Appendix A. Psychological Measures Included in Neurocognitive Screening Evaluation (NCSE).

CNS Vital Signs: The CNS-VS is a computer-administered neurocognitive battery with eight subtests: 1. Verbal memory (immediate and delayed); 2. Visual memory (immediate and delayed); 3. Finger tapping; 4. Symbol digit coding; 5. Stroop test; 6. Shifting attention; 7. Continuous performance test; and 8. Nonverbal reasoning test. This assessment battery was initially standardized, and norms were based on a sample of 1069 subjects, ages 7 – 90 years, [84] and has subsequently had updated normative data, and numerous studies on cognitive functioning have been published using this battery as a core measure, including studies on concussion (e.g., Vander Vegt, *et al*, [85] Mozayeni, *et al*, [86]).

Neurobehavioral Symptom Inventory:The NSI is a self-report form initially developed by the US Department of Veterans Affairs to assess mTBI. [87,88] The instrument has had numerous validation studies, and applied studies relevant to the assessment of concussion, mTBI, and PCS. [18,89,90] There are four scale scores that reflect different dimensions of complaints relevant to PCS: 1. Somatosensory; 2. Affective; 3. Cognitive; and 4. Vestibular. There is also a subset of 10 items which have been shown to be sensitive to non-valid, magnified symptom reports, known as the *NSI Validity-10 index.* [18,50]

Minnesota Multiphasic Personality Scale, Second Edition, Restructured Format: The MMPI-2-RF is a 338 item, true-false response format clinical, validity, and personality inventory which was released in 2008. [91,92] The norms for the restructured format were based on the earlier version, MMPI-2, but were utilized to generate restructured scales, based on additional applications following literally dozens (actually, hundreds), of studies. There are 51 scales in the interpretive report, but for the purposes of this study, the relevant ones included mainly the nine validity scales, especially FBS-r (Symptom Validity scale, aka, “Fake Bad Scale,”) which assesses somatic and cognitive complaints associated with high levels of over-reporting, and RBS (Response Bias Scale), which reflects exaggerated memory complaints. The clinical scales also include the following: EID (Emotional/Internalizing Dysfunction), which assesses problems with mood and affect, RCd (Demoralization), unhappiness and dissatisfaction, RC1 (Somatic Complaints), RC2 (Low Positive Emotions), RC7 (Dysfunctional Negative Emotions), MLS (Malaise), which assesses overall sense of physical debilitation and poor health, HPC (Head Pain Complaints), NUC (Neurological Complaints), and COG (Cognitive Complaints).

PTSD Checklist for DSM-5: The PCL-5, which was also developed by the US Department of Veterans Affairs, [93,94] is a 20-item self-report measure used to assess the nature and severity of post-traumatic stress symptoms. The scale results in an overall symptom severity score (0 -80), as well as DSM-5 symptom cluster scores: B – intrusive symptoms; C – persistent avoidance; D – negative thoughts and mood; and E – alterations in arousal and reactivity.

 *Demographic Estimate of Pre-Morbid IQ*: The DEP-IQ, [95] was used to provide a baseline comparison for the CNS-VS results. It is a simple weighted predictive regression equation based on vocational level, educational history, and chronological age.