



USAMRMC

STRATEGIC COMMUNICATION PLAN

U.S. ARMY MEDICAL RESEARCH AND MATERIEL COMMAND



Blast Injury Research Program Coordinating Office (PCO)

Mission: The Blast Injury Research PCO was established within USAMRMC to assist the Executive Agent in coordinating and managing relevant DoD medical research efforts and programs related to the prevention, mitigation, and treatment of blast injuries. This PCO coordinates and leverages military, academia, and industrial investments to promote collaboration and development of medical countermeasures to prevent, mitigate, and treat blast injuries with the ultimate goal of coordinating and expediting prevention, mitigation, and treatment strategies.

Background

Blast-related injuries continue to be one of the primary injuries sustained by Soldiers in deployment zones. The Blast Injury Research PCO has played an important role in helping to make significant advances in blast protection equipment. Accomplishments are evident in the number of devastating but survivable blast injuries that would have been lethal only a few short years ago. Blast injuries are designated by the following taxonomy:

- 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.
- There are four key components that comprise a blast injury prevention standard: valid human effects models, simulation software to run those models, assessment methodologies for using the simulations to evaluate protection systems, and policy thresholds of minimum acceptable protection or maximum acceptable risk of injury.

Our efforts to disseminate findings on the prevention, diagnosis, and treatment of blast injuries and on the rehabilitation of blast-injured service members through civilian and military research and medical communities have resulted in significant improvements in the way blast injuries are prevented and in the way we care for blast-injured service members.

USAMRMC Public Affairs Office
504 Scott Street
Fort Detrick, MD 21702
301.619.7549
<https://mrmc.amedd.army.mil>



Blast Injury Research Program Coordinating Office

The Blast Injury Research PCO uses three key research topics to drive research:

- Injury Prevention mitigates the risk of blast injuries by providing medically based design guidelines and performance standards for individual and vehicle crew 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 mitigate or prevent injuries.
- Acute Treatment mitigates injury by providing acute 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 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.

The Blast Injury Research PCO is leveraging new extramural blast research partnerships to achieve a cutting-edge approach to solving blast injury problems.

Key Themes & Messages

- From its inception in 2007, the Blast Injury Research PCO recognizes that 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. Achievements span the range of blast injury research issues within the broad framework of prevention, acute treatment, and reset and include diverse scientific areas ranging from the mathematical modeling of blast-related brain injuries to combat trauma care and the emerging field of regenerative medicine.
- Blast injury includes the entire spectrum of injuries that can result from exposure to an explosion. The DoD Blast Injury Research PCO uses the Taxonomy of Injuries from Explosive Devices defined as primary, secondary, tertiary, quaternary, and quinary.
- The Blast Injury Research PCO focuses on filling gaps in the blast injury knowledge base. Key research topics of the program include: Injury Prevention, Acute Treatment, and Reset. The research program uses these major thrust areas to develop a comprehensive and balanced portfolio of blast injury research and related projects designed to prevent, treat, and mitigate blast-related injuries.

Q & A

Q: What are some the most significant research accomplishments for the Blast Injury Research PCO?

A: Accomplishments include:

- Researchers at the University of Alabama, Birmingham, are assessing whether the intravenous administration of high-dose, soluble estrogen will decrease the damage of traumatic brain injury (TBI) from blast wave-induced injury.



USAMRMC Public Affairs Office
504 Scott Street
Fort Detrick, MD 21702
301.619.7549
<https://mrmc.amedd.army.mil>



Blast Injury Research Program Coordinating Office

- Investigators at Washington University are looking into the diagnosis of blast-induced TBI using advanced magnetic resonance imaging techniques.
- The Military Amputee Research Program is developing a prosthetic knee that allows the user to have the capability of walking, running, and climbing and offers the potential of replacing up to six separate lower limb prostheses with one device.

Q: *What are some of the key initiatives for the Blast Injury Research PCO?*

A: Initiatives include:

- A process established in collaboration with the Johns Hopkins University Applied Physics Laboratory for identifying and independently assessing blast injury prediction tools for implementation in blast injury prevention standards that guide the design of effective protection systems.
- The International State-of-the-Science Meeting Series that brings together the world's leading blast injury researchers to assess the scientific community's current understanding of key blast injury topics and to identify knowledge gaps to focus future research investments.
- The newly formed DoD Expert Panel on Computational Modeling of Non-Impact, Blast-Induced mildTBI that is providing a venue where the world's leading computational modeling experts are working collaboratively to close a major knowledge gap in the DoD Blast Injury Research PCO.

Q: *Is the Blast Injury Research PCO conducting any research on TBI and post-traumatic stress disorder (PTSD)?*

A: Yes. The Blast Injury Research Program is currently addressing critical medical research gaps for blast-related injuries and will fully address TBI and PTSD.

Q: *How were the knowledge gaps identified?*

A: The Research Program held the first planning meeting in July 2006, during which representatives from the DoD, federal agencies, academic institutions, and industry assessed the state of the science and identified knowledge gaps in blast injury research. These gaps, detailed in the January 2008 Annual Report to Congress, were used to develop a prioritized list of program funding requirements and prepare program announcements and solicitations for research proposals.

