



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Extremity Injury

Venous Thromboembolism Clinical Decision Support Tool (CDST)

Combat casualties have a relatively high incidence of venous thromboembolism (VTE); rates of VTE in the combat wounded can reach up to 28 percent and complications are severe, including death. Building on a retrospective review of 560 consecutive combat casualties from October 2010 to November 2012 admitted to a Military Treatment Facility (MTF) in the US, the Surgical Critical Care Initiative (SC2i) at Uniformed Services University of the Health Sciences (USUHS) is developing a CDST that can predict those at the highest risk for developing VTE. The work of the SC2i in this space suggests that a more refined predictive model is needed to accurately apply resources with regards to VTE screening and prophylaxis. The development of this tool is currently under way, using both clinical and biomarker variables to predict incidences of VTE, and initial models show encouraging findings with promising area under the curve (AUC) and high net benefit decision curve analysis. SC2i will continue to develop this tool by incorporating machine learning algorithms and heterogeneous data such as systemic immune protein biomarkers that will help to establish a better approach in predicting VTE events in combat trauma patients. The development of a predictive algorithm is expected to have a substantial and measurable impact on both clinical outcomes and resource utilization for the MHS by assisting in guiding surveillance and prophylaxis of VTE. Furthermore, development of a model to predict VTE will have direct translatability in both military and civilian healthcare settings.

