

DEPARTMENT OF DEFENSE  
BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

3-5 NOVEMBER 2015

## Meeting Requirements and Output

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# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## DoD Blast Injury Research Program

- 2006 – Public Law 109-163, Section 256, directs the establishment of a DoD Executive Agent (EA) for blast injury research
- 2007– DoD Directive 6025.21E designates the Secretary of the Army as the DoD EA
- 2007– U.S. Army Medical Research and Materiel Command (USAMRMC) establishes the Program Coordinating Office (PCO) to support the EA



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## Requirement for this Meeting

Specific EA responsibilities established in Public Law and codified in DoD Directive:

- Identify blast injury knowledge gaps
- Ensure gaps are addressed in DoD medical research programs
- Share information with all stakeholder communities (medical, operational, materiel development)
- Foster collaboration among experts within and outside of the DoD, including other federal agencies, academia, industry and the international community



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## Output from this Meeting

- Prepare detailed meeting proceedings report **with help of Expert Panel** (available on Blast Injury Research Website (est. end of Feb 2016): <https://blastinjuryresearch.amedd.army.mil>)
- Inform DoD medical research program planning and management processes of knowledge gaps and recommended research to fill gaps
  - ✓ PCO membership on research planning committees [(e.g., Joint Program Committees (JPCs))]
  - ✓ Active participation of JPCs in SoS topic selection and on meeting planning committee
- Inform EA and DoD senior leadership via Significant Activity Reports, briefings, and Annual Report to the EA
- Publish meeting proceedings in special supplement, Journal of Neurotrauma

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Department of Defense Blast Injury Research  
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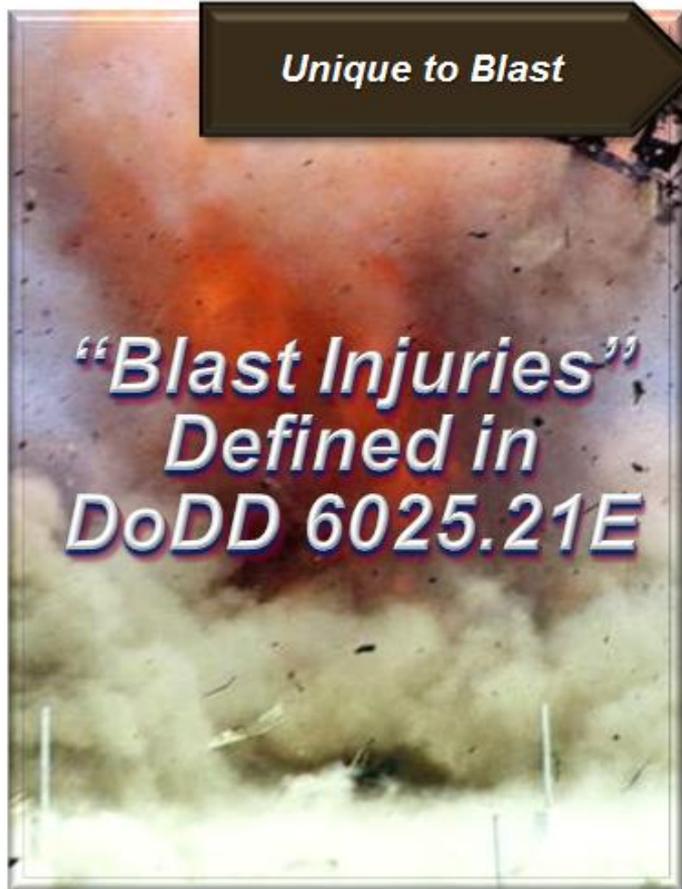
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# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Definition of “Blast Injuries”



### 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")

The EA is responsible for coordinating medical research that addresses the entire spectrum of blast injuries that occur in training and operational environments



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## State-of-the-Science (SoS) Meetings

- PCO established the SoS Meeting Series in 2009 to support EA responsibilities to identify blast injury knowledge gaps and inform research needed to fill the gaps
- Four SoS meetings since 2009:
  - ✓ “Non-impact, Blast-induced Mild Traumatic Brain Injury (mTBI)”
  - ✓ “Blast Injury Dosimetry”
  - ✓ “Blast-induced Tinnitus”
  - ✓ “Biomedical Basis for mTBI Environmental Sensor Threshold values”
- Meetings succeeded in identifying knowledge gaps, informing research to close the gaps, sharing information, fostering collaboration, and **recommending immediate or near-term actions to protect and care for Service Members**



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Purpose of this SoS Meeting

- Examine the scientific evidence linking repeated blast-related trauma, neurodegeneration, and the development of CTE
- Identify knowledge gaps and recommend research that will close the gaps
- Share information and foster collaboration
- **Recommend immediate or near-term actions to protect and care for Service Members**



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Meeting Format

- Opening Plenary Session
  - Keynote
  - Presentations on requirements and problem definition
  - Scientific presentations
  
- Scientific Poster Presentations
  
- Working Groups led by Expert Panel members (each Working Group will answer the same five questions)
  
- Working Groups report their answers to the five questions in a final plenary session



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Questions to be Answered

1. What are the definitive pathological characteristics of neurodegeneration from repeated blast-induced trauma?
2. What risk factors, both traumatic and non-traumatic, are predictive of CTE?
3. What research is needed to explore the putative spatiotemporal development of CTE resulting from repeated blast exposure?
4. What approaches can be used to detect early stages of blast-related neurodegeneration and evaluate the progression to CTE to support screening, detection, diagnosis, prognosis, assessment of therapeutic interventions, and determination of return to duty status?
5. What are the strategies that can be used to prevent, mitigate, or treat neurodegeneration following repeated blast exposure?



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Expert Panel

**COL Jamie Grimes**, Chief, Department of Neurology, Walter Reed National Military Medical Center, and Chair of Neurology, Uniformed Services University of the Health Sciences (*Panel Chair*)

**Dr. Stephen Ahlers**, Director, Operational Undersea Medicine Directorate, Naval Medical Research Center

**Dr. Kelley Brix**, Division Director, Research, Development, and Acquisition Directorate, Defense Health Agency

**Dr. David Brody**, Tenured Associate Professor of Neurology, Washington University, St. Louis, Missouri

**Dr. William Stewart**, Consultant and Lead Neuropathologist, Queen Elizabeth University Hospital, Glasgow, and Honorary Associate Professor, University of Glasgow and University of Pennsylvania

**LTC (Dr.) Avraham Yitzhak**, Head of the Trauma and Combat Branch, Israel Defense Forces



# Does Repeated Blast-Related Trauma Contribute to the Development of Chronic Traumatic Encephalopathy (CTE)?

## Meeting Planning Committee

**Mr. Michael Leggieri, Planning Committee Chair, DoD Blast Injury Research PCO, USAMRMC**  
**Dr. Raj Gupta, Planning Committee Co-Chair, DoD Blast Injury Research PCO, USAMRMC**  
**Dr. Regina Armstrong, Uniformed Services University of the Health Sciences (USUHS)**  
**Dr. Faris Bandak, Defense Advanced Research Projects Agency (DARPA)**  
**Dr. Patrick Bellgowan, National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS)**  
**Dr. Timothy Bentley, Office of Naval Research (ONR)**  
**Dr. Sean Biggerstaff, Office of the Assistant Secretary of Defense, Health Affairs (ASD[HA])**  
**Dr. Joan Cmarik, Office of the Principal Assistant for Acquisition (PAA), USAMRMC**  
**Dr. Alicia Crowder, Combat Casualty Care Research Program, JPC6, USAMRMC**  
**Dr. Tom DeGraba, National Intrepid Center of Excellence (NiCoE)**  
**Dr. Richard Ellenbogen, University of Washington/National Football League (NFL)**  
**COL Colin Greene, Joint Trauma Analysis and Prevention of Injuries in Combat (JTAPIC) Program**  
**Dr. Ramona Hicks, One Mind**  
**Dr. Stuart Hoffman, Department of Veterans Affairs (VA)**  
**Capt Robert Latta, United States Air Force (USAF)**  
**Dr. Geoffrey Ling, Defense Advanced Research Projects Agency (DARPA)**  
**Dr. Donald Marion, Defense and Veterans Brain Injury Center**  
**Dr. Robert Mazzoli, Vision Center of Excellence (VCE)**  
**Dr. Michael McCrea, Medical College of Wisconsin/National Collegiate Athletic Association (NCAA)**  
**Mr. John O'Donnell, Marine Corps Systems Command (MCSC)**  
**Col Mark Packer, Hearing Center of Excellence (HCE)**  
**Dr. James B. Petro, Office of the Assistant Secretary of Defense, Research and Engineering (OASD[R&E])**  
**Col Todd Rasmussen, Combat Casualty Care Research Program, JPC6, USAMRMC**  
**LTC Wendy Sammons-Jackson, Office of the Principal Assistant for Research and Technology (PA[R&T]), USAMRMC**  
**Dr. Richard Shoge, Military Operational Medicine Research Program, JPC5, USAMRMC**  
**Dr. Victoria Tepe, Hearing Center of Excellence (HCE)**  
**COL Ladd Tremaine, Armed Forces Medical Examiner Systems (AFMES)**  
**Dr. James Zheng, PEO Soldier**