

Follow-up shows 'very high odds' of long-term disability for veterans with combat concussion

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Service members who sustained combat-related traumatic brain injury (TBI) in Iraq or Afghanistan are at high risk of long-term disability—up

to 49 times higher than in other groups of deployed veterans, reports a study in the March/April issue of the *Journal of Head Trauma Rehabilitation (JHTR)*.

"[W]e found very high odds of being on a trajectory of worse long-term outcome for those who sustained a concussion in combat and were younger at the time of exposure, well above the risk of deployment alone," according to the new research, led by Christine L. Mac Donald, Ph.D., of University of Washington School of Medicine, Seattle. The researchers hope their findings can aid in identifying veterans at high risk of long-term disability after sustaining a combat-related TBI.

Findings may help target veterans at greatest risk of disability

Dr. Mac Donald and colleagues analyzed 10 years of follow-up data on veterans deployed to Iraq or Afghanistan, drawn from the "Evaluation of longitudinal outcomes in mild TBI Active-Duty Military and Veterans" (EVOLVE Study). "Our study is unique, as we were able to evaluate these patients at the time of their injuries and have carefully followed them ever since," Dr. Mac Donald comments. She notes that the veterans have now been followed up every 6 months for 10 years, plus thorough in-person examinations at 1-, 5-, and 10-year follow-up time points.

Disability in combat-deployed cohorts was compared for 236 veterans with concussive "blast TBI" and 143 veterans with no blast exposure. The study also included exploratory groups of 54 deployed veterans who experienced blast exposure but not TBI and 42 "non-blast TBI" veterans with other causes of concussion.

Using a technique called latent class growth analysis, Dr. Mac Donald and colleagues defined four "trajectory groups" with similar levels and

patterns of outcomes. The researchers were then able to identify the characteristics of veterans in four trajectory groups: good recovery, upper moderate disability, lower moderate disability, and death. (Since very few veterans died, comparisons focused on veterans with good recovery versus upper and lower moderate disability groups.)

Sustaining a concussion during deployment was by far the most important factor determining long-term outcome. Compared to those with no blast exposure, the odds of being in the worse disability trajectories were 49 times higher for service members with blast TBI and 37 times higher for those with non-blast TBI. Even veterans who had blast exposure without concussion were five times more likely to be in worse disability categories, compared to those with no blast exposure.

Other risk factors for worse long-term outcome trajectories were younger age at the time of injury and enlistment status at the time of deployment. All identified risk factors remained significant after accounting for demographic factors and subsequent brain injury exposure over the decade following deployment.

Beyond the personal toll on veterans and their families, US combat-related TBI carries high economic costs: current estimates from the conflicts in Iraq and Afghanistan exceed \$1 trillion in coming years. Based on the experience of World War I, World War II, and the Vietnam War, the true impact of disability among those injured in Iraq and Afghanistan "is likely not to be felt for decades," the researchers write.

The findings confirm that veterans with blast- or non-blast TBI sustained in combat have higher odds of worse disability trajectories over the long-term. Age and enlistment status at the time of deployment also have a significant impact on 10-year outcomes. Dr. Mac Donald and coauthors conclude, "[W]e believe these findings help inform targeting of more

aggressive treatment strategies in service members meeting this profile of greatest risk following deployment to aid in reducing the high public health burden identified with prior conflicts."

More information: Christine L. Mac Donald et al, Global Disability Trajectories Over the First Decade Following Combat Concussion, *Journal of Head Trauma Rehabilitation* (2022). [DOI: 10.1097/HTR.0000000000000738](https://doi.org/10.1097/HTR.0000000000000738)

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