BLAST-INDUCED MILD TRAUMATIC BRAIN INJURY (MTBI): CURRENT STATE-OF-THE-SCIENCE

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ABSTRACT

In 2009, the US Department of Defense (DoD) Blast Injury Research Program Coordinating Office (PCO) established the International State-of-the-Science (SoS) Meeting Series on behalf of the DoD Executive Agent for Blast Injury Research. The SoS Meeting Series is a unique and enduring capability that leverages the expertise of the world's best scientists, engineers, and clinicians to identify blast injury knowledge gaps and to recommend medical research and other actions that will close the gaps and enable the delivery of timely and effective blast injury prevention, mitigation, and treatment strategies to Service Members. Since 2009, five SoS meetings have taken place, and four of these have focused on various aspects of blast-induced mild traumatic brain injury (mTBI), a topic of great importance to the DoD. The specific focus areas of these four meetings included, evidence supporting the existence and possible mechanisms of non-impact, blast-induced mTBI, blast injury dosimetry, the biomedical basis for mTBI sensor threshold values, and evidence linking repeated blast-related trauma with neurodegeneration and the development of chronic traumatic encephalopathy.

Each of these SoS meetings attracted more than 100 participants from military medical, operational, and materiel development stakeholder communities, and multidisciplinary subject matter experts from the DoD, other US government agencies, academia, industry, and allied nations. The unique format of these meetings includes a plenary session where meeting participants are informed on the state-of-the-science by topic-specific, scientific presentations, and working group deliberations, in which meeting participants engage in discussions led by members of a multidisciplinary Expert Panel to document findings and formulate specific and actionable recommendations. This paper will review the findings and recommendations from these four SoS meetings, which include the identification of knowledge gaps, recommendations for near- and long-term medical research that can close the gaps, and recommendations for immediate changes in policy and practices that will break down communication barriers and foster information sharing across stakeholder communities. In all, these recommendations are intended to advance the state-of-the-science and improve the way we protect and care for blast-exposed and blast-injured Service Members.