

# Concussion can now be diagnosed with 95 percent specificity

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A team of researchers from the University of Miami Miller School of Medicine has shown that the I-Portal Neuro Otologic Test, which uses the head-mounted goggle that gauged eye movement through video cameras and computers, can successfully diagnose concussion with 95 percent specificity and 89 percent sensitivity. These findings illustrate how use of the I-Portal goggle can better identify oculomotor, vestibular and reaction time (OVRT) differences between those with mild traumatic brain injury (mTBI) and non-affected individuals.

Mild [traumatic brain injury](#) is typically diagnosed through physical exam findings. However, to best manage mTBI, researchers have felt it critical to develop objective tests to substantiate the diagnosis. With these findings, it appears the I-Portal goggle may be a solution.

Michael Hoffer, M.D., an otolaryngologist and concussion expert at UHealth - the University of Miami Health System and lead investigator, has been using the goggle for two years, recruiting study participants from the emergency rooms of University of Miami Hospital and two military hospitals. Control subjects were recruited from volunteers at the locations where the study was being conducted.

Another benefit for this research was that "this next generation test has the considerable advantage of not requiring baseline testing," said study co-author Carey Balaban, Ph.D., of the University of Pittsburgh.

The goal was to identify OVRT performance metrics that differentiated

between mTBI and control groups and to create a model that could accurately evaluate mTBI neurologic status in patients. The results of the trial met the expectations of Hoffer and his team of researchers.

"This is the first paper demonstrating an objective method of diagnosing mTBI that relies on physiologic parameters," said Hoffer, who is professor of otolaryngology at the University of Miami Miller School of Medicine. "This work opens the door for site of injury testing and access to physiologic tests for athletes of all ages."

Mild traumatic brain injury is a public health issue. Since the development of the goggle, researchers have hoped that the technology used by the goggle in a research setting could be translated to the sidelines of all sports - from professional leagues to amateur and little leagues. The research findings published by *PLOS ONE* help support their objective.

"It is not inconceivable that in the near future you will see the I-Portal goggle used on every sideline in America," Hoffer said. "With accurate and timely diagnosis, which is possible through this technology, patients could receive better treatment faster. It's one of many developments that are needed to begin to curb the concussion epidemic."

**More information:** Carey Balaban et al. Oculomotor, Vestibular, and Reaction Time Tests in Mild Traumatic Brain Injury, *PLOS ONE* (2016). DOI: [10.1371/journal.pone.0162168](https://doi.org/10.1371/journal.pone.0162168)

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