



Mild Traumatic Brain Injury—Cause for Concern

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Most research on traumatic brain injury (TBI) has focused on the effects of moderate or severe TBI; however, about 75% of TBI is classified as mild, and recent literature is not conclusive as to the [possible long-term causal effects](#) of mild traumatic brain injury (mTBI) on mental health. In a recently released article in *Pediatrics*, Dr. Richard Delmonico and colleagues from Kaiser Permanente, Oakland, California, and the Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, conducted an observational matched cohort design study comparing children ages 5–17 years with mTBI to matched children without mTBI to determine if sustaining an mTBI significantly increased the risks of having a new affective or behavioral disorder up to 4 years post-injury ([10.1542/peds.2023-062340](#)). This seminal study was conducted within the Kaiser integrated health system.

In total, 2,139,984 pediatric patients received care in the integrated health system over the study period between 2001 and 2014. The diagnosis of mTBI was made using ICD-9 codes and included those with brief (<30 minutes) or no loss of consciousness and no documented traumatic intracranial lesion. The mTBI group, after exclusionary criteria were met, included 18,917 children 17 years or younger. Each was matched by sex, age, race and ethnicity, insurance type, and residential poverty level to two unaffected non-brain-injured pediatric patients in a 2:1 match, thus including 37,834 control patients. The study included a one-year lookback and a four-year follow-up period, and the medical record was reviewed for affective disorders (depression, anxiety, post-traumatic stress disorder, acute stress, and adjustment disorders) and behavioral disorders (conduct, oppositional defiant, and attention deficit disorders). Of note, psychiatry and

behavioral health clinicians diagnosed most affective disorders (84%) and most behavioral disorders (70%), adding validity to the study findings.

The results of this comprehensive and well-designed study are highly concerning:

- The mTBI group was 25% more likely to be diagnosed with an affective disorder during the four-year follow-up.
- The mTBI group was 18% more likely to be diagnosed with any behavioral disorder during the four-year follow-up.
- The 10-13-years-old mTBI group had significantly increased pan-category risk in the first two years post mTBI and were:
 - 40% more likely to be diagnosed with depression,
 - 42% more likely to be diagnosed with anxiety, and
 - up to 50% more likely to be diagnosed with any behavioral condition.

The authors suggest that increased “social and academic demands” and reluctance to diagnose mental health conditions in much younger children could be explanatory for the elevated risk in the 10-13-years-old group, but caution that additional research is needed since unexplored factors could be involved.

In summary, the results of this study emphasize that while we have much to learn about mTBI, it appears that the risk of affective and behavioral disorders is increased in the 4 years following injury, especially among 10-13-year-olds, and careful follow-up of all children with mTBI will be critical to optimizing their mental health. For additional guidance related to management of TBI, see both the [AAP](#) and the [CDC websites](#).