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# Concussions and Student Sports: A 'Silent Epidemic'

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Commentary

**\*759 CONCUSSIONS AND STUDENT SPORTS: A SILENT EPIDEMIC** [\[FN1\]](#)

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**Introduction**

An issue that has gained attention concerns concussions among student–athletes in elementary and secondary schools. In fact, in light of the “silent epidemic” [\[FN1\]](#) of concussions among student–athletes, in the six month period ending in August of 2011, the number of states that enacted statutes on concussion management jumped from eleven to thirty–one [\[FN2\]](#) and the list of jurisdictions with laws in place continues to grow. [\[FN3\]](#)

Based on the significance of concussion management, the remainder of this article is divided into two sections. The first part of the article examines the background on concussions while the second offers recommendations for concussion management and prevention. The article ends with a brief conclusion.

**The Nature of Concussions**

Concussions are caused by bumps, blows, or jolts to the head or body as sudden movements cause stretching and tearing of brain cells which can cause damage and chemical changes. While most individuals recover, some **\*760** can have symptoms that last for weeks or longer. [\[FN4\]](#) Concussions can lead to cognitive, academic, behavioral, and emotional problems. These effects are compounded when individuals sustain second concussions before they recover from either first injuries; this is known as “second impact syndrome.” Repeat concussions can slow recoveries, increase the likelihood of long–term problems, and in rare cases result in swelling of the brain, permanent brain damage, and even death. [\[FN5\]](#)

Concussions have been called a “silent epidemic” because symptoms can be subtle and covert. [\[FN6\]](#) High profile incidents involving professional athletes [\[FN7\]](#) have helped to turn attention to the risks for children since the numbers of student–athletes who sustain concussions continue to grow. [\[FN8\]](#) Although concussions involving adult athletes have received a great deal of press, young children and adolescents are more likely to get concussions and take longer to recover than adults. [\[FN9\]](#)

According to the most recent data from the Center for Disease Control and Prevention (CDC), of the estimated 2,651,581 children nineteen and under who were treated for sports and recreation related injuries, about 6.5% or 173,285 were for traumatic brain injuries (TBIs) of which 71% were sustained by males. [\[FN10\]](#) In addition, the report noted that between 2001 and 2009 the number of annual TBI–related emergency room visits increased from 153,375 in 2001 to 248,418 in 2009, with the highest rates among males aged ten to nineteen. [\[FN11\]](#) The report also identified the activities with the greatest [\[FN12\]](#) and least [\[FN13\]](#) estimated number of TBI–related emergency room visits among those nineteen and under.

**\*761** The data reveal that although most who sustain concussions appear to recover fully in a week or two, the brains of adolescents can take weeks longer to recover than those of adults. [\[FN14\]](#) Those at risk for slower recovery include individuals with prior brain illness or injuries, learning disabilities, or psychiatric disorders. Educators must be aware of concussion signs and symptoms, their educational implications, and assessment strategies because they are in excellent positions to initiate and sustain system-level changes with prevention and intervention efforts.

### Signs and Symptoms

Unlike cuts or broken bones, concussions are not always easily detected. Moreover, because concussions are problems of function, not structure, medical tests such as MRIs or CAT scans generally appear normal. In fact, nine-percent of concussions do not result in full loss of consciousness. [\[FN15\]](#)

The CDC identifies four categories of concussion symptoms. The first group, thinking/ remembering includes difficulty thinking clearly, concentrating, remembering new information and feeling slowed down. The second set, described as physical, includes headaches, fuzzy or blurred vision, nausea or vomiting early on, dizziness, sensitivity to noise or light, balance problems, and feeling tired. The third set, emotional/ mood symptoms address irritability, sadness, emotional, nervousness, and/ or anxiety. Finally, the slowing down symptoms cover sleeping more or less than usual and/ or having trouble falling asleep. Activities such as exercising or those that require high levels of concentration such as studying, computer work, and/ or video games can cause concussion symptoms to reappear or intensify. [\[FN16\]](#)

Post-concussion syndrome (PCS) is a collection of symptoms lasting for varying amounts of time. Since symptoms can take time to appear, teachers may be the first to notice changes in students. Children may sustain falls or hits at recess but not show signs until it is time for a learning activity an hour later. Moreover, some symptoms may resolve quickly or may persist much longer or worsen following injuries. [\[FN17\]](#)

The number and severity of symptoms, speed of recovery, and their impact on academic and social functioning varies from one student to the next. Since concussions are not visible injuries, student difficulties may not be attributed to concussions. In fact, since students may not attribute problems to their head injuries and become frustrated or confused by their inability to function, a clear understanding of the signs and symptoms is critical.

### Recommendations

Given the rapid growth of laws aimed at concussion management and prevention, school boards should develop written policies addressing related issues since their doing so can help to keep students safe while avoiding **\*762** injury-related litigation. [\[FN18\]](#) In developing written policies, boards should address the following elements.

First, boards must develop collaborative teams both for policy writing and implementation to help students who have sustained concussions. Team members should include board members, parents, teachers, a school nurse, administrators, coaches, athletic directors, [\[FN19\]](#) a board's attorney, and a team doctor. Parents play especially critical roles in the recovery process and development of treatment plans that include return to school, sports, recreation, and everyday activities.

Second, boards should include policies in faculty/ staff handbooks, student handbooks, agreements that students and parents sign before children can participate on teams, and on their websites.

Third, in a related item, boards should provide professional development sessions for staff on the consequences of head injuries. Also, boards should have mandatory information sessions for parents and students who wish to participate in sports.

Fourth, boards should work to change perception of concussions as “no big deal” or rites of passage for athletes. Athletes, in particular, should be taught that playing hurt does not show toughness and that playing through injuries can increase their risks of repeat concussions and long-term problems, including permanent brain damage.

Fifth, policies should make prevention a priority, recognizing that this involves establishing effective prevention programs and school cultures promoting safety. While accidents happen, educators can help initiate systems-level change to increase awareness in students, teachers, parents, coaches, and athletic directors regarding safety precautions that can minimize risk of concussion. More specifically boards should require educators and coaches to

—emphasize the importance of clear data collection, making parents, coaches, and students aware that even mild blows to the head from years ago are important because this is an essential component of concussion assessments. [FN20] Boards should enact programs in which professionals complete preseason neurocognitive testing to gather baseline information on brain functions. Athletes' learning and memory skills, attention and concentration, and rate of thinking and problem solving should be evaluated at the beginning of seasons and again if they sustain concussions in order to be able to help identify the effects of injuries. Moreover, when students are evaluated for learning or behavior problem, assessments should include questioning surrounding their histories of head injuries. If the parents or students \*763 acknowledge that they suffered head injuries, then evaluators should follow-up;

—require students to wear protective equipment that is appropriate for the activity, checking to ensure that it fits properly and is well maintained;

—be key parts of the collaboration to develop and disseminate resources to have a positive impact on student athletes' success in classrooms and on fields, keeping in mind the importance of broadening the message beyond school sports to remind children that all students have chances of sustaining concussions. Children should know how to play safely and how to recognize signs and symptoms in themselves and in classmates; and

—share information such that if students participate in two sports, coaches for both teams must know that athletes sustained concussions even if they no longer demonstrating symptoms.

Sixth, students who demonstrate signs of concussions should be evaluated by health care professionals to determine the degree of severity of their injuries and to offer advice on their returning to school or physical activities. The consensus is that athletes who sustained concussions should not be permitted to return to play on the same day and that they should not return to school or play again until they are cleared as “symptom free” by health care professionals before returning to physical education classes, sports practices or games, or physical activities at recess. [FN21] Since children who return to play while their brains are still healing risk a greater chance of having second concussions, all parties should have a mindset of “we all need to work together to protect” those with concussions.

Early diagnosis and education is critical, especially to minimize the risk of re-injury, especially in crowded hallways, physical education classes, and stairwells. Even though there are no cures for concussions, educators can help students to heal while symptomatic by providing cognitive rest and gradually return to school activities.

Seventh, in a related item, policies should establish return to play rules requiring athletes to be kept out of play for the rest of the day of their injuries and until health care professionals who are experienced in evaluating for concussions determines whether they are symptom-free and able to return to play. Parents, athletes, and coaches should sign forms at the beginning of play for each sport each season agreeing to abide by these rules. Athletes should also be taught to be aware of concussion signs and instructed to report to coaches if they suspect that teammates sustained concussions. When there is any doubt, coaches should forbid athletes from playing.

Eighth, boards should identify at least one person in each school, such as the nurse, to take the lead in com-

municating with parents, school staff, and medical professionals. This liaison can coordinate meetings to communicate information about students' medical and educational status, clarify how post-concussion symptoms might impact their learning and behavior while coordinating school-based intervention efforts. If parents agree, subject to the Family and Education Rights Privacy Act, [\[FN22\]](#) this might be a good person to \*764 communicate to peers about students' injury so they understand what to expect when their classmates return to school.

As part of the “*Heads Up*” to Schools materials available from the CDC, educators can obtain checklists of symptoms so that if staff members suspect that students have sustained blows to their heads, they can be sent to the professional designated to address health issues. Educators can thus observe students for danger signs for at least 30 minutes; [\[FN23\]](#) indicators here are having one pupil being larger than the other; drowsiness or loss of consciousness; headaches that gets worse and do not go away; weakness, numbness, or decreased coordination; repeated vomiting or nausea, slurred speech, convulsions or seizures, difficulty recognizing people or places, increased confusion, restlessness, or agitation; or unusual behavior. If students experience one or more symptoms, they should be referred to health care professionals. A copy of the checklist can be sent with the parent for the health care professional to review. At the same time, students should never be permitted to drive home while those with confirmed concussions should not be left alone for twenty-four hours and should be monitored for changes or deterioration over the first few hours post-concussion.

While a complete review of assessment strategies is beyond the scope of this article, educators should know how students might be assessed after initial screenings and they have been referred for medical/ neuropsychological testing. Hospital-based assessments, such as the Glasgow Coma Scale (GCS), and indicators such as loss of consciousness, are only weakly related to accurate diagnoses because many neuropsychological tests are not sensitive enough to detect concussion impairments. [\[FN24\]](#) Moreover, since few standardized tools and methods are adequate in assessing concussions in children, researchers have proposed a multi-lateral, multi-method assessment using standardized methods completed by key respondents that tap multiple domains of functioning. [\[FN25\]](#) Methods of assessment include standardized tests, observations, interviews, and symptom rating scales. The Pediatric Concussion Symptom Inventory (PCSI) is one rating scale that involves self-reports, as well as parent and teacher reports, of concussion symptoms. [\[FN26\]](#) Respondents rate the extent to which symptoms were observed at home or school in retrospective pre-injury baseline and post-injury reports.

Ninth, once educators are aware that students sustained concussions, they must deviate from the typical progression of supervision to more intensive interventions with ongoing progress monitoring that can be gradually reduced as students recover. Typically, students are instructed to rest immediately following concussions by staying home from school or limiting their attendance. Students can then return to school with restrictions and should not return to play or physical activities until they are no longer \*765 exhibiting signs of concussion. Physical activities can be permitted to resume in a gradual sequence of light exercise, running, non-contact training drills, full contact practice or training, and eventually (after being cleared by an approved health care provider), return to play in games.

By way of illustration, the Oregon Concussion Awareness and Management Program highlights its four key elements of *Recognize, Remove, Refer, and Return*. [\[FN27\]](#) First, educators and students must learn to recognize the symptoms of concussions. Second, boards must enact policies to remove children from schools and athletes from play immediately post-concussion. Third, educators must refer students to and appropriate health care professionals. Fourth, students should return to school and sports only when cleared by medical professionals while under the careful watch of concussion management teams.

Tenth, consistent with Section 504 of the Rehabilitation Act of 1973, [\[FN28\]](#) policies should provide for the development of service plans, when need by qualifying students. Examples of modifications and accommodations that can be made for student-athletes who suffered concussions when they return to school. Examples of possible accommodations include rest breaks throughout the day; shortened school days; more time to complete tests and assignments or permission to complete them in smaller parts rather than all at once; quiet places to take tests and complete assignments; reduced assignments, particularly those involving reading, writing, or computer work; re-

duced homework and/ or course loads; general help with school work and organization; removal from physical education class and physical activities during recess; permission to have lunch in quiet spaces with a few friends; permission to wear sunglasses or hats with visors to reduce sensitivity to light; and permission to transition between classes longer than usual before to decrease chance of being jostled in crowded hallways and/ or stairwells. Also, students should be limited to activities not requiring high levels of thinking or concentration and should not participate in high exertion activities because these can worsen symptoms while delaying healing.

When students return to school, educators must find the right balance. If students who sustained concussions cannot immediately return to school or sports, they might be frustrated, angry, and/ or anxious about getting behind on school work or being isolated from peers or teams. Yet, too slow of return to school can protract students' recovery time by causing undue stress for fear of falling behind, being away from friends, and disrupting normal family routine. [\[FN29\]](#)

Eleventh, policies should require ongoing progress monitoring of students who sustained concussions led by team doctors with experience treating \*766 TBIs. Educators can monitor students for worsening of symptoms by reporting to team leaders, parents, and the medical personnel responsible for monitoring their progress outside of school. Worsening of symptoms typically indicates that children have been over-exerting and require breaks. While return to play and activities should always be considered medical decisions, educators can play important roles by assisting with progress monitoring, and watching students for worsening, or improvement, of symptoms.

General tests of achievement are not likely to capture the effects of concussion symptoms. Curriculum-based measures (CBMs) may be more sensitive and provide quick means of ongoing progress monitoring of academic skills. CBMs have the added benefit of not being particularly taxing to concussed individuals who have difficulty mustering the mental stamina needed for focusing on academic material for long period of time.

Twelfth, boards should review their policies annually, typically between school years, not during or immediately after controversies. Revising policies on a scheduled basis affords educators better perspectives, and, in the event of litigation, provides evidence that educators are doing their best to be up-to-date by keeping abreast of changes in the law and medicine with regard to the detection and management of concussions.

### Conclusion

Clearly, neither medical nor legal professionals know everything about concussions. Although individuals often seem fine after recovering from concussions, little is known about the long-term damages that they inflict. Little research exists regarding concussions, particularly in children. Concussion education and response is a key part of having safe, healthy schools. With a coordinated effort and continued dissemination of information, educators and parents can work together to prevent, recognize, and respond appropriately to concussions.

[\[FNa1\]](#) *Education Law Into Practice* is a special section of the EDUCATION LAW REPORTERR sponsored by the Education Law Association. The views expressed are those of the author and do not necessarily reflect the views of the publisher or the Education Law Association. Cite as 282 Ed.Law Rep. [759] (September 27, 2012).

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[\[FN1\]](#). Jean A. Langlois et al., *The Epidemiology and impact of traumatic brain injury*. 21 J. OF HEAD TRAUMA REHABILITATION 375 (2006).

[FN2]. Bryan Toporek, *Concussion Law Targeting Student–Athletes on Upswing*, EDUC. WEEK, Aug. 10, 2011 at 10.

[FN3]. Most recently, Wisconsin enacted a law forbidding student–athletes under the age of nineteen from returning to play until they are cleared by health care professionals trained in concussion evaluation and management. *Gov. Scott Walker Signs Concussion Bill for Youth Sports During Lambeau Visit*, GREEN BAY (WI) PRESS GAZETTE, April 3, 2012 at A 1. The New Hampshire legislature is currently considering similar legislation. *New Hampshire House takes bill that would require districts to implement concussion policy for student–athletes*. NSBA LEGAL CLIPS, available at [http://legal.clips.nsba.org/?p=13782&utm\\_source=NSBA+e-News+letter+Subscribers&utm\\_campaign=761c6fe4a0-Legal+Clips+News+letter&utm\\_medium=email](http://legal.clips.nsba.org/?p=13782&utm_source=NSBA+e-News+letter+Subscribers&utm_campaign=761c6fe4a0-Legal+Clips+News+letter&utm_medium=email).

[FN4]. Michael W. Kirkwood et al., *Management of Pediatric Mild Traumatic Brain Injury: A Neuropsychological Review from Injury through Recovery*. 22 THE CLINICAL NEUROPSYCHOLOGIST 769 (2008).

[FN5]. Michael W. Collins et al., *Cumulative Effects of Concussion in High School Athletes*. 51 NEUROSURGERY 1175 (2002).

[FN6]. Langlois et al., *supra* note 1.

[FN7]. *See, e.g.*, Ken Belson, *For N.F.L., Concussion Suits May be Test for Sport Itself*, N.Y. TIMES, Dec. 30, 2011 at A 1.

[FN8]. *See infra* notes 11–14 and accompanying text.

[FN9]. Sergio R. Buzzini & Kevin M. Guskiewicz, *Sport–Related Concussion in the Young Athlete*, 18 CURRENT OPINION IN PEDIATRICS, 376 (2006); Cara Camiolo Reedy et al., *Adolescent Sports Concussion*, 19 PHYSICAL MED. AND REHABILITATION CLINICS OF N. AM. 247 (2008).

[FN10]. Nonfatal Traumatic Brain Injuries Related to Sports and Recreation Activities Among Persons Aged—19 Years—United States, 2001—2009, Table 1. Estimated annual number and rate of emergency department visits for all nonfatal injuries and nonfatal traumatic brain injuries (TBIs) related to sports and recreation activities among persons aged—19 years, by selected characteristics—National Electronic Injury Surveillance System—All Injury Program, United States, 2001–2009, CDC, Oct. 7, 2011, [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6039a1.htm?s\\_cid=mm6039a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6039a1.htm?s_cid=mm6039a1_w)

[FN11]. *Id.* at 1.

[FN12]. The largest number of TBI–related emergency room visits were bicycling, football, playground activities, basketball, and soccer. *See Id.* at Table 2. Estimated annual number of emergency department visits for all nonfatal injuries and nonfatal traumatic brain injuries (TBIs) related to sports and recreation activities among persons aged '19 years, by type of activity—National Electronic Injury Surveillance System—All Injury Program, United States, 2001–2009.

[FN13]. Activities for which TBIs accounted for less than 10% of the emergency room visits included horseback riding, ice skating, golfing, all–terrain vehicle riding, and tobogganing/sledding (10.2%). *Id.*

[FN14]. Keith Owen Yeates, & Gerry H. *Neurobehavioral Outcomes of Mild Head Injury in Pediatric Populations*. 8 SEMINAR IN PEDIATRIC NEUROLOGY 5 (2005).

[FN15]. Neal McGrath, *Supporting the Student–Athlete's Return to the Classroom after a Sport–Related Concussion*. 45 J. OF ATHLETIC TRAINING 492 (2010).

[FN16]. [www.cdc.gov/concussion](http://www.cdc.gov/concussion)

[FN17]. Wiley Mittenberg et al., *Postconcussion Syndrome Persists in Children*. 11 CLINICAL NEUROPSYCHOLOGY 305 (1997).

[FN18]. *See, e.g., Cerny v. Cedar Bluffs Junior/Senior Pub. Sch.*, 679 N.W.2d 198 [187 Ed.Law Rep. [783]] (Neb. 2004) (finding that football coaches met the appropriate standard of care when they evaluated a player multiple times before allowing him to return to a game since they were familiar with the symptoms of concussions).

[FN19]. For a commentary on the role of athletic directors, *see* Ralph D. Mawdsley & Charles J. Russo, *The Role of Athletic Directors in Operating a Safe K–12 Athletic Program*. 226 Ed. Law Rep. 15 (2008).

[FN20]. Paul McCrory et al., *Consensus statement on concussion in sport: The 3rd International Conference on Concussion in Sport, held in Zurich, November 2008*. 16 J. OF CLINICAL NEUROSCIENCE 755 (2009).

[FN21]. *Id.*

[FN22]. 20 U.S.C. § 1232g (2006). FERPA outlines the rights of students and parents regarding educational records. It gives parents and eligible students access to school records while, at the same time, limiting access by third parties.

[FN23]. [www.cdc.gov/Concussion](http://www.cdc.gov/Concussion)

[FN24]. Lawrence Lewandowski, & Brian Rieger, *The role of a School Psychologist in a Concussion*, 25 J. OF APPLIED SCH. PSYCH 95 (2000).

[FN25]. Gerald A. Gioia et al., *New Approaches to Assessment and Monitoring of Concussion in Children*, 29 TOPICS IN LANGUAGE DISORDERS 266 (2009).

[FN26]. *Id.*

[FN27]. Oregon Concussion Awareness and Management Program, *Max's Law: Concussion management implementation guide for school administrators*. Center on Brain Injury Research and Training: Western Oregon University (2010).

[FN28]. 29 U.S.C. § 794 (2006) as amended by the ADA Amendments Act of 2008, 122 STAT. 3553. Section 504 generally does not apply to short–term impairments. Even so, educators should consider the feasibility of implementing service plans in situations where the effects of concussions may be long–term. For a general treatment of Section 504, *see* CHARLES J. RUSSO & ALLAN OSBORNE, SECTION 504 AND THE ADA (2009).

[FN29]. Kirkwood, *supra* note 5.

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