

## **THE CLINICAL UTILITY OF THE VESTIBULAR AND OCULAR MOTOR SCREENING FOR PROTRACTED RECOVERY IN PEDIATRIC CONCUSSION PATIENTS**

**Todd J. Caze II, PhD<sup>01,02</sup>, August Price PsyD<sup>01,02</sup>, Gregory Knell, PhD, MS<sup>01,03</sup>, Christine Ellis, NP<sup>01</sup>, John Abt PhD<sup>01</sup>, Scott Burkhart, PsyD<sup>01</sup>**

<sup>01</sup> Children's Health Andrews Institute for Orthopaedics and Sports Medicine, TX, USA,

<sup>02</sup>University of Texas-Southwestern Medical Center TX, USA, <sup>03</sup>The University of Texas Health Science Center at Houston TX, USA,

**Background:** Sports-related concussions (SRCs) are a concern for youth athletes and their subsequent healthy development into adulthood. Protracted recovery (>28 days) from a SRC may lead to long-term complications resultant of persistent symptoms. There is a current lack in understanding of the factors contributing to protracted recovery from SRC in children, and in particular no tools exist to identify those SRC patients that may be more likely have a protracted recovery in an acute clinical setting.

**Hypothesis/Purpose:** To examine the relationship between initial Vestibular and Ocular Motor Screening (VOMS) and protracted recovery from concussion in youth.

**Methods:** Children aged 8-12 years old, who were diagnosed with a SRC and seen in a concussion specialty clinic within 7-days of injury were included in the analysis. VOMS was administered during the initial visit. A positive VOMS score was defined as any 2-point increase from baseline in patient reported symptom severity on dizziness, fogginess, headache, and nausea, or any convergence measure greater than 6 centimeters. Recovery time (days) was the interval between date of injury and date of medical clearance. Multivariable logistic regressions were used to determine the odds of protracted recovery based on an initial positive VOMS.

**Results:** A total of 108 males (mean age=10.8, sd=1.3) and 66 females (mean age=10.8, sd=1.4), took a median (IQR) 20.0 (15.0-28.5) and 22.0 (15.0-34.0) days to recover, respectively. After controlling for age and days since injury, those with a positive VOMS were 3.92 (95% CI = 1.58-9.71,  $p=0.003$ ) times more likely to have a protracted recovery compared to those with a negative VOMS. When stratified by sex, observed effects were more amplified among males (OR=5.92, 95% CI=1.59-21.96,  $p=0.008$ ), than among females (OR=2.44, 95% CI=0.61-9.71,  $p=0.21$ ).

**Conclusion:** There is a need to determine the relationship between SRC assessment measures and recovery time to improve clinical management and outcomes. In this sample of pediatric concussion patients aged 8-12 years, the VOMS displayed potential as a tool to screen for delayed recovery among males. Future studies should confirm these findings in other, larger samples, while taking into consideration other factors that may influence recovery time.