Cleveland Clinic Innovations

PRODUCT

Augmented reality (AR) platform to quantify cognitive and motor performance during military specific activities. Aids in the detection mild traumatic brain injury and facilitates appropriate return-to-duty decision making.

INDICATIONS

Mild traumatic brain injury, return-to-duty (RTD) readiness assessment

VALUE PROPOSITION

- First of its kind augmented reality platform that provides a standardized approach to evaluate service member performance in a simulated environment
- Opportunity to develop the use of augmented reality headsets in the assessment of other neurological conditions

DEVELOPMENT STAGE

Undergoing validation assessment

PUBLICATION

Rosenfeldt, Anson B et al. "Development of the Troop Readiness Evaluation With Augmented Reality Return-to-Duty (Troop READY) Platform to Aid in the Detection and Treatment of Military Mild Traumatic Brain Injury." *Military medicine* vol. 188, Suppl 6 (2023): 67-74.

CONTACT INFORMATION

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Troop Readiness Evaluation with Augmented Reality Return-to-Duty (READY) System

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OPPORTUNITY

One of the greatest challenges in assessing troop / service member (SM) readiness is the proper identification of mild traumatic brain injuries (mTBIs). From 2000 through the first quarter of 2022, over 458,000 United States service members experienced a traumatic brain injury, 82% of which were classified as mild. Symptom resolution following mTBIs has proven to be an unreliable method of determining service member return to duty (RTD) readiness. In fact, 50% of service members with mTBIs still reported abnormally high levels of symptoms, despite being cleared for RTD. There is currently an unmet need for a validated health technology platform that can standardize the assessment of service member readiness (neurological / motor function) following mTBIs. Failure to objectively detect motor and cognitive dysfunction in service members under dual motor - cognitive task conditions can lead to missed diagnoses, misallocated treatment, and incomplete clearance for unrestricted duty, all of which severely compromising troop readiness.

SOLUTION

We have developed a health technology system that utilizes a head-mounted augmented reality environment (Microsoft HoloLens2) to objectively characterize service member performance of military relevant activities. Military-relevant activities are assessed across three modules that aim to collectively capture the overall motor and neurological function of service members as well as identify any deficiencies in mobility. By utilizing this easy-to-use augmented reality platform, the user maintains contact and position with the physical world while still being able to interact with a simulated assessment-focused environment. The development of this novel health technology system offers a first-in-class opportunity to standardize the detection of mTBIs and objectively evaluate the motor / cognitive function of service members in military relevant activities.

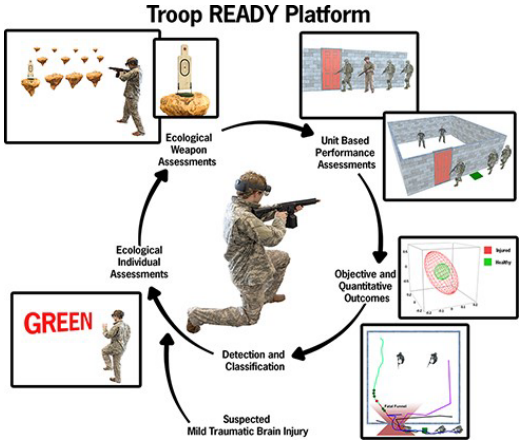

Figure 1: The Troop READY platform. A service member suspected of mTBI or under consideration for return-to-duty completes three assigned modules using the HL2 and a Bluetooth compatible M4 rifle replica. The modules include individual and team-based tasks. Following completion, biomechanical data characterizing motor performance (balance, gait, transitions, etc.), cognitive (reaction time, accuracy, etc.), and military-specific outcomes are automatically calculated, and summary data can be provided to the medical professional and the command team.