

# Preventing Suicidal Behavior After Traumatic Brain Injury



## From Science to Practice

Using Research to Promote Safety and Prevent Suicide

### Overview

**Traumatic brain injury (TBI) is a risk factor for suicidal ideation and behavior.<sup>1,2,3,4,5,6</sup> A TBI is “a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury.”<sup>7</sup> The duration of increased suicide risk is not well understood. Some researchers have found that elevated suicide risk lasts up to six months following the injury,<sup>3,8</sup> while others have found that increased risk following a TBI persists for years or even the individual’s lifetime.<sup>1,9,10</sup>**

**The severity of TBI – mild, moderate, or severe – is assessed using several factors, including the duration of unconsciousness following the injury, the results of structural imaging tests, and the presence of posttraumatic amnesia.<sup>11</sup> For most people, the symptoms of mild TBI (mTBI) resolve within a week. However, all people with TBI more generally can experience persistent cognitive, somatic, or psychological symptoms that can lead to poorer mental health, physical function, and quality of life.<sup>12</sup> Veterans with a history of TBI were found to be at higher risk for suicide than Veterans with no TBI history.<sup>2,13,14</sup>**

**There is a paucity of data on interventions to reduce suicide risk among patients with TBI. Developing interventions and demonstrating their efficacy require further research. Some studies show promising results in reducing hopelessness in patients with moderate to severe TBI,<sup>15,16</sup> but few studies have examined interventions for patients with mTBI. Patients with mTBI may benefit from traditional pharmacologic and psychotherapeutic interventions as standard of care for certain symptoms.<sup>11</sup>**

## Key Findings

### General Population

- In most U.S. states, firearm-related suicide has been identified as the leading cause of TBI-related death.<sup>7</sup>
- During 2018 and 2019, 121,176 TBI-related deaths occurred in the general population in the U.S.<sup>7</sup> Of these TBI-related deaths, suicide accounted for 35.5%.<sup>7</sup>
- TBI-related death rates that were attributable to suicide were highest among individuals aged 75 years or older (12.2 per 100,000).<sup>17</sup>
- Between 2008 and 2017, when combining all injury categories, firearm suicide accounted for 48.3% of the increase in the absolute incidence of TBI-related deaths.<sup>17</sup>
- Among those with TBI, men compared to women have a higher rate of hospitalization and mortality.<sup>7</sup>

- A prospective cohort study of individuals aged between 18 and 59 years with moderate to severe TBI (n=1,377) found that depression, substance misuse, unemployment, and more severe extracranial injury were implicated as contributing factors to suicidal ideation at 1-year post TBI.<sup>1</sup> Experiencing year 1 post TBI suicidal ideation was associated with greater likelihood of year 2 suicidal ideation.<sup>1</sup>
- Another prospective cohort study found that patients with mTBI presenting at an emergency department with pre-injury psychiatric history and prior TBI were more likely than those without psychiatric history or prior TBI to report suicidal ideation during the year after their injury.<sup>3</sup>

### Veterans and Service Members

- Between 2000 and 2023, nearly 500,000 Service members were diagnosed with TBI.<sup>18</sup>

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- Mild injuries are the most common form of TBI, with the Defense and Veterans Brain Injury Center estimating that mTBIs account for approximately 82% of all TBI diagnoses in service members.<sup>18</sup>
- Among Service members, reporting post concussive or post TBI symptoms in the past month was associated with an increased risk of suicide attempt following deployment when compared to their counterparts who did not experience past-month post concussive or post TBI symptoms.<sup>19</sup>
- The rate of suicide for Veterans with moderate to severe TBI was 81.5 per 100,000 person-years, compared with 34.3 per 100,000 person-years for Veterans without TBI and 15.9 per 100,000 person-years for the general population.<sup>20</sup>
- Among combat Veterans, sustaining a TBI during deployment almost doubled the risk of suicidal ideation.<sup>21</sup>
- One study found that 78% of Veterans with moderate to severe TBI who used the VHA between 2005 and 2015 and who died by suicide, used a firearm.<sup>14</sup> Another study found that, compared to Veterans without TBI, Veterans with moderate to severe TBI had a 33% greater risk for death by firearm and Veterans with mTBI had a 9% greater risk for death by firearm.<sup>2</sup>
- Among Veterans, 17.5% had mTBI and 3.0% had moderate to severe TBI.<sup>20</sup> Veterans with moderate to severe TBI accounted for nearly 34% of total excess deaths, which is 11 times higher than expected.<sup>20</sup> Most of these excess deaths were the result of suicide.<sup>20</sup>
- Veterans with a history of moderate to severe TBI and suicide attempts may have poorer cognitive and decision-making ability than those without such a history. A combined history of TBI and suicide attempts may indicate greater risk for making impulsive decisions to relieve psychological distress, leading to a greater risk for suicide.<sup>22</sup>

## Ways You Can Help

- Screen patients with a history of TBI for suicidal thoughts and behaviors, particularly during periods of transition or the first few months after injury.
- Consider evidence-based psychotherapies for patients with TBI, such as problem-solving therapy for suicide prevention, a cognitive behavioral therapy that combines problem-solving skills with safety planning.<sup>16</sup>
- Discuss the safety of lethal means (e.g., medications, firearms) in the home with:
  - Patients with a history of moderate to severe TBI who are transitioning from acute rehabilitative care to home care
  - Patients with TBI and a history of suicidal behavior
  - Patients with TBI and stressors that may increase risk for suicide
- Ask Veterans if they keep firearms in their homes but note that some Veterans may not disclose firearm ownership if asked directly due to concerns that they may lose the ability to keep firearms. Discuss ways they can protect themselves and others in their home from unintentional harm, including by safely storing firearms. Safe storage means storing firearms unloaded and in a secure location, such as a firearm safe, when not in use. Avoid sounding judgmental; begin conversations with open-ended questions (e.g., “Do you have any concerns about the accessibility of your firearms?”).
- Ask firearm owners if they have thought about ways or methods to kill themselves. This may be more effective than asking about suicidal thoughts. Firearm owners who have attempted suicide are less likely to have experienced suicidal ideation as traditionally measured and assessed than those who do not own firearms.
- Keep gun locks in your clinics to easily access and give to Veterans and their families. Gunlocks are available by request from your **local suicide prevention coordinator (SPC)**.
- Counsel Veterans at risk for suicide, and their families or other household members, on temporarily, voluntarily storing firearms outside the home until it is safe, if viable according to state law. If not possible, discuss other ways to reduce lethal means access (e.g., removing firing pins). The short window of time between the decision to attempt suicide and the actual attempt creates a challenge for “in the moment” intervention.



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- Familiarize yourself with VA resources on how to care for patients with a history of TBI:
  - **VA's Polytrauma System of Care (PSC)** is an integrated network of specialized rehabilitation program dedicated to serving Veterans with combat and civilian related TBI and polytrauma.
  - **VA/DoD Clinical Practice Guideline for the Management of Concussion-Mild Traumatic Brain Injury**
  - **Rocky Mountain Mental Illness Research, Education and Clinical Center TBI Toolkit**
  - **Conceptualizing Suicide Risk in TBI Supplemental Handbook**
  - Suggest to patients with a TBI that they use **Concussion Coach** — a mobile app that can help them manage their symptoms.

***There is no single cause of suicide. It is often the result of a complex interaction of risk and protective factors at the individual, interpersonal, community, and societal levels. To prevent Veteran suicide, we must maximize protective factors and minimize risk factors at all of these levels.***

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