

# Saliva test predicts prolonged concussion symptoms in children

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Credit: Robert Kraft/public domain

Although most of the 3 million concussions diagnosed in the U.S. each year occur in children, the bulk of clinical guidelines are based on adults. Because of this, pediatricians are limited in how accurately they can advise families about how long a child may suffer symptoms such as headaches, fatigue and trouble concentrating that can interfere with

school and other activities.

New research being presented at the 2017 Pediatric Academic Societies Meeting, however, suggests a simple saliva test may yield more answers. Investigators will present an abstract of the study, "Peripheral microRNA patterns predict prolonged [concussion symptoms](#) in [pediatric patients](#)," on Saturday, May 6, at the Moscone West Convention Center.

Micro ribonucleic acids (miRNAs) are genetic molecules, chiefly found within cells, that help regulate protein production. Previous studies have found altered miRNA levels in the saliva of children with mild concussions. This mirrored similar miRNA changes in cerebrospinal fluid, which cushions the brain and spinal cord, of patients with [severe brain injury](#).

Researchers at Penn State College of Medicine studied 50 children between the ages of 7 and 18 years with mild traumatic [brain injury](#). Spit samples were collected and tested for miRNA levels. In addition, [concussion](#) symptoms were evaluated through parent and child Sports Concussion Assessment Tool (SCAT-3) surveys, a standardized tool commonly used to evaluate injured children for concussion and to guide clinical decision-making. The surveys were taken within 14 days of injury and again 4 weeks post-concussion. The 29 children with prolonged concussion symptoms had higher scores for headaches, fatigue and difficulties concentrating.

Steven Hicks, MD, PhD, FAAP, lead author of the study, said the salivary miRNA levels were significantly more effective than evaluations using SCAT-3 survey in predicting which children would continue to experience headaches, fatigue, concentration difficulties and other concussion symptoms that lasted longer than 4 weeks. Results showed the standard survey to be less than 70 percent accurate in identifying [children](#) who would have prolonged concussion symptoms,

he said. In comparison, he said, miRNA in saliva correctly predicted whether concussion symptoms would remain present for at least a month nearly 90 percent of the time.

"We believe that saliva-based RNA testing holds great promise as an accurate and non-invasive method for evaluating pediatric concussions and giving patients and families a more solid prognosis," Dr. Hicks said.

Steven Hicks, MD, PhD, FAAP, will present the abstract, "Peripheral microRNA patterns predict prolonged concussion symptoms in pediatric patients," at 9 a.m. on Saturday, May 6.

**More information:** Peripheral microRNA patterns predict prolonged concussion symptoms in pediatric patients, 2017 Pediatric Academic Societies Meeting.

Provided by American Academy of Pediatrics

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