

# A Prospective Study of PTSD and Early-Age Heart Disease Mortality Among Vietnam Veterans: Implications for Surveillance and Prevention

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### RESEARCH HIGHLIGHTS:

- Previous studies have suggested that PTSD is associated with increased medical morbidity, including a national study of veterans that found that all-cause mortality was associated with PTSD among Vietnam veterans.
- Findings from this study show PTSD to be prospectively associated with early-age mortality from heart disease among Vietnam veterans initially free of major heart disease, even after controlling for heart disease risk factors.
- Increases in the severity of PTSD symptoms resulted in an increase in future mortality from heart disease. Evidence from this study indicates that veterans may need healthcare that addresses both the immediate and long-term impacts of PTSD, including the development of heart disease.

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### ABSTRACT:

**Objective:** To examine prospectively early-age heart disease (HD) among a national random sample of 4328 male Vietnam veterans, who did not have HD at baseline in 1985. Studies have suggested that posttraumatic stress disorder (PTSD) may result in cardiovascular disease. However, many past studies had important methodological limitations to their designs.

**Method:** Using Cox regressions, we assessed PTSD, age, race, intelligence, family history, obesity, smoking, alcohol abuse, antisocial personality, and depression in predicting HD mortality at follow-up in December 31, 2000. The men were 65 years old at follow-up.

**Results:** Using two PTSD measures, a Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition (DSM-III) measure (D-PTSD) and one developed by Keane (K-PTSD), we found that among Vietnam theater and era veterans combined (era veterans had no Vietnam service), having PTSD was associated with HD mortality for D-PTSD (hazard ratio (HR) 2.25,  $p$  .045) and approached significance for K-PTSD (HR 2.16,  $p$  .066). However, having higher PTSD symptoms on either scale was associated with mortality, with a 5-point increase associated with 20% increase in mortality risk (all  $p$  .05). Controlling for lifetime depression only slightly altered the results. The effects for theater veterans alone were stronger (D-PTSD: HR 2.58,  $p$  .025; K-PTSD: HR 2.73,  $p$  .022). Among theater veterans, controlling for lifetime depression or combat exposure made little difference.

**Conclusion:** PTSD was prospectively associated with HD mortality among veterans free of HD at baseline. This study suggests that early-age HD may be an outcome after military service among PTSD-positive veterans.”

## Implications

### FOR PRACTICE

The prevalence of PTSD among service members returning from Iraq and Afghanistan may be comparable to that of Vietnam War era service members. In order to plan for adequate health services and prevention for this population, family members, clinicians, community advocates and health providers will need to fully understand the burden of illnesses associated with military service. In this study, having PTSD was prospectively associated with early-age heart disease (HD) mortality in a national, representative sample of Vietnam-era veterans. The association between PTSD and early-age HD mortality remained among men of the same age who were free of HD at baseline, even after controlling for HD risk factors. Veterans with PTSD after military service may therefore be at risk of developing HD as an adverse outcome, a risk that increases among those with more severe symptoms. A five-point increase on the PTSD scales used in this study resulted in a 20% increase in the risk of HD mortality in the future. Clinicians treating veterans with PTSD should monitor them for HD risk factors, and community advocates for military populations should inform veterans and military families of these potential additional risks associated with PTSD.

### FOR POLICY

Policy makers should focus on the provision and regulation of early treatment interventions for veterans and military service members exposed to traumatic stressors. After the attack on the World Trade Center in New York City, early work site interventions were effective among the civilian workforce; a similar kind of intervention formulated for military personnel could potentially prove just as effective. In addition to the provision of early interventions, policy makers should work with the Department of Defense and the Veterans Health Administration to encourage veterans returning from service to avail themselves of existing treatment services. Policies requiring military clinicians to utilize standardized PTSD screening scales and improved clinical surveillance to reduce the long-term burden of morbidity among trauma-exposed service members can be particularly beneficial. The long-term impact of stressor exposures may be just as deadly as other toxic occupational exposures, such as occupational exposure to toxic chemicals or heavy metals. Policies providing both mental and physical healthcare coverage for veterans are especially important for returning service members, as this study suggests that these populations will have to cope with both short-term psychological consequences and long-term stress injuries, which can manifest as clinical disease decades after exposure.

### FOR FUTURE RESEARCH

In this study, the new-onset HD rate was relatively low and only included major HD cases. Future studies should include potential borderline cases of HD to determine whether the relationships between HD and PTSD hold true. Future researchers will need to measure time-dependent factors, such as sedentary lifestyle and drug or alcohol abuse, related to both psychological trauma and increased risk of HD. More comprehensive longitudinal studies were just being conducted at the time this article was published, so researchers should continue to investigate the links between PTSD and HD over the long term. Although previous studies have shown PTSD and depression to be comorbid, one of the most noteworthy results of this study was that PTSD serves as a significant marker for future mortality, independent of depression. Future researchers should further investigate these relationships while controlling for PTSD, especially to assess the impacts of PTSD and depression on HD mortality among high-risk, trauma-exposed populations.

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