entry (Ashman et al., 2009; Lee et al., 2005). The class I pharmacotherapy study (Ashman et al., 2009) showed trends toward superiority of sertraline over placebo in a demographically heterogeneous sample that was temporally far removed from their TBI, but was underpowered to examine predictors of response. The class I psychosocial study (Powell et al., 2002) demonstrated improvements in general psychological well-being, but not depressive symptoms specifically, following a comprehensive, community based, interdisciplinary team intervention targeted to multiple outcomes. The class II studies spanned modalities from pharmacotherapy (Lee et al., 2005) to psychotherapy (Tiersky et al., 2005) to alternative approaches such as biofeedback (Schoenberger et al., 2001) and meditation (McMillan, 2002). While none of these studies provided sufficient evidence for practice guidelines, taken together they do indicate that well-controlled studies are beginning to be applied to the problem of depression after TBI.
Hopelessness - strong risk factor for suicide among non-brain injured cohorts with greater predictive power than depression

35 percent of those with TBI endorsed moderate to severe hopelessness between 1 and 10 years post-injury
Suicide Prevention After Traumatic Brain Injury: A Randomized Controlled Trial of a Program for the Psychological Treatment of Hopelessness

Grahame K. Simpson, PhD; Ralyn L. Tate, PhD; Diane L. Whiting MPychol (Clinical); Rachel E. Cotter, BA (Hons) (Psychol)

10 Session Small group intervention

Beck Hopelessness Scale (BHS)
<table>
<thead>
<tr>
<th>Session</th>
<th>Therapeutic Principle</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting started</td>
<td>Group formation</td>
<td>Group participants meet, introduce program theme</td>
</tr>
<tr>
<td>2. Living a positive lifestyle</td>
<td>Behavioral activation</td>
<td>Examine relationship between affect and lifestyle factors</td>
</tr>
<tr>
<td>3. Thoughts and feelings</td>
<td>Socialization to CBT</td>
<td>Learn about the relationship between thoughts and feelings</td>
</tr>
<tr>
<td>4,5. Take another look</td>
<td>Cognitive restructuring</td>
<td>How cognitive restructuring can ameliorate distress</td>
</tr>
<tr>
<td>6,7. Problem-solving</td>
<td>Problem-solving</td>
<td>To develop a systematic approach to solving problems</td>
</tr>
<tr>
<td>8. Problem-solving and recovery</td>
<td>Compensatory techniques</td>
<td>To develop skills to facilitate adjustment to the extent of post-injury recovery</td>
</tr>
</tbody>
</table>
### Positive Lifestyle – EASE
- Eating
- Activity
- Sleep
- Exercise

### Take Another Look
**Cognitive Restructuring**
- Stop
- Drop
- Roll

### How to be a STAR
**Problem Solving**
- Spot the problem
- Think of options
- Act on best option
- Review how it went

### Building Hope
**Post Traumatic Growth**
- Self-esteem/ value
- Finding connection
- Sense of purpose
- Expect good things
Window to Hope: A Randomized Controlled Trial of a Psychological Intervention for the Treatment of Hopelessness Among Veterans With Moderate to Severe Traumatic Brain Injury

Lisa A. Bremner, PhD; Jeri E. Forster, PhD; Adam S. Hoffsberg, MHS; Bridget B. Meiarazzo, PsyD; Trisha A. Hostetter, MPH; Gina Signorecci, PhD; Graham E. Simpson, PhD

Objective: To evaluate the efficacy of a psychological intervention to reduce moderate to severe hopelessness among Veterans with moderate to severe traumatic brain injury (TBI). Design: Two-arm parallel groups, controlled, randomized crossover trial, with 3-months follow-up for those initially allocated to treatment. Participants were randomly allocated in blocks of 4 on a 1:1 ratio to treatment (n = 15) or waitlist (n = 20). Setting: A Veteran Affairs Medical Center. Participants: Veterans between the ages of 26 and 65 years, with a history of moderate to severe TBI and moderate to severe hopelessness. Interventions: A 20-hour manualized small group cognitive-behavioral intervention. Main Outcome Measure: Beck Hopelessness Scale (primary), Beck Depression Inventory, and Beck Scale for Suicide Ideation. Results: A significant difference between groups was found for postintervention scores on the Beck Hopelessness Scale (P = .03). Significant decreases were maintained at follow-up. For those initially allocated to the waitlist group who completed the intervention, treatment gains were noted in decreased hopelessness (P = .01) and depression (P = .002). Conclusions: Findings from this trial provide additional support for the efficacy of this method of psychological treatment of hopelessness among individuals with moderate to severe TBI. Keywords: cognitive-behavior therapy, depression, hopelessness, randomized controlled trial, replication, suicide ideation, suicide prevention, traumatic brain injury, Veterans.
### VA Window to Hope – Participant Characteristics

*Table showing participant characteristics and their statistical analysis.*

<table>
<thead>
<tr>
<th>Demographic and military</th>
<th>Initially allocated to waitlist (n = 20)</th>
<th>Initially allocated to WtHII (n = 15)</th>
<th>Fisher exact P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>54.6 (8.8)</td>
<td>47.7 (12.1)</td>
<td>.08</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19 (95%)</td>
<td>13 (87%)</td>
<td>.71</td>
</tr>
<tr>
<td>Female</td>
<td>1 (5%)</td>
<td>1 (7%)</td>
<td></td>
</tr>
<tr>
<td>Transgender</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>10 (53%)</td>
<td>11 (73%)</td>
<td>.30</td>
</tr>
<tr>
<td>Other</td>
<td>5 (27%)</td>
<td>4 (27%)</td>
<td>.95</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>6 (32%)</td>
<td>6 (40%)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>4 (21%)</td>
<td>3 (20%)</td>
<td></td>
</tr>
<tr>
<td>Cohabiting</td>
<td>1 (5%)</td>
<td>1 (7%)</td>
<td></td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>6 (32%)</td>
<td>7 (47%)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th-12th grade/no diploma or HS diploma or equivalent</td>
<td>4 (20%)</td>
<td>2 (13%)</td>
<td>.007</td>
</tr>
<tr>
<td>Some college or associate degree</td>
<td>16 (80%)</td>
<td>7 (47%)</td>
<td></td>
</tr>
<tr>
<td>Bachelor, graduate, or professional degree</td>
<td>1 (5%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>1 (6%)</td>
<td>0 (0%)</td>
<td>.83</td>
</tr>
<tr>
<td>Part-time or not employed</td>
<td>13 (67%)</td>
<td>11 (73%)</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>5 (25%)</td>
<td>3 (21%)</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>2 (10%)</td>
<td>1 (7%)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>Branch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Army</td>
<td>7 (35%)</td>
<td>7 (47%)</td>
<td>.33</td>
</tr>
<tr>
<td>Air force</td>
<td>5 (25%)</td>
<td>4 (27%)</td>
<td></td>
</tr>
<tr>
<td>Navy</td>
<td>3 (15%)</td>
<td>1 (7%)</td>
<td></td>
</tr>
<tr>
<td>Marines</td>
<td>6 (32%)</td>
<td>1 (7%)</td>
<td></td>
</tr>
<tr>
<td>Multiple</td>
<td>1 (5%)</td>
<td>3 (20%)</td>
<td></td>
</tr>
<tr>
<td>Deployed</td>
<td>9 (45%)</td>
<td>12 (80%)</td>
<td>.25</td>
</tr>
<tr>
<td>Combat</td>
<td>4 (20%)</td>
<td>9 (60%)</td>
<td>.03</td>
</tr>
<tr>
<td>Months in the military</td>
<td>88.6 (31.3)</td>
<td>126.1 (104.4)</td>
<td>.09</td>
</tr>
<tr>
<td>Unique episodes of homelessness</td>
<td>0.08 (1.5)</td>
<td>0.06 (0.60)</td>
<td>.81</td>
</tr>
</tbody>
</table>

**Legend:**
- HS: high school
- WtHII: Window to Hope
- *P:* Fisher exact P value

**Notes:**
- *P* < .10 is significant (*P* < .05 is generally considered significant).
- *n* = 10 waitlist, *n* = 14 WtHII.

---

**Moderate to Severe TBI**

**Greater than 9 on the Beck Hopelessness Scale**
VA Window to Hope – Clinical Characteristics

<table>
<thead>
<tr>
<th>Clinical variables</th>
<th>Initially allocated to waitlist (n = 20)</th>
<th>Initially allocated to WtHoH (n = 16)</th>
<th>Fisher exact test ( P ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifetime mood disorder</td>
<td>19 (95%)</td>
<td>15 (100%)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>Lifetime anxiety disorder</td>
<td>18 (90%)</td>
<td>12 (75%)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>Lifetime alcohol or substance dependence or abuse</td>
<td>4 (20%)</td>
<td>2 (13%)</td>
<td>.88</td>
</tr>
<tr>
<td>Lifetime PTSD</td>
<td>7 (35%)</td>
<td>6 (38%)</td>
<td>.32</td>
</tr>
<tr>
<td>Lifetime psychotic disorder</td>
<td>2 (10%)</td>
<td>2 (13%)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>History of a suicide attempt</td>
<td>10 (50%)</td>
<td>6 (38%)</td>
<td>.49</td>
</tr>
<tr>
<td>BHS</td>
<td>14.0 (3.1)</td>
<td>15.2 (5.2)</td>
<td>.34</td>
</tr>
<tr>
<td>BDI</td>
<td>26.4 (6.4)</td>
<td>37.6 (11.6)</td>
<td>.01*</td>
</tr>
<tr>
<td>BSS</td>
<td>4.6 (5.5)</td>
<td>5.6 (8.8)</td>
<td>.89*</td>
</tr>
</tbody>
</table>

### BHS Score (20 items)
- **Range**: 0 - 3
  - **Minimal**: 0 - 3
  - **Mild**: 4 - 8
  - **Moderate**: 9 - 14
  - **Severe**: 15 - 20

### BDI Score (21 items)
- **Range**: 0 - 9
  - **Minimal**: 0 - 9
  - **Mild**: 10 - 16
  - **Moderate**: 17 - 29
  - **Severe**: 30 - 63

### BSS Score (19 item)
All items rated on a 3-point scale; scores range from 0-48; non-zero score is notable

---

**Abbreviations**: BDI, Beck Depression Inventory; BHS, Beck Hopelessness Scale; BSS, Beck Scale for Suicidal Ideation; PTSD, posttraumatic stress disorder; WtHoH, Window to Hope.
*Wisconsin rank sum test.

---

**Part 1**

1. I have no desire to kill myself.
2. I have no wish to die.
3. My reasons for living outweigh my reasons for dying.

**Part 2**

4. I have a moderate to strong wish to live.
5. I have a weak wish to live.

---

**Notes**

- If you have used the past statements in both Groups A and B, then you belong to Group A.
- If you have only used the past statements in Group A, then you belong to Group B.
- If you have only used the past statements in Group B, then you belong to Group C.
Primary Outcome – Hopelessness

Statistically vs. Clinically Significant

<table>
<thead>
<tr>
<th>Score</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>Minimal</td>
</tr>
<tr>
<td>4-8</td>
<td>Mild</td>
</tr>
<tr>
<td>9-14</td>
<td>Moderate</td>
</tr>
<tr>
<td>15-20</td>
<td>Severe</td>
</tr>
</tbody>
</table>
Objective: To examine the relationship between executive dysfunction, as a multidimensional construct (i.e., decision making, impulsivity, aggression, and concept formation) and suicide attempts.

Design: Observational, 2x2 factorial design

Setting: Veterans Health Administration

Participants: 133 (No SA No TBI: n=48, No SA Yes TBI: n=51, Yes SA No TBI: n = 12, Yes SA Yes TBI: n = 22).

Main Outcome Measures: Iowa Gambling Test (IGT), Immediate and Delayed Memory Test (IMT/DMT), State Trait Anger Expression Inventory (STAXI-2), Wisconsin Card Sorting Test (WCST)
TBI-related sequelae (e.g., cognitive deficits, feelings of hopelessness) may lead to difficulty finding solutions when faced with stressful life events. Resulting distress further impairs problem-solving abilities. When successful solutions cannot be found, suicide may appear to be the only option.
Problem Solving: Therapy Strategies (Emotional regulation & planful problem solving skills)

Creating an Action Plan

Veterans’ Version

Lisa Brenner, PhD, ABPP (Rp)
with Beeta Homaifar, PhD
Lindsey Monteith, PhD
Sean Barnes, PhD
Adam Hoffberg, MHS
Georgia Gerard, LCSW

Facilitate Safety Planning (Action Plan)
### Problem Solving Therapy for Suicide Prevention Session Topics

<table>
<thead>
<tr>
<th>Session</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction to problem solving</td>
<td>Introduce group members, present PST overview</td>
</tr>
<tr>
<td>2. Recognizing and identifying triggers, warning signs &amp; crises</td>
<td>Learn about crises and triggers, learn warning signs can lead to a crisis</td>
</tr>
<tr>
<td>3. Problem solving steps</td>
<td>Learn specific steps to solving a problem (ABCDEFF)</td>
</tr>
<tr>
<td>4. PASTA: A strategy to help with triggers &amp; warning signs</td>
<td>Learn techniques to handle stress when feeling triggered</td>
</tr>
<tr>
<td>5. Unhelpful thinking &amp; problem solving</td>
<td>Learn to identify unhelpful thoughts that make it hard to problem solve</td>
</tr>
<tr>
<td>6. Thoughts are thoughts</td>
<td>Learn strategies to lessen impact of unhelpful thoughts and ways to come up with more helpful thoughts</td>
</tr>
<tr>
<td>7. Assessing and brainstorming</td>
<td>Learn to clarify the problem and brainstorm solutions</td>
</tr>
<tr>
<td>8. Consider and choose: Pros &amp; cons of each solution</td>
<td>Learn to evaluate pros &amp; cons and choose a solution</td>
</tr>
<tr>
<td>9. Developing &amp; evaluating SMART problem solving plans</td>
<td>Learn to develop a SMART plan to understand what is needed to solve the problem</td>
</tr>
<tr>
<td>10. Fight on!</td>
<td>Review take-away messages from past classes</td>
</tr>
</tbody>
</table>

*Note. PST = problem solving therapy*
Problem Solving Ability

Problem solving ability withstands everyday stress

When stress increases, the ability to solve problems can fail

Problem Solving Ability

If you apply the skills you learn in this class – your ability to cope with stress will increase
Assessed for eligibility (n=85)

Excluded (n=68)
- Not meeting inclusion criteria (n=68)
- Other reasons - unable to contact (n=2)

Enrollment

Time 1 Baseline Assessment (n=17)

- Lost to follow-up, did not complete baseline (n=1)

Allocation

Assigned to intervention (PST-SP) (n=16)
- Received ≥50% of PST-SP sessions (n=13)
- Did not receive ≥50% of PST-SP sessions (n=3)
  - Did not attend any sessions (n=2)
  - Dropped out after 3 sessions (n=1)

Follow-Up

- Completed follow-up assessment (n=13)
- Dropped out of follow-up (n=3)
  - Reasons: No contact (n=3)

Analysis

- Baseline analyzed (n=14)
- Baseline not analyzed (n=2)
  - Did not attend any sessions (n=2)
- Follow-up analyzed (n=13)
- Follow-up not analyzed (n=3)
  - Did not complete follow-up assessment (n=3)
### Client Satisfaction: CSQ-8

<table>
<thead>
<tr>
<th>Item</th>
<th>Anchors</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Service</td>
<td>Excellent (4) to Poor (1)</td>
<td>3.8</td>
<td>0.37</td>
<td>4.0</td>
<td>3-4</td>
</tr>
<tr>
<td>Kind of Service</td>
<td>Yes, Definitely (4) to Definitely Not (1)</td>
<td>3.4</td>
<td>0.87</td>
<td>4.0</td>
<td>1-4</td>
</tr>
<tr>
<td>Needs Met</td>
<td>Almost All (4) to None (1)</td>
<td>3.2</td>
<td>0.69</td>
<td>3.0</td>
<td>2-4</td>
</tr>
<tr>
<td>Recommend to a Friend</td>
<td>Yes, Definitely (4) to Definitely Not (1)</td>
<td>3.7</td>
<td>0.63</td>
<td>4.0</td>
<td>2-4</td>
</tr>
<tr>
<td>Help Satisfaction</td>
<td>Very Satisfied (4) to Quite Dissatisfied (1)</td>
<td>3.3</td>
<td>1.11</td>
<td>4.0</td>
<td>1-4</td>
</tr>
<tr>
<td>Deal with Problems</td>
<td>Great Deal (4) to Make Things Worse (1)</td>
<td>3.5</td>
<td>0.66</td>
<td>4.0</td>
<td>2-4</td>
</tr>
<tr>
<td>Overall Satisfaction</td>
<td>Very Satisfied (4) to Quite Dissatisfied (1)</td>
<td>3.3</td>
<td>1.11</td>
<td>4.0</td>
<td>1-4</td>
</tr>
<tr>
<td>Return to Program</td>
<td>Yes, Definitely (4) to Definitely Not (1)</td>
<td>3.7</td>
<td>0.63</td>
<td>4.0</td>
<td>2-4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27.8</td>
<td>4.78</td>
<td>29.0</td>
<td>14-32</td>
</tr>
</tbody>
</table>
Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury: Generalization of Prolonged-Exposure PTSD Treatment Outcomes to Postconcussive Symptoms, Cognition, and Self-Efficacy in Veterans and Active Duty Service Members

Gregory K. Wolf, PsyD; Gregory J. Mauzestel, PsyD; Tracy Kretzmer, PhD; Eric Crawford, PhD; Christina Thors, PhD; Thad Q. Strom, PhD; Rodney D. Vanderploeg, PhD

Objectives: To examine (a) generalization of the effectiveness of prolonged exposure (PE) therapy for posttraumatic stress disorder (PTSD) in improving postconcussive symptoms (PCSs) and other outcomes in military service members and Veterans (VA) with histories of mild to severe traumatic brain injury (TBI), and (b) factors associated with PCS reduction. Setting: VA polytrauma medical center. Participants: Consecutive referrals for PTSD treatment of Active Duty (n = 17) or Veterans (n = 27) diagnosed with PTSD and TBI (N = 44). Main Outcome Measures: Neurobehavioral Symptom Inventory, Key Behavior Change Inventory, Self-Efficacy for Symptom Management, Posttraumatic Stress Disorder Checklist, and Beck Depression Inventory. Second edition. Design: Post hoc analysis of archival clinical effectiveness program evaluation data. Interventions: PE for PTSD. Results: There were significant improvements on all outcome measures with large effect sizes (Cohen’s d ranging from 0.68 to 2.02). Improvement on PCS (Cohen’s d = 1.21) was associated with lower levels of VA service-connected disability and PE treatment completion. Conclusions: PE treatment-related improvements for participants with comorbid PTSD and TBI generalize from PTSD outcomes to PCS and other TBI-related outcomes. Positive outcomes were independent of TBI severity, treatment setting, or Veteran status, but dependent upon PE treatment completion and lower levels of VA service-connected disability. Key words: concussion, postconcussive syndrome, postdeployment, posttraumatic stress disorder, rehabilitation, traumatic brain injury, Veterans

| Table 2 | NSI, KBCI, and self-efficacy treatment outcomes
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Pre Mean (SD)</td>
<td>Post Mean (SD)</td>
<td>Cohen’s d</td>
</tr>
<tr>
<td>NSI total score</td>
<td>44</td>
<td>48.32 (12.30)</td>
<td>33.88 (19.63)</td>
<td>1.21*</td>
</tr>
<tr>
<td>NSI effective</td>
<td>44</td>
<td>16.57 (5.94)</td>
<td>10.34 (5.59)</td>
<td>1.07*</td>
</tr>
<tr>
<td>Cognitive</td>
<td>44</td>
<td>10.64 (3.27)</td>
<td>6.05 (4.26)</td>
<td>1.03*</td>
</tr>
<tr>
<td>Somatoform</td>
<td>44</td>
<td>12.91 (4.47)</td>
<td>10.02 (5.93)</td>
<td>0.68*</td>
</tr>
<tr>
<td>Vestibular</td>
<td>44</td>
<td>4.72 (2.54)</td>
<td>3.59 (4.43)</td>
<td>0.68*</td>
</tr>
<tr>
<td>KBCI average T score</td>
<td>28</td>
<td>44.07 (18.80)</td>
<td>27.72 (17.92)</td>
<td>1.57*</td>
</tr>
<tr>
<td>KBCI depression</td>
<td>28</td>
<td>76.46 (11.35)</td>
<td>64.85 (12.73)</td>
<td>0.85*</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>29</td>
<td>65.75 (11.02)</td>
<td>57.54 (8.59)</td>
<td>1.14*</td>
</tr>
<tr>
<td>Apathy</td>
<td>29</td>
<td>69.91 (11.48)</td>
<td>58.17 (10.00)</td>
<td>1.12*</td>
</tr>
<tr>
<td>Unawareness</td>
<td>28</td>
<td>61.93 (5.54)</td>
<td>50.02 (8.84)</td>
<td>0.78*</td>
</tr>
<tr>
<td>Interpersonal difficulties</td>
<td>28</td>
<td>64.71 (5.58)</td>
<td>54.88 (6.19)</td>
<td>1.14*</td>
</tr>
<tr>
<td>Communication problems</td>
<td>29</td>
<td>64.13 (11.42)</td>
<td>58.60 (10.88)</td>
<td>0.75*</td>
</tr>
<tr>
<td>Emotional adjustment</td>
<td>28</td>
<td>66.88 (8.21)</td>
<td>55.99 (7.81)</td>
<td>1.46*</td>
</tr>
<tr>
<td>Somatic concerns</td>
<td>28</td>
<td>65.51 (3.36)</td>
<td>56.58 (10.29)</td>
<td>1.04*</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>29</td>
<td>57.59 (17.64)</td>
<td>48.36 (23.68)</td>
<td>2.02*</td>
</tr>
</tbody>
</table>

Abbreviations: KBCI, Key Behavior Change Inventory; NSI, Neurobehavioral Symptom Inventory; SD, standard deviation.

*All those who had KBCI and self-efficacy data completed prolonged exposure treatment. These 2 measures were added after the study began.

P < .001.

NSI subscales were based on Vanderploeg et al. (2006)
Research Study: Yoga-Based Treatment for Veterans with mTBI and Post-Concussive Headaches

It is well known that military personnel are returning from recent conflicts with notable rates of mild traumatic brain injury (mTBI) and associated persistent post-concussive symptoms (PCS), including headaches and emotional distress. Such symptoms can negatively impact the performance of those on Active Duty, throughout deployment, in and post-combat, as well as following discharge (Veterans). Because of these far-reaching effects, mTBI and associated comorbidities pose a significant challenge and burden to Service Members/Veterans, their families, the Department of Defense (DoD), and the Veterans Health Administration (VHA), and local, regional and national resources including, health care, educational, and vocational systems.

Optimally, an intervention for those with chronic post-concussive headaches (PCH) would show efficacy at reversing post-mTBI adversity, and be able to be utilized with minimal stigma. In addition, the intervention should be highly accessible, low cost, be able to be self-sustaining (e.g., portable) and with minimal side effects.

One potential intervention is yoga, a practice involving physical postures, breath awareness and exercises, and mindfulness meditation.

As such, the goal of this study is to learn more about a yoga-based treatment for Veterans with mTBI and Post-Concussive Headaches.
Rocky Mountain MIRECC TBI Toolkit

https://www.mirecc.va.gov/visn19/tbi_toolkit/
Mental Health and TBI

Jump to: Substance Misuse/Abuse | Depression | Posttraumatic Stress Disorder (PTSD) | References

Co-Occurring Mental Health Disorders

The relationship and co-occurrence of mental health issues, substance use disorders, and TBI is well-documented (Corrigan and Deutschle, 2008). While assessment and treatment of TBI frequently focus on physical or cognitive impairment, psychological and psychosocial difficulties account for causes of disability (NIH Consensus Development Panel on Rehabilitation of Persons with TBI, 1999). Premorbid psychiatric symptoms may impair an individual’s cognitive and psychosocial functioning (Rapoport, McCullagh, Streiner, and Feinstein, 2003; Rosenthal, Christensen, and Ross, 1998) and may be further exacerbated post injury. It may be helpful for clinicians to discuss if and how the individual’s TBI history and associated symptoms are impacting co-occurring problems. While there are many co-occurring mental health concerns among Veterans with TBI history, we will focus specifically on substance misuse/abuse, depression, and post-traumatic stress disorder (PTSD).

To learn more about Veteran mental health and TBI, view the RAND Corporation’s report: “Invisible Wounds: Mental Health and Cognitive Care Needs of America’s Returning Veterans”
Military/Veteran Culture

Understanding Military culture is an essential component to working with Veterans and Active Duty Personnel. This section offers introductory information regarding Military structure along with links to help civilian community providers better understand Military culture.

Basics of the United States Military can also be found at this link.
“...talk to a professional. That's why you guys are here professionally trained to deal with people with my problem or problems like I have, you know...Left to myself, I'd probably kill myself. But that didn't feel right so I turned to professionals, you guys.”
Many thanks to our funders and collaborators

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@RMIRECC
@LisaABrenner
Gregory Ayotte
Director of Consumer Services
Brain Injury Association of America (BIAA)
Brain Injury and Substance Abuse
Vision

Everyone in the U.S. who sustains a brain injury is diagnosed, treated, and accepted.

Mission

Advance awareness, research, treatment, and education to improve the quality of life for all people affected by brain injury.
Challenges

Access to the Right Care

How much rehabilitation should an adult with moderate to severe BI receive, in what setting, and at what point(s) after injury?
We receive requests from all over the country. It does not matter which state a person lives in the challenges are similar:

- Reduced time for rehab, regardless of the funding source
- Limited access to appropriate service
- Limited time staff have to educate families
- Family stress – managing care, jobs, dealing with insurance, recovery and more
- Transition from one care setting to another can be challenging
What is BIAA Doing?

• Guidelines project to help shape care in post acute world
• Education for families through website and 800 line (800-444-6443)
• Continuing education of professionals in the field through ACBIS certification program
• Federal Advocacy efforts for increased funding for research and services
Substance Use and TBI: A SynapShot from OVC

See also Substance Use Materials from OVC

- The Problem of Substance Use and TBI
  1. Who is at risk for developing a substance abuse problem after TBI?
  2. How many people who have traumatic brain injuries are intoxicated at the time of injury?
  3. How common is a history of substance abuse before the injury?
  4. How common is TBI among persons receiving substance abuse treatment?

- The Effects of Substance Use and TBI
  1. How does substance abuse affect a person who has had a traumatic brain injury?
  2. How is the brain affected?
  3. How much alcohol or other drugs is it safe to consume after brain injury?

- Treatment for Substance Use with TBI
  1. Are there treatment approaches that have been proven effective for people with traumatic brain injury?
  2. How can existing substance abuse services be adapted for people with traumatic brain injury?
Brain Injury is a long term issue. We receive calls from one week to 20+ years after an injury.

HOW LONG AFTER AN INJURY DO PEOPLE CONTACT BIAA

- Within 6 months: 22%
- Within 2 years: 26%
- Within 10 years: 25%
- 10+ years: 27%
We answer questions about a wide range of issues

Top 10 Requests for NBIIC in 2017

- Cognition
- Concussion/MTBI
- Rehabilitation
- Behavioral Issues
- Acquired Brain Injury
- Financial
- Insurance
- Mental Health
- Aging with Brain Injury
- Cargiver Family Coping
Fundamentals Program

Being launched in fall 2018:

• Basic Education about brain injury for non-professionals
  – Practical information
  – Written in easy to understand language
  – Can be used to educate families, caregivers and professionals who do not see people with brain injury often
# Substance Use after TBI: Information for Consumers

What persons with TBI and their families should know about alcohol or drug use after TBI

If you or someone you care about has a TBI, learning about the effects of substance use with TBI is an important first step toward improving the chances for recovery.

- Why do so many individuals with TBI have problems with substance use?
- How does alcohol and drug use affect a person who has had a TBI?
- How much alcohol is safe after TBI?
- What is appropriate substance use treatment for a person with TBI?
- Living in recovery

## Why do so many individuals with TBI have problems with substance use?

Many people with TBI have problems with the use of alcohol or other drugs prior to their injuries. It is not surprising that there is a strong link between being intoxicated and having a serious injury. Being intoxicated puts a person at greater risk for a TBI due to problems with motor control, blurred vision, and poor decision-making. People who are
Information for Families (cont’d)

Ohio Valley Center for Brain Injury Prevention and Rehabilitation

Information for Individuals and Family Members

User’s Manual for Faster...More Reliable Operation of a Brain After Injury

Table of Contents:

- Your brain is like a computer
- After brain injury, you need new facts
- Before you begin
- Effects of alcohol on your brain
- Consider the risks
- Benefits of new brain software

http://ohiovalley.org/informationeducation/materials/usersmanual/
Resources for Families

- 800-444-6443 National Brain Injury Information Center
- Connect with brain injury specialists
- Information about brain injury for families
- Local Resources and Supports
Tips for Families

• It is important to take care of yourself
• This is much more common than many people realize
• Contact organizations like BIAA for information
• Recovery is a long journey
SAMHSA’s Service Members, Veterans, and their Families Technical Assistance Center

345 Delaware Avenue
Delmar, NY 12054
Phone: 518-439-7415, ext. 5270
Email: smvftacenter@prainc.com
Thank You

SAMHSA’s mission is to reduce the impact of substance abuse and mental illness on America’s communities.

www.samhsa.gov

1-877-SAMHSA-7 (1-877-726-4727) ● 1-800-487-4889 (TDD)