Journal of Legal Medicine
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/ulgm20

High School Athletes and Concussions
Lesley Lueke a
a Southern Illinois University
Available online: 04 Jan 2012

To cite this article: Lesley Lueke (2011): High School Athletes and Concussions, Journal of Legal Medicine, 32:4, 483-501
To link to this article: http://dx.doi.org/10.1080/01947648.2011.632710

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.tandfonline.com/page/terms-and-conditions

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.
HIGH SCHOOL ATHLETES AND CONCUSSIONS
MORE THAN A GAME AT STAKE

Lesley Lueke*

No head injury is too severe to despair of, nor too trivial to ignore.
—Hippocrates

INTRODUCTION

In 2006, Zackery Lystedt, age 13, was a star football player.1 He was so talented that he played on both the offensive and defensive sides for his Washington state school’s football team.2 During a game, he was injured when his head hit the ground hard after being tackled by a member of the opposing team. After the impact, Zackery fell to the ground, grabbing his helmet as if he were in pain.3 He sat out for 15 minutes to “shake it off,” and then his coaches allowed him to return to play.5 Later in that same game, he suffered another hit, which resulted in a brain hemorrhage.6 The removal of both sides of his cranium was necessary.7 For more than three months, Zackery drifted in and out of a coma, while his loved ones and doctors feared he would not make it.8

---

* Third-year law student at Southern Illinois University. Address correspondence to Ms. Lueke at Southern Illinois University School of Law, Law Journal Office, Lewis Law Building, Carbondale, Illinois 62901, or via e-mail at lesleylu@siu.edu.


2 Id.

3 Id.


5 SPORTS CONCUSSIONS, supra note 1.

6 Id.

7 Id.

8 Id.; see also Teen Defies Odds, Takes Amazing Graduation Walk, CBSNEWS.COM (Jun. 11, 2011, 11:13 PM), http://www.cbsnews.com/stories/2011/06/11/earlyshow/saturday/main20070657.shtml (stating that Zackery’s condition continues to improve, and, five years after his injury, he was able to walk in his high school graduation on June 10, 2011).
At the time, Washington did not have in effect a law that would prevent youth athletes who were suspected of having a concussion or head injury from returning to play until they received medical clearance from a licensed health care provider. Instead, there was a lack of awareness about the serious consequences and risks of sports-related head injuries combined with a macho “get back in the game” mentality. As a result, Zackery was allowed to go back in the football game after his obvious signs of physical symptoms. After a long, painful recovery, Zackery and his family began lobbying for a law to prevent others from going through what Zachary and his family had just endured.9 In 2009, due in part to the Lystedts’ family efforts, Washington passed House Bill 1824, also known as the Zackery Lystedt Law, requiring medical clearance of youth athletes suspected of sustaining a concussion, before sending them back into a game, practice, or training.10 Had that law been in force in 2006, Zackery would have been prevented from returning to the game, thereby avoiding the second blow to his head, which resulted in a severe, life-threatening injury.

Too often, it takes a tragedy to inspire change. Zackery Lystedt experienced such a tragedy, and his home state responded. Now, it is time for the rest of the United States to follow suit so other young athletes do not face the potential risk of subsequent concussions or related head injuries. This commentary begins by describing the symptoms, diagnostic procedures and problems related to concussions and their effects on student-athletes at the high school level. Section II discusses what states and the federal government have done in attempting to combat high school athletes prematurely returning to play when they are suspected of suffering from a concussion. Finally, section III proposes a federal regulation that requires schools to conduct baseline testing of athletes before the start of each season and prohibits athletes from returning to practice or play the same day that they experience or are suspected of suffering from a concussion.

I. BACKGROUND

Athletics are an integral part of many high school students’ lives. According to the National Federation of State High School Associations, 7.6 million students participated in high school sports in 2009-2010.11 With 1.1 million players, football had nearly twice as many participants as the second most popular sport, track and field, in which 570,000 students participated.12

---

9 Hughes, supra note 4.
12 Id.
Basketball ranked third with 540,000 student-athletes nation-wide. With such a large number of students participating in high school sports, measures must be taken to protect their safety while on the field, track, or court.

Concussions are a common occurrence in sports; they are so common, in fact, that athletes and coaches, alike, may not realize the consequences that can result from concussions sustained during sports play. One study estimated that 300,000 sports-related concussions occur in the United States yearly. Of the 10 most played high school sports, 41% of concussions sustained by athletes occurred while playing football, while 22% resulted from girls’ soccer. Boys’ soccer and girls’ basketball made up the majority of the remaining concussions, with 15% and 10%, respectively. These numbers should not be surprising considering twice as many high-schoolers play football as any other sport. Also noteworthy, concussions are twice as likely to occur during game play as in practice.

Incidents of concussion are on the rise. Researchers found, in an 11-year study, that the concussion rate in scholastic sports has increased 16.5% since 1997. Even though report rates may have increased due to athletic trainers’ more prominent roll in athletics, these numbers are alarming. Although concussion prevention and management has recently received publicity due to the development of new policies adopted by the National Football League (NFL), professional football players are not the only athletes who suffer from concussions. In fact, concussions can occur in almost any contact sport, including rugby and lacrosse; limited-contact sports, like basketball and baseball; and even non-contact sports, such as swimming and gymnastics.

13 Id.
14 See generally Mark R. Lovell et al., Grade 1 or “Ding” Concussions in High School Athletes, 32 Am. J. Sports Med. 47, 48 (2004) (discussion of return to play procedures that do not have scientific validation and the need for scientific studies of return to play practices after a high school athlete receives a Grade 1 concussion).
16 Id. at 496.
17 Id. at 496. See also Stephanie Smith, Footballer: “Are You OK with Destroying a Kid’s Brain for this Game?,” CNN (Feb. 4, 2011, 12:38 PM), http://www.cnn.com/2011/HEALTH/02/04/tackle.technique.concussion/ (stating that, while the reasons for the difference in concussion occurrence rates between practices and games is not fully known, it could be due to the modification or elimination of dangerous drills and reducing tackling drills and hits that youth athletes take during practices).
19 Id.
As noted above, sports-related concussions have received recent media and legislative attention.\footnote{See generally R.I Gen. Laws Ann. § 16-91-3 (West 2010) (addressing issues related to informing those involved in youth sports about the risks of concussions, requiring training for coaches, volunteers, and trainers, and mandating clearance by a medical professional before an injured youth can return to play); N.J. Stat. Ann. § 18A:40-41.2 (West 2010) (addressing informing about, training to recognize, and preventing sports-related concussions through new programs); Wash. Rev. Code Ann. § 28A.600.190 (West 2011) (requiring collaboration between state agencies and associations to train those involved with youth sports to prevent sports-related concussions); H.R. 6172, 111th Cong. (2nd Sess. 2010) (promoting the creation of minimum state requirements for the treatment and, ultimately, prevention of youth sports-related concussions); H.R. 1347, 111th Cong. (2nd Sess. 2010) (seeking to create and implement new guidelines for the prevention and treatment of concussions in school-aged children); Alan Schwartz, \textit{Madden Puts Concussions in New Light in His Game}, N.Y. Times, Apr. 2, 2011, http://www.nytimes.com/2011/04/03/sports/football/03madden.html (describing new features of a football video game in which players sometimes suffer concussions and are barred from participating for the rest of the game); Ralph D. Russo, \textit{More Attention, Better Treatment for Concussions}, USA Today, Nov. 8 2009, http://www.usatoday.com/sports/2009-10-08-concussion-treatment-evaluation_N.htm (describing the dangers of concussions through stories of pro-sports players who have suffered from such injuries); Thomas H. Maugh II, \textit{Football Concussions Catching Up with Terry Bradshaw}, L.A. Times, Apr. 15, 2011, http://www.latimes.com/health/boostershots/la-heb-concussions-football-bradshaw-04152011, 0.4467937.story (describing problems faced by former football player, Terry Bradshaw, and concerns about the long-term impact of concussions).} Even video game makers are beginning to add concussion injuries to their sports games.\footnote{Schwartz, \textit{supra} note 22.} For example, a popular NFL video game, John Madden’s \textit{Madden 12}, added a concussion injury to raise gamers’ awareness.\footnote{Id.} \textit{Madden 12} forbids players from returning to the game if they have a concussion.\footnote{Id.}

This recent publicity is due, in part, to former sports players’ reports of post-concussion difficulties and new studies that have rebutted the presumption that because athletes seem to recover from concussions so rapidly, concussions’ long-term effects are minimal.\footnote{Louis De Beaumont et al., \textit{Brain Function Decline in Healthy Retired Athletes Who Sustained Their Last Sports Injury in Early Adulthood}, 132 Brains 695, 696 (2009).} This misplaced belief in the harmlessness of concussions was highlighted by the tragic suicide of former NFL player, Dave Duerson in February 2011.\footnote{Alan Schwarz, \textit{A Suicide, a Last Request, a Family’s Questions}, N.Y. Times, Feb. 22, 2011, http://www.nytimes.com/2011/02/23/sports/football/23duerson.html?_r=2&partner=rss&emc=rss.} The former safety played 11 seasons and took many hits.\footnote{Id.} After his retirement, his family reported that he had difficulty speaking and remembering. Unfortunately, dementia was not the only effect of the hard hits he had taken while playing in the NFL.\footnote{Id.} After sending his family text messages and leaving a paper note stating, “Please see that my brain is given to the NFL’s brain bank,” Dave Duerson shot himself in the chest so that his last wish could be fulfilled.\footnote{Id.} Sadly, Dave Duerson is one
of many retired sports players who have dealt with cognitive disorders after leaving the field.31

Tales of athletes whose lives were affected by concussions received decades ago, along with the new studies, however, suggest that concussions will have long-term effects on young athletes, particularly in cases where an athlete has sustained multiple concussions.32 These studies, coupled with the increased occurrence of concussions in high school sports, have sparked legislatures to propose state and federal bills in an effort to prevent, identify, treat, and manage concussions.33

A. Symptoms

According to the Centers for Disease Control and Prevention (CDC), a concussion is a type of traumatic head injury that results from a blow to the head, which, in turn, causes the brain to rapidly move back and forth inside the skull.34 The severity of a concussion is measured by the symptoms displayed, and, depending on the symptoms and their durations, the concussion can be designated as Grade 1, Grade 2, or Grade 3.35 Symptoms of a Grade 1 concussion consist of any of a wide scope of mild symptoms including both cognitive and physical effects such as difficulty thinking clearly and concentrating, anterograde amnesia, retrograde amnesia, headache, nausea, dizziness, blurred vision, and sensitivity to noise or light.36 Grade 1 concussion symptoms generally appear to resolve in less than 15 minutes.37 Grade 2 concussions are more severe, and symptoms are similar to those in Grade 1 but last longer than 15 minutes.38 The most severe concussions, Grade 3, occur when there is any loss of consciousness, even if it lasts only seconds.39 Grade 1 concussions are commonly the most difficult to diagnose because they do not result in a loss of consciousness, and players experiencing a Grade 1 concussion may not manifest serious symptoms immediately.40 Moreover, the severity of a concussion often goes unrecognized because the

signs of a concussion might not be immediately present and may take days to surface.\footnote{Id.}

Once an athlete has experienced one concussion, there is increased susceptibility to subsequent concussions.\footnote{Michael W. Collins et al., \textit{Cumulative Effects of Concussion in High School Athletes}, 51 \textit{Neurosurgery} 1175, 1180 (2002).} Compared to an athlete with no prior concussions, a player with three prior self-reported concussions is nine times more likely to exhibit the symptoms of a concussion.\footnote{Id. at 1178.} While it is unclear why this is so, scientists have suggested that, while some individuals may be predisposed to be more susceptible to concussions, there is strong support for the hypothesis that successive concussive injuries may increase an individual’s vulnerability through the cumulative effect of multiple injuries.\footnote{Id.}

\section*{B. Diagnosis}

Concussions are often difficult to diagnose because “CT scan and MRI are insensitive to the injury.”\footnote{Melvin Field et al., \textit{Does Age Play a Role in Recovery from Sports-Related Concussion? A Comparison of High School and College Athletes}, 142 \textit{J. Pediatrics} 546, 552 (2003).} One computer program, however, has proven particularly useful in diagnosing concussions. Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) is utilized by physicians, trainers, and coaches to assess an athlete’s post-injury condition and objectively evaluate recovery so a coach or trainer can make an informed decision regarding the injured athlete’s ability to return to play.\footnote{ImpACT, \textit{Overview and Features of the ImPACT Test}, http://impacttest.com/about/background (last visited Aug. 08, 2011).} ImPACT, a 20-minute test, measures players’ symptoms, verbal and visual memory, reaction time, and processing speed.\footnote{Id.} Teams using the ImPACT program assess each player prior to the commencement of the season’s practice to establish a baseline for each athlete.\footnote{Id.} The program stores that information, and in the event that an athlete is suspected of suffering from a concussion, the athlete is given another ImPACT test.\footnote{Id.} The results of the subsequent test are compared to the injured athlete’s baseline data.\footnote{Id.}

In terms of cost, schools can purchase a yearly license for the testing software, with rates based on the number of athletes.\footnote{ImpACT, \textit{Purchase ImPACT}, http://impacttest.com/purchase (last visited Aug. 08, 2011).} For example, Package 1 contains baseline tests for 75 athletes and post-injury testing for 30 athletes.
during each school year for $350.\textsuperscript{52} For $750 per year, Package 3 offers 600 baseline tests and 240 post-injury tests.\textsuperscript{53} Based on their needs, schools can add additional baseline and post-injury tests to their package for merely $2 and $10, respectively.\textsuperscript{54} Nevertheless, even though the price is low in comparison with the injury the program may prevent, some high schools may not possess the funds to purchase the program license. Furthermore, as a practical matter, a computer may not always be on the sidelines during a game for an injured athlete to take the 20-minute test.

Unfortunately, in the case of a student athlete being injured during a practice or game when physical symptoms are absent or not easily apparent, coaches and physicians often rely on the athlete to report any symptoms.\textsuperscript{55} Self-reporting, however, is often inadequate for three reasons.\textsuperscript{56} First, a student may falsely report feeling “normal” because he or she desires to return to the game.\textsuperscript{57} Second, symptoms of a concussion may not present immediately after the trauma,\textsuperscript{58} so an athlete may not actually know if he or she is experiencing any abnormalities due to a concussion. Third, an “athlete can be influenced by a general naiveté of the potential severity of the injury.”\textsuperscript{59}

C. Recovery and Effects

One study, utilizing the ImPACT memory composite evaluation, found that mildly concussed high school athletes demonstrated significantly more symptoms and performed significantly poorer on the memory test 36 hours post-injury.\textsuperscript{60} After six days, the study noted a return to baseline levels for memory performance, as well as a drop in symptoms to below baseline levels.\textsuperscript{61} Another study found a relationship between a post-concussion headache and a decline in neuropsychological test performance.\textsuperscript{62}

As noted above, not all symptoms are immediately present after injury;\textsuperscript{63} accordingly, athletes do not always receive the proper post-injury follow-up treatment.\textsuperscript{64} Allowing a player with an undiagnosed concussion to return to the
field may lead to long-term neuropsychological dysfunction, severe disability, or death.65

When an athlete has a prior concussion history, he or she is more susceptible to the effects of subsequent concussions.66 One study found that when a football player had sustained one concussion in his past, the chances of a subsequent concussion following a hard hit were four to six times more likely than an athlete who had not suffered a prior concussion.67 Studies show that the long-term effects from multiple concussions are detrimental to mental health later in life.68 The gravity of the long-term effects depends on the severity of each subsequent concussion.69 Thus, the more severe the subsequent concussion, the more acute and prolonged the side effects are likely to be.70

Specifically, one study found that experiencing multiple concussions at a young age significantly affects motor cortex function later in life.71 Other studies have shown that Alzheimer’s disease is also related to early incidence of concussions.72 In fact, those studies have proven that retired, previously concussed athletes experienced Alzheimer’s symptoms much earlier than the general American population.73 Although the effects of a concussion will vary due to the severity of each blow, almost all concussion-causing blows can induce long-term effects.74

D. Detrimental Difference Between High School and College Athletes

One study found that there are significant differences in concussion recovery between high school and college athletes.75 A pre-season baseline test was administered to all participants in the study, and the results of the pre-season test were used as the standard for comparison if the athlete was injured.76 Results indicated that high school students who suffered from a

---

65 Id.
66 Collins et al., supra note 42.
68 See generally Louis De Beaumont et al., Long-Term and Cumulative Effects of Sports Concussion on Motor Cortex Inhibition, 61 NEUROSURGERY 329 (2007) (discussing a study indicating sports-related concussions can lead to long-term effects to an athlete’s motor skills, and subsequent concussions may exacerbate the problems).
69 See id.
70 See id.
71 De Beaumont et al., supra note 26.
72 Id. (citing A. Heyman et al., Alzheimer’s Disease: A Study of Epidemiological Aspects, 15 ANN. NEUROLOGY 335 (1984); B. Plassman et al., Documented Head Injury in Early Adulthood and Risk of Alzheimer’s Disease and Other Dementias, 55 NEUROLOGY 1158 (2000)).
73 Id.
75 Field et al., supra note 45.
76 Id. at 548.
concussion experienced significant memory impairment seven days following
the concussion, whereas the college athletes had significant memory deficits
the first day only. The researchers hypothesized the differences in memory
recovery between the age groups was caused by more prolonged cerebral
swelling in children than adults. Accordingly, the cerebral swelling caused
by a concussion makes juveniles more prone to a slower recovery period and
more likely to experience severe neurologic deficit if exposed to a subsequent
concussion. The results of this study support the idea that younger athletes
should receive more protection because they are more susceptible to the effects
of concussions.

II. STATE AND FEDERAL METHODS OF ASSESSMENT
ARE INADEQUATE

As of early 2011, no federal law or regulation was in place that prohib-
ited high school athletes from returning to practice or play after a suspected
concussion. In the last session of Congress, however, two acts were intro-
duced, but both failed to pass before the session’s close. Ideally, the two
bills—the Protecting Student Athletes from Concussions Act of 2010 and the
Concussion Treatment and Care Tools Act of 2010 (ConTACT Act)—could
be merged into one, but states’ rights activists would likely oppose any such
measure because this legislation would burden states with yet another federal
mandate.

On September 30, 2010, the House of Representatives passed the Con-
TACT Act, but it was never voted on in the Senate. With the underlying
rationale of establishing a uniform, national standard, the ConTACT Act
would have required computerized baseline and post-injury testing, similar to
the ImPACT testing, for school-aged children. Additionally, the Secretary
of Health and Human Services (HHS) would have been required to create
guidelines for when concussed athletes could return to play. This mandate
would have been funded through federal monies. If reintroduced and passed
in its original form, this bill would provide protection for student athletes in an

77 Id. at 552.
78 Id.
79 Id.
80 H.R. 1347, 111th Cong. (2nd Sess. 2010); H.R. 6172, 111th Cong. (2nd Sess. 2010).
82 H.R. 1347, 111th Cong. (2nd Sess. 2010).
83 Schwarz, supra note 81.
84 Id.
85 Id.
86 Id.
area that state laws are lacking, but it would still be inadequate because it fails
to address the education component of concussion prevention, assessment, and management.

The second bill that did not pass was the Protecting Student Athletes from
Concussions Act of 2010. If enacted, this bill would have required state agen-
cies to issue regulations concerning concussion prevention and treatment. Each public school district would be responsible for enacting its own plan, and
states would receive funding on the condition that concussed athletes would not be permitted to return to play until the athletes had obtained a written re-
lease from a health care professional. The bill was originally introduced on
September 22, 2010, but it died in committee when the congressional session ended without voting to pass the bill into law. The bill was reintroduced un-
der the same name on January 26, 2011, and it has been referred to the House
Education and Workforce Committee. Nevertheless, like the ConTACT Act,
even if the Protecting Student Athletes from Concussions Act were passed
in its current form, it will fall short of the mark because it lacks a baseline
testing requirement. Without such testing, it is difficult to assess whether an
athlete is suffering from a concussion, and coaches may make return-to-play
decisions that are detrimental to athletes’ health.

A. Existing Nation-Wide Guidelines

Although no federal law is currently in place, federal agencies have
issued guidelines to assist schools in preventing and managing concussions.
Specifically, the CDC, responsible for promoting the health and well being of
Americans, established the Heads Up Concussion in Youth Sports Program
(Heads Up). Information regarding the symptoms, recognition, and treatment
of concussions for coaches, athletes, and parents is available on the CDC’s
website. The Heads Up program has also issued a printable “clip board
sticker” that lists the signs and symptoms of a concussion, an action plan
should an athlete become injured, and an area to enter emergency contact
information for use by coaches. Heads Up also gives coaches free access to
a concussion management training course.

87 H.R. 6172, 111th Cong. (2nd Sess. 2010).
88 Id.
89 Id.
93 Id.
94 Id.
95 Id.
While other federal programs issue guidelines and programs with respect to concussions, none of those speaks directly to concussion prevention at the high school level.\(^6\) For example, the Consumer Product Safety Commission (CPSC) develops and distributes brochures and fact sheets pertaining to specific topics, such as helmet use, that generally apply to all levels of sports from youth to adult.\(^9\) Additionally, the National Institutes of Health (NIH) and the Health Resources and Services Administration (HRSA) under the Department of Health and Human Services (HHS), administer grant programs related to concussion research and prevention among all age groups, but neither agency specifically focuses on concussions in high school sports.\(^8\)

The rules for participation in high school athletics established by the National Federation of State High School Associations (NFHS) are “blanket rules,” applying to all member schools and associations.\(^9\) Recent changes to sports rules, such as a change to the ice hockey rules forbidding any contact with an opposing player’s neck or head with the penalties for such contact ranging from a minor penalty to disqualification, reflect increased awareness of the danger of concussions.\(^10\)

The National Federation’s rule book for football, effective for the 2010 high school football season, provides that “any player who exhibits signs, symptoms, or behaviors consistent with those of a concussion (such as loss of consciousness, headache, dizziness, confusion, or balance problems) shall be immediately removed from the game and shall not return to play until cleared by an appropriate health-care professional.”\(^10\) The problem with this rule is that officials are the responsible parties for removing the injured player.\(^10\) Although, typically, multiple persons officiate football games, it is unrealistic to place the burden of monitoring all players solely on them because signs of concussions are not always apparent, and they cannot possibly monitor every player as closely as necessary to effectuate this mandate.
B. State Laws

Presently, at least 32 states have enacted legislation aimed at preventing or raising awareness of the prevalence of concussions in student-athletes.\(^\text{103}\) Unfortunately, the various state laws that are currently in effect do not attempt a comprehensive approach to concussion prevention and treatment. Indeed, some state laws provide school districts with a starting point, but they are failing to require a multifaceted plan to combat concussion prevalence and management in high school-level sports.\(^\text{104}\) For example, states may require coaches to participate in a concussion training program, but the mandate falls short because it does not require students or officials to also complete such training.\(^\text{105}\) Other state laws require training of coaches, trainers, physicians, and athletes, but they fail to enforce the mandate.\(^\text{106}\) The effective concussion law in Maryland attempts to address the awareness aspect of concussion laws by requiring that a “concussion and head injury information sheet” be sent home to parents with a signature acknowledging its receipt.\(^\text{107}\) While the statute attempts to provide awareness, it lacks an education component. Similarly, the Nebraska law in effect only seeks to raise concussion awareness of students and parents, but fails to provide a means to train coaches, volunteers, or officials in concussion recognition.\(^\text{108}\)

Some states go beyond simply increasing awareness of the danger of concussions and require that school districts enforce coaching training mandates.\(^\text{109}\) For example, Rhode Island requires coaches, volunteers, and any


\(^{104}\) See, e.g., N.J. STAT. ANN. § 18A:40-41.2 (West 2010) (only addresses training and education, does not include any provisions dealing with those who fail to comply); R.I. GEN. LAWS ANN. § 16-91-3 (West 2010) (encouraging education but failing to create sanctions for those who do not comply).

\(^{105}\) E.g., N.J. STAT. ANN. § 18A:40-41.2 (West 2010); R.I. GEN. LAWS ANN. § 16-91-3 (West 2010).

\(^{106}\) See, e.g., N.J. STAT. ANN. § 18A:40-41.2 (West 2010) (does not specify a punishment for a school district’s non-compliance with the concussion training mandate).

\(^{107}\) MD. CODE ANN., EDUC. § 7-433 (West 2011).

\(^{108}\) See L.B. 260, 102nd Leg., 1st Sess. (Neb. 2011).

\(^{109}\) For example, Rhode Island and New Jersey require some form of concussion training for coaches.
person involved in school athletic training programs to utilize the materials made available by the CDC’s Heads Up program.\textsuperscript{110} New Jersey mandates that physicians, coaches at both private and public schools, and trainers complete safety-training programs that are specifically tailored to concussion recognition and treatment.\textsuperscript{111} Both states’ laws are lacking, however, because athletes and officials are not included in the training.

Besides deficiencies in training requirements, the state laws that are in effect are difficult to enforce. For instance, Iowa’s law essentially directs the Iowa High School Athletic Association to collaborate with the Iowa Girls High School Athletic Union to compile and disseminate forms and guidelines about the dangers of concussions to coaches and parents.\textsuperscript{112} The law further states that the parents of athletes must sign and return a concussion and brain injury information sheet to the school.\textsuperscript{113} Because of the lack of penalties for non-compliance and the vague wording of the statute, the statute is likely ineffective when it comes to ensuring parents, athletes, and students are informed of the dangers of concussions, familiar with the signs and symptoms, and knowledgeable about when a player should be pulled out of a game.\textsuperscript{114}

Iowa is not singular in having a weakly worded, unenforceable statute regarding concussive injuries in youth athletics. Maryland’s law fails to create consequences for noncompliance as well.\textsuperscript{115} States with such laws must change them to enumerate punishments or remedies for a school district’s non-compliance to have any remedial effect on the problem of concussions in youth sports.

Not all states, however, have lackluster statutes regarding concussions in high school sports. For instance, Washington boasts one of the most comprehensive concussion laws of any state, in part because it covers school districts and targets coaches, athletes, and parents.\textsuperscript{116} The Washington law is unique in that it requires parents to receive concussion symptom education in addition to coaches and athletes.\textsuperscript{117} School districts are required to work with state athletic organizations to develop the education materials and guidelines.\textsuperscript{118} The Washington law’s strongest point is that it requires athletes to be removed from play if suspected of suffering from a concussion and does not allow that athlete to return to play until receiving written clearance from a licensed

\textsuperscript{110} R.I. GEN. LAWS ANN. § 16-91-3.
\textsuperscript{111} N.J. STAT. ANN. § 18A:40-41.2.
\textsuperscript{112} IOWA CODE ANN. § 280.13C (West 2010).
\textsuperscript{113} Id.
\textsuperscript{114} See id.
\textsuperscript{115} See MD. CODE ANN. EDUC. § 7-433 (West 2011).
\textsuperscript{116} WASH. REV. CODE ANN. § 28A.600.190 (West 2011).
\textsuperscript{117} Id.
\textsuperscript{118} Id.
health care professional who has been trained in concussion evaluation and management. Nevertheless, although Washington’s concussion law is fairly comprehensive, it is still lacking because it does not require crucial baseline testing. Furthermore, the most detrimental shortcoming of the Washington law is, perhaps, that it does not provide sanctions for failure to comply with the law.

III. PROPOSAL

While some states are making commendable attempts at addressing the prevalence of concussions in high school athletics, a nation-wide approach is necessary to protect students in states where no such legislation exists or where existing state laws fail to offer a comprehensive approach to the problem. All public schools should be required to: (1) train coaches, staff, volunteers, and athletes in concussion prevention and recognition; (2) conduct baseline testing of all high school athletes; and (3) prevent athletes suspected of suffering a concussion from returning to practice or play until cleared by a qualified health care professional. Finally, a law without penalties for failure to comply will not be effective, so school districts and individuals must face repercussions for non-compliance.

A. Mandatory Training for Coaches and Athletes

Because it is not feasible for coaches, alone, to monitor all athletes on a team, concussion prevention and recognition training should be required of all individuals on the playing field or court, including athletes, coaches, trainers, officials, and volunteers. Concussion training is necessary for sport participants, themselves, because high school students are likely unaware of the prevalence, risk, or seriousness of a concussion. By requiring athletes to participate in a training course as part of their membership on a team, they can learn to spot the signs of a concussion when a coach might not recognize them. By having more trained eyes on the field and sidelines, athletes will be better protected. Wyoming recently passed a law that requires a similar measure. Specifically, the statute mandates that schools follow certain protocols that:

(A) . . . include training of coaches and athletic trainers to facilitate the recognition of symptoms of concussions; (B) [a]ddress restrictions concerning participation in school athletic events after suffering a concussion or head injury; (C) [i]nclude means

119 Id. (those whose acts or omissions amount to gross negligence or misconduct may be held civilly liable under this statute so there is substantial deterrence to ignore a potential problem).
120 Id. (there are no penalties established for non-compliance, other than the possibility of a health care provider being held liable for gross negligence or misconduct).
for providing to students and parents information on head injuries and concussions and related restrictions on participation in athletic activities.\textsuperscript{122}

States should use Wyoming’s law as an example of who to target in spreading concussion education and awareness.

Requiring a training course for all individuals involved would be very inexpensive, if not free. For example, states could simply require that athletes, coaches, trainers, physicians, and volunteers complete materials provided by the CDC’s Heads Up program. At higher cost, states could develop their own programs or place on school districts the responsibility of tailoring training programs specific to their needs. Regardless of the approach a state chooses, so long as all involved in practices and game days are trained in concussion recognition, athletes will reap the benefits.

\textbf{B. Baseline Testing}

Even if the Protecting Student Athletes from Concussions Act of 2011 were to be passed in its current form, baseline testing will not necessarily be required because the Act leaves such specifics up to the states. Accordingly, an act that requires baseline testing in schools is necessary to protect students in the event they are suspected of experiencing a concussion.

Baseline testing is necessary because, as explained above, it offers an individualized comparison of an athlete’s status with regard to verbal memory, visual memory, reaction time, and processing speed before the start of a sports season to his or her performance on these same measures after a suspected concussion. Trainers and physicians can use the comparative results to determine whether an athlete is, in fact, suffering from a concussion and, as a result, whether an athlete should return to play. Such comparative results allow for coaches, and appropriate others, to make data-based decisions if they are unsure of whether to allow a player to return to the game.

Requiring all states to conduct baseline testing without offering them any guidance would result in each state conducting research on the same topic. As such, the federal agency charged with enforcing any such statute must assist the states by compiling, and perhaps mandating, a protocol for baseline testing. One option would be to adopt ImPACT testing, as several studies have used the ImPACT testing as the main method of assessing athletes before and after experiencing a concussion,\textsuperscript{123} suggesting that ImPACT is the gold-standard baseline and post-concussion analyzer. Nevertheless, the federal government should not require states to purchase ImPACT for their baseline

\textsuperscript{122} \textit{Id.}
\textsuperscript{123} De Beaumont et al., \textit{supra} note 26; Iverson et al., \textit{supra} note 67; Collins et al., \textit{supra} note 62 (noting their respective studies utilized the ImPACT test as a method of ascertaining baseline and post-concussion neurological symptoms and using the ImPACT computer analysis program to compare those results).
due to the issue of unfair government promotion; rather, in its baseline resource list, the federal oversight agency should include the benefits and shortcomings of each testing program to allow states and school districts to make an informed decision regarding the testing method they ultimately chose.

Opponents of such a baseline testing requirement will assert that some schools, particularly those in rural areas, do not have the funds to purchase the computer program, such as ImPACT. While many school districts could find money by reorganizing their budgets, others could petition for a grant, fundraise, or require parents to pay a nominal amount. If a school placed the cost on parents, it is very unlikely that any parent would object to forfeiting the few dollars equivalent to one morning coffee in exchange for an accurate, unbiased assessment of a child’s condition pre- and post-injury.

It is true that reports of concussion incidents have risen, and some experts believe this is partly due to increased awareness and attention to symptoms, as well as pressure for student athletes to perform better and to be stronger and faster, resulting in more and harder hits in contact sports.\textsuperscript{124} Yet, even with increasing rates of concussive injuries, many athletes will go an entire season without experiencing a concussion. Consequently, the group of athletes that do not experience a concussion—or suspected concussion—will not need the secondary test—the more expensive of the two under the ImPACT program.

C. Athletes Prohibited from Returning to Play If Concussion Suspected

If an athlete sustains a concussion and subsequently experiences a second head trauma, the seriousness of the injury significantly increases.\textsuperscript{125} As previously discussed, high school athletes’ brains are particularly susceptible to the effects of a second concussion or head trauma.\textsuperscript{126} In states without laws regarding concussions in sports, coaches may allow a player who has suffered a hard hit to the head back in the game too soon after the eager athlete says he or she feels alright. Accordingly, the proposed legislation must prevent this scenario, which is similar to that of Zackery Lystedt, from occurring by requiring any athlete suspected of suffering from a concussion or other brain injury to receive clearance from a qualified medical professional before returning to practice or play. In the past, concussions were considered a normal occurrence in sports, and they were afforded little attention. The outcomes of the new studies and stories of old injuries, however, have altered how concussions and brain injuries are viewed. The realization that sports-related brain injuries are very serious and researchers’ conclusions that an injury’s quickly disappearing—or initially absent—symptoms are no indication that

\textsuperscript{124} Lincoln et al., supra note 20.
\textsuperscript{125} Collins et al., supra note 42.
\textsuperscript{126} Gessel et al., supra note 15, at 496.
long-term effects will be minimal must be met with action. Therefore, even though such legislation may prevent a star player from going back in to score the winning basket, goal, or touchdown, it is necessary to remove a potentially concussed athlete from the game to protect that athlete’s health and well-being.

D. Meaningful Enforcement

One of the most troubling shortcomings of state laws, where they exist, is the absence of enforcement guidelines and consequences for failure to comply. To be effective and to achieve the overall goal of safety for high school athletes, the legislation must include an active method for assessing school districts’ compliance with each facet of concussion prevention and treatment. To do this, coaches and staff must report to school districts, who, in turn, must report to state officials with details regarding: baseline testing; training of coaches, team staff, and athletes; and the course of treatment of students who did suffer a concussion.

Because self-reporting alone is insufficient, states will need to have investigative procedures in place to determine if coaches or other team personnel fail to comply with the required procedures and specifications. Furthermore, due to the weaknesses inherent in a self-reporting scheme, a better approach would be to take the investigations out of the hands of school district officials and, instead, have state boards of education promulgate regulations and methods for investigating compliance with the rules. Another, less viable, option could be to appoint a school employee for each school district or for a group of districts who serves as an investigator, but this could lead to an appearance of impropriety where the school district is being investigated by its own employee. Once the investigator gathers the required information, he or she would report the findings directly to the state board of education, which would then determine whether the offending party should be sanctioned.

High school sports tend to get very intense. In the heat of the moment, and when the game is on the line, some coaches may be inclined to make rash, short-term decisions that are in the interest of the team, rather than in the interest of individual players. For example, a coach might actually suspect a star athlete to be suffering from a concussion, but during a big game, the coach might ignore the warning signs and tell the player to “suck it up” and return him or her to play. Because of the research that indicates the detrimental effects of subsequent concussions, if that player suffers another blow in a game, he or she could suffer serious neurological difficulties. A law with consequences for failing to adhere to the school district’s guidelines and policies regarding concussion safety will deter a coach from making such a devastating decision.

127 Iverson et al., supra note 67.
The severity of the sanction should send athletes, school districts, coaches, trainers, and volunteer staff a clear message that violation will not be tolerated; on the other hand, such sanctions should not deter coaches and staff from wanting to participate in high school sports. Examples of appropriate sanctions for coaches, trainers, and volunteers include: game forfeiture; suspensions from coaching, training, or volunteer participation; and team ineligibility for state tournaments. In addition, athletes should be penalized for returning to play when they show signs of a concussion. Such penalization would send athletes the message that their health and well-being is of paramount importance. Athletes could be sanctioned by game suspensions, or for repeat offenders, ineligibility for school sports could result.

Coaches are not the only participating officials at a game or practice. Referees, umpires, and others responsible for observing and enforcing game rules should also be responsible for looking for symptoms of brain injury in players. In fact, the NFHS already has included in its rules the responsibility for game officials to call a time-out and have a player removed from play if a head injury is suspected in the 2010 football rules.\textsuperscript{128} Such a rule must be adopted and promulgated in other sports.

Any statute or regulation addressing sanctions for non-compliance with rules regarding the handling of a suspected brain injury in a young athlete must address not only a failure of a coaching staff to recognize symptoms of an injury, but also the failure of trainers, volunteers, school district officials, and athletes. Accordingly, there must be sanctions available for each group to deter dangerous conduct. Also, if it becomes apparent that a particular sanction, such as a low fine, is not effective to deter an individual or group, there must be more severe sanctions to respond to each successive violation, culminating in the dismissal of habitual offenders.

E. Jurisdiction Rules for Interstate Games

A jurisdiction issue will surely arise when school teams compete against schools in a different state than their own as to which states’ specific return to play rules apply. To prevent such confusion, and to protect against the effect of a poorly written statute, the federal legislation should provide for a solution. A straightforward solution would be to require each school to follow their home state’s rules without regard to which state the school is physically competing. A rule requiring schools to abide by another state’s requirements would create unnecessary game day confusion. The federal legislation should be narrowly worded, and as a result, most states would put in place very similar, if not identical return to play guidelines. Because coaches and trainers typically travel with the team, they will be present and aware of their own state’s rules

\textsuperscript{128} Nat’l Fed., supra note 101.
and will be able to act pursuant to those rules in the event that an athlete sustains or is suspected of sustaining a concussion during the game.

F. Civil Liability

Zackery Lystedt and his family were able to reach a settlement agreement with the Tahoma School District in 2009. However, it is not clear whether tort liability for coaches, game officials, and school districts will be an available remedy for others facing brain injuries due to sports injuries. To clarify the issue of liability, the federal regulation should include a provision that instructs states to determine instances in which coaches and staff could be civilly liable to athletes and parents when an athlete is allowed to return to play after sustaining a concussion or other brain injury and is subsequently injured. This determination should be left solely to the states because state tort law varies from state to state. Some states may also choose to be more liberal when allowing a suit, and others may simply follow an assumption of risk approach and decline to allow an athlete to bring suit against a game official or a school district unless there is willful misconduct or gross negligence.

CONCLUSION

Concussions are inevitable in high school sports. Even if athletes take the utmost care during games and in practices, concussions will still occur. Accordingly, coaches, training staff, athletes, officials, and volunteers must be trained in concussion prevention and recognition. Baseline testing is imperative for qualified health care providers to properly assess a player’s status after an apparent concussion and to make return-to-play decisions. If school districts fail to take advantage of modern technologies, such as ImPACT testing, they are doing their athletes a disservice by putting athletes’ health at unnecessary risk. High school sports are only a game. After high school, the game ends for many athletes, but life goes on. To ensure that those athletes’ lives are not impacted by their high school athletic prowess, federal legislation is necessary to require states to implement guidelines to protect athletes from long-term effects of concussions.