

Neuropsychological Testing is predictive of severity of disability following Traumatic Brain Injury: Findings from the VA TBI Model Systems & Implications for the Chronic Effects of Neurotrauma Consortium

Tamara McKenzie, PsyD^{1,2}, Marc A. Silva, PhD², Risa Nakase-Richardson, PhD^{2,3}

Background:

Performance on neuropsychological tests is important in predicting cognitive recovery in rehabilitation settings following traumatic brain injury (TBI). Predicting additional outcomes such as need for supervision, return to work or school, and level of disability are also important for planning discharge needs and have also been shown to be correlated with neuropsychological test performance. As such, this poster aims to examine the current knowledge garnered from the TBIMS with regard to cognitive performance across injury severity, and the relationship between specific neuropsychological tests and predictions about disability outcome following acute rehabilitation.

Method:

The study sample was drawn from participants enrolled in the TBIMS at the James A. Haley Veterans' Hospital. Participants were veterans and active duty military service members admitted for inpatient rehabilitation following TBI. Multiple regression was used with a sample of 79 individuals to examine the influence of cognitive functioning on degree of disability at rehabilitation discharge using the Disability Rating Scale (DRS). As this study aimed to evaluate differences in cognitive performance and disability outcome by injury severity, the sample was divided by calculated length of post-traumatic amnesia (PTA) per DoD/VA Classification Guidelines. Injury severity (Mild: PTA \leq 24 hours; Moderate & Severe: PTA > 24 hours) was entered into the regression in block one, followed by neuropsychological variables entered in the second block. Participants completed neuropsychological tests including the Orientation Log (O-Log), Trail Making Test (TMT, Parts A & B), and California Verbal Learning Test (CVLT-II).

Results:

Injury severity accounted for 10% of the variance, while the total amount of the variance explained by the complete model with neuropsychological variables was 34%, $F(5,73) = 7.39$, $p < .001$. Of the neuropsychological measures administered, only the CVLT-II made a significant contribution in predicting degree of disability at discharge (CVLT-II $\beta = -.46$, $p < .001$), and upon visual analysis, also appeared to be a larger contributor than injury severity alone (injury severity $\beta = -.31$, $p = .002$).

Conclusion:

Results support previous research indicating that that neuropsychological testing utilized to assess cognitive status during inpatient rehabilitation is clinically useful in predicting functional outcomes at discharge. Specifically, lower learning, as measured by the CVLT-II was the most predictive of increased disability at discharge. As such, strategies aimed at facilitating increased learning and/or compensatory strategies may be a key point of intervention during hospital admission in order to facilitate greater adaptation and less disability. Implications for longitudinal studies will be discussed.

This material is the result of work supported with resources and the use of facilities at the James A. Haley VA Healthcare System.

The views, opinions, and/or findings contained in this poster are those of the authors and should not be construed as an official Department of Defense position, policy or decision unless so designated by other official documentation.

¹Defense & Veteran's Brain Injury Center (DVBIC), contract for General Dynamics Information Technology (GDIT).

²Mental Health and Behavioral Sciences Service, James A. Haley VA Healthcare System, Tampa, FL.

³University of South Florida, College of Medicine.

Acknowledgments/Disclosures:

- This research was sponsored by VHA Central Office Division of Rehabilitation Medicine and VA TBI Model System Program of Research.
- This material is based upon work supported in part by the Defense and Veterans Brain Injury Center (DVBIC) and US Army Medical Research and Materiel Command (USAMRMC).