



US DEPARTMENT OF DEFENSE

# BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

## Neurocognitive and Psychological Health Treatment Strategies

### Brain Training to Enhance Frontal Lobe Reasoning in Soldiers with Traumatic Brain Injury (TBI)

TBI is a leading cause of death and disability within the US with a high occurrence of TBI-related disability within both civilian and military populations. The objective of this collaborative study at the University of Dallas, Texas, was to evaluate the effectiveness of a cognitive rehabilitation therapy after mild TBI (mTBI) in Service Members. The study was funded by the DMRDP managed by CDMRP. The Strategic Memory and Reasoning Training (SMART) program was tested for its effectiveness to improve strategic attention, higher-order reasoning, and innovative problem solving in order to help Service Members return to a productive work life after injury. The investigators used objective measures of cognition, functional life outcomes, and advanced brain imaging techniques to measure the effects of SMART. The study completed recruitment, enrollment, and data collection in FY16, and the study team has several manuscripts under review in peer reviewed journals summarizing the results of this work. Overall, the researchers demonstrated that the SMART program led to gains in cognitive functioning, reduced symptoms of depression, as well as changes in cerebral blood flow (CBF) and measures of white matter integrity. Initial results suggest that this program has the ability to improve cognitive capacity and enhance brain function in Service Members through the use of a manualized, evidence-based higher-order cognitive training protocol. The potential to reduce deficits in frontal lobe based executive functions has high relevance to improve outcomes for a population who typically suffer from persistent symptoms long after the initial injuries. Thus, the impact of these studies could enhance Service Members' mental productivity, improve cognitive competence, as well as, reduce the long-term economic burden of TBI-related disability.

