Risk Assessment and Surveillance

Developing an Improved Understanding of Blast Injuries through Physiological and Behavioral Measures

The Blast Exposure Accelerated Sensor Transition (BEAST) program, a project performed at USUHS and sponsored by DARPA, builds on progress made during the Blast Gauge program to enable a better understanding of blast-related injuries such as TBI and PTSD. Previous efforts to characterize blast injury effects have been primarily carried out in animal models, while human data are generally limited to self-reporting and lack objective information about blast characteristics (e.g., intensity, duration) and effects following multiple, cumulative exposures. Previously, DARPA's Blast Gauge program resulted in the production of a small, lightweight environmental dosimeter device that monitors physical impacts of exposure to an explosive blast. The device is designed for flexible mounting on a combat helmet or tactical device. The Blast Gauge device captures environmental event data to develop a 3D recreation of the blast and potentially help identify Service Members with significant exposures. The BEAST program supports medical studies using Blast Gauge devices and has completed development of a web-based tool to store, organize, analyze, and visualize Blast Gauge recordings. Researchers have also established a data collection plan for cognitive testing in clinical studies, and finalized approvals to commence clinical studies on physiological and behavioral measures correlated to blast exposure. This research will contribute to the TBI and PTSD knowledge base for improved treatment, and develop enhanced understanding of blast events to mitigate exposure and improve training procedures.