**CHARACTERIZATION OF HEALTHY CONTROL GROUP IN THE DEVELOPMENT OF THE POWAR-TOTAL- A TEST OF RETURN TO DUTY READINESS FOLLOWING CONCUSSION**

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**Introduction:** Clinicians evaluating for readiness to return-to-duty (RTD) in servicemembers post-concussion are faced with challenges in objectively assessing the various impairments associated with mild traumatic brain injury. This is in part due to limited validated assessments that are feasible in the clinic setting. Dual task deficits are common among this population and may lead to decreased performance upon RTD. The Portable Warrior Test of Tactical Agility (POWAR-TOTAL) is a dual-task performance-based assessment that requires less space, time, and technology than previously validated laboratory-based RTD assessments. It has a high external validity and provides immediate feedback to clinicians regarding patient status. In order to validate this measure, POWAR-TOTAL performance in healthy controls must be compared to those with concussion.

**Objective:** We aim to characterize and measure performance of the healthy control group to understand how healthy subjects prioritize motor vs. cognitive tasks during a dual-task assessment.

**Methods:** This study utilized a single session, cross-sectional study design. 45 healthy active-duty participants performed the POWAR-TOTAL, which consisted of a single task (ST) motor component, ST cognitive component, and dual-task (DT) component. Data was collected using an accelerometer smartphone application. The motor component included running, combat rolling, and side shuffling. The cognitive component consisted of a working memory task of grid coordinates. DT condition included both the motor and cognitive ST components. The subjects were required to repeat the grid coordinates in the correct order after completion of the agility task. Multiple trials of ST and DT conditions were completed to compare performance and prioritization of motor vs. cognitive tasks.

**Results:** 45 subjects with a mean age of 28.39 (SD= 7.09) years completed the POWAR-TOTAL and demonstrated prioritization of motor performance over cognitive performance. Of those subjects that prioritized motor performance, there was a concurrent dual task cognitive cost in 13 subjects, while 21 subjects performed better in dual task conditions for both cognitive and motor performance. **Table 1** shows averages for all conditions.

**Conclusions:** Understanding how healthy active-duty individuals prioritize attention in dual-task situations provides a comparison for servicemembers recovering from concussion. This data will help establish guidelines for the determination of RTD readiness using the POWAR-TOTAL.

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| **Table 1.** Results | |
| Single Task Cognitive | 6.93 (SD= 1.37) coordinates |
| Single Task Motor | 13.87 (SD= 1.98) seconds |
| Dual-Task Cognitive | 6.23 (SD= 1.42) coordinates |
| Dual-Task Motor | 13.78 (SD= 2.13) seconds |
| Dual-Task Motor Cost | 0.006 (SD= 0.06) seconds |
| Dual-Task Cognitive Cost | -0.10 (SD= 0.29) coordinates |