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Don't Put Me Back In, Coach

A device from startup BrainScope may help doctors better judge the severity of on-field head injuries

by [Peter Burrows](#)

You won't hear about this during Super Bowl Weekend, but the National Football League is battling charges that it isn't doing enough to protect players from concussions. After a player gets banged on the head, the team doctor asks him some questions and watches him for a few minutes. Barring any major concerns, he often sends the player right back onto the field. But recent studies suggest that the odds of long-term damage skyrocket if the player suffers another concussion before the brain has healed. This is also a growing concern in high school and college sports, where athletes often shake off hard hits to rush back into the game.

A startup called BrainScope is developing a tool that may help inform doctors about which injured players should stay on the sidelines—or be taken to a hospital. The Chesterfield (Mo.) company's handheld device determines the severity of concussions by reading the brain's electrical signals. The National Collegiate Athletic Assn. is planning a clinical trial later this year. Ira Casson, co-chair of the NFL's Mild Traumatic Brain Injury Committee, is eyeing the technology. "Today, you often have to use only your judgment" to gauge how serious a concussion is, Casson says. "If there were something more objective, that would be very useful."

BrainScope employs an old and somewhat controversial technology called qEEG (quantitative electroencephalogram). Originally developed in the 1930s, qEEG later grew popular among New Age clinics. Some still say it can be used to diagnose and treat learning disabilities and depression. Such claims have never been fully substantiated. Many neurologists are still skeptical when they hear about approaches like BrainScope's. "This sounds like a promising tool, but who knows if it will be useful once it's put through its paces?" asks Howard Rosen, a neurologist at the University of California at San Francisco. Neurologists today often use costly MRI exams to spot concussions.

BrainScope CEO Elvir Causevic was well aware of questions surrounding qEEG, so he sought the advice of 30 leading brain experts before the company started developing its first product in 2003. The result was a tool that's cheap and simple enough to be used on the sidelines. Rather than producing hard-to-decipher squiggly lines, the BrainScope device displays a meter, which shows whether brain activity after an injury falls in or out of the danger zone. Built-in signal-processing technology picks up abnormal brain signals, while simultaneously canceling out electrical noise from blinking, breathing, and the like. The device calculates the severity of each injury by comparing brain wave readings to a database of 15,000 scans compiled at New York University's Brain Research Lab. "We're going about it exactly the way many doctors told us to go about it," says Causevic.

On Jan. 15, Causevic met with brain experts for the NCAA to design a pilot program. Before they roll out BrainScope, they'll measure the brain activity of 750 high school and college players. That will provide an additional comparison to validate BrainScope's accuracy after an on-field collision.

BrainScope is also attracting attention beyond the gridiron. Four university hospitals are testing a version that

emergency room doctors can use to determine whether a patient complaining of a headache is in real danger or just suffering from a hangover. The company expects FDA approval this summer. It is also in talks with the U.S. Army, which it says plans to look into the technology later this year. The Pentagon estimates that 150,000 soldiers serving in the Middle East have suffered blast concussions, mostly from roadside bombs. A portable tool to gauge the severity of those injuries in real time could help protect wounded soldiers from rushing too quickly back into the fray.

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