

**Participants and Methods:** The FDC is the longest running cohort of GW veterans with initial baseline cognitive, mood, exposure and trauma assessments in 1997-1998 and follow-up evaluations in 2019-2022. FDC veterans (N=48) who completed both time points were the participants for this study. Veterans were categorized into dichotomous (yes/no) groups of PTSD classification. The PTSD checklist (PCL) was used to determine PTSD case status. Symptom ratings on the PCL were summed (range:17-85) and a cutoff score of 36 or higher was utilized to indicate probable PTSD. Neuropsychological measures of mood (POMS) and memory (Visual Reproductions from the Weschler Memory Scale-R; California Verbal Learning Test Second Edition; CVLT2) and executive function and language; (Delis-Kaplan Executive Function System- Color Word and Verbal fluency- Animals) were compared overtime using Paired T-tests.

**Results:** The study sample (N=48) was 92% male and 96% reported active-duty status at the time of the GW. Mean current age was 58 years. All veterans reported exposure to at least one war-related toxicant. 48% met criteria for probable PTSD (N = 23) while 52% did not (n=25). No differences between groups were found in any of the POMS subscales, nor were differences seen in verbal memory, executive function, or language tasks. There were, however, significant differences in nonverbal memory in those with probable PTSD showing fewer details recalled during delay on the WMS-R Visual Reproductions ( $p<0.05$ ).

**Conclusions:** In this longitudinal analysis, GW veterans with PTSD showed declines in nonverbal memory and consistent levels of function in all other tasks. Basic mood scales did not show decline; therefore, these results are not due to generalized changes in mood. All participants reported at least one neurotoxicant exposure and we did not have the power to examine the impact of the individual exposures, thus we cannot rule any contributing factors other than PTSD. This study highlights the importance of longitudinal follow up and continual documentation of GW veterans' memory performance and their endorsement of mood symptoms overtime. Specifically, these findings reveal that future studies should examine the prolonged course of memory and mood symptomatology in GW veterans who have endorsed a traumatic experience.

**Categories:** Drug/Toxin-Related Disorders (including Alcohol)

**Keyword 1:** neuropsychological assessment

**Keyword 2:** post-traumatic stress disorder

**Keyword 3:** memory complaints

**Correspondence:** Kathryn Price, Boston University School of Public Health 715 Albany Street Boston, MA 02118, Email: kaprice@bu.edu

## 25 Longitudinal Decline in Memory in 1991 Gulf War Veterans: Where you Start Matters.

Leah A Orlinsky<sup>1,2</sup>, Kathryn A Price<sup>1,2</sup>, Clara G Zundel<sup>3</sup>, Kimberly Sullivan<sup>1</sup>, Maxine H Krenzel<sup>2,4</sup>

<sup>1</sup>Boston University School of Public Health, Boston, MA, USA. <sup>2</sup>VA Boston Healthcare System, Boston, MA, USA. <sup>3</sup>Wayne State University, Detroit, MI, USA. <sup>4</sup>Boston University College of Medicine, Boston, MA, USA

**Objective:** Memory complaints have been a concern of Gulf War (GW) veterans since their return from the war in 1991, and over time it has been reported that exposures to neurotoxicants during the war have been associated with memory decline from premorbid levels. However, many of the studies that have shown slight or no memory decrements only looked at one time point and have not followed participants to document trajectory of symptoms over time. Longitudinal design is an optimal way to document change in cognitive function over time and the Fort Devens cohort (FDC), the longest running cohort of GW veterans, is ideal for assessing such change. This prospectively designed non-treatment seeking cohort were assessed at multiple timepoints with neuropsychological assessments and surveys. Initial neuropsychological assessments from 1997 showed above average scores on tests of verbal memory (California Verbal Learning Test) and average nonverbal memory (Wechsler Memory Scale-R) performances. A follow-up study of neuropsychological testing was completed between 2019-2022. This study was designed to document change in cognitive status between the two time points.

**Participants and Methods:** Participants (N=50) from the original 1991 cohort were again tested from 2019-2022. Neuropsychological tests included California Verbal Learning Test-

Second edition (CVLT2) for verbal learning, and the visual reproduction subtest from the Wechsler Memory Scale-Revised (WMS-R) for nonverbal learning and memory. For both time points, the average scores of the participants were compared with age scaled scores for each neuropsychological test.

**Results:** The mean age of our current participants was 58 years. 72% were men. Relative to standardized test norms at the first time point, the scores for total learning from trials 1 through 5 from the CVLT2 were in the above average range relative to age and gender-based norms. During the second time point, the participants average scores on the same scale had dropped to the average range, one full standard deviation below their prior performances. In addition, at the first time point, total learning from visual reproductions was in the average range and dropped to the low average range for the second time point. This value dropped by one-half a standard deviation.

**Conclusions:** Results showed significant diminishment in verbal and visual memory relative to prior test performances. Whenever possible, documenting the trajectory of symptoms relative to where each participant started on neuropsychological functional outcomes is key to understanding the longitudinal impact of neurotoxicant and other war-related exposures in military veterans. Given this decline, further assessment of GW veterans' cognitive trajectories is warranted.

**Categories:** Drug/Toxin-Related Disorders (including Alcohol)

**Keyword 1:** memory complaints

**Keyword 2:** neuropsychological assessment

**Keyword 3:** cognitive functioning

**Correspondence:** Leah Orlinsky, VA Boston Healthcare System, leah.orlinsky@va.gov, Boston University School of Public Health, leahorl@bu.edu.

## 26 Apathy in Korsakoff Patients with and without Neurovascular Comorbidity

Misha J Oey<sup>1,2</sup>, Veerle Brouwer<sup>1</sup>, Marie Buijs<sup>1</sup>, Jan Wijnia<sup>2</sup>, Albert Postma<sup>1</sup>, Erik Oudman<sup>1,2</sup>

<sup>1</sup>Utrecht University, Utrecht, Netherlands.

<sup>2</sup>Slingsdael, Leliezorggroep, Rotterdam, Netherlands

**Objective:** People with Korsakoff syndrome (KS) experience severe neuropsychological and neuropsychiatric complications following vitamin B1 deficiency predominantly due to alcoholism. KS often presents itself with neuropsychological symptoms such as problems in episodic memory, executive functioning, and social cognition. Common neuropsychiatric symptoms in KS are disorders of affect, confabulations, anosognosia, and apathy. Apathy can be defined by a pathological lack of goal-directed behaviors, goal-directed cognitions, and goal-directed emotions. Patients with KS have an increased risk of cerebrovascular comorbidity. Cerebrovascular accidents are known to increase the risk for developing apathy. Apathy in KS patients can negatively influence the ability to live an autonomous life, often making 24-hour care a necessity. Limited research on apathy in KS patients has been published to this day. Our aim was to assess apathy in Korsakoff patients with and without neurovascular comorbidity.

**Participants and Methods:** General apathy and related subconstructs, such as judgment and decision-making skills, emotional blunting, and the intentions to perform pleasurable activities, were studied in fifteen KS patients, fifteen KS patients with additional cerebrovascular comorbidity, and fifteen healthy controls. The first responsible caregiver of each patient filled in the Apathy Evaluation Scale and Scale for Emotional Blunting. An examiner administered the interview-based Judgement scale of the Neuropsychology Assessment Battery with the KS patients and each KS patient filled in the self-report section of the Pleasurable Activities List. Both KS patient groups receive 24-hour care in a specialized facility for Korsakoff Syndrome.

**Results:** Our study found higher levels of general apathy in both KS patient groups, when rated by their caregiver compared to healthy controls. No difference was found between the KS patient groups and the healthy control group on the self-reported section of the Pleasurable Activities List, which might suggest the presence of intrinsic motivation in KS patients. However, a discrepancy was found between the self-reported activity levels and proxy reported levels of apathy. KS patients with cerebrovascular comorbidity showed increased levels of emotional blunting compared to KS patients without cerebrovascular comorbidity and healthy controls. Decreased judgment and decision-making skills were found in both patient groups