

Second Announcement and Call for Papers



Virtual

5th International Forum on Blast Injury Countermeasures (IFBIC 2021)

*Video-on-demand presentation and
text-based interactive discussion for all papers*

September 27 (Mon) – October 10 (Sun), 2021

New abstract deadline: July 23 (Fri), 2021

<http://www.ndmc.ac.jp/schoolnews/ifbic2021/>

Objective and Scope

In recent years, attacks using explosive devices occur frequently not only on battlefields and in regions of conflict but also in urban areas due to terrorism, resulting in a large number of blast injury victims. The US Department of Defense uses the *Taxonomy of Injuries from Explosive Devices* (DoDD 6025.21E) to organize blast injuries into five groupings. Primary injuries result from the blast shock wave. Secondary injuries result from penetrating fragments accelerated by the blast. Tertiary injuries are caused by acceleration or blunt impact to tissues. Quaternary injuries include dermal burns and toxic gas inhalation. Quinary injuries include contamination by nuclear, chemical or biological agents. Primary injuries that are peculiar to blast shock wave exposures include blast-induced traumatic brain injury (bTBI), hearing loss, ocular injury and lung injury. All body systems are vulnerable to secondary and tertiary injuries. In addition to injuries caused by blasts of explosive devices, bioeffects of repeated exposure to shock waves associated with high-overpressure weapons have also received much attention recently.

International cross-disciplinary collaboration is regarded as essential to investigate physical causes of blast injury, to characterize the vulnerability of anatomical systems and their functions to blasts and to develop the means to prevent, mitigate and treat blast injuries. Countermeasures may include personal protective equipments; weapons and vehicle systems engineered for safety; tactics, techniques and procedures (TTPs) for injury prevention; and medical interventions tailored to the specific needs of blast injuries.

This International Forum on Blast Injury Countermeasures (IFBIC) started as a Technical Information Exchange Forum between Japan and the United States, which brought together broad knowledge and expertise, and to share national experiences and evidence-based approaches for blast injuries. The previous three Japan-

US Technical Information Exchange Forum on Blast Injury (JUFBI) were held in June 2016, April 2017 and May 2018 in Tokyo. At the end of JUFBI 2018, the organizing committee decided to change the name to International Forum on Blast Injury Countermeasures to reflect the expanding participation by additional nations such as Australia, Canada, Germany, South Korea and the United Kingdom. The IFBIC 2019 was held in Washington D.C. area from 8 to 10 May 2019. Due to the pandemic of COVID-19, the IFBIC 2020, which had been planned to be held in Tokyo, was postponed, and the Organizing Committee has decided that the IFBIC 2021 will be held *online* (video-on-demand presentation and text-based interactive discussion for all papers) from September 27 (Mon) to October 10 (Sun), 2021.

The objectives for the 5th Forum include:

- a. Assembly of an international forum focused on multi-disciplinary science, engineering, and medicine necessary to increase our understanding of blast injury and its countermeasures from bench to bedside
- b. Achieving a mutual understanding of international efforts in blast injury research
- c. Identifying knowledge gaps requiring collaborative research
- d. Increasing understanding and promoting further collaboration to improve prevention, protection, clinical diagnosis, and treatment addressing the entire spectrum of blast-related injuries

The meeting agenda includes the following broad topic areas. Innovative research beyond this topic list will also be considered:

- 1) Blast injury epidemiology and environmental sensing of blast shockwave hazards**
 - a) Clinical prevalence of varieties of blast injuries sorted by context, anatomy, and severity
 - b) Blast energy / physics / waveforms, reflections, effects of media (e.g., air vs. water vs. solid material)
 - c) Blast sensor engineering, test and evaluation, fidelity, usability
 - d) Correlation of blast sensing with clinical outcomes
 - e) Use of multiple sensors to reconstruct blast phenomena
- 2) Primary blast injury (due directly to shockwave effects)**
 - a) Experimentally derived injury risk criteria for anatomical structures and their functions, including brain, ocular, auditory, and lung
 - b) Predicted incapacitation due to blast injuries (e.g., loss of neuromuscular control, reduced sensory or cognitive function, reduced respiration)
- 3) Secondary (penetrating ballistic fragments) and tertiary (acceleration and blunt force) blast injury**
 - a) Experimentally derived injury risk criteria for anatomical structures and their functions
 - b) Predicted incapacitation due to blast injuries (e.g., loss of musculoskeletal force)
- 4) Long-term effects, cumulative effects, and chronic symptoms due to blast exposure**
 - a) Brain: aberrant protein expression and accumulation (e.g., phosphorylated Tau)
 - b) Brain: chronic traumatic encephalopathy (CTE)-like symptoms
 - c) Brain: correlation and comorbidity with post-traumatic stress disorder (PTSD)
 - d) Effect of cumulative subclinical (i.e., not provoking diagnosis) exposures to blast phenomena for all body systems
 - e) Effect of repeated clinical (i.e., provoking diagnosis) exposures to blast phenomena for all body systems
- 5) Prevention, mitigation, treatment of blast injuries**
 - a) Personal protective equipment (PPE) such as helmets, body armor, eye protection, hearing protection, etc.
 - b) Weapon and vehicle systems engineered for safety in blast environments
 - c) Tactics, techniques, and procedures (TTPs) for Warfighter safety in blast environments
 - d) Operational mission planning for needed medical response
 - e) Lessons learned from military operations
 - f) Resilience training (e.g., stress inoculation, mindfulness-based cognitive therapies to prevent sequelae of psychological trauma from blast exposures)
 - g) Biomedically-based design and acquisition standards for military equipment (materiel)
 - h) Biomedically-based health hazard assessments
 - i) Clinical current practices, interventions, surgeries, rehabilitative therapies

- 6) **Diagnostic measures / biomarkers**
 - a) Innovations in self-reported symptom inventories
 - b) Innovations in diagnostics based on observations by clinical staff
 - c) Innovations in molecular markers of blast injury
 - d) Innovations in biomedical imaging measures of blast injury
 - e) Innovations in behavioral or functional tests for blast injury
- 7) **Computational modeling and simulation of blast phenomena and blast injury**
 - a) Deformable finite element modeling (FEM) of stresses and strains
 - b) Injury risk criteria applied to force-time histories from FEM
 - c) Incapacitation risk criteria applied to injury predictions from FEM
 - d) Shockwave modeling
 - e) Innovations in coupling between computational fluid dynamics (CFD) and FEM
 - f) Integration of computational models with blast sensors and other sensors (e.g, strain gauges or force transducers on cadavers or simulant manikins)
- 8) **Characteristics comparison between blast-related TBI and blunt TBI**
- 9) **New technology and methods for blast injury research and medicine**

Contributions from all countries, as well as from young investigators, are welcome.

General Information

Meeting title:

The 5th International Forum on Blast Injury Countermeasures (IFBIC 2021)

Organized by:

National Defense Medical College Japan (NDMC)
 U.S. Army Medical Research and Development Command (USAMRDC)
 U.S. Army Combat Capabilities Development Command (CCDC)

Important dates:

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|--------------------------------------|--|
| Abstract submission deadline: | July 23 (Fri), 2021 July 9 (Fri), 2021 |
| Abstract acceptance notification: | August 10 (Tue), 2021 July 27 (Mon), 2021 |
| Pre-registration: | July 27 (Tue) – August 20 (Fri), 2021 |
| Contents upload: | August 23 (Mon) – September 10 (Fri) |
| IFBIC 2021 (online): | September 27 (Mon) – October 10 (Sun), 2021 |

Abstract Submission

Please prepare your abstract using the template provided at the conference website. Abstract submissions should be emailed to the IFBIC 2021 secretary office no later than **July 23 (Fri), 2021** ~~July 9 (Fri), 2021~~.

IFBIC 2021 secretary office: ifbic2021@ndmc.ac.jp

All submitted abstracts will be reviewed by the IFBIC 2021 Program Committee and notification of abstract acceptance will be made by August 10 (Tue), 2021 ~~July 27 (Mon), 2021~~.

Upload of presentation files

Presenters of accepted abstracts will be requested to upload a presentation file(s). Information about uploading will be posted at the conference website.

Registration

Pre-registration is required for all participants. Please send the pre-registration form (available at the conference website) to the conference secretary office. The term for pre-registration is from July 27 (Tue) to August 20 (Fri), 2021.

Meeting Organization Committee

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Daizoh Saitoh (NDMC, Japan)

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Raj Gupta (USAMRDC, USA)

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