

A DIFFERENT VIEW

Returning to play after concussion

Alan B Ashare (Alan_Ashare_MD@caritaschristi.org)

Department of Radiology, St. Elizabeth's Medical Center, Boston, MA, USA



Correspondence

Alan B. Ashare, Department of Radiology,
St. Elizabeth's Medical Center,
736 Cambridge Street, Boston, MA 02135.
Tel: +617-789-2828 |
Fax: +617-562-7247 |
Email: Alan_Ashare_MD@caritaschristi.org

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Most agree that organized sports provide a vital source of therapeutic satisfaction for our patients. It is our responsibility to encourage these activities, while also fostering safety and reducing the risk of injury. One such risk, concussion, has always been an inherent danger – one that medical professionals, trainers and equipment designers are still striving to understand. Recent reports of a high incidence of early dementia after repeated head traumas in professional ice hockey and American football players have brought a new immediacy to the problem. These represent some of the more powerful and prominent examples of a topic that the medical community must address at every level of sports.

Here are some questions that I have been asked:

My son had a concussion in last night's ice hockey game. How long should he stay out?

My daughter was knocked unconscious for just a few seconds in this weekend's basketball game. She had a CT scan and the emergency room doctor said that everything was okay. Should I be concerned?

My son plays football. He's never had a concussion, but I find that he has become very sensitive to light, and after maintaining an A average for several years, his grades have begun to slip. My doctor says that there is nothing to worry about. Has my son sustained head injury?

Concussion, also called minimal traumatic brain injury, has become a prominent issue in the last 10 years (1). Conferences and symposia are now dedicated to addressing the risks of head trauma (2), and the US Centers for Disease Control and Prevention has instituted programmes aimed at reducing the incidence of concussion (3,4). These meetings and hundreds of papers are dedicated to prevention, diagnosis and treatment as well to broadening our understanding of the long- and short-term impact of concussion (5).

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Rest is an agreed-upon treatment for concussion (6). Beyond that, there remains a growing desire for preventative measures and better treatment protocols. But, this recent focus on head trauma does not mean that the incidence of concussion has increased; rather, it probably reflects our improved ability to recognize head trauma, which was often overlooked. Research documenting the effects of concussion has focused on reforming play guidelines, minimizing the severity of head trauma and reliably determining the safe return from concussion (6).

Unfortunately, concussion has had many 'definitions'. Neurological textbooks and medical dictionaries have yet to offer the kind of precise answers we seek. In 1991, the Concussion in Sport Group at the First International Conference on Concussion in Sport held in Vienna developed a rather long and cumbersome, yet useful, definition of the syndrome (2): 'Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathological, and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:

- Concussion may be caused either by a direct blow to the head, face, or elsewhere on the body with an "impulsive" force transmitted to the head.
- Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously.
- Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than structural injury.
- Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course.
- Concussion is typically associated with grossly normal structural neuroimaging studies.'

Any blow to the head can result in concussion. Moreover, both the immediate and the long-term effects of concussion appear to have been very much underestimated (6). In the absence of visible symptoms, a young athlete might still be suffering from head trauma, sometimes weeks after sustaining the injury. Our current evaluation techniques for a patient suffering concussion are inadequate (6). Skull X-rays, CT scans and MRI scans have failed to detect the abnormalities that might guide a physician to project how soon a player might safely resume play. And, we still cannot predict the chances that one concussion might lead to more, even though that often seems to be the case. The best new technique for evaluating concussion is cognitive and psychometric testing that begins with a preseason screening that can be used as a baseline when compared with congruent tests performed after concussion occurs (7,8). Return to baseline on a psychometric test can help determine when a player can safely resume strenuous exercise and body contact (7).

The Vienna guidelines from 2001 have done away with grading the severity of concussions (2). They recommend that no player be allowed to return to the same game after concussion (2). When players do come back, they should do so in a graded fashion. Should a player suffer a recurrence of concussive symptoms, a return to less strenuous drills is indicated. We still do not know how long the interval of restraint should be. Every case must be considered individually. Commonly, players can return in 1 or 2 weeks, depending on age. More time is needed for younger players (9,10). Exposure to jarring body contact too soon after the initial head trauma risks exposing the player to a second impact syndrome, which can be fatal (11).

We have learned a lot in the past 10 years about recognizing and treating concussions.

1. A proper helmet is likely to decrease the risk for concussion and/or decrease the severity of a concussion, but helmets are not designed to prevent concussion (12). In the United States, these helmets have stickers indicating testing to a safety standard, such as the American Society for Testing and Materials (ASTM) or the National Operating Committee on Standards for Athletic Equipment (NOCSAE). The helmet should fit snugly, not move easily on the head during the game or practice and be secured with a chin or neck strap.
2. While further research is necessary, it appears that dehydrated players stand a heightened risk for a concussion, and that proper hydration might reduce that risk.
3. Coaches should train players not to use their helmeted heads as a weapon and to use proper techniques to protect their heads. Players should not put their heads in situations that may lead to a concussion. Skating with your head down is not a good idea.
4. Once concussion is diagnosed, players should be excluded from exercise and from body contact until all symptoms have subsided.

5. Psychometric testing appears to be a reliable means of gauging when it is safe for players to return, and that return should take place in a graded fashion.
6. It takes longer for young players to recover than older players.
7. Players do not have to lose consciousness to have sustained concussion.
8. Players who have lost consciousness do not necessarily fare worse than those concussed players who did not lose consciousness.

Here are possible answers to the proposed questions:

1. *My son had a concussion in last night's ice hockey game. How long should he stay out?*
It depends on how long the symptoms of concussion persist and how quickly your son's psychometric abilities return. The general rule of thumb is a minimum of 2 weeks for teenage players, with longer time for children under 10.
2. *My daughter was knocked unconscious for just a few seconds in this weekend's basketball game. She had a CT scan and the emergency room doctor said that everything was okay. Should I be concerned?*
Your daughter has sustained concussion. Psychometric testing is indicated.
3. *My son plays football. He's never had a concussion, but I find that he has become very sensitive to light, and he is not doing very well in his studies after maintaining an A average for several years. My doctor says that he can't find anything wrong. Has my son sustained head injury?*
Your son most likely has sustained concussion and should immediately cease all exercise, especially contact drills, until the symptoms subside. He should also have a psychometric study. Without a baseline assessment, this will not provide any information about a decrement. However, it can guide teachers how best to meet the child's needs. It can also serve as a benchmark to see if improvement occurs subsequently.

Perhaps the best times to discuss these issues with children and their parents is when children come for their annual examination or the examination they need for medical eligibility to play. No need to wait for the questions to be asked.

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