



## USAMRMC STRATEGIC COMMUNICATION PLAN

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE (PCO)

## MISSION

Coordinate the DOD's medical blast injury research programs, on behalf of the Executive Agent, to ensure critical knowledge gaps are filled, to avoid costly and unnecessary duplication of effort and to accelerate the fielding of prevention and treatment strategies by leveraging existing knowledge and fostering collaboration and information sharing among the world's blast injury experts.

## BACKGROUND

Operations in Afghanistan and Iraq, worldwide terrorist bombings, the advent of novel explosives and the growing use of improvised explosive devices have resulted in a significant number of blast-related casualties. In 2006, Congress directed the Secretary of Defense to designate an Executive Agent to coordinate the DOD's medical research programs relating to the prevention, mitigation and treatment of blast injuries. The DOD responded by issuing DOD Directive DOD 6025.21E, 5 July 2006, "Medical Research for Prevention, Mitigation, and Treatment of Blast Injuries," that designated the Secretary of the Army as the DOD's EA. The Secretary of the Army delegated EA authority to the Assistant Secretary of the Army for Acquisition, Logistics and Technology, who further delegated EA authority to the Commander, U.S. Army Medical Command. The PCO was established at the U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland, under a charter signed by the CDR, USAMEDCOM. The USAMRMC provides direct management and sustainment of the PCO; however, as a DOD EA support office, the PCO has DOD mission responsibilities. The overarching objective of the PCO's EA support mission is to coordinate and leverage injury research expertise and investments from the DOD, other Federal agencies, academia,

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*The PCO was established at the U.S. Army Medical Research and Materiel Command (USAMRMC), Fort Detrick, Maryland, under a charter signed by the CDR, USAMEDCOM.*

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## USAMRMC STRATEGIC COMMUNICATION PLAN

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE (PCO) CONTINUED

industry and our international partners and allies to promote collaboration and development of medical countermeasures to prevent, mitigate and treat blast injuries. The PCO's EA support mission comprises five thrust areas that address a broad spectrum of blast injury research program coordination activities.

### These mission thrust areas and related activities are:

- **Identify Knowledge Gaps:** Conduct annual International State-of-the-Science Meetings that leverage worldwide expertise to identify blast injury knowledge gaps and inform medical research needed to close the gaps; establish and facilitate expert panels which bring together diverse communities of medical researchers, clinicians, physicists and engineers to assess the state-of-the-science of key blast injury research topics and inform future research and participate on NATO and other international research panels that leverage the expertise of our allies to identify and close key blast injury knowledge gaps.
- **Shape Research Programs to Fill Knowledge Gaps:** Participation on Army and joint medical research planning committees and collaboration advisory committees to ensure that key blast injury knowledge gaps are adequately addressed in current and future research programs.
- **Facilitate Collaboration:** Identify and recommend Military Health System Blast Injury Prevention Standards for approval by the Assistant Secretary of Defense for Health Affairs in fulfillment of EA responsibilities stated in DODD 6025.21E and facilitate blast injury research collaborative agreements among DOD and other federal organizations, academia and industry to leverage blast injury research expertise.
- **Disseminate Information:** Dissemination of information occurs through multiple channels, including formal reporting mechanisms, direct requests "for information to the PCO and stakeholder community briefings.
- **Promote Information Sharing and Partnerships:** Mechanisms of information sharing and promotion of partnerships include participation in the NATO HFM-234, seminar presentations, international collaborations and funding initiatives to recover and share historical blast injury information.

## KEY THEMES AND MESSAGES

Blast injury includes the entire spectrum of injuries that can result from exposure to an explosion.

The Blast Injury Research Program uses the broad research topic areas of Injury Prevention, Acute Treatment, and Reset to develop a comprehensive and balanced portfolio of blast injury research and related projects designed to filling gaps in the blast injury knowledge base.

Only a coordinated medical research effort involving the DOD, other federal agencies, academia, industry, and international partners can solve our toughest blast injury research challenges.



## QUESTIONS & ANSWERS

**Q** *How are blast injuries classified?*

**A** Blast injuries are designated according to the Taxonomy of Injuries from Explosive Devices found in DoDD 6025.21E:

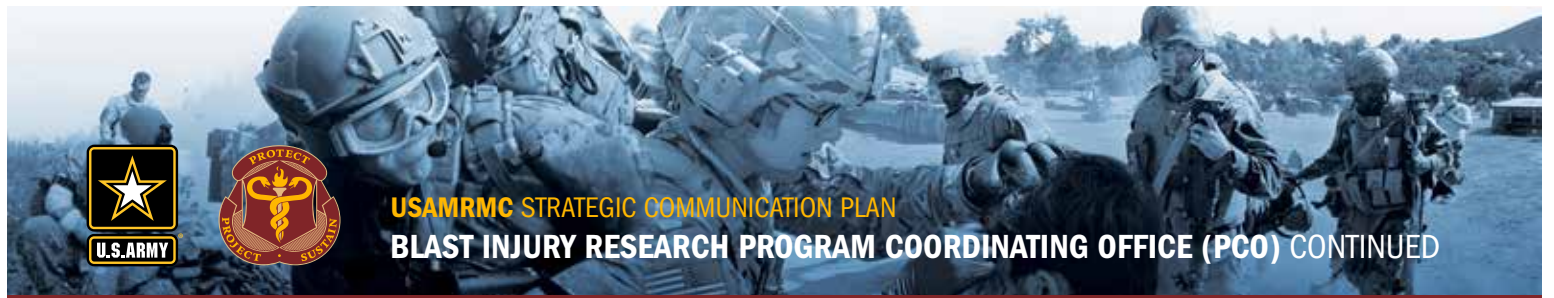
- **Primary blast injuries** result from the high pressures created by the blast itself. These high pressures, known as blast overpressure, can crush the body and cause internal injuries.
- **Secondary blast injuries** result when the strong blast winds behind the pressure front propel fragments and debris against the body and cause blunt and penetrating injuries.
- **Tertiary blast injuries** are caused by strong winds and pressure gradients that can accelerate the body and cause the same types of blunt force injuries that would occur in a car crash or a fall.
- **Quaternary blast injuries** are the result of other explosive products, such as heat, light and toxic gases, that can cause burns, blindness, and inhalation injuries.
- **Quinary blast injuries** refer to the clinical consequences of “post-detonation environmental contaminants,” including bacteria, radiation (dirty bombs), and tissue reactions to fuel and metals.

**Q** *What are meant by Injury Prevention, Acute Treatment and Reset?*

**A** Injury Prevention, Acute Treatment and Reset are defined as follows:

- **Injury Prevention** mitigates the risk of blast injuries by providing medically based design guidelines and performance standards for individual and combat platform occupant protection systems; comprehensive injury surveillance systems that link injury, operational, and protection system performance data; tools to identify individual susceptibility to injury; and individual resilience training to prevent or mitigate injuries.
- **Acute Treatment** mitigates injury by providing immediate and definitive treatment across the spectrum of blast-related injuries through improved diagnostic tools, health care provider training, wound care, and medical treatment outcomes analysis.
- **Reset** mitigates disability by providing a biomedically based performance assessment capability for return-to-duty in redeployment and following injury, restoring full performance capabilities in redeployed individuals, and restoring function and ability to seriously injured Service members with prosthetics and regenerative medicine. The term “reset” acknowledges a concept that extends beyond rehabilitation to include all activities necessary to return injured Service members to duty or to productive civilian life.





**Q** What are some of the most significant accomplishments for the Blast Injury Research PCO?

**A** Accomplishments include:

- The PCO implemented the International State-of-The-Science Meeting Series to leverage worldwide expertise to identify blast injury knowledge gaps and inform medical research needed to close the gaps. Topics have included Non-impact Blast-induced Mild Traumatic Brain Injury, Blast Injury Dosimetry, Blast-induced Tinnitus, Biomedical Basis for mTBI Environmental Sensor Threshold Values and “Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy?” The unique format of this annual meeting allows maximal cross-disciplinary discussion to solve complex blast injury problems and serves as a model for the DOD programmatic and research community.
- The PCO, in collaboration with the Johns Hopkins University Applied Physics Laboratory, developed and implemented the Blast Injury Prevention Standards Recommendation Process. This unbiased, inclusive, stakeholder-driven process for identifying and recommending MHS Blast Injury Prevention Standards ensures that the DOD is using the best available, biomedically valid standards to develop safe weapon systems, survivable combat platforms and effective protection against blast-related threats. Recent activities with MITRE Corporation have resulted in further refinement of this process to significantly shorten the timeline from blast injury type selection to final recommendations. The first blast injury type, lower extremity, has completed the process with the outcome of no standard currently exists due to a number of knowledge gaps.
- The PCO established the DOD Brain Injury Computational Modeling Expert Panel to bring together a diverse community of medical researchers, clinicians, physicists and engineers to assess the state-of-the-science of computational models of non-impact, blast-induced mTBI and to inform future research. Outcomes of this effort and the final roadmap going forward are available on the Blast PCO website.

“ The PCO implemented the International State-of-The-Science Meeting Series to leverage worldwide expertise to identify blast injury knowledge gaps and inform medical research needed to close the gaps. ”



- The PCO co-chaired the NATO Human Factors and Medicine (HFM)-207 Symposium, “A Survey of Blast Injury Across the Full Landscape of Military Science.” The HFM-207 brought together appointed representatives from eight NATO Nations to share the latest information on a wide range of topics focused on the prevention and treatment of blast injuries. Recommendations from this group resulted in the formation of the HFM-234 Research Task Group to address, “Environmental Toxicology of Blast Exposures: Injury Metrics, Modeling, Methods and Standards.” The multi-national and interdisciplinary group of experts serving on this technical team will work to generate guidelines addressing blast injury epidemiological studies, laboratory blast exposure conditions, standardized blast injury animal models as well as produce a comprehensive dictionary of blast injury research terms. Successful completion and dissemination of these products will serve to advance the state-of-the-science, close knowledge gaps and accelerate the delivery of solutions that protect Service Members from blast injury.
- The PCO’s annual report to the executive agent describes the efforts of the DOD Blast Injury Research Program to address the entire spectrum of blast injury challenges. More importantly, it illustrates the power of collaborative research efforts and what can be accomplished when diverse DOD medical, operational and materiel development communities eliminate traditional stove pipes, break down communication barriers, establish effective partnerships and leverage the vast biomedical research expertise that resides within other federal agencies, academia, industry and among our allies.

**Q** *What’s on the horizon for the Blast Injury Research PCO?*

**A** Key Blast Injury Research PCO Initiatives include:

- **BIPSR Process:** The DOD’s first objective, stakeholder driven, unbiased process for identifying the best available science to guide the development of effective blast injury protection systems. Analyses of three injury types — spine/back, auditory, and upper extremity — are currently underway.
- **NATO HFM-234:** The NATO HFM-234 Technical Team’s work on the Environmental Toxicology of Blast Exposures: Injury Metrics, Modeling, Methods and Standards that evolved out of the HFM-207 symposium, will be completed in July 2016. This collaboration of members from eight NATO Nations involved five workshops focused on developing guidelines for blast injury research and a Dictionary of Blast Injury Terms. The deliverables will be published in peer reviewed journals to ensure the widest dissemination to the scientific community.
- **International State-of-the-Science Meeting series:** The Blast PCO will continue to hold this meeting annually and focus each meeting on a blast injury-related topic of high interest to DOD stakeholders.



- **Preservation of DOD Historical Blast Bioeffects Data:** The Blast PCO has initiated a project to preserve and disseminate DOD historical blast bioeffects injury research data collected over 40 years at the Albuquerque Blast Test Site on Kirtland Air Force Base, New Mexico. The goal of this effort is to provide broad access to the considerable wealth of DOD historical data and findings on the biological effects of blast from studies so that program managers, researchers, and medical decision makers can solve current and future problems with a minimum of duplication and a maximum of efficiency. The four major steps of the project include: (1) recovery of historical data into a form that is complete, organized and can be readily accessed; (2) qualification of the data to ensure that the data is reliable and consistent; (3) development of a web-based application that allows controlled access to the data, literature and findings; and (4) populate the online repository and provide user tools for ongoing data collection and user interaction. As the historical and contemporary blast data are captured and made available, the scientific community will be able to begin testing hypothesis and validate proposed models. The potential payoffs include: preservation and wide availability of the blast data to researchers and the scientific community; guidance to research program managers on past research/data to avoid duplication, speed up addressing gaps and validating new models and hypotheses; guidance to protective measures programs on past research/data to understand threat levels and preventing undesirable outcomes; and guidance to medical decision makers on screening algorithms and countermeasures for blast injuries.
- **International Research Collaboration on Blast-Induced Brain Injury:** The Blast PCO initiated a project with the All India Institute of Medical Sciences, the New Jersey Institute of Technology, the USAMRMC and the NRL to elucidate the mechanisms of blast-induced mTBI to support the development of effective prevention and treatment strategies.