



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Blast Exposure Research

The Blast Exposure Accelerated Sensor Transition (BEAST) Program

The BEAST program at 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 done in animal models, while human trials investigating the effects of real-world blast injury, especially in training, are limited to self-reporting. Studies to date do not have clear measurement of objective blast characteristics, such as the duration and intensity of blast overpressure, or the effects on interval between exposure and cumulative exposure over time. Previously, the Blast Gauge program resulted in production of a small, lightweight environmental dosimeter that monitors physical impacts of exposure to an explosive blast. The device is designed for flexible mounting; typically it is mounted on the nape pad of the combat helmet or the webbing of the outer tactical vest. During a blast event, the Blast Gauge device captures environmental data and available operational information in order to develop a three-dimensional recreation of the event and is used to help identify Service Members with significant exposures and to increase the knowledge base regarding conditions that cause injuries, including TBI. The BEAST program supports medical studies that utilize the Blast Gauge sensors to investigate the blast overpressure that Service Members sustain during heavy weapons training, and assess physiological and behavioral measures for any deficit following multiple sub-concussive blast exposures. Preliminary results suggest that some neurological effects, including temporary reduced performance on neuromotor, learning, and memory tasks, may result from repetitive low-level blast exposure. Clinical studies continue to refine experimental results and investigate physiological biomarkers that may be an early indicator of impairment.