

Differential Pain Presentations Observed across Post-Traumatic Stress Disorder Symptom Trajectories after Combat Injury

This study evaluated the association between pain outcomes and post-traumatic stress disorder (PTSD) symptom trajectories after combat-related injury, while adjusting for receipt of regional anesthesia soon after injury.

This study has several implications for the future of trauma care as well as the injury and violence prevention field. Findings support a need for integrated mental health and primary trauma treatment, allowing clinicians to identify patients at risk of poor symptom trajectories. Integrated assessment and treatment of pain and PTSD symptoms could help mitigate risks of developing worsening or chronic symptom trajectories by informing the targeted delivery of multimodal interventions.

Citation:

Giordano, N.A., Richmond, T.S., Farrar, J.T., Buckenmaier, C., Gallagher, R.M., and Polomano, R.C. "Differential Pain Presentations Observed across Post-Traumatic Stress Disorder Symptom Trajectories after Combat Injury" *Pain Medicine* (2021): pnab204. doi: 10.1093/pm/pnab204.

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Methods: This secondary analysis of a prospective observational cohort study examined PTSD symptom trajectories of 288 combat-injured service members from within a month of injury up to two-years after. The authors used linear mixed-effects models to evaluate the association between PTSD symptom trajectories and average pain and pain interference (defined as the extent to which pain interferes with activity, mood, relationships, sleep, and enjoyment of life) while adjusting for receipt of regional anesthesia during combat casualty care.

Findings:

- Using results from a validated PTSD assessment tool, four PTSD trajectory categories were established: *resilient, recovering, worsening, and chronic*. Figure 1 displays the significant differences in average pain scores observed across PTSD trajectories.
- Differential pain presentations were associated with PTSD symptom trajectories, even after adjusting for receipt of regional anesthesia.
- Compared to those with a resilient PTSD symptom trajectory (green line), individuals presenting with chronic PTSD trajectories (red line) were estimated to experience average pain scores 2.61 points higher (95% CI: 1.71, 3.14).
- Participants presenting with worsening (yellow line) ($\beta = 1.42$; 95% CI: 0.77, 1.78) and recovering (blue line) PTSD trajectories ($\beta = 0.65$; 95% CI: 0.09, 1.08) were estimated to experience higher average pain scores than participants with resilient PTSD trajectories (green line).
- Receiving regional anesthesia was associated with improved pain up to two years after injury ($\beta = -0.31$; 95% CI: -0.90, -0.04).

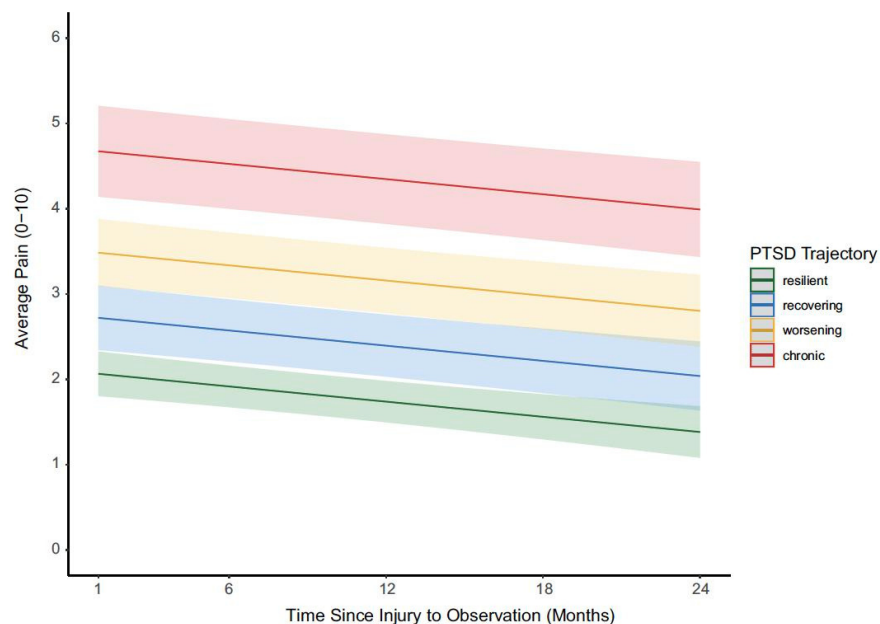


Figure 1. Plotted linear mixed effects model coefficients estimating Brief Pain Inventory Average Pain from 1 to 24 months after injury.

Discussion: This study reveals that an association between pain outcomes and PTSD symptom trajectories persists up to two years following combat-related related injury, even after adjusting for administration of regional anesthesia. Compared to individuals with resilient PTSD symptom trajectories, participants experiencing *worsening, recovering, and chronic* PTSD trajectories reported poorer pain outcomes long after initial injury. These findings indicate that mitigating the development of PTSD symptom trajectory may also help mitigate the exacerbation of pain. The relationship between anesthesia receipt and improved pain up to two years after injury underscores the benefits of active, long-term, incremental pain treatments as part of trauma care. Given the established co-occurring nature between pain and PTSD, supported by the findings of this investigation, clinicians should consider jointly evaluating PTSD symptoms and pain outcomes. Furthermore, providing integrated treatment throughout the continuum of trauma care will enable clinicians to identify patients at high risk of experiencing poor symptom trajectories.