

## Deployment-related rehospitalizations following TBI: A VA TBI Model Systems Study

### Authors:

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### Background:

With ongoing advances in health care service delivery, a greater number of those with the most neurologically devastating brain injuries are surviving. Patients with moderate to severe TBI experience higher rates of complications such as pneumonia, seizures, and suicide. Studies of all TBI rehabilitation admissions demonstrate an annual incidence of rehospitalization of approximately 15-20% for the first five years after injury. Common readmission reasons in declining order of frequency include orthopedic or reconstructive procedures, general health maintenance, infections, seizures, and psychiatric disorders. However, data regarding rehospitalization has been primarily described in civilian samples. Recent reports indicate that military-related TBI is unique relative to civilian counterparts with higher rates of medical comorbidities and neurosurgical intervention. Taken together, civilian studies may not clearly describe the chronic health care needs of those with deployment-related TBI. Therefore the purpose of this study was to investigate the frequency and nature of rehospitalization in the first year post deployment and non-deployment related TBI.

### Methods:

This is a multi-center prospective observational study using the VA TBI Model System (TBIMS) dataset at five Department of Veterans Affairs (VA) Polytrauma Rehabilitation Centers (PRCs). The study sample consisted of 395 Veterans and Active Duty Service Members who were primarily male (96%) with a median age of 27. Injuries were primarily severe (median GCS =8) with smaller subset of mild (38%) and moderate (10%) injuries. Primary cause of injury was motor-vehicle related (45%), blast (26%), and fall (11%).

### Results:

Of 627 VA TBIMS enrolled participants, 395 met study criteria. Thirty-six percent sustained TBI during deployment. Two-hundred and fifty rehospitalizations occurred within the first year post-injury. Deployment-related TBI was associated with more frequent rehospitalizations (M=2.2, SD 3.4) compared to non-deployment TBI (M=1.18, SD 2.4;  $F=(1, 393), 12.54, p>.001$ ). Primary causes of rehospitalization were similar across both groups (i.e., rehabilitation, other, orthopedic, infections, seizures, psychiatric and general health); however, deployment-related TBI was associated with significantly more orthopedic admissions ( $t=2.2, p=.026$ ). A linear regression model

using age, GCS, TBI etiology, and time to rehabilitation admission was not significant in predicting number of rehospitalizations

**Conclusions:**

Chronic rehabilitation and health care needs of Veterans and Active Duty Service Members are understudied. This study highlights frequent rehospitalization with deployment related TBI with more frequent orthopedic admissions. Predictors of rehospitalization remain poorly understood; however, a high index of suspicion for orthopedic injuries, subclinical infection, and seizure in its various presentations may help prevent morbidity in chronic stages of TBI.