



US DEPARTMENT OF DEFENSE

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

## Blast Exposure Analysis

### Environmental Sensors for Blast Overpressure in Military Training

In 2013, the Army Resources and Requirements Board (AR2B) determined a need for additional capability in the protection of military personnel from neurotrauma following exposure to explosive blast or accelerative/decelerative force. AR2B decision making yielded a US Army Training and Doctrine Command (TRADOC) Tasker for a holistic review of environmental sensors in training, and US Army Medical Research and Materiel Command (USAMRMC) was designated as the lead for that review. The USAMRMC Environmental Sensors in Training (ESiT) program was established with the purpose of informing technical requirements for environmental sensors and methodology for employment of those sensors in select training events. Laboratory and field evaluations of available sensor technologies were conducted for mortar, artillery, grenade, breaching, combatives, and airborne training units. The ESiT Program also supported and closely monitored other military field evaluations that included environmental sensors as well as measures of brain dysfunction. ESiT produces technical reports which may be requested from the Defense Technical Information Center (DTIC) website, published manuscripts, and conference presentations to document program methods and findings. Complementing the TRADOC Tasker, the Executive Order for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families yielded the National Research Action Plan (NRAP) (2013) which stipulated an immediate action to “determine whether point of injury blast and impact sensors can be correlated to mechanism and severity of injury.” Going forward, the most informative ESiT field studies are those that combine wearable sensors with acute measurements of brain function. Based on evidence to date, from ESiT and other directly relevant studies and programs, wearable environmental sensor capability has proven to be of critical value for research on neurotrauma in military environments. Routine use of effective sensors, beyond research, is expected to be an important future capability. The envisioned end state of the ESiT Program is wearable sensors for recording environmental exposures in select training environments and making these data available for use by medical providers to inform clinical decisions. The envisioned end state of the ESiT program is wearable sensor capability for recording acute environmental exposures in select training environments and making these data available in an integrated system for use by medical providers to inform clinical decisions. In addition, in the end state a reduced version of sensor data would be suitable for archiving, recording chronic environmental exposures across a Service Member’s time in uniform.

