



Third in the International State-of-the-Science Meeting Series

International State-of-the-Science Meeting Blast-induced Tinnitus

15-16 November 2011
Chantilly, Virginia



DoD Blast Injury Research Program Coordinating Office
U.S. Army Medical Research and Materiel Command





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Department of Defense (DoD) Blast Injury Research Program

Program History

- Mandated by U.S. Congress and established by Secretary of Defense in July 2006
- Secretary of the Army designated as Executive Agent
- Objective: To coordinate medical research focused on the prevention, mitigation and treatment of blast injuries
- Governed by Department of Defense (DoD) Directive 6025.21E
- Program Coordinating Office (PCO) established at U.S. Army Medical Research and Materiel Command (USAMRMC) in June 2007

Key PCO Functions

- Identify blast injury knowledge gaps and help prioritize research to fill gaps
- Leverage expertise from academia, industry, DoD and other federal agencies, and other nations to solve difficult blast injury problems
- Recommend blast injury prevention standards, including protection equipment performance standards for DoD
- Oversee the Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC) Program
- Widely disseminate blast injury research information:
(<https://blastinjuryresearch.amedd.army.mil>)



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Unique
to
Blast

**“Blast Injuries”
Defined
(DoDD 6025.21E)**

PRIMARY

- Blast lung
- Eardrum rupture and middle ear damage
- Abdominal hemorrhage and perforation
- Eye rupture
- Non-impact, blast-induced mTBI

SECONDARY

- Penetrating ballistic (fragmentation) or blunt injuries
- Eye penetration

TERTIARY

- Fracture and traumatic amputation
- Closed and open brain injury
- Blunt injuries
- Crush injuries

QUATERNARY

- Burns
- Injury or incapacitation from inhaled toxic fire gases

QUINARY

- Illnesses, injuries, or diseases caused by chemical, biological, or radiological substances (e.g., "dirty bombs")

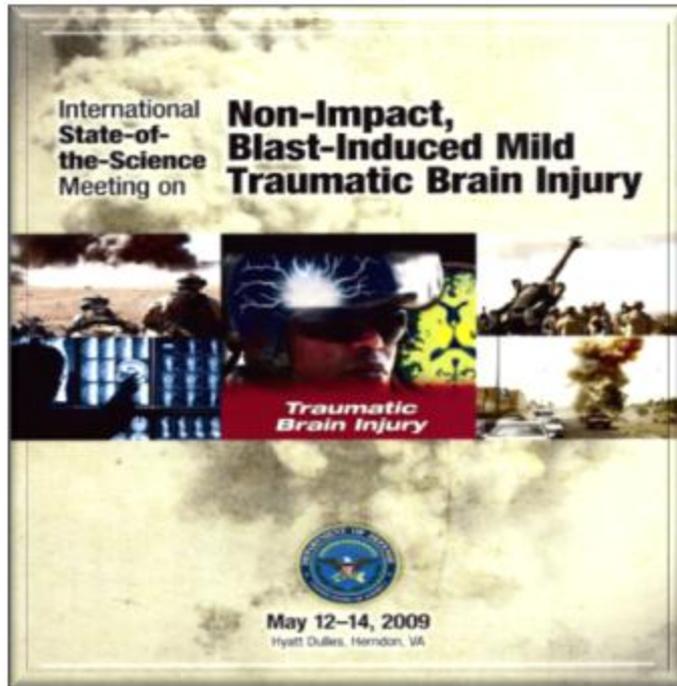
Psychological trauma (including PTSD)



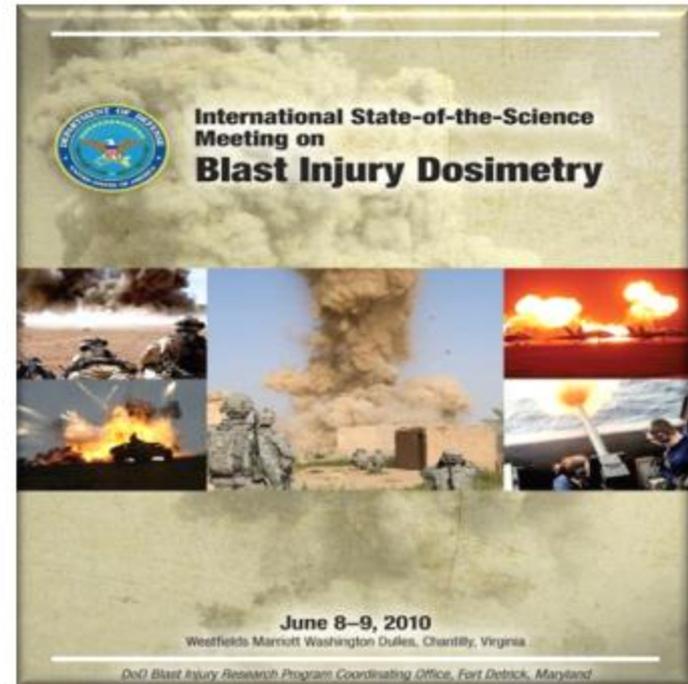
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Previous Meetings and Outcomes



- Knowledge gaps identified in meeting proceedings—informed research investment
- DoD Brain Injury Computational Modeling Expert Panel
- Eleven papers published in the journal *NeuroImage*



- Knowledge gaps identified in meeting proceedings—informed research investment
- Fostered collaborations between sensor developers and biomedical researchers
- Inspired development of advanced dosimeters (helmet sensor/blast gauges)



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Why Focus on Blast-induced Tinnitus for this Meeting?

- **What is Tinnitus?** According to the American Tinnitus Association (ATA), “Tinnitus is the perception of sound where no external sound exists. Those who are affected describe tinnitus as a “ringing, hissing, buzzing or whooshing,” perceived in one or both ears.”

- **Why is Tinnitus a Concern for the Military?**
 - ❖ Tinnitus is often associated with acoustic trauma and head injuries which are prevalent injuries in current conflicts

 - ❖ The ATA reports that the Department of Veterans Affairs (VA) has identified tinnitus as **the #1 service-connected disability** for veterans from all periods of service, with 744,000 veterans receiving disability compensation for tinnitus alone

 - ❖ In 2010, the VA paid out over \$1.1 billion to veterans for tinnitus disability compensation, and projects these costs to exceed \$2.26 billion by 2014

- **Worldwide Interest:** 114 participants from 8 countries, and 50 abstracts received (12 selected for presentations/20 selected for posters)



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Meeting Objectives

Leverage expertise from DoD, other federal agencies, academia, industry and other nations:

- ✓ To identify the cause of tinnitus and determine its association, if any, with post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI)
- ✓ To determine if there are existing diagnostic tools that can be used to objectively identify tinnitus
- ✓ To identify and prioritize the research gaps that exist in standardizing methods used in the treatment of tinnitus
- ✓ To inform the medical research community on critical knowledge gaps relating to the prevention, diagnosis, and treatment of blast-induced tinnitus



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Questions to be Answered

1. What are the current theories concerning the neurobiological basis of tinnitus?
2. Is there substantial evidence that tinnitus is associated with PTSD and TBI. If so, what are the common biomarkers?
3. What are the current technological approaches to tinnitus diagnosis?
4. How can research standardize methods of effective tinnitus treatment?



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Meeting Format

- 15 November: 9 technical presentations [30-min including time for Q&A] covering the topic areas of Etiology, Diagnostics, Treatment, and Association with TBI/PTSD
- 16 November:
 - ✓ Finish technical presentations (3)
 - ✓ Break into 5 workgroups led by panel members (each workgroup will answer the 4 key questions)
 - ✓ Workgroups brief their answers in final plenary session
- 17 November: Closed Executive Session for panel members and PCO staff to synthesize information and generate conclusions



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Panel Members

Name	Position	Organization Name	Country
Dr. Richard Salvi*	Professor, Department of Communicative Disorders and Sciences and Director of the Center for Hearing and Deafness	State University of New York at Buffalo, Center for Hearing and Deafness	USA
Dr. Carol Bauer	Professor, Division of Otolaryngology	Southern Illinois School of Medicine	USA
Dr. Anthony Cacace	Professor of Communication Sciences and Otolaryngology	Wayne State University	USA
Dr. James Henry	Research Career Scientist and Associate Professor, Department of Otolaryngology, Oregon Health & Sciences University	VA National Center for Rehabilitative Auditory Research	USA
Dr. Berthold Langguth	Senior Psychiatrist, Department of Psychiatry and Head of the Tinnitus Center	University of Regensburg	Germany
Dr. Pim van Dijk	Professor, School of Behavioral and Cognitive Neurosciences	University Medical Center Groningen	The Netherlands

* Panel Chair



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Meeting Planning Committee

Lt Col Robert Shull	U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH
LTC Kristen Casto	U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL
Dr. Kyle Dennis	Headquarters VA, Washington, DC
Dr. Patricia Dorn	Headquarters VA, Washington, DC
LTC Marjorie Grantham	U.S. Army Public Health Command, Aberdeen Proving Ground, MD
Dr. Caton Harris	Branch Medical Clinic Marine Corps Air Station Miramar, CA
Dr. Michael Holtel	Telemedicine and Advanced Technology Research Center, Fort Detrick, MD
Dr. Benigno Sierra-Irizarry	Lackland Air Force Base, TX
Dr. Michele Spencer	Walter Reed National Military Medical Center, Bethesda, MD



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