

# Longitudinal Cognitive Functioning in Gulf War veterans with and without Gulf War Illness: Data Mining from the BBRAIN Repository

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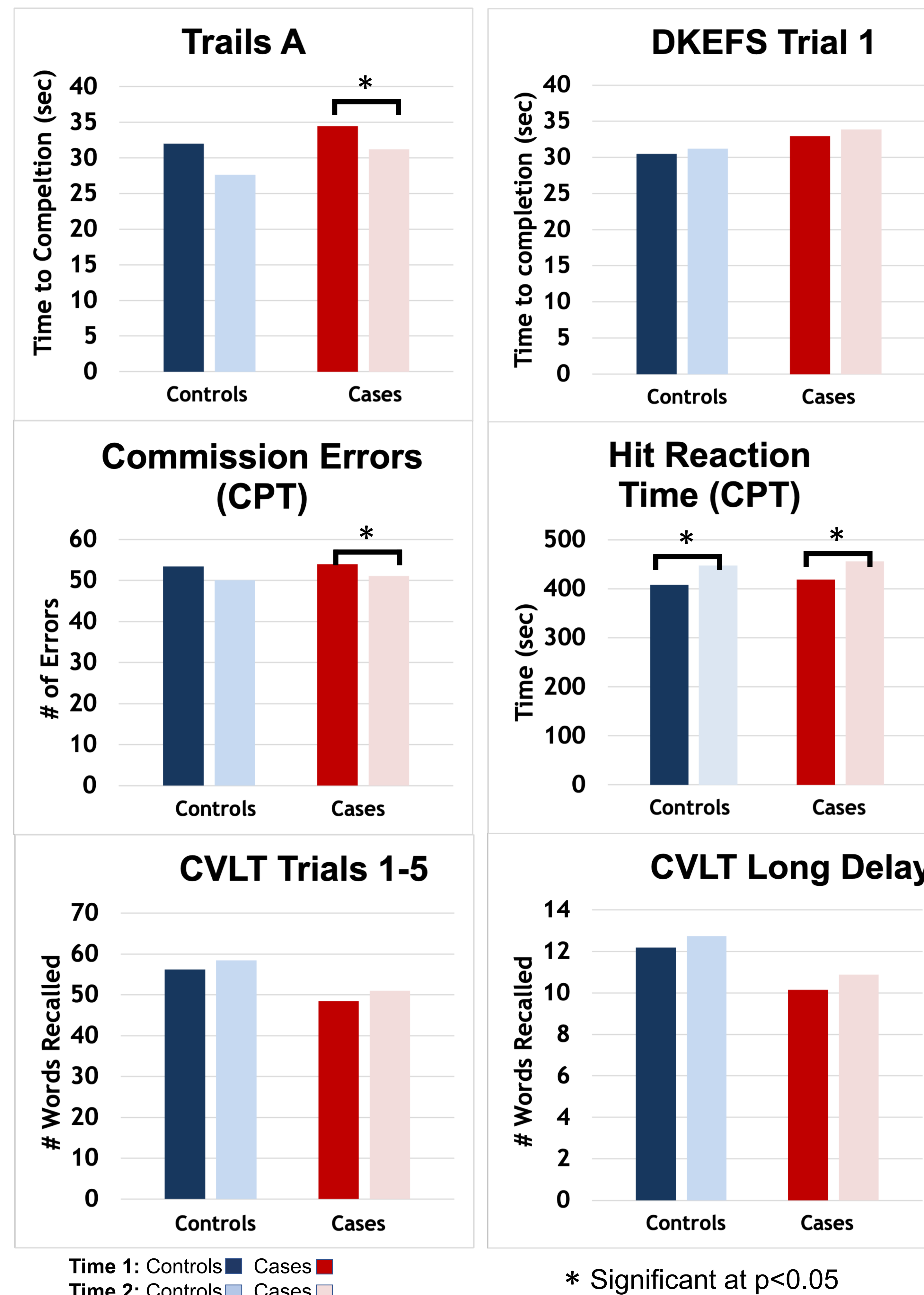
## Background

- Veterans from the 1991 Gulf War (GW) experienced several neurotoxicant exposures, including chemical weapons, pesticide sprays and creams, oil well fires and pyridostigmine bromide anti-nerve gas pills during the war.
- Over a third of all GW veterans suffer from a chronic multi-symptom disorder called Gulf War Illness (GWI).
- The Boston Gulf War Illness Consortium (GWIC) was a multi-site study designed to assess symptoms of GWI. After the conclusion of the GWIC study, the Boston Biorepository Recruitment and Integrative Network for Gulf War Illness (BBRAIN) was developed to harmonize retrospectively collected GW Veteran data while simultaneously collecting Time 2 data and samples from GW veterans who participated in the original study.

## Methods

- A total of 62 participants were re-evaluated from the original GWIC cohort (51 cases and 11 controls).
- Verbal learning, memory, attention, and executive functioning were assessed at Time 1 and Time 2 using neuropsychological tests including the Continuous Performance Test (CPT3), Trail Making Test A, Delis-Kaplan Executive Function System (DKEFS) Color-Word Interference Test, California Verbal Learning Test (CVLT-II).
- Paired t-tests for the cognitive measures were completed separately for GWI cases and healthy GW veteran controls for each of the neuropsychological test measures.
- Average time between assessments was four years.

## Figure 1: Longitudinal Results



## Objectives

- Compare neuropsychological outcomes in cases and controls in a longitudinal analysis of cognitive data from the BBRAIN repository.

## Demographics

	Controls (n=11)	Cases (n=51)
%Male	100%	78%
Age	57.2 (7.1)	56.4 (4.8)
Education Yrs.	15.8 (2.4)	15.2 (2.4)
Race: n (%)		
White/Caucasian	11 (100%)	41 (82%)
Black/AA	-	6 (12%)
Asian/Pacific Islander	-	1 (2%)
Multiracial	-	2 (4%)

## Results

- Cases and Controls both showed slower hit reaction time on the CPT3 at Time 2 as compared to Time 1 (p < 0.001 and p = 0.01 respectively).
- Cases showed less commission errors at Time 2 compared to Time 1 (p = 0.01) and a faster time to completion on Trails A at Time 2 (p = 0.04).
- No other tests showed statistical significance.

## Conclusions

- The GWI veterans are slower on the CPT but make less commission errors over time potentially indicating less impulsivity.
- Continued enrollment may yield further differences and more clear patterns in cognitive outcomes. This analysis was limited by current small sample sizes.