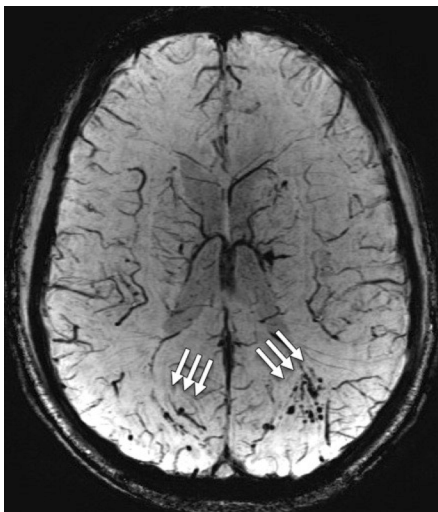




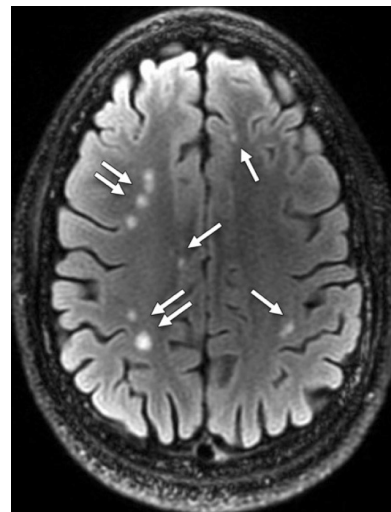
US DEPARTMENT OF DEFENSE  
**BLAST INJURY RESEARCH PROGRAM**  
COORDINATING OFFICE

## Neurobehavioral and Psychological Health Outcomes Findings from Structural Magnetic Resonance Imaging (MRI) in Military Traumatic Brain Injury (TBI)

Researchers at the National Intrepid Center of Excellence (NICoE) investigated the effects of chronic mild TBI (mTBI) in Service Members using an integrated MRI protocol. The predominant form of TBI in deployed personnel occurs as a result of blast injury. Blast injury may be associated with higher rates of sensory impairment, neuroimaging findings, and emotional impairment. However, this has not been a consistent finding in military populations. This study described the neuro-radiological findings by using radiological common data elements in an integrated MRI protocol. Participants included a control group without TBI (n = 42), which consisted of active duty Service Members or dependents. The second group consisted of individuals who received a TBI (n = 834). The primary measure was anatomic MRI, which focused on structural aspects of TBI. Additional parameters, identified as neuroimaging common data elements, were also collected for comparison. In this patient population, the most common finding was white matter T2-weighted hyper-intense areas, occurring in 51.8 percent of the blast injured patients (Figure 1).<sup>1</sup> Cerebral micro-hemorrhage did occur in a small percentage of the patients (Figure 2).



**FIGURE 1:** Susceptibility-weighted image shows extensive microhemorrhage (arrows) consistent with diffuse axonal injury in a 25-year-old man with blast-related mTBI. (used with permission of the authors)



**FIGURE 2:** Axial T2 FLAIR image shows multiple white matter T2-weighted hyperintense areas (arrows) in a 28-year-old man with blast-related mTBI. This patient had a total of 76 lesions on all sections. (used with permission of the authors)

1 Riedy, G., Senseney, J. S., Liu, W., Ollinger, J., Sham, E., Krapiva, P., ... Oakes, T. R. (2015). Findings from Structural MR Imaging in Military Traumatic Brain Injury. *Radiology*, 279(1), 207–215. <https://doi.org/10.1148/radiol.2015150438>

