

Extensive study on concussions in youth sports finds 'culture of resistance' for self-reporting injury

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Young athletes in the U.S. face a "culture of resistance" to reporting when they might have a concussion and to complying with treatment plans, which could endanger their well-being, says a new report from the Institute of Medicine and National Research Council. The report provides a broad examination of concussions in a variety of youth sports with athletes aged 5 to 21. Overall, reported concussions rates are more frequent among high school athletes than college athletes in some sports—including football, men's lacrosse and soccer, and baseball; higher for competition than practice (except for cheerleading); and highest in football, ice hockey, lacrosse, wrestling, soccer, and women's basketball. Concussion rates also appear higher for youths with a history of prior concussions and among female athletes.

Although the committee that wrote the report examined useful scientific information to inform its study, it discovered that research about [youth](#) concussions is limited. To address these gaps in knowledge, the committee identified several areas for further research, including establishing a national surveillance system to accurately determine the number of [sports](#)-related concussions, identifying changes in the brain following concussions in youth, conducting studies to assess the consequences and effects of concussions over a life span, and evaluating the effectiveness of sports rules and playing practices in reducing concussions.

"The findings of our report justify the concerns about sports concussions in young people," said Robert Graham, chair of the committee and director of the national program office for Aligning Forces for Quality at George Washington University, Washington, D.C. "However, there are numerous areas in which we need more and better data. Until we have that information, we urge parents, schools, athletic departments, and the public to examine carefully what we do know, as with any decision regarding risk, so they can make more informed decisions about young [athletes](#) playing sports."

The committee found little evidence that current sports helmet designs reduce the risk of concussions. It stressed that properly fitted helmets, face masks, and mouth guards should still be used, because they reduce the risk of other injuries—such as skull fractures; bleeding inside the skull; and injuries to the eyes, face, and mouth. The marketing for some protective devices designed for youth athletes, such as mouth guards and headbands for soccer, has advertised that these devices reduce [concussion](#) risk, but there is a lack of scientific evidence to support such claims, the committee said.

The committee examined scientific literature on concussion recognition, diagnosis, and management and found that the signs and symptoms of concussion are usually placed into four categories—physical, cognitive, emotional, and sleep—with patients experiencing one or more symptoms from one or more categories. Typically, youth athletes recover from a concussion within two weeks of the injury, but in 10 percent to 20 percent of cases concussion symptoms persist for a number of weeks, months, or even years. A potentially concussive injury requires removing the athlete from play, caring for the injury appropriately in both the acute stage and during the recovery process, and returning to play only when he or she has recovered demonstrably and is no longer having any symptoms, the committee said. An individualized treatment plan that includes physical and mental rest may be beneficial for recovery from a

concussion, but current research does not indicate a standard or universal level and duration of rest needed. Athletes who return to play before their brain has fully healed may place themselves at increased risk for prolonged recovery or more serious consequences if they sustain a second brain injury.

The committee examined data on the effects of single and multiple concussions and found some observed impairments in the areas of memory and processing speed. It also determined that a history of previous concussions is a predictor of increased risk for future concussions, although the extent to which the risk is increased is unknown. In several studies, the number and severity of concussion symptoms is greater in athletes with a history of two or more concussions. Additionally, athletes with a history of prior concussions may have more severe subsequent concussions and may take longer to recover. The time interval between concussions may also be an important factor in the risk for and the severity of subsequent concussions. Whether repetitive head impacts and multiple concussions sustained in youth lead to long-term neurodegenerative disease, such as Chronic Traumatic Encephalopathy (CTE), remains unclear.

The committee reviewed surveys of retired professional athletes, which provided some evidence that a history of multiple concussions increases risk for depression. In a survey of more than 2,500 retired professional football players, approximately 11 percent reported having a prior or current diagnosis of clinical depression. Very little research has evaluated the relationship between concussions and suicidal thoughts and behaviors. There currently are no data to evaluate this relationship because existing post-concussion symptom evaluations do not assess suicidal thoughts.

Some studies have shown that enforcement of sports rules by coaches and officials and adherence to these rules by players may help reduce the

incidence and severity of sport-related concussions in youths. Several organizations have called for a "hit count" in youth sports to limit the amount of head contact a particular player should experience over a given amount of time. While the concept of limiting the number of head impacts is fundamentally sound, the committee found that implementing a specific threshold for the number of impacts or the magnitude of impacts per week or per season is without scientific basis.

The committee included additional noteworthy findings in the report:

- The reported number of individuals aged 19 and under treated in U.S. emergency departments for concussions and other non-fatal, sports- and recreation-related TBIs increased from 150,000 in 2001 to 250,000 in 2009.
- Football, [ice hockey](#), lacrosse, wrestling, and soccer are associated with the highest rates of reported concussions for U.S. male athletes at the high school and college levels.
- Soccer, lacrosse, and basketball are associated with the highest rates of reported concussions for U.S. female athletes at the [high school](#) and college levels. Women's ice hockey at the collegiate level has the highest rate of reported concussions.
- Youths with a history of prior concussion have higher rates of reported sports-related concussions.
- Among military personnel, mild traumatic brain injuries, of which concussions are one category, represent about 85 percent of all TBIs.
- Among military personnel, about 80 percent of mild TBIs do not occur in the deployed setting and are commonly caused by automobile crashes involving privately owned and military vehicles, falls, sports and recreation activities, and military training.

Provided by National Academy of Sciences

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