

Return to Play after Concussion for Child Athletes

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Editorial

Hundreds of thousands of high school students suffer concussions annually, according to conservative estimates. While most concussions are mild, not much more than 'head bumps' which resolve without sequelae, many represent serious brain trauma. Especially worrisome are injuries heralded by 'blacking out', losing consciousness, for more than one minute or extensive memory loss. Concussive brain injuries in student athletes are not limited to sports considered notoriously violent such as football, boxing, ice hockey, wrestling, and lacrosse. Other sports bearing a high risk for head injury include gymnastics, soccer and basketball.

Some young athletes exhibit symptoms which persist for more than a month after a concussion. Manifestations of a 'post-concussive syndrome' may include: headaches, slowed reaction times, difficulty concentrating and irritability. Students typically minimize or conceal symptoms because they are extremely motivated to return to play. Players who return to competition before the symptoms of a first concussion have completely resolved are at risk for 'second impact syndrome'. In this rare but serious syndrome a sensitized brain, subjected to a repeat trauma, becomes swollen to a degree which can cause catastrophic brain damage, coma or death. The young developing brain is more prone to this type of injury than the brain of an adult [1-5].

Cumulative damage from repeated concussions may accrue insidiously, even after quiescent years or decades have passed. Later in life irreversible problems may appear. These may be physical, such as tremors, lack of coordination, speech abnormalities or unsteady gait. One variant has been referred to as the 'punch drunk syndrome'. Inappropriate, psychotic or explosive behaviors have also been reported. Medical science has not yet determined the magnitude or number of concussions requisite for permanent brain damage. These factors are likely to vary for each child.

Parents, teachers, coaches and legislators have a duty to take reasonable precautions to protect student athletes from injury. Regulations must be balanced against unduly curtailing the opportunities for children to be children: to play, compete, make friends, develop skills and have fun [6]. Multiple organizations, including the American College of Sports Medicine, the National Collegiate Athletic Association and, most recently, the American Academy of Neurology have attempted to formalize recommendations regarding return to team sport competition after concussion. One clear emerging trend is a more conservative attitude towards return to play. However, no consensus exists as to which set of guidelines is the most appropriate and none of these guidelines are specific to the developing brains of children.

A panel comprised of pediatric head injury medical specialists and high school sports coaches may be empowered to advise legislators as

to common sense rules to be enforced for organized youth athletic competition. This may occur on a federal or state wide level. A good starting point would be a "three strike" paradigm [7-12].

Strike one: Any athlete eighteen or younger who is believed to have sustained a concussion during a game or practice should not be allowed to return to the playing field the same day.

If symptoms resolve within a week to ten days, the athlete may resume competition in a stepwise fashion. The student should begin with a period of light aerobic activity. Provided symptoms don't return, activity may increase to sport-specific exercises without head impact. The athlete then may advance to full contact practice and finally, to game play. Caution is advocated when deciding when a concussed athlete should return to play. 'When in doubt, sit the child out'.

Neurocognitive tests, which evaluate decision making ability, reaction time, attention and memory may provide ancillary guidance for a clinician making decisions regarding return to play. These tests are particularly valuable if a pre-injury baseline is available [12].

Strike two: A second concussion warrants the termination of the season.

Strike three: A third concussion, for most student athletes, mandates retiring from contact or collision sports.

The recommendation to terminate a budding athletic career is not made lightly. Forced cessation of athletic activity has a major impact on the student's life, often underestimated by clinicians, parents, teachers and other adults. When an athlete stops playing and practicing with his or her team, he or she misses out on bonding time and esprit de corps which create and nourish friendship and self esteem. For elite high school athletes with professional aspirations, quitting means abandoning a dream. Nonetheless, stringent measures are indicated. Mounting evidence indicates the danger of head trauma which appears to rise exponentially with repeated injury.

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