

Mild traumatic brain injury associated with increased risk of behavioral and emotional problems in kids

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University of Rochester researchers have been at the forefront of efforts to understand how blows to the head impact the brain, including how

concussions change brain structure. Now researchers at the Del Monte Institute for Neuroscience have found that kids who experience a traumatic brain injury (TBI), even a mild one, have more emotional and behavioral problems than kids who do not.

"These hits to the head are hard to study because much of it depends on recall of an injury since the impacts do not all require a visit to a doctor," said Daniel Lopez, a Ph.D. candidate in the Epidemiology program and first author of the study out today in *NeuroImage*. "But being able to analyze [longitudinal data](#) from a large cohort and ask important questions like this gives us valuable information into how a TBI, even a mild one, impacts a developing brain."

Researchers used MRI and behavioral data collected from thousands of children who participated in the Adolescence Brain Cognitive Development (ABCD) Study. They revealed children with a mild TBI experienced a 15 percent increased risk of an emotional or behavioral problem. The risk was the highest in children around ten years old. Researchers found that children who had a significant hit to the head but did not meet [diagnostic criteria](#) for a mild TBI also had an increased risk of these behavioral and emotional problems.

The University of Rochester Medical Center is one of 21 research sites collecting data for the National Institutes of Health ABCD Study. Since 2017, 340 children from the greater Rochester area have been part of the 10-year study that is following 11,750 children through early adulthood. It looks at how biological development, behaviors, and experiences impact brain maturation and other aspects of their lives, including academic achievement, social development, and overall health.

Researchers hope future ABCD Study data will better reveal the impact these head hits have on mental health and psychiatric problems. "We know some of the [brain](#) regions associated with increased risk of mental

health problems are impacted during a TBI," said Ed Freedman, Ph.D., associate professor of Neuroscience and co-principal investigator of the ABCD Study at the University of Rochester. Freedman also led this study. "With more time and data, we hope to gain a better understanding of the long-term impact of even a mild TBI."

Additional co-authors include Zachary Christensen, John J. Foxe, Ph.D., Laura Ziemer, and Paige Nicklas, all members of the Frederick J. and Marion A Schindler Cognitive Neurophysiology Lab that is part of the Del Monte Institute for Neuroscience at the University of Rochester.

More information: Daniel A. Lopez et al, Association between mild traumatic brain injury, brain structure, and mental health outcomes in the Adolescent Brain Cognitive Development Study, *NeuroImage* (2022). [DOI: 10.1016/j.neuroimage.2022.119626](https://doi.org/10.1016/j.neuroimage.2022.119626)

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