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### 43 Chronic Neurobehavioral and Cognitive Symptoms in Combat Deployed Military Service Personnel With and Without History of Blast-Related Mild Traumatic Brain Injury

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**Objective:** Investigate the relationship of chronic neurobehavioral and cognitive symptoms in military personnel with history of blast-related mild TBI and compare to a well-matched group of combat-deployed controls.

**Participants and Methods:** 274 participants (mean age=34 years; mean education=14.75 years; 91.2% male) enrolled in the EVOLVE longitudinal study of combat-deployed military personnel were subdivided into those with history of blast TBI (n=165) and controls without history of blast exposure and TBI (n=109). As part of a larger study, we conducted a sub-analysis of 5-year follow up data. We focused on group differences (Mann-Whitney U) and correlational relationships between self-report neurobehavioral symptoms via the Frontal Systems Behavior Scale (FrSBE) and cognitive performances on measures of attention, working memory, processing speed, and executive functioning including D-KEFS Color Word Interference (CWI), Trailmaking A and B, and the Conners Continuous Performance Test (CPT).

**Results:** The Blast TBI group reported higher levels of neurobehavioral symptoms on the FrSBE ( $p < .001$ ), including domains of apathy ( $p < .001$ ), disinhibition ( $p < .001$ ), and executive

dysfunction ( $p < .001$ ), compared to Controls. On cognitive measures, group differences were observed on CWI Inhibition/Switching ( $p = .008$ ), Trails B time ( $p = .010$ ), and CPT commission errors ( $p = .014$ ), such that the Blast TBI group performed worse than Controls. No significant group differences were observed for CPT omission errors or CPT hit rate ( $p$ 's  $> .05$ ). After adjustment for multiple comparisons, greater FrSBE apathy correlated with slower performance on Trails A for Blast TBI ( $r = 0.22$ ,  $p = .014$ ) but not Controls. Apathy endorsement was not significantly related to CPT omission errors for either group ( $p$ 's  $> .05$ ). Higher endorsement of disinhibition symptoms was associated with worse performance on CWI Inhibition (Blast TBI:  $r = -0.19$ ,  $p = .036$ ; Controls:  $r = -0.28$ ,  $p = .012$ ) and Inhibition/Switching (Blast TBI:  $r = -0.23$ ,  $p = .010$ ; Controls:  $r = -0.29$ ,  $p = .010$ ) conditions for both groups, whereas only the Blast TBI group showed significant relationships between disinhibition symptoms and Trails B-A time ( $r = 0.20$ ,  $p = .025$ ) and CPT commission errors ( $r = .18$ ,  $p = .038$ ). Higher endorsement of executive dysfunction correlated with poorer performance for Trails B-A for both groups (Blast TBI:  $r = .24$ ,  $p = .009$ ; Controls:  $r = .24$ ,  $p = .030$ ).

**Conclusions:** Our findings reveal that at 5-year follow up, military personnel with history of blast-related mild TBI reported significantly greater neurobehavioral symptoms and performed lower on standardized measures of executive functioning, relative to combat-deployed controls without TBI or blast exposure. Significant relationships between neurobehavioral symptoms and cognitive performance were present in both groups. However, these relationships were more pronounced in the Blast TBI group, including greater apathy associated with slower visual tracking as well as greater endorsement of disinhibition associated with set-switching. Objective measures of response inhibition were related to disinhibition endorsement for both groups, though impulsive errors were more pronounced for the Blast TBI group. Our results suggest chronic cognitive and neurobehavioral symptoms are present in military personnel with history of blast TBI exposure, and also discrepant from a well-matched control group of combat deployed military personnel. Future studies of this population should explore models to predict cognitive performance from neurobehavioral symptoms in military personnel, as this could inform treatment approaches for those at greatest risk of cognitive change.

**Categories:** Concussion/Mild TBI (Adult)

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#### 44 The Link Between Loss of Consciousness, Working Memory, and Depressive Symptoms in Adult Concussion Patients.

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**Objective:** Individuals who have experienced a mild traumatic brain injury, or concussion, often experience a variety of cognitive and emotional sequelae. Specifically, concussions can place individuals at increased risk for experiencing symptoms of depression. It is important to understand if loss of consciousness (LOC) is related to higher rates of depression in order to improve care and cognitive functioning by appropriately monitoring for mood-related symptoms post-concussion. The current study sought to examine the relationship between depressive symptoms (measured using the PHQ-9), working memory (WM; measured using RBANS Digit Span subtest), and presence of LOC in individuals who have sustained a head injury. The relationships between presence of LOC, depressive symptoms, and WM performance were examined, as it was expected LOC would result in greater depressive symptoms and negatively impact WM performance. Finally, the relationship between depressive symptoms and WM performance, while controlling for LOC, was also assessed.

**Participants and Methods:** Data was drawn from archival medical records of 40 patients who underwent brief neuropsychological screening in an outpatient, community clinic after being referred following a head injury. Patients ranged in ages from 14 to 75, with a mean age of 39.1. The average years of education amongst patients was 14.62. Twenty-five (62%) of the patients were women. Ten individuals endorsed LOC secondary to their head injury.

**Results:** The average PHQ-9 score was 9.68 (SD=7.69). LOC did not impact reported depressive symptoms ( $p > .05$ ). The correlation between LOC and WM performance was also nonsignificant ( $p > .05$ ). While it was predicted there would be an inverse relationship between PHQ-9 scores and WM performance, there was no statistical significance ( $p > .05$ ). Similarly, there was no significant relationship between PHQ-9 and WM performance when controlling for LOC ( $p > .05$ ).

**Conclusions:** While the relationships between LOC, depressive symptoms, and WM performance were found to be nonsignificant, understanding the course and best supports of cognitive and emotional sequelae of head injuries is of paramount importance. Future research exploring these relationships with larger, diverse populations would likely prove beneficial.

**Categories:** Concussion/Mild TBI (Adult)

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#### 45 Providing a Definition of Head Injuries Increases Reported Trauma in Women Between 30 and 50

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**Objective:** Utilization of an objective measure to evaluate history of head trauma has been demonstrated to have a significant effect on the amount of sustained trauma reported by the individual, in athletic male populations. The ability to generalize this definition across a more diverse population remains an opportunity; a report from the World Health Organization recognized that 93% of current research on mild traumatic brain injuries omitted gender specific data. Further, relative to reports in young adults, research on the effects of concussions in midlife remain sparse. Researchers hypothesized that women between the ages of 30 and 50 from a