

Mayo Clinic researchers develop test to gauge severity of concussions

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Neurologists at Mayo Clinic in Arizona have taken a promising step toward identifying a test that helps support the diagnosis of concussion. Their research has shown that autonomic reflex testing, which measures involuntary changes in heart rate and blood pressure, consistently appear to demonstrate significant changes in those with concussion. They presented the findings at the American Academy of Neurology annual meeting in San Diego this week.

Right now doctors rely primarily on self-reporting of symptoms to make a diagnosis of [concussion](#). In addition, other than the absence of symptoms, there is no reliable test to determine when an athlete's brain has fully recovered from concussion. Doctors know from brain imaging research studies, that there is a lag between when the patient reports that their symptoms have resolved and the time when the brain has actually healed. Therefore, a rapid, reliable, cost-effective tool is needed to identify full brain recovery from concussion.

"This has the potential to change the way we approach concussion patients," says David Dodick, M.D., a [neurologist](#) and director of the [Mayo Clinic](#) Concussion Program. "One of the challenges of treating someone with a concussion is to reliably make a diagnosis: to know when the brain is injured and to know when the brain is actually recovered."

"Autonomic nervous system dysfunction has long been recognized as a possible complication of people with severe [traumatic brain injury](#) but has rarely been associated with people with concussions or milder forms

of [brain](#) injury," adds co-author Brent Goodman, M.D., a Mayo neurologist and autonomic expert. The [autonomic nervous system](#) acts as an involuntary control system for functions such as heart rate, blood pressure, digestion, respiratory rate and perspiration.

In the study, Mayo Clinic doctors monitored 21 consecutive patients after concussion, and all experienced significant abnormalities in [heart rate](#) and blood pressure during autonomic testing. The physicians conclude that these abnormalities are tied to the concussion.

"Contrary to popular belief, the symptoms of 'dizziness' that patients feel just after a concussion may, in some cases, be symptoms of autonomic system impairment rather than a vestibular or inner ear disturbance," says Bert Vargas, M.D., a Mayo neurologist.

More research is needed, but the Mayo team is optimistic, Dr. Dodick says.

"This study shows a possible electrophysiological biomarker that indicates that a concussion has occurred—we are hopeful that with more research this will be confirmed and that this may also be a biomarker for recovery," he says.

Provided by Mayo Clinic

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