EXPLORING THE ROLE OF COMBINED COGNITIVE AND MOTOR DUAL-TASK ASSESSMENT AND REHABILITATION FOR INDIVIDUALS WITH RESIDUAL SYMPTOMS AFTER MTBI

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Background and Purpose: Concussion, also called mild traumatic brain injury (mTBI) is an important public health issue that can hamper a person's full participation in work, school, sport and other everyday activities. Lingering mTBI complaints can include problems with thinking, balance, and vision or eye control. These problems are often very subtle but troublesome in everyday folks and especially in highly trained athletes or military members. There is growing evidence that dual-task (doing two things at once) testing and therapy may be beneficial in treating persons with lasting concussion symptoms and determining if an individual is fully recovered.

Subject(s): In preliminary work on this ongoing project, 3 healthy, 30-31 year old female athletic subjects without history of concussion participated.

Methods: We developed 6 exercise stations that combined mTBI-specific motor and cognitive challenges into a progressive, challenging rehabilitation program. Wearable sensors were incorporated into 4 functional dual-task tests to detect the subtle cognitive, motor and postural deficits not detectible by standard clinical tests.

Results: We have verified our ability to record compliance, task station participation and level as well as subject reported exertion (BORG Rate of Perceived Exertion) during training sessions. Pretest data collections for the 3 healthy subjects using the APDM Mobility Lab inertial sensor system has demonstrated the face validity of the assessment physical set up, as well as demonstrated that subjects can follow directions, tolerate and complete the dual-task measures. We have been able to verify the data collection process for data from sensors and recording responses to cognitive overlays, including use of algorithms to obtain peak turning velocities in walking, running and turning tasks.

Conclusions and implications: Information from the healthy individuals provides a starting point for next steps treatment and instrumented testing in adults with lingering concussion/mTBI symptoms.