

**LIMBIC-CENC Clinical Care Monograph Version 2**

**B. TBI, Mortality, and Suicide**

from LIMBIC-CENC Knowledge Translation Center (LIMBICTM)

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**Key Findings**

1. **TBI and Mortality**. Risk of early death is higher for Veterans with TBI than those with no TBI and varies by TBI severity and time since exposure.1 All Veteran groups have higher mortality rates than the general population, with the highest rates for Veterans with moderate-severe TBI followed by mTBI and then no TBI.1 For moderate to severe TBI, mortality risk is highest within 6 months of injury and decreases over time.1 For mild TBI, risk for mortality is elevated and remains constant over time.1 Research on mTBI comorbidity phenotypes indicates that Polytrauma and Mental Health subtypes have a >3 times risk of early mortality; the Moderately Health and Declining subtype has a 2 times greater risk of early mortality.2
2. **TBI and Mortality Causes**. Risk of death due to unintentional injury and stroke are higher in the first 6 months after moderate to severe TBI. 1 For cancer, cardiovascular disease, and other causes of death, Veterans with moderate-severe TBI have significantly higher rates than all others in older age groups (e.g., 55+).1, 3
3. **TBI and Suicide**. Veterans with mild and moderate-to-severe TBI are at increased risk of death by drug overdose and firearms; overdose risk is heightened in middle-aged and older adults.4 Research on mTBI comorbidity phenotypes indicates that the ‘Mental Health’ subtype had 2 times the risk of overdose and suicide-related behavior.2 The ‘Polytrauma’ and ‘Moderately Healthy and Declining’ subtypes have a small but significant increased risk of overdose and suicide-related behavior.2

**Clinical Impact**

* **Recommendations to Reduce Mortality following TBI**. LIMBIC-CENC findings on the association between TBI and higher risk of Veteran mortality replicate and extend the current literature in both military and civilian populations, especially for the risk of death due to unintentional injury in the first year following moderate to severe TBI.
* **Clinical Care Policies.** LIMBIC-CENC research provides evidence for DOD/V.A. healthcare policies that recommend: 1) providing full-time, direct supervision in the first year for individuals with severe TBI who have cognitive impairments and lack awareness of their deficits, 2) self-management training and/or caregiving assistance to Veterans with moderate-severe TBI who have multiple, complex, chronic health conditions, and 3) a combination of counseling, family involvement, and targeted means reduction to prevent suicide and unintended death.
* **Brain Health and Wellness Tool**. LIMBIC-CENC findings on preventable behavioral health risk factors after TBI, synthesized with the current research literature, led to the development, testing, and release of the LIMBIC-CENC a brain health and wellness survey that generates personalized recommendations to support Service Members and Veterans efforts to identify and self-manage their health-related risk factors after TBI. The LIMBIC-CENC’s Brain Health and Wellness Video Series complements the survey tool and provides a series of 4-minute primers on how to identify, prevent or self-manage TBI and co-morbid risk factors that can decrease mortality risk.

**Primary Knowledge Translation Products**

* LIMBIC-CENC provides a repository of information on [Suicide Prevention for Service Members, Veterans and Families](https://www.limbic-cenc.org/for-service-members-and-veterans-with-tbi/suicide-prevention-veterans/) and [Managing Medical Conditions for Service Members, Veterans, and Families](https://www.limbic-cenc.org/for-service-members-and-veterans-with-tbi/medical-conditions-veterans/), and [Suicide Prevention and Managing Medical Condition Information for TBI Clinicians](https://www.limbic-cenc.org/for-tbi-clinicians/).
* LIMBIC-CENC’s [Brain Health and Wellness Survey and Personalized Recommendations Report](https://knowledgetranslation.limbic-cenc.org/BrainHealthWellnessTool/BrainHealthWellnessTool)  provides a yes-no survey for SMs and Vs to identify their behavioral health risk factors and receive personalized information and recommendations.

**LIMBIC-CENC TBI, Mortality and Suicide Primary References**

1. Byers AL, Li Y, Barnes DE, Boscardin WJ, Peltz CB, Yaffe K. TBI and risk of death in military veterans over 14 years: Injury severity, timing, and cause of death. J Psychiatr Res. 2022 Dec;156:200-205. doi: 10.1016/j.jpsychires.2022.09.035. Epub 2022 Sep 25. PMID: 36257114.
2. Stewart IJ, Amuan ME, Wang CP, et al: Association between traumatic brain injury and cardiovascular disease among post-911 veterans. JAMA Neurol 2022;79(11):1122-1129.
3. Pugh MJ, Swan AA, Amuan ME, Eapen BC, Jaramillo CA, Delgado R, Tate DF, Yaffe K, Wang CP. Deployment, suicide, and overdose among comorbidity phenotypes following mild traumatic brain injury: A retrospective cohort study from the Chronic Effects of Neurotrauma Consortium. PLoS One. 2019 Sep 20;14(9):e0222674. doi: 10.1371/journal.pone.0222674. PMID: 31539410; PMCID: PMC6754132.
4. Byers, A. L., Li, Y., Barnes, D. E., Seal, K. H., Boscardin, W. J., & Yaffe, K. (2019). A national study of TBI and risk of suicide and unintended death by overdose and firearms. Brain Injury, 34(3), 328-334. doi:10.1080/02699052.2019.1701708

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