



US DEPARTMENT OF DEFENSE

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

## Facial, Hearing, and Visual Injuries

### Effects of Blast Injury on Hearing in a Screened Military Population

Blast injury to the ear has emerged as one of the most common combat-related injuries among military personnel deployed during OEF and OIF, and may result in symptoms of tinnitus, hearing loss, and/or hearing shifts. Exposure to hazardous noise, such as blasts, can compromise a Service Member's ability to hear and communicate, and thus, reduce situational awareness and operational readiness. mTBI's are also highly prevalent among those exposed to blasts and may pose a greater risk for future auditory impairments in blast-injured Service Members. To address this research gap, the NHRC examined audiometric data from the comprehensive Blast-Related Auditory Injury Database of Navy and Marine Corps personnel who sustained a blast-related injury compared to those with a non-blast-related injury while deployed. Subjects included only those who had an audiogram within 12 months prior to and following injury. There were 661 Service Members with a blast-related injury and 913 with a non-blast-related injury identified by NHRC as having at least one audiogram within a year before and after injury (N = 1,574). Service Members in the blast-related injury group were more likely to be younger, infantry, sustain more injuries, and have higher ISS. Personnel who sustained a blast injury were significantly more likely than those with a non-blast-related injury to experience post-injury hearing loss and significant threshold shifts. An estimated 54 percent of risk for hearing loss in the blast-injured Service Members could be attributed to the blast-related injury event. A subgroup of 94 Navy and Marine Corps personnel with a provider-diagnosed, blast-related mTBI in NHRC's Theatre Concussion Clinic Neuroregistry and a pre- and post-injury audiogram were also examined to assess the association between initial mTBI symptoms and auditory outcomes. Results demonstrated that acute mTBI auditory symptoms are most related to auditory impairments within the first year after a blast-related mTBI. There were not any mTBI-specific acute symptoms that were related to auditory impairments. Future studies should compare blast and non-blast mTBI and its association with long-term auditory impairments.

Auditory health and readiness are critical components of situational awareness and quality of life for the US military and combat Veterans. The results of NHRC's investigation about the hearing health status of deployed Service Members could provide decisive insight about



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operational readiness, injury prevention, and related medical problems. It is imperative to monitor the effects of blast injury on hearing outcomes, identify at-risk populations for early intervention and prevention, develop supportive policies and best practice guidelines, and allocate appropriate funds and resources.