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H.R. 6172, PROTECTING STUDENT ATHLETES FROM CONCUSSIONS

HEARING

BEFORE THE

COMMITTEE ON
EDUCATION AND LABOR

U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

HEARING HELD IN WASHINGTON, DC, SEPTEMBER 23, 2010

Serial No. 111–75

Printed for the use of the Committee on Education and Labor

Available on the Internet:
http://www.gpoaccess.gov/congress/house/education/index.html

U.S. GOVERNMENT PRINTING OFFICE

58–256 PDF WASHINGTON : 2010

For sale by the Superintendent of Documents, U.S. Government Printing Office
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H.R. 6172, PROTECTING STUDENT ATHLETES FROM CONCUSSIONS

Thursday, September 23, 2010
U.S. House of Representatives
Committee on Education and Labor
Washington, DC

The committee met, pursuant to call, at 10:03 a.m., in room 2175 Rayburn House Office Building, Hon. George Miller [chairman of the committee] presiding.

Present: Representatives Miller, Kildee, Payne, Scott, Woolsey, McCarthy, Davis, Bishop of New York, Altmire, Hare, Courtney, Polis, Kline, Petri, and Platts.

Also present: Representatives Pascrell and McIntyre.

Staff present: Andra Belknap, Press Assistant; Calla Brown, Staff Assistant, Education; Daniel Brown, Staff Assistant; Jody Calemine, General Counsel; Jamie Fasteau, Senior Education Policy Advisor; Ruth Friedman, Senior Education Policy Advisor (Early Childhood); Jose Garza, Deputy General Counsel; David Hartzler, Systems Administrator; Sadie Marshall, Chief Clerk; Bryce McKibbon, Staff Assistant; Alex Nock, Deputy Staff Director; Lillian Pace, Policy Advisor, Subcommittee on Early Childhood, Elementary and Secondary Education; Helen Pajcic, Policy Assistant; Melissa Salmanowitz, Press Secretary; Dray Thorne, Senior Systems Administrator; Daniel Weiss, Special Assistant to the Chairman; Nu Wexler, Communications Director; Kim Zarish-Becknell, Policy Advisor, Subcommittee on Healthy Families; Mark Zuckerman, Staff Director; Stephanie Arras, Minority Legislative Assistant; James Bergeron, Minority Deputy Director of Education and Human Services Policy; Kirk Boyle, Minority General Counsel; Allison Dembeck, Minority Professional Staff Member; Brian Newell, Minority Press Secretary; Susan Ross, Minority Director of Education and Human Services Policy; and Linda Stevens, Minority Chief Clerk/Assistant to the General Counsel.

Chairman MILLER [presiding]. The committee will come to order, a quorum being present.

Good morning to everyone. Today we will be discussing new legislation I introduced this week to help raise awareness about concussions for student athletes and to improve students' well-being both on the field and in the classroom.

Concussions have always been part of the conversation about student athletes, but for far too long we have talked about what has happened without taking any action to help students manage

those dangerous injuries. When the student suffers a concussion, it is not just their athletic future that is at stake. Without proper management, their performance in the classroom is also in jeopardy. The student athlete needs to be much more about the student than the athlete.

We simply can't talk about student athletes without really talking about what brain injuries really mean for a student's future. In the concussion management arena, there is a saying, "When in doubt, send it out." Unlike a broken leg or a bruise, concussions are not easily identified, but they are equally, if not more, dangerous.

Ninety percent of the concussions occur without a loss of consciousness, and many students simply don't know if they are injured. A prolonged diagnosis when the pressure to play surpasses the need for treatment can mean dangerous and harmful results to students.

In the past 4 years there were nearly 400,000 reported concussions in high school athletes, and experts believe that prevalence of sports-related concussions is much higher than reported. It is now commonly reported that 300,000 sports-related concussions occur annually, and once you factor in the recreation-related concussions like those occurring on the playground, the number rises dramatically.

We need to empower students to know when they may be at risk. Students deserve to know the signs and symptoms and the risks of concussions so they will be able to take appropriate next steps to prevent further injury and to prevent their successes in school from suffering. Student athletes with information about the symptoms of concussion are more likely to treat and manage their injuries.

Many states have already taken action, but there is little regulation on the whole to ensure that the students in every state will have the same minimum protection. High school athletes are at greater risk with sports-related concussions than college or professional athletes, because their younger brains are more susceptible to injury, and female youth athletes are even more likely to suffer concussions.

The Protecting Student Athletes from Concussions Act will help improve concussion safety and management for student athletes by requiring school districts to develop and implement a standard community-based plan for concussions safety and management. It will require school districts to take four minimum steps. These will set a floor in the terms of what school districts will have to do. I am confident that many states will far exceed these minimum expectations.

First, similar to a plan the NFL has implemented for the players, schools must post information about how to prevent and manage concussions for students to see. The information will be publicly visible on a school's Web site.

Second, when a student who is suspected of sustaining a concussion during the school-sponsored athletic activity, he or she must be removed from the game, prohibited from returning to play that day, and evaluated by health care professionals, and parents must also be notified.

And third, schools must provide support for students recovering from concussions and access to special education services for students who are not recovering.

This is commonsense legislation to protect our students. We may not fully understand the complexities of concussions, but we do know enough to improve the outcomes for student athletes now. Recent news reports about the prevalence and dangers of concussions have made it very clear that we will need to help prevent—what we need to do to help prevent the injuries at all levels.

The National Football League has already taken an important step to protect their athletes from the risk of concussions. At the very least, our schools should do the same.

And I would just like to interject here that it is not just about their athletes. One of the things we will hear about this morning is a program that the National Football League has entered into on behalf of all athletes, certainly playing the sport of football, but the impact is across all youth athletics, and also their work with the Center for Disease Control in working up educational, informational, public information programs on this issue.

I think it is a very, very important partnership both on behalf of this legislation and on behalf of working with states and school districts and parents about this danger.

Let me go back and just say that athletics plays an important role for student development. Team sports teach students about leadership, about teamwork, about commitment. And, unfortunately, the injuries are part of any team sport, and injury management should be a key component. But we have to do better for our students when they are hurt and need our support most.

I hope my colleagues will join me in supporting this legislation. The bill is supported by leading groups representing teachers and parents, school administrators, the disability community, the sports medicine community, medical organizations and athletic organizations.

I look forward to hearing from our witnesses about why it is so urgent that we help protect our students from the risks of concussions and keep them informed and safe. Thank you very much for joining us, all the witnesses.

And I would like now to recognize Congressman Kline, the senior Republican on our committee.

[The statement of Mr. Miller follows:]

Prepared Statement of Hon. George Miller, Chairman, Committee on Education and Labor

Good morning.

Today we'll discuss new legislation I introduced this week to help raise awareness about concussions for student athletes and improve students' well-being both on the field and in the classroom.

Concussions have always been a part of the conversation about student athletes. But for far too long, we've talked about what has happened without taking any action to help student's manage these dangerous injuries.

When a student suffers a concussion, it is not just their athletic future that is at stake. Without proper management, their performance in the classroom is also in jeopardy.

The "student athlete" needs to be as much about the "student" as the "athlete."

We simply can't talk about the student athlete without really thinking about what these brain injuries really mean for a student's future.

In the concussion management arena, there is a saying. "When in doubt, sit him out." Unlike a broken leg or a bruise, concussions aren't as easily identified, but they are equally, if not more dangerous.

Ninety percent of concussions occur without loss of consciousness and many students simply do not know if they're injured.

A prolonged diagnosis, when the pressure to play surpasses the need for treatment, can mean dangerous and harmful results to students.

In the past four years, there were nearly 400,000 reported concussions in high school athletes, and experts believe the prevalence of sport-related concussions is much higher than reported.

It is now commonly reported that 300,000 sport-related concussion occur annually, and once you factor in recreation-related concussions—like those occurring on the playground, the number rises dramatically.

We need to empower students to know when they may be at risk.

Students deserve to know the signs, symptoms and risks of concussions so they're able to take the appropriate next steps to prevent further injury and to prevent their success in school from suffering.

Student athletes with information about the symptoms of concussion are more likely to treat and manage their injuries. Many states have already taken action but there is little regulation on the whole to ensure that students in every state will have the same minimum protections.

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Athletics play an important role for student development. Team sports teach students about leadership, teamwork and commitment.

Unfortunately, injuries are a part of any sports team and injury management should also be a key component. But we have to do better for our students when they're hurt and need the most support.

I hope my colleagues will join me in supporting this legislation.

The bill is supported by leading groups representing teachers and parents, school administrators, the disability community, medicine, sports medicine and athletic organizations. I look forward to hearing from our witnesses about why it is so urgent that we help protect our students from the risks of concussions and keep them informed and safe.

Thank you for joining us today.

Mr. KLINE. Thank you, Mr. Chairman. And good morning to you and to all of our witnesses and guests here this morning.

We are here today to look at the issue of concussions among high school athletes and the effects of these traumatic brain injuries on the student's academic achievement. This is the third in a series

of hearings examining what policies and practices are in place to protect students from these injuries and help them safely recover when injuries do occur.

Across the country children are settling back into classes and school-related activities. The fall sports season is an especially familiar ritual for many, bringing parents, students, friends and neighbors together to support their local teams.

Over the years we have learned a great deal about creating a safer field of play. Helmets, pads and other safety equipment are now prerequisites. Coaches, umpires and referees keep a watchful eye to prevent injuries. Yet despite all of the safety precautions, we know injuries do occur, including head and neck injuries that sometimes include concussions. Local policymakers, teachers, coaches and parents must be well-informed and empowered to help prevent concussions and take appropriate action when they do occur.

We know that what happens on the field can directly affect what happens in the classroom. Academic research shows that student athletes who suffer from concussions tend to have lower attendance rates and lower grades than their peers. Particularly when concussions are unrecognized and untreated, such injuries can have long-term implications.

As we learned at our hearing in May, state and local school districts are continuing to step up and address this issue directly. Today's hearing will continue to shed light on the research surrounding concussions among student athletes and what steps are being taken to prevent and properly treat these injuries.

Thank you, Mr. Chairman. I yield back.

[The statement of Mr. Kline follows:]

Prepared Statement of Hon. John Kline, Senior Republican Member, Committee on Education and Labor

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Chairman MILLER. Thank you.

Without objection, the committee is joined today by two additional members of the House, who may participate in the hearing

with questions and comments when recognized—Mr. Pascrell of New Jersey and Mr. McIntyre of North Carolina.

Congressman Pascrell has been a leader on concussion treatment and prevention issues for school-age children. He founded the Congressional Brain Injury Task Force in 2001 and has introduced the Contact Act.

Congressman McIntyre is the co-chair and co-founder of the Congressional Caucus on Youth Sports and is hosting a forum on this subject both for members and staff, I believe, and a lunch later this afternoon, so people should be advised of that.

Thank you for joining us, Michael, and for your leadership on this issue.

Our panel today, I think, will be very helpful to all of the members to gain additional knowledge of this issue, but also, importantly, hear from the victims of concussion, but also people who are working in partnership to develop programs for the diagnosis and the protection and the recovery of individuals who suffer concussions in youth sports.

Our first witness will be Dr. Gerard Gioia, who is the director of the pediatric neuropsychology program at Children's National Medical Center in Washington, DC. He also oversees the hospital's Safe Concussion Outcome and Recovery and Education Program, the SCORE Program, where he evaluates and treats youth who have sustained concussions. Dr. Gioia has conducted extensive research on how to care for young athletes recovering from concussion and how the injury affects learning.

Alison Conca-Cheng is a senior at Centennial High School in Elicott City, Maryland. Ms. Conca-Cheng is an active member of her community and an honor student, editor of the school newspaper, "The Wingspan," and an avid soccer player. Alison is recovering from her first concussion, which she sustained during soccer practice this past August. She is still experiencing cognitive impairments as a result of her injury, including problems with concentration and memory, headaches and sleep difficulties.

Reverend Katherine Brearley is the pastor of Longswamp United Church of Christ and is the mother of the late Owen Thomas. Her son Owen played football from age nine. He was 21 years old, a lineman at the University of Pennsylvania, when he committed suicide this past April. Owen was never diagnosed with a concussion, but his autopsy revealed early stages of CTE, the disease caused by repetitive brain injury. That is the very disease found to be primarily in professional football players who have committed suicide over the last 10 years.

Sean Morey is a retired NFL player. He played for four NFL teams as a special teams wide receiver over the past 10 years. Mr. Morey, who graduated with honors from Brown University, was selected as the Ivy League rookie of the year and player of the year and as second-team All-American. Mr. Morey was drafted in the seventh round in the 1999 NFL draft and later was selected to be captain of the Super Bowl XL champion Pittsburgh Steelers. Sean is also a Pro Bowl special teams player. In the past August just before the starting of training camp, Mr. Morey retired due to post-concussion syndrome.

Dr. Stanley Herring is a board-certified physical medicine and rehabilitation specialist, who has been in practice over 28 years. Dr. Herring is a clinical professor in the Department of Rehabilitative Medicine, Orthopedics and Sports Medicine and Neurological Surgery at the University of Washington, co-medical director of the Seattle Sports Concussion Program. Dr. Herring also serves as one of the team physicians for the Seattle Seahawks and for the Seattle Mariners. He is a member of the NFL Head, Neck and Spine Committee and chairman of the Education Advocacy Subcommittee and serves as a concussion expert on the Football Wellness Committee of USA Football.

Welcome. Thank you so much for your time and your expertise that you are going to share with the committee this morning.

For those of you for which this is a first-time experience, in front of you there is a small box. When you begin testifying, a green light will go on. You will then have 5 minutes to present your thoughts to the committee. With 1 minute remaining, an orange light will go on, so if you could think about wrapping up your remarks. But we want you to make sure that you deliver your thoughts to the committee. It is a rather limited amount of time, but we want to also make time for questions from the members of the committee.

And, Dr. Gioia, we are going to begin with you. So we will begin with you, Dr. Gioia. Again, welcome to the committee.

STATEMENT OF GERARD GIOIA, PH.D., DIRECTOR OF NEUROPSYCHOLOGY, CHILDREN'S NATIONAL MEDICAL CENTER

Mr. GIOIA. Thank you. And good morning, Chairman Miller and members of the committee, and thank you for the opportunity to speak again on today's important topic.

Today we continue our focus on concussion, a type of traumatic brain injury, and its negative effects on the academic learning and performance of the student athlete. Learning in school is the child's job, and that job is impaired after concussion. The consequences of a concussion can be significant for the academic learning and performance of that student athlete.

Our current research finds adverse effects of this injury upon school performance of close to 90 percent of the students that come to us in our clinic. They report a significant worsening of post-concussion symptoms when they attempt school tasks.

But the effects of concussion are quite significant and could be quite wide-ranging, with an adverse effect on their ability to think and for their social and emotional functioning. The student also typically experiences physical pain with headaches and significant fatigue. These symptoms can be debilitating and disabling for a child's learning and their social interactions.

The length of time to a full recovery following a concussion and of that functional impairment varies from days to months, and for some even beyond that. Academic problems can also have significant downstream effects, especially for the high school student. For example, concussions at the end of the semester significantly reduce performance and grades on final exams, reducing the student's grade point average. Taking and SAT prior to recovery from

a concussion can also have significant adverse impact on that student athlete's college future.

Are our schools currently prepared to handle the academic consequences of these injuries? Through our clinical work we can clearly see that schools are very much caring and want to help students with these injuries. But they are often not adequately prepared to help them. They lack the necessary policies, procedures, knowledge, skills and tools to properly support the return of the concussed student athlete.

In a survey we conducted this summer of 140 school nurses in the Washington, DC, area, they reported that less than half of the schools were prepared to assess a concussion, and less than one-third were prepared to offer academic support after the injury. Training with the new CDC Heads Up to Schools Know Your Concussion ABCs Toolkit was very effective, though, in increasing their knowledge of the injury and ways to assess and to treat it.

So how can we help students with concussions return to school? We know that these students typically do not meet the criteria for special education services, yet they are still not able to handle the normal academic learning and performance demands. And the reality is that the school learning environment places significant physiological demands on that recovering brain. The effective management of these adverse academic effects is an important priority, and we have to provide effective support that maximizes the student's recovery and minimizes any long-term post-concussion problems.

The Protecting Student Athletes from Concussions Act that was introduced yesterday provides an important vehicle to improve care and assistance for students with concussions. This legislation places the focus directly on the student side of the student athlete equation. It places the focus on supporting the academic learning and performance needs of that student athlete after this entry. It focuses on what schools can actually do to support the academic return of a recovering student.

So this legislation asks schools to, number one, develop policies and methods to implement concussion education and training of school and related persons, including parents, students and coaches.

Number two, it provides a range of academic supports to help those students as they are attempting to manage school.

And third, it reinforces through its response to concussion elements the sport removal provisions of the Zurich consensus meeting and what we have seen in some of the laws, such as the Lysted Law. It also reinforces the need for appropriate evaluation to return the student athlete back to the field and to the classroom to support their academic needs.

So in conclusion, a concussion is a serious injury to the brain that presents significant risks and challenges to the academic performance and learning of the student. It negatively affects the primary job that they have. These academic problems, even if temporary, can have significant potential negative consequences for the student down the road. And if not treated properly, these academic problems could become prolonged and result in significant long-term difficulties for that student.

We must assist our schools to become better prepared to properly support the return of the concussed student athlete with the necessary assistance put in place to improve the knowledge and the skills of our school personnel. The Protecting Student Athletes from Concussion Act does this, seeking to develop and implement a national system of concussion education, protections and academic supports for students with concussions.

Now, this legislation promotes more effective recovery, and it will help return our students back to the schools effectively. Next, you are going to hear from Alison, who will tell you about her injury and its challenges just in this way. Thank you.

[The statement of Mr. Gioia follows:]

Prepared Statement of Gerard A. Gioia, Ph.D., Chief, Division of Pediatric Neuropsychology, Children's National Medical Center; Director, Safe Concussion Outcome, Recovery & Education (SCORE) Program, Children's National Medical Center

About Children's National Medical Center

Children's National Medical Center, a 303 bed not-for-profit academic medical center in Washington, DC, has provided hope to sick children and their families throughout the metropolitan region for nearly 140 years. The mission of Children's National is to improve health outcomes for children regionally, nationally and internationally; to be a leader in creating innovative solutions to pediatric healthcare problems; and to excel in care, advocacy, research and education to meet the unique needs of children, adolescents and their families. Children's National is ranked among the best pediatric hospitals in America by U.S. News & World Report and the Leapfrog Group. It is a Magnet recognized pediatric hospital, one of a handful of elite healthcare facilities nationwide.

Children's Safe Concussion Outcome, Recovery & Education Program

Children's National has long been an advocate for child safety and injury prevention. Safe Kids Worldwide, the first national advocacy organization solely dedicated to pediatric injury prevention, was founded by Children's National in 1987. With respect to concussions, Children's Safe Concussion Outcome, Recovery & Education (SCORE) Program is the first and only program in the greater Baltimore-Washington region that specializes in the clinical evaluation and treatment of concussions in children, as well as conducting research and delivering public health education and advocacy nationally and internationally. The SCORE program evaluates and treats children and adolescents with concussions (also known as a mild traumatic brain injury or mTBI). In 2009-2010, the SCORE program at Children's National treated more than 1,000 children in its concussion clinics.

Introduction

Children's National Medical Center applauds Chairman Miller for introducing the "Protecting Student Athletes from Concussions Act" and is pleased to support this important legislation. The child's brain is his most precious resource and the key to a happy, successful future. The primary job of the child is to develop and learn. Sports and recreation provide important learning activities that further enrich the lives of our youth by teaching important lessons of teamwork, commitment, discipline, goal-setting, competition, and sacrifice, among other things. These essential developmental experiences are put at significant risk, whether temporary or long-term, when the child's brain is injured. It is our responsibility to maximize the child's involvement in learning and sports/recreation activities. We must balance the significant benefits of sports with careful attention to safety issues—especially when involving the precious resource of the student-athlete's brain.

The consequences of a concussion, a type of mild traumatic brain injury, can be significant for the academic learning and performance of the student-athlete. Our current research finds adverse effects on school learning, with close to 90% of students in our clinics reporting significant worsening of post-concussion symptoms when they attempt school tasks. In our clinic sample, these problems persisted well beyond a month for many students. At the same time, we also find that schools in general are not prepared to provide the necessary supports and accommodations to the recovering student. We must provide effective treatments that maximize the student's recovery and minimize any long-term post-concussion problems. The "Pro-

tecting Student Athletes from Concussions Act" is an important vehicle to improve care systems for students with concussions.

About Concussion/Traumatic Brain Injuries

A concussion involves a strong, violent force applied to the brain that, in most people, changes the brain's electrochemistry (i.e., software); in some people it may alter the brain's structure (i.e., hardware). We know from working with repeated concussions that if this injury goes unchecked, the brain's hardware can be permanently damaged with dire consequences for the individual's long-term cognitive, social, and emotional quality of life.

The incidence of traumatic brain injuries (TBI) occurring to children annually is significant, but the full extent of the problem is as yet unknown. The existing epidemiologic methods are not yet developed to precisely identify the number of concussions. With current figures as likely underestimates, the Centers for Disease Control and Prevention (CDC) studied emergency department visits, hospitalizations and deaths between 2002 and 2006 and reported 1.7 million people sustain TBI annually, of which 52,000 died, 275,000 were hospitalized, and 1.365 million were treated and released from the Emergency Department.[1] However, these data do not include concussions diagnosed in primary or specialty care office settings, or concussions that go unreported. Children aged 0 to 4 years and older adolescents aged 15-19 years, together with senior citizens over 75 years of age, are most likely to sustain a TBI.

Other data sources tell us that the majority of TBIs (80-90%) are of a "mild" nature. With respect to sports, recent data (Yard & Comstock, 2009) indicates an estimated 400,000 sport-related concussions reported to athletic trainers at the high school level in five major male sports and four female sports. The true figures, though, are significantly higher as many other sports (e.g., ice hockey, field hockey, lacrosse, equestrian, rugby, cheerleading) were not included in these estimates, nor were non-scholastic high school or younger-age youth sports. In addition, a significantly higher rate of sport-related concussion occurs than what is formally reported to the athletic trainer.

The developing brains of children and adolescents are much more vulnerable to injury than those of adults. In fact, according to recently published consensus recommendations by the International Concussion in Sport Group (CISG)—an international panel of experts of which I am a member -differences in identifying and treating concussions in children and adolescents versus adults must be recognized. The CISG guidelines, published in the May 2009 issue of The British Journal of Sports Medicine, recommend that children and teens:

- Be removed from play if any sign or symptom of concussion is exhibited;
- Be strictly monitored; and
- Be restricted from activities until they're fully healed.

The important roles of parents and the school were also highlighted.

When managing concussions in children and adolescents, the guidance strongly reiterates several key points for coaches, parents, and physicians:

- Injury to the developing brain, especially repeat concussions, may increase the risk of long term effects in children, so no return-to-play until completely symptom free.
- No child or adolescent athlete should ever return to play on the same day of an injury, regardless of level of athletic performance.
- Children and adolescents may need a longer period of full rest and then gradual return to normal activities than adults.

Academic Consequences of Sport Related Concussion

There are significant threats to the child and adolescent as a result of an injury to the developing brain from concussion. The "Protecting Student Athletes from Concussions Act" places the focus on supporting the academic learning and performance of the student-athlete following a concussion. The effects of a concussion are quite significant and potentially wide ranging, with an adverse impact on the student-athlete's ability to think and learn (e.g., concentration, memory, speed of thinking -and therefore school performance), and his or her social and emotional functioning (e.g., irritability, depression). The student-athlete also typically experiences physical pain and/or significant fatigue. This is debilitating and disabling for a child's learning and social interactions. The length of time for a full recovery following a concussion—and of functional impairment—varies from days to months. For most, it takes at least several weeks. For others, the effects can be long-term.

[1] Blue Book, March 2010 *www.cdc.gov/traumaticbraininjury.*

Clinically, the majority of concussed student athletes recover fully with no long-term academic problems. Yet almost all student-athletes experience significant challenges in their academic performance during their period of recovery, with direct neurocognitive dysfunction in attention/concentration, memory, and speed of processing and performance. Student-athletes also experience cognitive difficulties secondary to the effects of post-concussion fatigue or other somatic or emotional symptoms. To further compound the academic difficulties, a high percentage of student-athletes experience "cognitive exertional effects," which are defined as an increase or re-emergence of symptoms following a period of cognitive activity (e.g., concentrating on a lecture, reading a textbook, performing math calculations). The reality is that the school learning environment places significant physiological demands on the recovering brain of the student-athlete. Effective management of these adverse academic effects is an important priority.

Why does the academic learning and performance of the student-athlete suffer after a concussion? The primary organ for learning is the brain. The brain is a very complex biological computer that requires properly working software and hardware systems. Concussions render the biological software systems dysfunctional, which produces functional deficits and symptoms, and consequently impairs the learning process. Students with concussions experience difficulties focusing their attention, performing multi-step tasks, putting new information into their memories, processing information and completing tasks at a normal speed. Without these neurocognitive abilities functioning properly, school learning and performance become significantly compromised. Academic problems can also have significant downstream effects, especially for the high school student-athlete. For example, concussions at the end of a semester can significantly reduce performance and grades on a final exam, reducing the student-athlete's grade point average. Taking the SAT or ACT prior to recovery from a concussion can also have a significant adverse impact on the student-athlete's future college options.

At this point in time, schools are not adequately prepared with the necessary systems, knowledge and skills to properly support the return of the concussed student-athlete. Students with more severe brain injuries have a vehicle of academic support services via the special education system, but students with mild TBI and concussion do not typically meet the criteria for special education services. While they are not "normal" in their academic skills and performance, they are also not significantly disabled from an educational perspective. This gap in student supports must be filled. The "Protecting Student Athletes from Concussions Act" does just this.

To support the academic return of the student-athlete, several excellent tools are now available to help schools transition the concussed student athlete back into the classroom. In 2005, Dr. Micky Collins and I developed the Acute Concussion Evaluation (ACE) Care Plan, to provide the family, student-athlete, and school team with a written plan of specific academic accommodations at each stage of recovery. The ACE Care Plan is updated regularly at each clinic appointment with new recommendations based on the recovery progress of the student-athlete. The ACE Care Plan is available to download within the CDC's "Heads Up: Brain Injury in Your Practice" physician's toolkit (*www.cdc.gov/concussion*).

While this Care Plan is useful in assisting the individual student-athlete, often school personnel are not prepared with the necessary knowledge and skill to easily implement the student's recommended accommodations. Increasing the knowledge and skill of school personnel is the focus of the CDC's May 2010 release of a school concussion toolkit called "Heads Up to Schools: Know Your Concussion ABCs." This toolkit provides guidance to policy development and key information for school nurses, counselors, school psychologists, teachers, parents, and student-athletes to develop and implement procedures to assist students with concussions in their return to school.

Protecting Student Athletes from Concussions Act

As previously noted, the student-athlete who sustains a concussion is at significant risk for adverse academic consequences. Chairman Miller's "Protecting Student Athletes from Concussions Act" places the focus directly on the student side of the student-athlete equation. This bill focuses on what schools can do to support the academic return of the injured/ recovering student. This bill is important as systematic school supports are an under-recognized and under-resourced aspect of concussion management. All students need to return to their job -school -but the associated cognitive, physical, and social demands can be very challenging, either supporting or detracting from appropriate recovery. The availability of the new CDC school toolkit materials now provides concrete methods to guide schools toward effective management.

The bill's requirements state that: (1) schools must develop policies and methods to implement concussion education and training of school and related persons (includes parent, students, coaches) tying into in part the youth version of the NFL posters; and (2) must include mechanisms for providing a range of academic supports. The bill reinforces the "Response to Concussion" or sport removal provisions of the Zachary Lystedt law in Washington state and the Zurich consensus statement, and also reinforces appropriate evaluation for return to play -but expands this to academic return as well. The bill ensures that the student-athlete does not return to school-sponsored sports activities and other school physical activities such as physical education class and recess in order to provide full post-injury protection. The need for these broader protections during the school day is well illustrated by the sad story of an 11-year-old boy in Wisconsin who recently died after first suffering a concussion while playing football and shortly thereafter striking his head during recess at school.

Conclusion

A concussion is a serious injury to the brain that presents a unique set of risks and challenges for the academic learning and performance of a student. As learning in school is the job of the child and adolescent, it is particularly challenged by this injury due to the associated neurocognitive dysfunction and adverse effects that the cognitive and learning demands of school place on the brain's dysfunctional biological software. These academic problems, even if temporary, can have potential negative consequences for the student down the road. Schools are not adequately prepared with the necessary systems, knowledge and skills to properly support the return of the concussed student-athlete. We must provide the same academic support structure for students with concussions as we do for more severe brain injuries. The "Protecting Student Athletes from Concussions Act" does just this. The bill seeks to develop and implement a national system of academic supports for student-athletes with concussions. This system would include directed efforts at education of key stakeholders and the delivery of key academic supports and accommodations to promote the effective reintegration of the student-athlete back into the school system.

Chairman MILLER. Thank you.

Alison, welcome to the committee. And go ahead and proceed.

STATEMENT OF ALISON CONCA–CHENG, STUDENT, CENTENNIAL HIGH SCHOOL

Ms. CONCA-CHENG. Thank you, Mr. Chairman.

My name is Alison Conca-Cheng. I am a 17-year-old high school senior at Centennial High in Ellicott City. I am an honor student, editor of my school newspaper, and active volunteer in my community. I also love reading and hanging out with my friends. I would say I am a pretty typical teenager.

I have been playing soccer my whole life, almost as soon as I could walk. This year was going to be my fourth year as a high school soccer player. Until recently, I was hoping to play Division III soccer in college. I was really looking forward to my senior season. But circumstances changed when I suffered a concussion on Friday, August 20th.

Practice was almost over, and I was playing central mid-field on an 11 versus 11 scrimmage. I jumped up, heading an approaching corner kick with the right side of my head. I don't remember anything that followed. I was told later that my friend and teammate, Lauren, had also gone up for the ball, and we had collided. Judging from the bruise I found later up and down the right side of my thigh, I assume I landed on that side of my body, and that I hit the ground hard.

The next thing I remember is sitting up unsteadily to see my teammates hovering concernedly around me. My vision had gone very blurry, and I had severe tunnel vision for several seconds. Ev-

erything was black around the edges. I was helped off the field, and soon my vision cleared a bit. I sat out the rest of practice that day.

Immediately after the concussion and for the rest of the day, I discovered that I was having severe balance problems. Even with the slightest nudge, it was a struggle not to fall down. I also had a lingering headache, as well as fairly constant dizziness. Later that day my boyfriend said I seemed fairly dazed and confused, and I noticed that my mind often drifted from the conversation or situation. I just felt very out of it. It is hard to explain, if you have never experienced it before.

I arrived at school the next morning for my scrimmage and was given some preliminary tests by my school's athletic trainer. I was told I had to see a doctor and either be diagnosed with a concussion or cleared. After a week of confusion with paperwork and forms, I was seen by my family doctor, who cleared me to play.

Meanwhile, school had started, and I was anxious to play. I thought I had fully recovered. The only thing standing in my way at the playing field was a computerized test. Before the start of the season, all athletes at my school are required to take a baseline concussion test. It is a half-hour test that evaluates basic cognitive functioning by measuring memory and reaction time. Remember the word, click when you see the green light, and so on.

About 2 weeks after I suffered the concussion, I took the test to see if I was functioning normally. I could tell that I didn't do very well, and I wasn't surprised when I was called back to the trainer to take the test a second time. Again, I knew I had done poorly. I just couldn't remember the words they were asking or the patterns and the numbers.

My trainer told me my test results were "inconsistent," with some test results significantly below my baseline data. Around this time I also started to notice other symptoms. The headaches lingered, and I began to forget things—not just day to day, but morning to evening, or even moment-to-moment.

My sleeping patterns changed. I slept more, feeling constantly tired, yet I had trouble falling asleep, a problem I had never had in the past. School became more difficult, once we started to delve into more complicated subjects. About 45 minutes into my hour-long class periods, my concentration would be completely gone, and I would develop a splitting headache.

This has been a problem for me, as I am taking five advanced placement classes this year. Reading textbooks and articles for homework was particularly difficult. It would take me twice as long, and it would be a constant battle with my concentration.

Because of my inconsistent test results and reappearing symptoms, I was sent to Dr. Gioia. He ran several tests on me, and my results were still subpar. After a full examination, he explained that I was still actively in the recovery stage and that my headaches and concentration troubles were indications that I was overtaxing my brain. I was going to have to pay special attention, and anytime a headache came on or my attention lagged substantially, I had to take a break and cool off.

Homework would have to be limited to 30 minutes at a time, with 10-minute breaks. Dr. Gioia wrote up a care plan for me that

I brought into school. The school and my teachers have been extremely understanding and accommodating. Whenever I need to cool off my brain, I can go to the nurse's office, and I have gotten extensions on reading assignments.

These adjustments have helped, but with the added time it takes to do my homework and mandated breaks, schoolwork now dominates my evenings and weekends. I am glad to say that I am feeling better and making progress. I appreciate the support I have received from my family, friends and the best high school in America, Centennial.

I am grateful that my school had a system in place to identify the severity of my injury and point me toward the medical care I have required. I am glad the committee is focusing attention on the issue. I have seen how it has impacted my life, and I worry about the student athletes who don't get properly diagnosed and fall through the cracks.

Thank you, Mr. Chairman.

[The statement of Ms. Conca-Cheng follows:]

Prepared Statement of Alison Conca-Cheng, Centennial High School, Ellicott City, MD

My name is Alison Conca-Cheng. I am a 17 year old high school senior at Centennial High in Ellicott City, MD. I am an honors student, editor of my school newspaper, and an active volunteer in my community. I also love reading and hanging out with my friends. I would say I'm a pretty typical teenager.

I've been playing soccer my whole life—almost as soon as I could walk. This year was going to be my fourth year as a high school soccer player.

Until recently I was hoping to play Division III soccer in college. I was really looking forward to my senior season. But, the circumstances changed when I suffered a concussion on Friday, August 20th.

Practice was almost over and I was playing central midfield in an 11 versus 11 scrimmage.

I jumped up to head an approaching corner kick with the right side of my head. I don't remember anything that followed. I was told later that my friend and teammate, Lauren, had also gone up for the ball and that we had collided. Judging from the bruise I later found up and down the right side of my thigh, I assume I landed on that side of my body and that I hit the ground hard. The next thing I remember is sitting up unsteadily to see my teammates huddling concernedly around me. My vision had gone very blurry and I had severe tunnel vision for several seconds. Everything looked black around the edges. I was helped off the field and soon my vision cleared a bit. I sat out the rest of practice.

Immediately after the collision and for the rest of the day I discovered that I was having severe balance problems. Even with the slightest nudge it was a struggle not to fall down. I also had a lingering headache as well as fairly constant dizziness. Later that day, my boyfriend said I seemed fairly dazed and confused, and I noticed that my mind often drifted from the conversation or situation. I just felt out of it. It's hard to explain if you've never experienced it.

I arrived at the school the next morning and was given some preliminary tests by my school's athletic trainer. I was told I had to see a doctor and either be diagnosed with a concussion or be cleared. After a week of confusion with paperwork and forms, I was seen by my family doctor, who cleared me to play. Meanwhile, school had started and I was anxious to play. I thought I had fully recovered. The only thing standing in my way of the playing field was a computerized test.

Before the start of the season, all athletes at my school are required to take a baseline concussion test. It is a half-hour test that evaluates basic cognitive functioning by measuring memory and reaction time: remember the word, click when you see the green light, and so on.

About two weeks after I suffered the concussion, I took the first baseline test to see if I was functioning normally. I could tell that I didn't do very well. And I wasn't surprised when I was called back to the trainer to take the test a second time. Again, I knew I had done poorly. I just couldn't remember the words, patterns, and numbers they were asking me to remember. My trainer told me my test results were "inconsistent" with some significantly below my baseline.

Around this time I also started to notice other symptoms. The headaches lingered. And I began to forget things. Not just day to day, but morning to evening, or even moment to moment. My sleeping patterns changed. I slept more, feeling constantly tired, yet I had trouble falling asleep, a problem I'd never had in the past. School became more difficult once we started to delve into more complicated subjects. About 45 minutes into my hour-long class periods, my concentration would be completely gone and I would develop a splitting headache. This has been a big problem for me, as I am taking five Advanced Placement classes. Reading textbooks and articles for homework was particularly difficult. It would take me twice as long, and it would be a constant battle with my concentration.

Because of my "inconsistent" test results and reappearing symptoms, I was sent to Dr. Gioia. He ran several more detailed tests on me, and my results were still subpar. After a full examination, he explained that I was still actively in the recovery stage and that my headaches and concentration troubles were indications that I was overtaxing my brain. I was going to have to pay special attention, and any time a headache came on or my attention flagged substantially, I had to take a break and "cool off." Homework would have to be limited to 30 minutes at a time with ten minutes of break.

Dr. Gioia wrote up a Care Plan for me that I brought to school. The school and my teachers have been extremely understanding and accommodating. Whenever I need to "cool off" my brain, I can go to the nurse's office and I have gotten extensions on reading assignments. These adjustments have helped. But with the added time it takes to do my homework and the mandated breaks, schoolwork now dominates my evenings and weekends.

I'm glad to say that I'm feeling better and making progress. I appreciate the support I've received from family, friends and the best high school in America * * * Centennial. I'm grateful that my school had a system in place to identify the severity of my injury and point me toward the medical care I've required. I'm glad the committee is focusing attention on this issue. I have seen how it has impacted my life, and I worry about the student-athletes who don't get properly diagnosed and fall through the cracks.

Chairman MILLER. Thank you very much.

I would just like to recognize also Sarah Rainey, who is in the audience, who was a previous witness to this committee and I believe will be participating in the forum this afternoon that Mr. McIntyre and his youth sports caucus is hosting.

Raise your hand so the members can see you, Sarah. Good to see you. Thank you.

Reverend Brearley?

STATEMENT OF KATHERINE E. BREARLEY, PH.D., MOTHER OF THE LATE OWEN THOMAS

Rev. BREARLEY. Thank you.

My son Owen would cringe at the thought of being the center of so much attention today. Although an excellent wordsmith, Owen would adhere to the unspoken football rule that words are used sparingly. In the ancient motif of oratory Athens versus warrior Sparta, today Owen would stand with Sparta.

Today I speak only for myself, and I do not even speak as an expert on football, a sport about which I learned only when I came to the United States in 1982. Nevertheless, I have thought deeply about the cultural role that football plays in the United States.

My first purpose is to put a human face on the disease called chronic traumatic encephalopathy, CTE. On April the 26th, 2010, my son Owen Thomas, age 21, a football player at the University of Pennsylvania in the Wharton School of Business, committed suicide on a dreary, rainy Monday afternoon. Friends and family were deeply shocked, as Owen seemed the most unlikely person to commit suicide.

Subsequent detailed analysis of Owen's brain tissue revealed that he had the onset of CTE in the frontal part of his brain. Owen's untimely death generates a new set of questions to be addressed by CTE research. He had no known concussions at any time when playing soccer, basketball, baseball or football.

To our knowledge Owen never used steroids or abused drugs or alcohol. He had no history of depression. We have no family history of depression or dementia. Owen never complained of headaches or acted strangely.

The only explanation for the presence of CTE is that Owen started to play football at the age of nine. He was a very physical and intense player, who threw himself into every sport he played. In pre-college football he often played offense and defense and was on the field for much of the game.

Maybe he had mild concussions that he never reported. Now, that would be Owen, anxious to return to the game, not a coach pressurizing him. Or maybe CTE is a cumulative effect of multiple subconcussions compounded by some as yet unknown genetic component.

We now know Owen, the recipient of his high school's Eisenhower Award for Leadership, faced an increasingly circumscribed future as his brain disease progressed. We would surely have loved and supported him no matter what the cost, but the bright future to which he aspired would have eluded him.

Since learning that Owen suffered from CTE, I have become more aware of the many facets of this problem and the immense human sorrow that lies behind the loss of young lives. In the bitterness of grief, it is hard not to be angry that the Philadelphia medical examiner did not preserve Owen's brain as a complete entity or ask me if I wanted it kept separate in case it was needed for research.

Clearly, changes are needed in the medical community as well as the sports community. We have to consider that if only 1 percent of students who play contact sports starting at a young age—if only 1 percent of those students have CTE, that will be a large public health cost to this nation, which is a concern for all of us. We know that high schools that are concerned about their budgets surely do not want to have lawsuits associated with this, and parents and coaches also are anxious for their youth to be safe in school sports.

Congress, this is a very widespread problem, and I appreciate the interest of Congress in this. And I think that Congress can use their goodwill, their good offices to promote widespread discussion of this very difficult situation.

When we think about football, I think it is important for us to think that many of these—that football is not a sport in which most people put out their emotions for people to see. If we think about the Steelers coach Bill Cowher, he was an unusual person to put out these demonstrative, terrible jowl, jutting out jaw, drama on the sidelines. Much more common is that stoic, taciturn demeanor of the late Tom Landry.

And so football is not a sport in which most players or coaches bring forth their emotions. Nevertheless, those emotions are very intense and should not be dismissed. So I think we come back to this ancient motif of what it means for people to be like Spartans.

It does not mean that they are ignorant or stupid. It does not mean that they don't have strong feelings. Thank you.

[The statement of Reverend Brearley follows:]

Prepared Statement of Rev. Dr. Katherine E. Brearley, Mother of the Late Owen Thomas

If my son Owen was sitting with us today he would say, "Mom, it's OK. Don't make a fuss." He would cringe at the thought of being the center of so much attention. Although an excellent wordsmith, Owen would adhere to the unspoken football rule that words are used sparingly. Actions speak for themselves. In that ancient motif of oratory Athens verses warrior Sparta—today Owen would stand with Sparta.

In as much as I speak, I speak only for myself. Nor do I speak as an expert or authority on football, a sport about which I learned only when I came to the United States in 1982. Nevertheless, I have thought deeply about the cultural role that football plays in the United States and I hope my comments are illuminating.

My Personal Story

My first purpose is to put a human face on the disease called Chronic Traumatic Encephalopathy (CTE). On April 26th 2010 my son Owen Thomas, aged 21, a football player at the University of Pennsylvania in the Wharton School of Business, committed suicide on a dreary rainy Monday afternoon. He hung himself in his room in the house he shared with four other football team mates. Family and friends were deeply shocked as Owen seemed the most unlikely person to commit suicide. Subsequent detailed analysis of Owen's brain tissue revealed that he had the onset of CTE in the frontal part of his brain.

Owen's untimely death generates a new set of questions to be addressed by future CTE research. He had no known concussions at any time when playing soccer, basketball, baseball or football. To our knowledge Owen never used steroids or abused drugs or alcohol. He had never been involved in a car accident and had never been hospitalized. He had no history of depression. We have no family history of depression or dementia. Owen never complained of headaches or acted strangely.

The only possible explanation we can see for the presence of CTE is that Owen started to play football at the age of 9. He was a very physical and intense player who threw himself into every sport he played. In precollege football he often played offense and defense and was on the field for much of the game. Maybe he had mild concussions that he never reported—that would be Owen anxious to return to the game, not a coach pressurizing him. No one could ever pressurize Owen to do anything. Or maybe CTE is the cumulative effect of multiple subconcussions, compounded by some as yet unknown genetic component.

Whatever the explanation, the fact is that we now know Owen—the recipient of his High School's Eisenhower Award for leadership—faced an increasingly circumscribed future as his brain disease progressed. We would surely have loved and supported him no matter what the cost, but the bright future to which he aspired would have eluded him.

The Complexity of the Problem

Since learning that Owen suffered from CTE I have become more aware of the many facets of this problem and the immense human sorrow that lies behind the loss of young lives. For example, in the bitterness of grief it is hard not to be angry that the Philadelphia Medical Examiner did not preserve Owen's brain as a complete entity or ask me if I wanted it kept separate in case it was needed for research. The brain was simply thrown in a bag with all the other parts. Another example: I received an e-mail from a woman telling me her husband was discharged following a snow board related concussion. He had had several sports related concussions previously. No discharge information was given to alert the family to watch for mood changes. Her husband committed suicide. Clearly changes are needed in the medical community as well as the sports community. Another facet: if CTE is found in only 1% of youth participating in protracted youth contact sports—that 1% will produce a crushing public health cost for long term skilled nursing care if this reaches a debilitating stage when the person is only in their 50's.

In face of the complexity of this issue, and its potentially widespread nature, Congress is uniquely placed to use its position to promote serious discussion of this public health concern. Lawmakers will surely want to protect their cash strapped school districts from threats of lawsuits, and coaches and parents surely want information of how to protect their young players.

The Social Implications of the Problem

It has given me great joy to learn about the character of America through watching professional, college, high school and suburban youth football. What other capital city has a sport where beefy male fans, dress as pigs, dressed as women? NFL and college football unite fans across economic boundaries and age groups. In a struggling economy football gives people something to cheer for, a pride and a hope.

Few characters are as demonstrative as former Steelers coach Bill Cowher. It is much more common to see the silent stoicism of the late Cowboys coach Tom Landry. Nevertheless, behind the silent facade lie deep passionate complex feelings. Football is indeed the spirit of Sparta acted out in our own time, a careful crafting of male athletic skill and team work. Football provides inspiration and hope to many including young African American players. High School football can be an avenue to college football and a college education.

In speaking out about Owen's brain disease it is my hope that parents and coaches will unite to improve the safety of younger players, so football can continue to be a powerful and exciting sport that unites families and communities all across the United States.

BACKGROUND INFORMATION FOR OWEN THOMAS

- Third generation college football player
- Two older bothers played football
- Excellent athlete
- Excellent scholar
- Well liked by friends
- Fan of Philadelphia Eagles

OWEN'S PERSONALITY

Owen had thick straight flaming red hair of which he was very proud. When it was long he liked to finish a football play and as he walked to the side lines he would take his helmet off and shake his long red hair as if he were a Viking.

As soon as he was born Owen was a dynamic "presence", a confident type-A personality. He was energetic and funny with a great capacity to imitate people. He was a born actor. He loved his older brothers Matt and Morgan. Owen was fearless.

One time when he was 2 years old he was dancing on a picnic table in a local park. He had covered his face and body in some charcoal ashes he had found and he was dancing and singing like an Aborigine. We were clapping and laughing at him, then he danced right off the end of the table! Luckily my husband reached out his strong right hand and caught him as if he were a football arriving in the end zone.

One summer when he was 4 we arrived at a motel on the Eastern Shore of Maryland. Owen was hot from a long trip so he got out of the car and ran and jumped in the deep end of the hotel swimming pool. I had to jump in fully clothed straight after him and grab him before he drowned!

Owen was deeply kind. Parents of bullied kids would ask him to sit next to their child on the bus, or give protection in the playground. That was the end of bullying.

He was well organized and planned ahead. He always brought me his school papers to sign, with a pen, days before they were needed. Every school year he color coded his files, got index tabs, stocked up on erasers and pencil leads and got "organized".

Owen was strong. On church mission trips he did twice the work that everyone else did, but came home starving because he didn't get enough food to eat. He drank gallons of milk and would stop at Wendy's to get 4 double hamburgers with French fries. He would have food "crazes". One time it was Sweet Lebanon Bologna. Another time it was eggs. Or it was pomegranate juice. As long as there was lots of food around, Owen was happy.

Owen was the funniest, most dynamic person you could ever want to meet. If he had not developed CTE he would have grown up to be a wonderful contributing citizen.

ADDITIONAL DATA

Background

- Owen Thomas committed suicide at the age of 21, at the end of his Junior year at the University of Pennsylvania. He had been playing football since he was 9 years old and was recently chosen to be a co-captain of the Penn football team. Owen had no known or reported concussions.

• His parents donated Owen's brain tissue to the BU Center for the Study of Traumatic Encephalopathy where it was examined by Dr. McKee.

• The examination revealed that Owen had mild but definite chronic traumatic encephalopathy (CTE), a progressive brain disease caused by repetitive brain trauma. Upon learning these findings, Owen's parents requested to make this information public.

Teaching Points

• CTE can develop even when an individual has no reported history of concussion.

• Whether Owen had undiagnosed concussions is unknown. Incidence data indicates it is likely that he did

• Perhaps subconcussive blows to the head alone, such as those commonly experienced by football linemen and linebackers around 1000 times a year, can lead to this progressive brain disease.

• If a reporter mentions this is like the WVU Chris Henry case, where they claimed he had no concussions, mention that Henry's mother said Henry had concussions in high school, so it's not the same (but WVU apparently didn't ask her)

• This further demonstrates that CTE can begin quite early in life (along with the 18 year-old case from 2009), though it is unclear if this mild stage of CTE results in the same symptoms seen in older individuals with more advanced disease.

• These symptoms include memory and cognitive impairment, depression, and problems with impulse control; CTE eventually leads to full-blown dementia.

• We cannot make any direct link between Owen's CTE and his suicide. Suicide is a very complex issue and far too common in teenage boys and young men.

• We do not know how common CTE is in young athletes.

Moving Forward

• Owen's case is additional evidence that we urgently need more research on CTE to fully understand the severity and frequency of brain trauma that can trigger this neurodegenerative disease—especially so we can make changes to sports to prevent it.

• Although more research is needed to understand this disease and who is at risk, it is not too early to implement changes to the way youth sports are played and practiced.

• Owen's parents hope their tragedy will promote education among coaches, parents and players.

• Owen's parents are not placing blame but they do hope Ivy League coaches and teams will step forward as leaders in changing the game to make it safe for players.

• The BU CSTE conducts this research to learn the following:

The cause of CTE
Why some people get this disease and others do not.
A way to diagnose CTE in living persons
Treatment for CTE
A cure for CTE
How to prevent CTE in current and future athletes

The Story of the Sports Legacy Institute

• SLI was founded on June 14, 2007 in Boston, Massachusetts by Christopher Nowinski and Dr. Robert Cantu in reaction to new medical research indicating brain trauma in sports had become a public health crisis. Post-mortem analysis of the brain tissue of former contact sports athletes was revealing that repetitive brain injuries, both concussions and non-concussive blows, could lead to a neurodegenerative disease known as Chronic Traumatic Encephalopathy. In addition, an absence of awareness and education on concussions, specifically proper diagnosis and management, was allowing the disease to proliferate. Finally, with brain trauma becoming the signature injury of the wars in Iraq and Afghanistan, this research/education model could also be applied to the military.

• SLI was founded to solve this concussion crisis in sports and the military through medical research, treatment, and education & prevention. The initial vision of SLI was to formalize the groundbreaking neuropathological research and develop treatment and a cure through partnering with a top-tier university medical school. That vision was achieved when SLI partnered with Boston University School of Medicine in September, 2008, to form the Center for the Study of Traumatic Encephalopathy. SLI would also develop ways to raise awareness of the issue and directly educate coaches, athletes and parents. As of 2009, SLI has achieved those goals through our Coaches Concussion Clinic program and raising awareness through media like the New York Times, 60 Minutes, CNN, ESPN, and many others.

Mission Statement

• The mission of the Sports Legacy Institute is to advance the study, treatment and prevention of the effects of brain trauma in athletes and other at-risk groups.

SLI CONTACT DATA

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Sports Legacy Institute's Minimum Recommended Guidelines for Brain Protection in Youth Sports

Why Establish Guidelines?

Medical research has exposed a brain trauma crisis in contact sports. In sports like football, soccer, and ice hockey, studies show that every season around 50% of athletes experience concussive symptoms after a hit to the head. Unfortunately, only a small percentage of these are reported and diagnosed. Additionally, many diagnosed concussions are not treated properly. These undiagnosed and poorly managed concussions put young athletes at risk of Second-Impact Syndrome, which can cause permanent injury or even death. Finally, the evidence is now clear that repetitive brain trauma suffered in youth sports causes some athletes to develop the progressive neurodegenerative brain disease Chronic Traumatic Encephalopathy (CTE), which eventually leads to dementia.

While sports provide immense value both to athletes and our society in general, with current practices they are exposing children to unacceptable levels of brain damage. Much of this brain damage, however, is preventable with a few simple steps.

For the first time, the Sports Legacy Institute is issuing Minimum Recommended Guidelines for Brain Protection in Youth Sports, also known as "SLI Guidelines." The list, developed by Dr. Robert Cantu and Christopher Nowinski, incorporating the input of multiple SLI Advisory Boards, comprises consensus best practices as well as progressive ideas. To be included, each guideline is required to be simple and free so that they can be adopted by any organized youth sports program. SLI hopes that programs choose to exceed these minimum guidelines.

We ask that sports programs voluntarily adopt SLI's Minimum Recommended Guidelines for Brain Protection in Youth Sports.

#1—EDUCATIONAL GUIDELINES FOR COACHES

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents. Coaches should be required to pass the CDC's certification program.

Recommended Program

CDC's "Heads Up" Online Training Course

Other Recommended Programs

1. NFHS Online Training Course
2. USA Football for Youth Coaches Video
3. ACTive—Athletic Concussion Training for Coaches
4. Brain Injury Association of MA—Play Smart

Additional Resources

CDC Heads Up Program including:

• Fact sheets
• Posters
• Action plans

Print out or order for free

#2—EDUCATIONAL GUIDELINES FOR ATHLETES

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents.

Recommended Program

Distribute CDC Fact Sheet for Athletes to facilitate discussion of concussive symptoms and why athletes should report them.

- CDC Fact Sheet for High School Athletes
- CDC Fact Sheet for Youth Athletes

Print out or order for free

Additional Recommended Resources

1. HeadStrongPlayer.org
2. CDC—Brandon's Story
3. Brain Injury Association of MA—Play Smart
4. CDC Heads Up Program including:

- Magnet
- Quiz

#3—EDUCATIONAL GUIDELINES FOR PARENTS

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents.

Recommended Program

Distribute CDC Fact Sheet for Parents:

- Of High School Athletes
- Of Youth Athletes

Other Recommended Resources

1. Brain Injury Association of MA—Play Smart
2. NFHS Online Training Course
3. CDC Heads Up Program including:

- Magnet
- Quiz

#4—CLIPBOARD STICKER FOR COACHES

Coaches should be required to have the CDC Heads Up Stickers on their clipboards for easier access to both a list of common concussive signs and symptoms and an action plan if an athlete potentially experiences a concussion.

Recommended Program

Use CDC Heads Up Clipboard Stickers

- For High School Coaches
- For Youth Coaches

Print out or order for free

Other Recommended Resources

CDC Heads Up Program including:

- Magnet
- Poster

#5—CDC CONCUSSION ACTION PLAN

Programs should adopt the CDC Heads Up Concussion Action Plan.

ACTION PLAN

If you suspect that a player has a concussion, you should take the following steps:

1. Remove athlete from play.
2. Ensure athlete is evaluated by an appropriate health care professional. Do not try to judge the seriousness of the injury yourself.
3. Inform athlete's parents or guardians about the known or possible concussion and give them the fact sheet on concussion.
4. Allow athlete to return to play **only** with permission from an appropriate health care professional.

It's better to miss one game than the whole season.

For more information and to order additional materials **free-of-charge**, visit:
www.cdc.gov/ConcussionInYouthSports

#6—PREVENTION THROUGH NECK STRENGTHENING

Studies* have revealed that neck strength may be an important factor in reducing the forces on the brain resulting from impacts to the head.

Recommended Program

There is no officially recommended training program for neck strengthening. Please work with a local certified strength and conditioning coach to develop a plan for your team.

#7—TOTAL BRAIN TRAUMA REDUCTION

Coaches should monitor total brain trauma and strive to reduce both the number of hits to the head that players receive and the severity. Research on Chronic Traumatic Encephalopathy from Boston University's Center for the Study of Traumatic Encephalopathy indicates that risk of CTE may be more correlated to total lifetime brain trauma than concussions.

Recommended Program

In 2010, there is no formal program available. SLI asks that coaches attempt to monitor brain trauma, and significantly reduce it going forward. SLI hopes to develop guidelines for brain trauma, starting with football, much like Little League Baseball has developed extensive guidelines for "Pitch Counts" to protect the elbows of children.

Chairman MILLER. Thank you.

Mr. Morey?

STATEMENT OF SEAN MOREY, EXECUTIVE BOARD MEMBER, NFL PLAYERS ASSOCIATION (NFLPA)

Mr. MOREY. Good morning, Chairman Miller and members of the Education and Labor Committee. Thank you for the opportunity to participate in this important discussion addressing the health risks of concussion in youth in high school athletics.

My name is Sean Morey. I serve as a co-chair of the NFL Players Association Mackey-White Traumatic Brain Injury Committee along with our medical director, Dr. Thom Mayer. I also serve as a member of the NFLPA Executive Committee and our Player Safety and Welfare Committee.

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*Tierney, R.T., Sitler, M.R., Swanik, B.C., Swank, K.A., Higgins, M., & Torg, J. (2004). Gender differences in head-neck segment dynamic stabilization during head. acceleration. Medicine & Science in Sports & Exercise, 37, 272-279.

For over the past decade, I have lived my dream of playing in the National Football League. I have always felt that the true privilege of being a professional athlete was the ability to reach and impact the lives of our youth in a profound and positive way. I took advantage of talking to student athletes many times to instill confidence and encourage them to raise their expectations both in school and in life. I am here today to issue a different message, one of concern for their health and safety.

The science of brain trauma is advancing rapidly. The short and long-term effects of acute symptomatic concussion and repetitive brain trauma are serious public health concerns. I applaud the work of Chairman Miller and his colleagues to address this issue in an attempt to educate and protect our youth athletes and make sports like football safer. The game of football has enriched my life, and I believe we must all play an active role to preserve the integrity of the game we love so dearly.

In response to the growing concern of brain trauma in our game, the NFL Players Association formed the Mackey-White TBI Committee last season to commission leading neurological and medical experts to interpret the science, support independent research, educate players, and make progressive changes in our game to advocate for the health, safety and welfare of active and former NFL players.

I would like to recognize and thank the members of the Mackey-White Committee and the NFL Head, Neck and Spine Committee for working together to educate and protect NFL players. We realize our efforts to manage concussions properly in our game can help protect many other athletes.

Football is the profession I have chosen. I chose to risk my health to financially provide for my family, not unlike policemen, firefighters, or members of the military. However, our children's developing brain is far more sensitive to chemical and metabolic changes of concussion.

In addition, we must realize that kids don't have a team of medical professionals on the sideline every day like I did, which is why we must support a bill like Protecting Student Athletes from Concussion Act to educate coaches, parents and student-athletes on how to identify concussions and get our kids proper care so they don't suffer additional and completely unnecessary secondary injury.

Our brain is the most vital organ in our body. The NFLPA, NFL and Centers for Disease Control have worked together recently to provide information that reflects scientific consensus about the short and long-term risks of concussion. These risks can include problems with memory and communication, personality changes, as well as depression and the early onset of dementia.

When a player sustains a concussion, there is a period of vulnerability where another impact can kill injured brain cells, which could have otherwise recovered. Proper diagnosis and treatment is the key to recovery and safe return to play.

As NFL players, we recognize we serve as a model for millions of youth, high school and collegiate athletes. The most profound impact we can have on these athletes is to set a better example and encourage them to be honest with their team medical staffs, coach-

es and teammates about their brain injuries and take the necessary time to recover.

My experience in the NFL has been incredibly fulfilling. I have played in every NFL stadium, in over 200 games, including three seasons in NFL Europe, a World Bowl, 17 playoff games, five conference championships, two Super Bowls and a Pro Bowl. I was selected to Peter King's All-Decade team as his special teams player. But I have also suffered more concussions than I care to admit.

I have learned repetitive brain trauma, especially when there is inadequate time to recover, may cause permanent damage to our brain. I understand the pressures we put on ourselves to play hurt. We all share a deep loyalty to our team to fight through pain and finish the game. However, athletes need to disregard the warrior mentality when addressing brain injuries.

Several independent neurological experts recommended that I retire from professional football due to post-concussion symptoms. On the eve of my 12th NFL training camp, I disclosed what the doctors told me and had to walk away from the game. I didn't want to have to change the way I played, take a roster spot from somebody else, or become a liability to my team or family. I took it as far as I could. I made the right call for the good of the team, my family and my own personal health.

NFL players today are working to change the culture in our locker rooms and on the field to manage concussions properly in our game. By raising awareness and protecting student athletes, we leave an enduring legacy that will impact the lives of others for decades to come. The game of football teaches us to value selflessness, accountability, leadership and, above all, teamwork. Let us continue to work together to change the culture about sports-related concussion.

Thank you for allowing me to be a part of this process to create real, meaningful and productive change, protecting our youth athletes.

[The statement of Mr. Morey follows:]

Prepared Statement of Sean Morey, Executive Board Member, NFL Players Association (NFLPA)

Good morning Chairman Miller and members of the Education and Labor Committee. Thank you for the invitation to participate in this important discussion addressing the health risks of concussion in youth and high school athletics. My name is Sean Morey. For over the past decade, I've lived my dream of playing in the National Football League. I was drafted as a wide receiver out of Brown University in the 7th round of the 1999 NFL draft to my hometown New England Patriots. I was a long shot. I realized quickly that if I wasn't going to be a starter, I had to find a way to earn a roster spot and contribute on Sundays to help my team win. I've survived playing in the NFL for longer than anyone expected, by doing a job most professional football players will admit they don't envy. I'm a Special Teams guy. The ability to overcome pain and ignore injury is an occupational requirement. My experience in the NFL has been incredibly rewarding, but it hasn't been easy. I've been cut eight times, played through my share of injuries, and suffered more concussions than I care to admit. However, during the course of my career I have played in every stadium in the NFL. I've played in NFL Europe, a World Bowl, 17 playoff games, 5 Conference Championships, a Pro Bowl, and two Super Bowls. Additionally, I serve as Co-Chair of the NFL Players Association Mackey-White Traumatic Brain Injury Committee (TBI) along with our Medical Director, Dr. Thom Mayer. I also serve as a member of our Executive Committee of the NFL Players Association (NFLPA) and as a member of our NFLPA Player Safety and Welfare Committee.

During Super Bowl Week in 2008, I was approached by Chris Nowinski, co-founder of Sports Legacy Institute, during which he told me about some disturbing new research about concussions and the potential long term cumulative effects of repetitive brain trauma. As a member of the NFLPA Players Safety and Welfare Committee, I felt compelled to do my part to research the issue and report back to our Union leadership. I spent the greater part of this past year and a half burning the candle at both ends to learn as much as I could about the effects of traumatic head injuries. Since that conversation with Chris, I've spent significant time discussing this issue with many different neurological and medical experts, athletic trainers, coaches, and players to gain a unique perspective on how to address the issue systematically and responsibly. We must all play a role to change the culture in our game to help make it safer for future generations. I've devoted my time to educate and protect players and give back to the game that has provided so much for my family.

The game of football has enriched my life immensely, but I also understand the harsh realities of the NFL and the brutal nature of our sport. Self preservation is an afterthought. The challenges we face playing this game builds character. We condition ourselves to value courage, mental and physical toughness, and resiliency. However, the science and awareness of brain trauma is advancing rapidly, and we need to significantly change the culture of how we manage brain injuries in our game. Football, and other contact sports, can provide our youth the ability to conquer their limitations and learn valuable lessons in humility, respect, teamwork, and selflessness. We must preserve the integrity of our game, and ensure the game is made safer for future generations.

As NFL players, we recognize we serve as a model for millions of youth, high school, and collegiate athletes. The most profound impact we can have on youth athletes is to set a good example and encourage them to be honest with their team medical staff, coaches, and teammates about their brain injuries and take time to recover. Educational and awareness initiatives can inform parents, coaches, trainers, and athletes to help identify the many signs and symptoms of concussion so they can communicate effectively. No athlete should return to the same game or practice after sustaining a concussion.

Our brain is the most vital organ in our body. NFL players have downplayed symptoms because we believed a concussion was a temporary or transient injury. We just shook it off. It's still a challenge to get players to buy in. We all share a deep loyalty to our fans, our coaches, and our teammates to "complete the mission", or finish the game. As professional athletes, we aspire to gain the approval of the men we respect. We don't want to let our team down. We don't want to lose our jobs. However, continuing to play through a concussion can prolong the time it takes to recover, shorten our careers, and compound problems transitioning into life after football. Repetitive brain trauma, especially when there is inadequate time to recover, may cause permanent damage to your brain. Playing through a concussion is no longer a badge of honor, it's reckless. Reporting our concussion is not a sign of weakness, it's a responsibility we share to advocate for our own health and safety.

I've learned how to play this game from some of the most inspiring coaches in the league. During my career I played this game the way it's supposed to be played, flying around the ball and going all out every play for a very long time. Playing the game recklessly has taken it's toll on my health. I had an exceptionally rough season last year. I was praying I'd come around all offseason, but I still couldn't hit anymore without getting injured. I've been suffering chronic headaches, intermittent migraines, and blind spots in my vision for almost a year now. I've utilized prescription medication to manage my injuries and in turn masked post concussive symptoms for a long time. I hadn't yet fully recovered and wasn't healthy enough to do my job effectively at the start of this season. And so, I retired on the eve of my twelfth NFL training camp. I felt like I was abandoning my team in the eleventh hour. It was the toughest decision of my life, but I made the right call for the good of the team, my family, and my own personal health.

As I mentioned earlier, one of the ways I am giving back to the game is by serving in a leadership role with the NFLPA and its Mackey-White TBI Committee. The NFLPA formed the Mackey-White TBI Committee last season to commission leading neurological and medical experts to interpret the science, support independent research, educate players, and make progressive changes in our game to advocate for the health, safety, and welfare of active and former NFL Players. I would like to thank and acknowledge the individual efforts and collective contributions of our group of experts who serve on our Mackey-White TBI Committee. They have made significant contributions to pushing the science surrounding sports related concussions.

NFLPA Medical Director and Mackey -White Co-Chair Dr. Thom Mayer has worked tirelessly to protect our players and enhance scientific dialogue with the NFL Head, Neck, and Spine Committee to maintain inclusivity and transparency addressing this complicated issue. We are all working together to address concussions in our game at every level. Last year, Dr. Mayer initiated collaboration with the NFL mid season to implement stricter Return to Play Guidelines intended to reduce the risk NFL players take when returning to the same game or practice following a concussion. We have also collaborated with the CDC to build a Youth Concussion Poster as well to educate youth athletes about identifying the signs and symptoms of concussion so that the younger athletes, medical staff, parents and coaches are all speaking the same language.

We have worked together with the members of the new NFL Head, Neck, and Spine Committee to make progressive changes in our game to protect the players we represent. The NFLPA, NFL, and Centers for Disease Control (CDC) have worked together recently to provide information that reflects scientific consensus about the short and long term risks of concussion. These risks can include problems with memory and communication, personality changes, as well as depression and the early onset of dementia. When a player sustains a concussion, there is a period of vulnerability where another impact can kill injured brain cells which could have otherwise recovered. Proper diagnosis and treatment is the key to recovery and safe return to play. Repetitive brain trauma, especially when there is inadequate time to recover can cause permanent damage to your brain.

Former athletes with a history of repetitive brain trauma, including NFL Players, have been diagnosed with a degenerative neurologic disease referred to as Chronic Traumatic Encephalopathy (CTE) at autopsy. The brain degeneration is associated with memory loss, confusion, paranoia, impaired judgment, impulse control problems, aggression, depression, Parkinsonism, and, eventually progressive dementia. The NFL and NFLPA are supporting independent research efforts, most notably at Boston University School of Medicine's Center for the Study of Traumatic Encephalopathy, targeted to identify specific risk factors and determine prevalence. The goal is to provide an effective means to diagnose, treat, and prevent CTE. The NFLPA and NFL will continue to work together to actively pursue definitive science to assure that we are doing everything possible to protect the interests of our players and their family's when it comes to health and safety.

Among the many initiatives intended to educate and protect NFL players, the NFL Players Association has also been a leader in raising awareness of sports-related concussions with youth athletes. NFL Players have made significant contributions in an effort to change the culture in our locker rooms and on the field to manage concussions properly in our game. The game of football provides a platform to teach valuable lessons and inspire our youth. As NFL Players, our greatest honor is to interact with our fans and impact the lives of others in a positive way.

The NFLPA has also partnered with apparel maker Muze Connects. Muze will design and create messages displayed on a designer T-shirts geared towards impacting the lives of countless youth, high school and collegiate athletes whom we serve as a model for dealing with brain injury. The T-shirts deliver an important message to players, parents, coaches, fans and media reminding us that we all must play an active role in addressing this public health concern—"What you do in life echoes in eternity."

As NFL Players, we are held accountable for reporting our own concussions promptly and taking the necessary time to recover, but we are also responsible for looking out for our teammates and ensuring youth athletes communicate with their coaches, athletic trainers, and teammates when they sustain a concussion. Playing through a concussion can prolong the time it takes to recover and increase the risk for permanent injury. We must work together to change the culture and make this game safer. As part of our NFLPA Grassroots Campaign to change the culture in our game, we are reminding athletes that if they have a concussion, "don't hide it, report it, and take time to recover."

With fan support and involvement from youth and high school football programs, our partnership will galvanize local communities all over our country to work together to raise awareness about concussions. Fans and athletes can wear our T-shirt proudly to demonstrate and share in the solidarity across NFL locker rooms, supporting our NFLPA Grassroots Campaign to help make our game safer. Former NFL Players have sacrificed so much to build this game. It is now our responsibility to protect football players on all levels and ensure the game we love is better for us having us all been a part of it. By raising awareness and supporting independent research for sports-related concussions, we leave an enduring legacy that will impact the lives of others for decades to come.

Chairman MILLER. Thank you.

Dr. Herring?

STATEMENT OF STANLEY HERRING, M.D., CHAIRMAN, SUBCOMMITTEE ON EDUCATION AND ADVOCACY, HEAD, NECK AND SPINE COMMITTEE OF THE NFL, TEAM PHYSICIAN, SEATTLE SEAHAWKS AND SEATTLE MARINERS

Dr. HERRING. Thank you, Chairman Miller and Ranking Member Kline and the members of the committee and guests.

Mr. Chairman, today you should have received a letter from Commissioner Roger Goodell of the National Football League supporting your legislation, and I know that his letter says that the NFL is grateful for the opportunity to work closely with you in developing this important legislation, which will further our shared goals of increasing concussion awareness and preventing these injuries among our youngest athletes, not only of football, but in all sports.

And as a member of the newly formed NFL Head, Neck and Spine Committee, I join the Commissioner in thanking you for this work. As someone who has spent his life managing athletes with sports concussions, this Protecting Student Athletes from Concussion Act is a really significant step forward. It is a great campaign to protect young athletes. And as a physician, educator, advocate and representing the NFL today, I am proud to testify after many years of work in this area.

I would take a little different bent today and make my testimony a bit more personal. I am sure the committee has heard of the name Zachary Lystedt by now. In October 2006 Zach was a 13-year-old middle school all-star football player, who suffered a blow to his head with a few minutes left in the first half. There was an injury timeout.

After halftime Zach returned to play. He was still having symptoms from his concussion. He sustained further head blows in the second half of the game and at the end of the game collapsed in his father's arms, lapsed into a coma and suffered life-threatening injuries. Zack survived, but he is now faced with a lifelong road of rehabilitation. The tragedy here, Mr. Chairman, is that was a preventable injury.

A coalition of brain injury advocates and doctors and athletic trainers, school administrators, risk managers and local elected officials in the State of Washington began to work on a law to prevent the next child and the next family from suffering the way Zachary and his family did, the Zachary Lystedt Law. It was during this process that I personally met Zach.

I take care of the Seahawks. I am on the sideline at a practice, and here is a young boy in a wheelchair with his parents. And Zach looks at me straight in the eye, and he very slowly and deliberately says, because he is just learning to re-talk, is "The reason I am here," he said, "is to help people."

And I have to tell you as a doctor who takes care of people with disability, that was a pretty powerful message from a young man who couldn't speak for 9 months, almost lost his life, and has had to work incredibly hard just to get some sense of normalcy. It is a pretty incredible statement.

Zach had choices during his recovery. He could be angry or he could be content or he could be depressed or he could come to accept it or he could be bitter or try to find peace. And each choice made that young man who he is today, this incredibly witty and driven and fabulous 17-year-old young man who still struggles with significant problems. And his family struggles along with them. But they really are changing the face of youth sports across this country.

The coalition in the State of Washington passed the Lystedt Law, and it had three essential components very similar to what is in your bill, and we just praise you for that. Seven more states have passed Lystedt Law since that time, and it is pretty easy. Educate parents and athletes, coaches and administrators. If there is a suspected concussion, take the youth athlete out at that time. And the third piece, don't put them back in until they have been cleared by a licensed health care provider who understands concussions.

Mr. Chairman, if your bill were to become law, it would protect athletes in every state that don't yet have a Zachary Lystedt Law. Commissioner Goodell has already given you NFL's pledge to work diligently in support of your legislation, and at the same time, Mr. Chairman, we are engaged in a state-by-state effort to pass a Zach law. We would hope to see legislation in California. And just this week I am very pleased to announce that a bill was introduced here in Washington, DC, a Zachary Lystedt Law.

Also as part of our state-by-state effort, the NFL will convene an educational and advocacy summit next month in my hometown of Seattle, a how-to course for the Zachary Lystedt Law, and that will be available online for anyone who wants to learn the process, at least on a state-by-state basis, of making the law available.

Passing these state laws however, takes time. But public awareness need not wait. That is why the NFL has taken the lead in promoting concussion education at all levels of sport and in every sport. And before the start of this NFL season, a new concussion awareness poster was developed by a group of medical experts and interested parties working in a great coalition.

One of those experts would be Sean Morey who personally, he and I, worked on this poster. I even have it. This is in every locker room in the NFL. It is in a brochure form for every player, and you will notice the commissioner of the NFL, the NFL Players Association, the CDC, professional football athletic trainers and the Professional NFL Physicians Society all worked together, as they should, to help make sports safer. It was a pleasure and an honor for me to sit next to Sean as we worked on that together.

The same group has developed a poster specifically for youth, which I know is part of your bill. And this poster for youth involves all sports and will be informational. It will be released shortly and made available at no cost.

The NFL has been interested also in other aspects of trying to make concussion safety their business. Other projects with the CDC, USA Football, the American College of Sports Medicine, the National Athletic Trainers Association have been put together to disseminate educational materials for young athletes and their coaches through a variety of different media and educational tools.

USA Football, which is the independent not-for-profit organization that serves as kind of the official youth force for the NFL recently, had educated 30,000 coaches since April 10th with the concussion education module, as an example.

Look for our Put Pride Aside campaign this fall to do just what Sean said to take the concussion issue and have people report honestly and directly. The NFL continues also to support the science of research for the tragedies like CTE, which are critical for us to understand so that we can try to make sports as safe as possible for as many as possible.

In closing, Mr. Chairman, as more has become known about the dangers of head injury, the NFL has become a leader in concussion, not just for the safety of its own players, but for all athletes at all levels of football and in all other sports. And I see them every day. I see young athletes—soccer, basketball, lacrosse—who have been concussed. And those children, those young athletes can recover and play again, but they must receive proper treatment.

I am proud of what the NFL has done in the professional game, but I am particularly pleased to share with you the NFL's initiative to educate and inform all sports at all levels about concussions. I think the NFL understands its obligation to continue to lead in this area and to provide a model for all sports. I know that the NFL looks forward to continuing to work with this committee and for all of the advocates for the benefit of youth athletes everywhere. Thank you.

[The statement of Dr. Herring follows:]

Prepared Statement of Stanley Herring, M.D., Clinical Professor, Departments of Rehabilitation Medicine, Orthopedics and Sports Medicine, and Neurological Surgery, University of Washington; Co-Medical Director, Seattle Sports Concussion Program; Team Physician, Seattle Seahawks and Seattle Mariners; and Member, National Football League's Head, Neck and Spine Committee

Chairman Miller, Ranking Member Kline, and Members of the Committee, my name is Dr. Stan Herring. I am the Co-Medical Director of the Seattle Sports Concussion Program and a Clinical Professor at the University of Washington. In addition, I serve as a team physician for the Seattle Seahawks and the Seattle Mariners. I appear before you today as a member of the National Football League's Head, Neck and Spine Committee and the Chairman of the Subcommittee on Education and Advocacy.

Mr. Chairman, today you received a letter from Commissioner Roger Goodell of the National Football League supporting your legislation. The Commissioner's letter states that, "The NFL is grateful for the opportunity to work closely with you in developing this important legislation which will further our shared goals of increasing concussion awareness and preventing these injuries among our youngest athletes, not only in football but in all sports." I join the Commissioner in thanking you and the Committee for your work to protect youth athletes of all ages, of both genders, and in all sports, from the dangers of concussions.

The "Protecting Student Athletes from Concussions Act" is a significant step forward in the campaign to protect our kids. As a physician, educator, advocate, and as a representative of the NFL, I am proud to testify here today after years of work in this area.

Mr. Chairman, my testimony today is very personal. The Committee has heard the name Zackery Lystedt by now. In October 2006 Zackery was a 13-year old star football player who suffered an undiagnosed concussion with a few minutes left in the first half. An injury time out was called. After resting during halftime, Zackery returned to play in the second half while still having symptoms from his injury. He sustained further head blows during the second half of the game, and at the end of the game collapsed in his father's arms. He lapsed into a coma suffering from life-threatening injuries. Zackery survived, but continues to face a long road of rehabilitation.

In the meanwhile, a coalition including brain injury advocates, doctors, athletic trainers, school administrators, risk managers and local elected officials in Washington State began work on a law designed to prevent the next child and the next family from suffering the way Zackery and his family did.

It is during this process that I met Zackery. Seated in his wheelchair at a Seahawks practice with his parents, Victor and Mercedes by his side, Zack looked me straight in the eye and very slowly and deliberately said, "The reason I'm here is to help people." Perhaps because he could not speak for nine months, or because he almost lost his life and has had to work so hard to regain any sense of normalcy, I knew how incredible that statement was. He has had choices along the way: anger or contentment, depression or acceptance, bitterness or peace. Each choice has made him who he is today—the driven, witty, fabulous 17-year-old young man who, along with his family, is changing the face of youth sports across the country.

The coalition succeeded in passing a law in Washington State and in seven more states since then. Like your bill, Mr. Chairman, it contains three core principles:

1. Student athletes and a parent or guardian must sign an education sheet that provides them with information about the signs and symptoms of concussion;

2. Any youth athlete who appears to have suffered a concussion in any sport is removed from play or practice at that time; and

3. That athlete must be cleared by a licensed healthcare provider trained in the diagnosis and management of concussions before returning to play or practice.

If this bill were to become law, it would protect the athletes in every state that has not passed Zack's law. Commissioner Goodell has already given you the NFL's pledge to work diligently in support of your legislation. At the same time, we are engaged in a state by state effort to pass Zack's law. We are actively working in California, Mr. Chairman, and just this week are pleased that the bill was introduced in Washington DC.

As part of this state-level effort, the NFL will convene an educational and advocacy summit next month in Seattle. It will be available on-line to anyone interested in learning more.

Passing state laws can take time. Public awareness need not wait. That is why the NFL has taken the lead in promoting concussion education at all levels of sport and in every sport. Before the start of the season, a new concussion awareness poster was developed by a group of independent medical experts working with the CDC. This poster, and a related player fact sheet, has been distributed throughout the NFL. I have attached copies to my testimony. I want to thank the group of organizations that worked together to produce this consensus document—NFL, NFLPA, CDC, Professional Football Athletic Trainers Association, and the NFL Physicians' Society.

The NFL, working with the Players Association and independent experts, ensures that professional football players receive the most information about concussions and the best treatment from the finest doctors. Yet, we also recognize that the risks of concussions go beyond the professional ranks and beyond football. We know that it is our responsibility to share what we know with all athletes at all levels. So, the NFL is replicating this poster idea for youth athletes in all sports, and together with the CDC and our other partners, we will make available shortly—and at no cost—a concussion education poster designed specifically for younger athletes.

I am personally involved in the design of the poster. So, once again I would like to commend your bill for the concept of publishing concussion information in schools. The NFL wholeheartedly supports the idea and is working to distribute more information as we speak.

In addition, the NFL is working closely with the CDC, USA Football, and others, to disseminate CDC educational materials for young athletes and their coaches. The NFL has assisted in the production of a concussion video developed jointly by the National Athletic Trainers Association and the National Academy of Neuropsychology. In addition, USA Football—the independent, non-profit organization that serves as the official youth football development partner of the NFL and its 32 teams—will conduct a national campaign from mid-September through November 2010, titled "Put Pride Aside for Player Safety" to emphasize concussion awareness in youth sports, particularly football. The campaign challenges and instructs coaches, parents and youth players to make the right decision about concussions. And I am personally involved with another initiative that the NFL is supporting—the development of a training module for coaches and health professionals that will provide them with the information they need to properly diagnose and treat athletes who have had a concussion.

Last December, in conjunction with the CDC, the NFL produced a public service announcement devoted to youth athletes as well as their parents and coaches re-

garding the importance of concussion awareness. The message aired repeatedly on national media throughout the end of the NFL season and the playoffs.

The NFL is also investing in the science around concussions, including support for research being conducted by doctors at Boston University.

Our medical committee, in conjunction with the NFL Players Association, will host a conference later this fall to consider new methods of testing the performance of safety equipment, such as football helmets. We are hopeful that this work will improve safety of athletes not just in football but other sports as well.

As more has become known about the dangers of head injuries, the NFL has become the leader on concussions not just for the safety of its own players, but for all athletes at all levels of football as well as all other sports. I see them every day—boys and girls, soccer, basketball and lacrosse players—young athletes who have endured concussions. Those children can recover and play again if they receive proper treatment. I am proud of what the NFL has done in the professional game, but I am particularly pleased to share with you the NFL's initiatives to educate and inform all sports at all levels about concussions.

The NFL understands its obligation to continue to lead in this area to provide the model for all sports. The NFL looks forward to continue working with this Committee and all other advocates for the benefit of youth athletes everywhere.

I look forward to any questions.

Thank you.

Chairman MILLER. Thank you very much.

And thank you to all of you for your testimony. To Alison and Reverend Brearley and Sean, I just want to say that—and, I think, Dr. Herring speaking on behalf of Zachary—that your testimony in many ways is a very, very important part of this public discussion, because I think it gives people ownership and license of this debate to change and to rethink the models as a player, as a parent, as a coach, as a team owner.

I mean, through the entire athletic community, I think that is very important. And I am very pleased with the way this discussion has developed nationally by working with local school districts, by working with the states, working with the Congress so that it can be comprehensive.

And your stories are all very, very difficult stories to tell, just as when Sarah joined us to share about her future and where she was headed in sports in college and the rest of this, and she has had to retract some of that and rethink how to accomplish all that. But she is doing it, and we are excited about that.

But I think for parents and students who are wondering is this real, is it not, the participants in this debate have really put together a remarkable coalition to bring this home, if you will, in every sense of the word, whether it is an NFL player's family or whether it is a parent with a child in youth soccer or lacrosse or Pop Warner football or high school sports.

I think that is where this discussion really has to take place. And because of the actions of your center, Dr. Gioia, and what the NFL is doing and what the Mackey-White Fund is doing, we see that people have options and places to go for information. And they are places that they respect, that have cachet. And that is worth so much in this kind of discussion when the stakes turn out to be so very high for individuals.

I know that Commissioner Goodell has also written every governor—I think every governor—where they don't have a plan in the state yet—I think 40 or 45 governors——

Dr. HERRING. Forty-four.

Chairman MILLER [continuing]. Urging them to take this on. And I hope that that is very successful.

I would like to address one part of this, Dr. Herring, if I might, first, with you. And that is the third part of the NFL program, and that is that an athlete must be cleared by a licensed health care provider trained in the diagnosis and management of concussions before returning to play or practice.

And then I would like, Alison, if you might follow up on what you hear here, because I am not quite sure how you got into the diagnosis when you were trying to think about going back and forth, whether that was a formal process or informal or where that is just with respect to your school or not.

But first, we will hear why this decision was made on this part of the proposal.

Dr. HERRING. Thank you, Mr. Chairman.

The fact that return to play after concussion is a medical decision is not new news. We have said this for a decade to multiple consensus conferences. It is not fair to make someone be a coach and a medical health care provider or apparent health care provider. That burden falls upon the health care community to make those decisions.

So our hope, through work like yours where this issue continues to be made more aware and systematically applied across all 50 states, that continued education of health care providers and continued awareness on their part will help them become better providers.

Passing the law is the first step. It helps bring awareness. And then, as you know, it is an iterative process. We begin to train all components. You want the parents to know, the athlete to know, the coaches to know, and the health care community to know, so someone sounds the alarm. But we do feel, and it just makes sense, that return to play after concussion should be made by a health care provider who understands the problem.

Chairman MILLER. Thank you.

Alison?

Ms. CONCA-CHENG. Well, I know Howard County has a very comprehensive system as to how to deal with concussions and suspected concussions. Once you are suspected of having concussion, you have to go to a health care provider, and your parents are notified. And the health care provider has to clear you to play or come up with a care plan. And once you are cleared to play by a physician, you must take the computerized test, as I spoke of, and those test results—they consult with Dr. Gioia to make sure that the test results are in agreement with the physician order to return to play.

Chairman MILLER. Thank you.

Sean, in this discussion back and forth here, to have this intervention by a health professional, to tell a player in a case of an NFL player or any professional athlete is a high-stakes decision. To have that intervention by, hopefully, you know, a neutral medical party—do you think that is helpful, because that player has got to decide, as you said, am I letting my teammates down? How close is the game? What is our opportunity? And the coach has many of the same concerns. And this question of having independent observation—do you want to address that?

Mr. MOREY. Sure. And thank you for asking. I think in the NFL when we suffer a concussion, we have to see—and we are removed from play—we have to see both an independent neurological consultant and get cleared by our team medical staff to be able to return to play safely.

I think in this situation with youth athletes, I think it is critical that they see a health care provider before they are cleared to return to play. Coaches have to be educated. Parents have to be educated. Kids have to know and be able to recognize the signs and symptoms of a concussion so they can communicate effectively.

And I think it is important that in the NFL, the NFLPA return to play guidelines stipulate that if you demonstrate persistent signs and symptoms of concussion when you sustain a concussion—that means confusion, headache, vision disturbances—persistent symptoms where you are not recovering from the concussion is deemed that you are a danger to yourself and to your team, and you need to be removed from play safely. And that is the role of our health care providers, of our team doctors that are—and the team doctors are sports certified.

So I think it is important to understand the realities of the NFL and the profession we have chosen as athletes, but I think especially with youth athletes, where their brains are still developing, where their brains are more vulnerable to acute symptomatic concussion because of——

You know, their brains are more sensitive to those chemical metabolic fluctuations of ions when they sustain a concussion. And when you sustain a concussion, your brain in effect, you know, becomes overwhelmed, and it shuts down. It becomes quiet. And there is a period of vulnerability where the secondary and further damage can have permanent damage or even catastrophic circumstances.

So for high school athletes and youth athletes, it is important to make sure that they are removed when they sustain a concussion.

Chairman MILLER. Thank you.

Reverend Brearley, I want to get your response to this, but I am going to—excuse me, my time is up. I will come back in a second round, but I wanted—because obviously it appears in Owen's case that this was almost invisible, you know, to the layperson, to your son, to yourself and others, and what the medical intervention may or may not have been.

Congressman Kline?

Mr. KLINE. Thank you. Thank you, Mr. Chairman.

And again, thanks to all the witnesses.

Dr. Gioia, it is nice to see you here again.

Both the physicians, the medical professionals, thank you for your work and for your testimony and input here today.

And to Alison Conca-Cheng and Dr. Brearley and Mr. Morey, thank you for your testimony and sharing your personal stories. I know there is a lot of pain associated with those stories, and we are very, very glad that you are here today to share those stories.

Reverend Brearley, you said that we should be using our offices and other means to promote widespread discussion, and I certainly agree with that. And it seems to me there has been more and more discussion, work that the NFL has done, the production of the post-

ers. There has been a lot of discussion, and I know that you would certainly like to have had more of that discussion earlier.

Alison, it seems to me that, I mean, it was a terrible accident, and the damage was pretty tough for you, but it seems that the system works like it is supposed to work. You were pulled out. You talked to medical professionals. Your trainer said, "No, you can't come back. You have got to go back and get cleared again." And the system was there, protecting you. Is my understanding correct? Do you feel like it worked like it was supposed to?

Ms. CONCA-CHENG. I believe that Howard County system is very comprehensive, and I hope that other schools would have the same system, because in my case the test definitely caught what was the more serious underlying problem than it appeared to be at first.

Mr. KLINE. And were you aware of the system before this happened to you?

Ms. CONCA-CHENG. Well, all athletes are required to complete the baseline test so that there are results to compare to post-concussion. So I think everyone has a general idea of the basic rules and procedures, but it is just—I mean, I think so most people are aware, but it is not that widespread.

Mr. KLINE. You sort of knew it was out there, because you had to go take the test.

Ms. CONCA-CHENG. Yes.

Mr. KLINE. Yes, all right. I got it. Tests will do that to you sometimes. But so there was an awareness on the part of the student body, but it is not something that you probably sat around and talked about all the time. That is fine. Nevertheless, the system stepped up, and it worked. And it does appear that that is a good model that the rest of the country should look at to adopt.

And, Dr. Gioia, we have talked the last time you were here. When you have to develop an academic program, which, I guess, is what we would call that in the case of Alison—restrictions on how much homework time, study time and all of that—remind us again how that has developed. Is that something that you do, that another doctor does, teacher does, you do it together?

How does that work, one more time? We talked about this last time, but I would just like to sort of clear that up. How do you get that plan in place and get it implemented so that she has the support that she needs to make that work?

Mr. GIOIA. Yes, great question. And basically, in our clinical examination of the student athlete, we have an understanding of where they are at in their recovery. What can they tolerate? What can they not tolerate? What cognitive functions are impaired, whether other physical or even emotional kinds of symptoms are still present?

And based on that symptom profile and what is impaired and what they are able to do, we then build that care plan. And as Alison knows, we go through the class schedule. What do you have? When do you have it? How long does it happen? Where can we build the breaks in? Given that it takes, you know, about 45 minutes before your symptoms start to flare, let us build these periods of your academic performance and learning into those 45-minute periods with respiration in there.

So we can start that and——

Mr. KLINE. Excuse me for the interruption, but you are constructing that in discussions in this case with Alison.

Mr. GIOIA. Yes.

Mr. KLINE. And so when does the teacher get involved in this? When does the school get involved in this?

Mr. GIOIA. So but we do—first of all, in our system we have also prepared the school nurses, the school psychologists and the other professionals to support this—the guidance counselors—so that when the care plan—literally, we make four or five copies, and the student brings it to the school.

The point person at the school—it could be a school nurse; it could be a guidance counselor; it could be a school psychologist—takes that care plan and works with the team—obviously, Alison is a major member of that; her mom and dad are, too—to make sure that that plan is understood and implemented.

Mr. KLINE. Okay. Great. Thank you.

I see my time has expired.

Again, thanks to all the witnesses.

Chairman MILLER. Thank you.

I would like to ask unanimous consent to insert into the record of this hearing a letter from the National Football League and the commissioner, Roger Goodell, to the governors. There is no objection. So ordered.

[The information follows:]

NATIONAL FOOTBALL LEAGUE

September 22, 2010

ROGER GOODELL
Commissioner

The Honorable George Miller
Chairman
Committee on Education and Labor
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Miller,

On behalf of the National Football League and its 32 member clubs, I write to express our strong support for the "Protecting Student Athletes from Concussions Act". The NFL is grateful for the opportunity to work closely with you in developing this important legislation, which will further our shared goals of increasing concussion awareness and preventing these injuries among our youngest athletes, not only in football but in all sports. The NFL looks forward to continue working with this Committee and all other advocates for the benefit of youth athletes.

The NFL understands its obligation to educate and inform parents, teachers, coaches, and especially youth athletes about the risks of concussions. As more has become known about head injuries, the NFL has become the leader on concussions not just for the safety of its own players, but for all athletes at all levels of football as well as all other sports. I am proud of what the NFL has done in the professional game, but I am particularly pleased to share with you the NFL's initiatives to educate and inform athletes, parents, coaches and others who work with athletes, about concussions.

The NFL has endorsed the adoption of the Zackery Lystedt law in every state. Zack's law is named after a 13-year old football player who suffered a serious brain injury after returning to play too soon following a concussion. Eight states have adopted a form of the Lystedt law to date, and it has three core principles: 1. Students athletes and a parent or guardian must sign a consent form every year acknowledging that they are informed about concussions; 2. Any youth athlete who appears to have suffered a concussion in any sport is not permitted to return to play or practice on the same day; and, 3. That athlete must be cleared in the subsequent days or weeks by a licensed healthcare provider trained in the management of concussions before returning to play or practice.

The "Protecting Student Athletes from Concussions Act" mandates the adoption of these core principles in every state as well. When Congress passes the "Protecting Student Athletes from Concussions Act," or when their state passes a version of the Zackery Lystedt law, every parent can be confident that their children who participate in sports – whether football, soccer, hockey, lacrosse, gymnastics, or other activities – will be safer and better informed.

280 Park Avenue, New York, New York 10017 Tel (212) 450-2000 Fax (212) 681-7574

As part of our support for adoption of the Lystedt law by other states, the NFL is convening an education and advocacy conference in October with the doctors, politicians and advocates responsible for the adoption of Zack's Law in Washington State. We will make the conference available to on-line to anyone interested in learning about youth concussion laws and how to make a difference in their own community.

We are also pleased to highlight an additional educational element of the "Protecting Student Athletes from Concussions Act". As you may know, before the start of this season, a new concussion awareness poster was placed in every locker room across the League, and was accompanied by a player "fact sheet". The poster and fact sheet were jointly developed by a group of respected medical experts who worked closely with the CDC. The NFL and CDC have taken the next step, and have jointly developed a concussion education poster targeting youth sports that will be available at no cost on the CDC's website in the coming weeks. Your bill mandating materials like these be posted in every school will help achieve our shared goal of promoting concussion education. This is just one element of the NFL's efforts to assist in the development and broad dissemination of reliable medical information on concussions, which will give players, parents, coaches and others the information they need.

Mr. Chairman, we commend your efforts in introducing the "Protecting Student Athletes from Concussions Act". The NFL shares your goals and stands ready to assist in your efforts to pass it into law. Together, we look forward to protecting youth athletes across the country from concussions.

Sincerely,

ROGER GOODELL

ROGER GOODELL
Commissioner

Chairman MILLER. Mrs. McCarthy?

Mrs. MCCARTHY. Thank you, Mr. Chairman. I thank you for bringing this hearing. To me it is extremely important, especially being a background as a nurse.

Mr. Bishop, my colleague from Long Island, New York—we held a hearing on September 13th and basically had the same kind of hearing that we are having right now with the same professionals and student. And I have to say one of the things that we heard constantly was—a term they used was the "warrior mentality."

And we actually heard that from—and I want to say thank you to the NFL and NFLPA, because they supplied us with two retired football players, Mr. Caster from the New York Jets and Mr. Hall

from the San Diego Chargers—they gave us an insight on what their life is like now from suffering so many concussions—to Alison, who was telling us about something recently.

My concern with what we are doing—and it is a concern that I am going to work with Mr. Chairman Miller as we go forward on the health care professionals—I think that is very important on how we clarify that. I agree that we need a doctor to be able to diagnose and then work with the school. And I think that when we even have, certainly, the words "health care professionals" in New York State, which has passed in the Senate, only physicians, physicians' assistants and nurse practitioners are allowed to diagnose.

As a nurse I can say, "I think you might have a concussion." The trainer can say, "I think you have a concussion." And I think sometimes when people forget—gosh, you have probably heard it all the time—it is only a concussion. And that is what we have to try to change around.

There is no such thing as "only a concussion." A concussion is an injury to the brain. And it is actually opposite. When a young person gets a concussion, it is actually more dangerous at that particular stage than someone that is even older. So we need to tighten up the language, and hopefully, I will be working with Chairman Miller to tighten that language up.

I want to go back to the warrior mentality—namely, because from what we found in talking to students that have gotten the concussion, or even the trainers or even the coach, that basically they will say, "Oh, you must be all right, because you are back to a fairly normal life, hanging out with your friends, laughing, smiling." So everybody thinks you are just absolutely fine, when probably you are still recovering.

And I don't know how we deal with it, but going back to the poster that you have, which I think is terrific, but one of the things from our young student that we found out on the poster, they probably won't read that. I am talking about younger students.

It has got to be almost like the poster that was out there years ago when we were trying to get kids not to take drugs. "This is your brain. This is your brain that is fried." So it has got to be colorful so that in the locker room, basically, the students will hopefully notice it with all the information that they need.

And I was just wondering with the comments that I just made, if anybody would like to add to that.

Dr. HERRING. Sure. You are absolutely right. The attribution of bravery to this issue is tragically misdirected. And what this will require is a culture shift. And it will not come easily.

And I think one of the strengths of your legislation is that it engages everyone. Listen, we sometimes find out it is the parent who figures it out. Sometimes it is the athletes themselves. Sometimes it is the coach, and sometimes it is the health care provider. Everyone is getting better. So as they say, when the crisis is over, the work begins.

So changing the culture around this warrior mentality, as you have determined, is essential. And many steps are in place to do that through multiple educational efforts, through work. This is very powerful work that this committee is doing.

It will have to go to coaches to reward behavior, such as reporting symptoms. It will, I believe, need to go to legislative efforts so that it is rule-driven. I don't think anyone should expect this to be easily modified, but I will suggest to you even in the last 2 or 3 years, there has been the first piece, awareness.

The second piece now is behavior change in education. That is why this type of work is so important, though. When you make it a national standard, that makes the work for all of us involved in health care or with advocacy for players, neuropsychological testing—it makes it easier for us to push this agenda forward.

Mrs. MCCARTHY. Thank you.

My time is up.

Oh, I am sorry. Go ahead.

Mr. MOREY. Thank you. I just wanted to mention I think the warrior mentality that you speak of—I think a lot of people think that it is a badge of honor to play through a concussion. And I think, realistically, more players don't ever want to show any vulnerabilities or do anything to demonstrate weakness, especially in the NFL locker room.

Respect is earned in the NFL locker room, and it is, you know, we have a deep loyalty to our teammates, to our fans, to our owners, to our coaches who stood on the table to give us our jobs. We have a loyalty to sort of complete the mission and finish the game.

And I think it is important to recognize that because we deeply care about our teammates, it is as if in that locker room it is kind of like family. And I think that culture has to shift enough so that players are looking out for each other, and they are telling each other and trying to limit the pressure that we feel to play through injuries.

Brain injuries are different. And I think if players can step over to their teammates and say, "Listen, we have got this. Your health is more important. We are going to take care of it, so get yourself right, take time to recover," I think that is the sort of a culture shift that we are all—that I envision.

And I think one of the initiatives that we have with the Mackey-White Committee is to try to reach our players and the mentality to change their behavior and change the culture as fast as we can to protect our guys. And this is a poster that we have built with the NFLPA, with Veronica Jenkins and Jason Belger and Tom DePaso and Thom Mayer and myself. I think there is—and players and even trainers in the NFL that I counseled.

I have done a lot of research and try to speak with coaches and trainers and players to try to address this issue in a very responsible and systematic way. I think we do a disservice to our players if we don't reach a consensus on how to address this issue.

But this is a poster that is in every NFL locker room. The poster that Stan showed is a poster that is in every NFL training room to disclose the potential risks. And this poster here was intended to change the culture.

It says—I will read it. It says, "Work smart and protect your future. Use your head. Don't lead with it." And there are pictures here of players in their most vulnerable positions where they are going to have to depend on the key medical staff to take care of

them, because when they are injured, those are the people that we trust to make sure that we are looked after and we are protected.

At the end it says, "All concussions are not created equally. If you are hurt, don't hide it. Report your head injury to your key medical staff and take time to recover." And I can submit this to the chairman.

Chairman MILLER. Thank you. We will make that available to the members of the committee.

Mrs. MCCARTHY. Thank you.

Chairman MILLER. Mr. Platts?

Mr. PLATTS. Thank you, Mr. Chairman. First, I want to thank you for holding this hearing, as well as my subcommittee chairwoman, for the focus on this issue. As I know you are both aware, our colleague, Bill Pascrell, and I are the sponsors of legislation very similar in the focus, moving through Energy and Commerce and to likely be part of your efforts in partnering with both of you as well as the full committee.

I certainly thank all of our witnesses. I apologize in coming from another commitment, didn't hear your testimony, but glad to have your written statements to review. And most importantly, I want to thank you for being here. And as we talk about that cultural shift, that is what you are helping to do—is this dialogue, this information you are sharing today is helping to raise awareness.

And, Mr. Morey—is that correct?

Mr. MOREY. Morey.

Mr. PLATTS. Morey.

Mr. MOREY. Yes, sir.

Mr. PLATTS. I apologize. Your statements there, as you described the locker room setting and earning respect and completing the mission, loyalty to your teammates, talking as a former NFL player, you could have been sitting there talking as an American soldier or Marine, because Bill Pascrell and I, as co-chairs of the Traumatic Brain Injury Caucus, focus a lot on TBI and related issues in the military, because the signature wound of Iraq and Afghanistan is TBI.

And so as you talked in that cultural shift in the locker room that has to occur, it is what we are also facing on the war front with our soldiers, because, you know, they don't want to admit that they can't go back out there and serve their country and, you know, watch the backs of their fellow soldiers and Marines. And so we are in a different setting, but the exact same challenge.

And it is interesting, your work in the NFL and really helping to lead this effort of a better approach. And we saw it watching the Eagles game last week, and when the quarterback took a hit, and they kept him out and wasn't released until he went through several checks that, yes, he is eligible to return.

You certainly would be a great messenger with our military as well, to partner with our military as they try to work at changing the cultural dynamic of the military, dealing with TBI and our courageous men and women on the war front.

So as I said, all of your testimonies bring a different perspective, and a very important one from the medical side, from the athlete side, both at high school and professional level.

And, Dr. Brearley, I can't say thank you enough for your willingness and ability to be here. I can only imagine. My boys are 14 and 11, active, and I am always out there, and my 14-year-old is, you know, rappelling from one of our trees in the front yard about a week ago, and I am standing under and thinking, "If he falls, I am going to do my best"—but that worry as a parent.

And I can't imagine the heartache that you and your family have suffered through in the tragic loss of your son, Owen. Your ability to take that family tragedy, that personal loss, and make it a public good through your efforts is remarkable and especially commendable. And so I especially thank you for being here and all that you are doing. And certainly, your son Owen continues to live on through your efforts and doing good work by your presence. So God bless you and your family as you continue to advocate to make sure we do better for all the Owens out there in the years ahead.

With that, Mr. Chairman, I yield back.

Chairman MILLER. Thank you.

Mr. Bishop?

Mr. BISHOP OF NEW YORK. Thank you, Mr. Chairman.

And thank you to our panel. It is very, very important testimony.

Dr. Herring, you made reference to the necessity to change the culture in response to a question from Congresswoman McCarthy. And, you know, we had this hearing on Long Island last week, and all four of our witnesses had a common strain on this with this reference to this warrior mentality. And, you know, my guess is that the warrior mentality in part is innate in the athlete that is wanting to achieve. And in part, it is in the athlete, because he or she believes that this is what the coaches want.

And so what I want to try to focus on is how do we best change the behavior of the coaches, and not so much at the highest levels at the NFL or even at Division I in colleges, but how do we change it at, you know, the Pop Warner league and the high schools, because it seems to me that, you know, built into the coaching profession is this desire to excel, and a desire to excel in the coaching profession is rooted in how good their players are and having the best players on the field and so on.

So how do we best deal with the coach's, basically, dilemma between succeeding and caring for his or her players?

Dr. HERRING. Thank you, Congressman. I think you have hit on the critical issue. Dr. Gioia and I can talk and lecture, and we have, and we have been all over the place, and you can change some aspects, but the relationship between the coach and a player is essential. Players want to please their coaches, and coaches want to win. And they also want to develop player character.

Coaches don't want to hurt their athletes, though. You know, I take care of a lot of young athletes, and their coaches don't want to hurt them. And part of this on the coach's part and the athlete's part is just a lack of awareness.

So the CDC has an educational module for coaches. USA Football has an educational module for coaches. In the State of Washington with the Lystedt Law, a coach has to pass a concussion education course before he or she can step on the field of play. Those are important steps, because information is power.

I wouldn't be so naive to think that that alone will do it. I think there has to be a social climate. This is a powerful room. This law is a powerful thing. So I think that it has to be done by education and legislation, I think, empowering parents to understand concussion.

An integral part, for example, of the Lystedt Law is that the parents and the athlete must read and sign an educational sheet about sports concussions. And in my practice now I have parents bringing that sheet to me saying, "I am worried about my daughter." So we are making the educational effort—that, combined with legislative effort and a change in what is acceptable in sport.

It is demonized, Congressman, not to give players fluids during practice now. That was not always the case. That was viewed as a sign of weakness. That culture has changed. I am positive, and I told the Lystedt family this, that we can work to change this culture so that it is just as unacceptable, just as socially unacceptable to play someone who is concussed as it is to withhold water during practice or play.

Mr. BISHOP OF NEW YORK. Thank you.

Dr. Gioia, if I understood Alison correctly, when——

Alison, when you were in the process of being cleared or trying to be cleared to return to normal activity, you were both seen and evaluated by a health care professional, and then you took this examination. Is that right?

Ms. CONCA-CHENG. Yes, that is correct.

Mr. BISHOP OF NEW YORK. Dr. Gioia, how common is that, that there is this two-step process? Or is this a particularly advanced assessment of the concussed athlete?

Mr. GIOIA. Well, in the State of Maryland, this is really the first program, the first county that is doing this. But I always use the example, as I am the team neuropsychologist for the Washington Capitals and it is a process we have had in place for many, many years, that if a player is injured, I hear about it. We institute the full evaluation process. It is a collaboration between the health care members.

And the idea here and in the Howard County system is to have that athletic trainer as that person that is there and who also knows the athlete better than many of us. We have a team neuropsychologist that can oversee that testing process, but we also include that primary care pediatrician, who also knows the medical history of that youngster.

And it is really that communication. It is a challenge. It is not simple. It is not easy. We have been working on this program now for several years, and it takes some work. But it is still somewhat unique. It is what we need to do nationally, though, and not just the high school level. There needs to be a process at the youth nonscholastic level as well.

Mr. BISHOP OF NEW YORK. Thank you.

Thank you, Mr. Chairman.

Chairman MILLER. Thank you.

I would ask unanimous consent that the testimony from Christopher Nowinski, who is from the Boston University Sports Legacy Institute, to be made part of this hearing, if there is no objection.

[The information follows:]

CENTER FOR THE STUDY OF TRAUMATIC ENCEPHALOPATHY

Written Testimony of Christopher Nowinski
Co-Director, Center for the Study of Traumatic Encephalopathy
Boston University School of Medicine

President and CEO, Sports Legacy Institute

Before Committee on Education and Labor
United States House of Representatives

Hearing on "Protecting Student Athletes from Concussions Act"

Thursday, September 22, 2010

Mr. Chairman, Ranking Member Kline, and Members of the Committee, thank you for the invitation to submit testimony in support of this hearing and in support of the "Protecting Student Athletes from Concussions Act", a well-crafted bill that will protect the developing brains of athletes across this great nation. My name is Chris Nowinski, and currently I am a Co-Director of the Center for the Study of Traumatic Encephalopathy (CSTE) at Boston University School of Medicine, co-founder, president, and CEO of the non-profit Sports Legacy Institute, or SLI, which is dedicated to solving the sports concussion crisis, a member of the board of directors of the Brain Injury Association of America, and a member of the National Football League Players Association Mackey-White Traumatic Brain Injury Committee.

I am submitting testimony today in support of committee witness Reverend Dr. Katherine Brearley. I met Reverend Brearley over the phone when I called her on behalf of the Sports Legacy Institute to inquire as to whether she was interested in supporting research on brain trauma taking place at Boston University School of Medicine (BU). I'm sure she wishes she had never heard from me. My role at SLI is to call the families of recently deceased athletes to see if the family would donate their loved one's brain tissue to our research as we try to understand the long term consequences of repetitive brain trauma, and I call families every week who have lost a child, partner, or parent in the prior 48 hours.

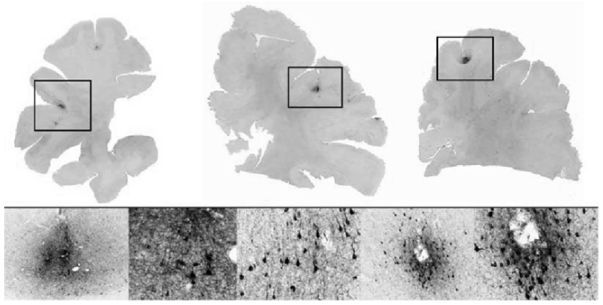
SLI reaches out at a difficult time in this manner because our mission is an important one, including the prevention of post-concussion syndrome and chronic traumatic encephalopathy (CTE), a progressive degenerative brain disease caused by repetitive trauma. Working with BU, we also hope to find effective treatment for CTE, which appears to affect far more athletes that we ever realized.

The BU Center for the Study of Traumatic Encephalopathy is the world's leading dedicated to studying CTE. Our team of co-directors, comprised of Drs. Robert Cantu, Ann McKee, Bob Stern and me, are attempting to answer the big questions posed by CTE, a disease that has been neglected by medicine since it was first described in 1928. Currently we don't know how it starts, when it starts, how it progresses, how to prevent it, or how to even diagnose it in a living person. All we know is that it develops in some who are exposed to repetitive brain trauma, most of them voluntarily while a child.

Reverend Brearley's experience has shown us just how far CTE may reach. I called her because her son, Owen Thomas, had tragically committed suicide. Owen was an All-Ivy defensive lineman and co-captain of the football team at the University of Pennsylvania. He had played football since age of 9, but had never been diagnosed with a concussion. The study of Mr. Thomas's brain would give important information, as no one in the world had ever studied the brain of a 21 year-old athlete with 12 years of repetitive voluntary brain trauma, including hitting his head about 1,000 times each fall in football practice and games.

What Dr. Ann McKee of BU found was shocking to the family, but not unexpected by our research team. At 21, Owen already had developed CTE, and his brain cells were slowly dying. CTE is an ugly disease we cannot diagnose in living people. Had Owen lived through his 40's, the disease would have spread, killing more cells, and eventually taken away Owen's charming

personality and likely replaced it with a man with problems with short-term memory, impulse control, aggression, abnormal emotional behavior, and depression. Eventually he would have developed dementia. An image of the disease is below – the brown spots are abnormal toxic tau protein, and represent dead and dying cells and brain structures. Even the small amounts of tau you see below represent extraordinary brain damage regardless of age.



Owen Thomas joined an unfortunate group of football players who were all diagnosed with CTE after death, including Andre Waters, Tom McHale, John Grimsley, Wally Hilgenberg, Terry Long, Justin Strelczyk, Mike Webster, Mike Borich, and Lou Creekmur. CTE has also been diagnosed in hockey player Reggie Fleming, pro wrestler Chris Benoit, and many boxers. The early stages of the disease have even been seen in an eighteen year-old former multi-sports athlete.

This research helps reveal the consequences of concussions and sub-concussive brain trauma, and underscores why the "Protecting Student Athletes from Concussions Act" is so crucial for the healthy futures of young athletes. I was a former All-Ivy defensive lineman like Owen at Harvard University, and I grew up in a world where if you had concussions symptoms after a hit you were considered 'soft' and were expected to play through them. When I pushed through concussions I received as a pro wrestler with World Wrestling Entertainment, I made the injury far worse and developed post-concussion syndrome. In the end, I was forced to retire and my late 20s were consumed by headaches, memory problems, and a sleep disorder.

The sad thing is that post-concussion syndrome, and perhaps even CTE, is largely preventable with appropriate concussion education and care. While we expose athletes to 'normalized' brain trauma in sports, we have never told athletes and youth coaches that when they get dizzy and confused after a hit that they have a brain injury that needs rest. That is remarkable in its absurdity. SLI was able to push a bill through the Massachusetts State Legislature to provide mandatory education and logical concussion management, and the "Protecting Student Athletes from Concussions Act" would allow this strategy to be national, as it should be.

If anyone questions the necessity for this bill, they should consider these points:

- In fact, one in four high school boys play contact sports in America, and now one in sixteen girls to as well.
- 20% of Massachusetts high school athletes surveyed said they had concussions symptoms after a hit to the head **in the last year**, but few reported it to an adult.
- Perhaps as many as 90% of concussion go undiagnosed, and studies show it's not primarily because students hide the information, but rather that they haven't been educated that a headache is worth talking about.
- The young, developing brain is more sensitive to trauma than adults.
- Younger players have weaker necks than adults, making head trauma more damaging to the brain.
- Nearly half of players, even when diagnosed with a concussion, return-to-play too soon, before their brains have had the chance to recover physiologically.
- Most children don't have access to medical care or oversight at football practices

SLI recently issued "Minimum Recommended Guidelines for Brain Protection in Youth Sports" that largely mirrors the substance of the "Protecting Student Athletes from Concussions Act", but also begins addressing the issue of minimizing repetitive brain trauma as well as concussions. That is not something that is easily legislated, but we must also begin educating coaches that repetitive, sub-concussive brain trauma is bad for the developing brain.

Teaching coaches to minimize brain trauma should not be difficult. Little League Baseball has developed extensive guidelines for "Pitch Counts" to protect the arms of children. For coaches, it's logical that repetitive throwing could wear out the elbows and shoulders of growing kids. Despite the fact that this injury affects only a small number of players, everyone is subject to the pitch count rule.

It is preposterous that the sports world accepts the logic of pitch counts, and yet we've never had a serious discussion of quantifying or minimizing the number of times you are allowed to hit a child in the head in sports. A youth football coach could cause 100 hits to the head a day for children and could be lauded for making them 'tough', but a youth baseball coach who allowed a child to throw 100 pitches would be called a monster.

I hope that by supporting further scientific research into brain trauma, we will develop the tools we need to guide sports to a safer destination. I hope that Owen Thomas is all the proof we need that we have been recklessly with our lack of respect for the consequences of brain trauma. Most importantly, I know that the passage of "Protecting Student Athletes from Concussions Act" would be a tremendous service to our country.

Selected CSTE Publications

McKee AC, Gavett BE, Stern RA, Nowinski CJ, Cantu RC, Kowall NW, Perl D, Hedley-Whyte ET, Price B, Sullivan C, Morin P, Lee HS, Kubilus CA, Daneshvar DH, Wulff M, Budson AE. TDP-43 Proteinopathy and Motor Neuron Disease in Chronic Traumatic Encephalopathy. J Neuropath Exp Neurol, 2010; 69(9): 918-929. [PDF]

Gavett BE, Stern RA, Cantu RC, Nowinski CJ, McKee AC. Mild traumatic brain injury: a risk factor for neurodegeneration. Alzheimer's Research & Therapy 2010, 2:18. [PDF]

McKee AC, Cantu RC, Nowinski CJ, Hedley-Whyte ET, Gavett BE, Budson AE, Santini VE, Lee H-Y, Kubilus CA, Stern RA. Chronic Traumatic Encephalopathy in Athletes: Progressive Tauopathy following Repetitive Head Injury. J Neuropath Exp Neurol, 2009; 68(7): 709-735. [PDF]

Chairman MILLER. I would also like to recognize the presence of Congressman Pascrell, who is the author of the Concussion Treatment and Care Tools Act, or the ConTACT Act, which is in the Energy and Commerce Committee.

Welcome to our forum.

And then I would recognize Mr. Hare, who is next for questioning.

Mr. HARE. Thank you, Mr. Chair. Thank you, Mr. Chairman.

Only having 5 minutes, there are two issues that I just wanted to bring up. And let me first of all just say I absolutely love sports. My son played soccer, and I am a big football fan. A lot of this—you know, and I have seen soccer games and, you know, butting, you know, hitting the ball with your head and the players colliding—one of the things I want to know in terms of preventative things that, you know, is there any equipment that would help?

That would be my question to you, Alison.

And also, you know, Doctor, you brought a football helmet with you.

And I am interested, Mr. Morey, from the NFL's perspective, is there additional equipment that would help keep younger people and professional people safer than we have right now?

And then lastly, when I always hear—I am watching a football game and I hear, "Oh, they got their bell rung," and they get up and—I worry very much about, you know, like Hunter Hillenmeyer, I know, from the Bears, is probably going to have to retire because of the series of concussions.

I am wondering from Alison, to your son, to you, Mr. Morey, how many concussions a person can have from the time that they are in high school or junior high school sports to the time they—if they are fortunate to play professional ball. I would wonder, Mr. Morey, do you have any idea how many—I am asking too many questions here—how many concussions you might have sustained in that time before you retired from football—I mean, from all the way up?

So part of my concern is how do we keep people safer so that if they do hit heads, can we avoid this? And what type of equipment is out there? Or what do we do? Because I am not advocating the elimination of any of these things, but I am wondering what we can do from a safety perspective.

Ms. CONCA-CHENG. Well, in soccer I have seen—one of my teammates is a goalie, and she sustained a fairly severe concussion a year or so ago, I think, and she now wears a headband. I don't know much about it. I have also seen it in English Premier League; a goalie wears it. But it is the only two instances I have ever seen any type of protective gear used. And I have only seen it with goalies.

Mr. MOREY. I think, you know, a lot of helmet manufacturers have made advances to reduce the forces that the brain takes upon contact. And what we are doing in that right now with the NFLPA Mackey-White and the NFL Head, Neck and Spine Committee, we are trying to take the next steps in our helmet studies to try to put helmets on the field using triaxial accelerometers and helmet impact telemetry systems and use biomechanical engineers to try to correlate that data and try to understand the true—try to under-

stand the biomechanics and how to prevent head injuries better in athletes.

And I think it is important to know that even though helmets have improved, no helmet can prevent or reduce the severity of concussion. It is usually the injury itself. I mean, every person is unique and different, and each injury is unique and different as well.

I think the only way we can try to limit the repetitive concussive and subconcussive episodes in the game is by continuing to make progressive rule changes to limit the helmet-to-helmet contact in practice and scrimmages over the course of a player's career and season. I think we have to manage concussions properly.

I think when we talked about the culture in sports, I think contact sports can teach very valuable lessons about resiliency and humility and the ability to fight through it and conquer limitations. I think playing in the NFL has—I have played through a lot of injuries, and I have had my share of concussions, but I think it has taught me a lot of valuable lessons about myself and, you know, it talks about sacrifice, accountability, leadership, teamwork.

And I think if we can—we don't necessarily want to change the culture of being able to play contact sports and do—and play physically. Coaches want smart physical and mentally tough players and disciplined players. And fans love our sport. And players love the physicality of—and the brutal nature of our sport. I don't think it is the culture of competing that we have to curb as much as it is the culture of how we manage brain injuries, when you sustain a concussion.

Mr. HARE. Would you guess, Mr. Morey, that a lot of NFL players right now are having concussion problems and not saying much because of that wanting to compete and not let the team down that you talked about earlier?

Mr. MOREY. You know, I think that is what we are trying to change. Up until recently, I think most players thought of concussion as a temporary or transient injury, just shake it off. We communicated it, and we just used the words like "ding" and "just got our bell rung."

And I think the next steps are trying to understand the injury better through research so that we can determine what the threshold is and what type of injury you can play through and what type of injury you are should be removed from play.

I think that is a very difficult thing to gauge, and I think you have to really, truly rely on the player being honest and the medical staff being very well trained to recognize the signs and symptoms of concussion, so that they can determine when it is safe to return to play. And we have to rely on our team medical staff.

And then with kids' cases, they don't have the type of medical staffs and professionals on the sideline like we do. That is why this initiative to protect athletes is so critical with these players.

Mr. HARE. Well, I just want to congratulate you on a great career and also what you are doing to help. Thanks so much.

Mr. BISHOP OF NEW YORK [presiding]. Thank you, Mr. Hare.

Mr. Scott?

Mr. SCOTT. Thank you.

And I want to thank all our witnesses for their testimony. We have been dealing with mostly football. The Judiciary Committee has had hearings, Energy and Commerce, and now Education. Are other sports equally at risk of concussions, Dr. Herring?

Dr. HERRING. This is not a football issue. It is not a boy sport issue. This is a contact and collision sport issue. Congressman Scott, the rate of concussion in high school girls' soccer is almost as high as it is in boys' football. Actually, in college sports the rate of concussion in women's soccer is higher than in men's football. So it is very important that we look at this as an issue for safety for all athletes. It is a great question.

Mr. SCOTT. Thank you.

Dr. HERRING. And to comment on one more thing for Mr. Hare, there is no piece of equipment that guarantees you will not get a concussion. It does not exist.

What does exist, though, what we do know is the best way to manage this is to identify the concussion and have there be complete recovery before returning to play.

Mr. SCOTT. Thank you.

Alison, is Centennial High School a public school?

Ms. CONCA-CHENG. Yes, it is.

Mr. SCOTT. And all public schools in the county have that process?

Ms. CONCA-CHENG. I believe all the schools in Howard County have a similar process to Centennial's.

Mr. SCOTT. Do you happen to know how much that program costs?

Ms. CONCA-CHENG. I have no idea.

Mr. SCOTT. Okay.

Dr. Gioia, do you know how much the program costs? Thank you.

Mr. GIOIA. Yes, I mean, I basically helped set it up. Now, what aspect? We have certified athletic trainers in all the high schools. We have, obviously, an educational program. We have the baseline and post-injury testing aspect. So all those are what I would refer to as the program. And is there a certain part of that you are——

Mr. SCOTT. Per student, how much does it cost—$10 a student, $3 million for the county—I mean, some numbers?

Mr. GIOIA. I mean, I know that the county is probably, you know, about $20,000 per athletic trainer. There are 12 high schools. They pay $750 for the test itself, and then they——

Mr. SCOTT. For the test per student?

Mr. GIOIA. No, no—for the school.

Mr. SCOTT. Okay.

Mr. GIOIA. Yes, per year, basically. And then they pay me some for my consultation input, so I guess if you put all that together, it is probably for the 12 high schools, you know, $400,000 or less. I don't know the total number of student athletes of the county, but certainly, it is probably, you know, 50, 60 thousand.

Mr. SCOTT. Now, somebody mentioned "just a concussion" when we were talking about repetitive concussions. Once you get to a traumatic brain injury, what is the cost of treating a traumatic brain injury, Dr. Herring—just an idea?

Dr. HERRING. Yes, if you have the rare but tragic consequence of taking a concussion and turning into a more moderate or severe

brain injury, the cost is exorbitant—the acute medical costs, the lifesaving costs, and then the lifelong costs—hundreds of thousands of dollars to, say, Zach in Harborview Medical Center, the trauma center in Seattle, where I work. But that is just the first piece.

Home modification, durable medical equipment, ongoing therapy, special accommodations at school——

Mr. SCOTT. So somebody with a traumatic brain injury, millions of dollars in costs would not be unusual.

Dr. HERRING. Yes. Yes, and——

Mr. SCOTT. And can you compare that cost to the cost of preventing the subsequent concussions that might lead to a traumatic brain injury?

Dr. HERRING. Seems to me like money well spent—pennies on the dollar. And I would say that the cost is not only medical. You should look at the cost to the family and the community where that young athlete lives.

Mr. SCOTT. Dr. Gioia, do you want to talk about the cost-benefit of prevention?

Mr. GIOIA. Yes, I mean, just sort of doing the quick math in my head, thinking about the Howard County program and the number of students that we have, I mean, we could argue that it is probably, you know, less than $25 to $50 per student to administer this program. And of course, the other part of it, too, is that the certified athletic trainers are treating all injuries, not just concussions, so there is benefit beyond that as well per student.

So when you are talking about, you know, $50 or less per student next to probably millions of dollars to manage that injury, it is a whole different story. The cost-benefit is there.

Mr. SCOTT. But if you add up the whole county costs, if you can prevent one traumatic brain injury, the money is well spent.

Mr. GIOIA. Yes, yes. Total cost probably, you know, as I said, $30,000 to $40,000 or less.

Mr. SCOTT. Thank you.

Thank you, Mr. Chairman.

Mr. MOREY. Mr. Scott, may I——

Mr. SCOTT. I am sorry.

Mr. MOREY. I think it is probably prudent to mention some of the members of our Mackey-White Committee—Dr. Kent, Robert Kent, who actually serves as a senior advisor to the NFL Head, Neck and Spine Committee and is co-founder of the Sports Legacy Institute, Chris Nowinski—have implemented and proposed a seven-point plan that is completely free, that coaches and parents and kids can get online, understand the signs and symptoms of concussion, utilize the CDC's information, and it is a seven-step program that is completely free, and it is online.

And I think it is something that I think every coach should be certified. If they are going to design the drills for full contact and be able to oversee some practices and assume the responsibility of the care and look after their players, they should be certified to be certified in concussion awareness so that they can protect their athletes.

Mr. SCOTT. But, Dr. Herring, a lot of the benefit is in preventing the subsequent concussions——

Dr. HERRING. Yes.

Mr. SCOTT [continuing]. And the additive effects. Is that right?

Dr. HERRING. Yes, sir, it is. Sometimes you can't prevent the first one. And as everyone has said, sports is a very good thing. I mean, the most dangerous thing you can do after school is not play sports. Unsupervised activity is where trouble really begins, so you want to make sports safer.

And this is not that hard to do. You make it a rule, and you make it a culture change. And you say, "Look, even if you can't prevent the first one, you get over the first one, because if you don't, that is where the trouble starts."

Mr. SCOTT. Thank you.

Thank you.

Mr. BISHOP OF NEW YORK. Mr. Payne?

Mr. PAYNE. Let me also thank you. And I think that the awareness has made a big difference. I doubt if several of those quarterbacks would be sitting out this year—Philadelphia and so forth—had not the attention been brought to the fact that you just don't play with concussions anymore.

I would like to certainly commend the NFL. I think that the commissioner is really trying to get this thing on the grips. I think we have got a lot of changing to do, you know, with Vince Lombardi playing out in zero degrees weather, the, you know, the old Giants in the 60s with the lineman that were, you know, Modzelewski and those guys. You can tell my age. I didn't dye my hair gray. [Laughter.]

But, you know, and so everything was just tough. I think that the NCAA has really taken a strong look at this, having maybe now college presidents having as much authority as athletic director or coaches. So there are definitely changes.

I do know that you got to get down to Pop Warner and got to get down to high school. I played ball in high school, injured ankle, not head, but so therefore it kept me really out from doing what I had the ability to do.

However, it was interesting. I met a fellow 50 years ago. We played on the same high school team, and the thing that he mentioned was that you remember when we clashed in a scrimmage and I tackled him and he got a concussion. I mean, this was the first thing we talked about 50 years later. But in those days you just came back the next week. I mean, it was unbelievable.

Coach used to say that, you know, I mean, it was different then. And the tougher you were—and this is not an NFL thing. I have never played in the NFL. I just did a little high school, played intramural in college. It is at even Pop Warner level. So we definitely have to.

I think the key thing is to change the culture that you got to be tough, you got to play injured, you got to go back out there because you can't let the team down or you don't want to look weak. We used to have a coach that used to say, "When you are injured, you just spit on it." That was the answer, you know.

So things have changed a lot. I think that we have to continually, though, have the changes. I also had the privilege to coach in high school football for 8 or 9 years, and had to just counsel fellows that "No, you can't play. It is best for your future."

And so I think that we have got to do a lot of education. That, I believe, is the biggest challenge, but I do have to say that the sports officials in the leagues are really kind of concentrating on let us protect the player.

Let me just ask—this is a great—the way that you have, Doctor, regarding what is being done in—and as the—that you have had, and let me commend you. The other person that we had here was also a female playing soccer, so, like I said, we have to shift it where we feel all these injuries are coming.

But maybe someone could answer. What happens to the poor school districts? You know, in my town I doubt if there are physicians even at a game. I mean, this is tremendous, what I hear is happening there, but do you know how that compares to inner city or rural areas, where you don't have the luxury to do what you are doing? Anybody do any research on that?

Mr. GIOIA. There hasn't been, although we can pretty much guess. I mean, you know, kids are unprotected. And again, I think the issue here, whether it is an underserved community or it is an underserved population, which again I would argue is probably many youth sports, whether you are in the, you know, highest socioeconomic strata or the lowest, they are without knowledge, without the skill and tools to recognize this problem. Everybody is, unfortunately, in that disadvantaged situation.

So we have got to find some solutions to make this a universal issue. And I think, again, by putting the systematic rules in place, then we identify everybody, all kids at all levels at all socioeconomic strata.

Dr. HERRING. It is harder. There is no question about it. It is a process that will be improved, if there are national standards. It needs funding. I guess that is never said in this room. It needs funding.

Wonderful questions from Congressman Scott. I can do a lot of good with a little money rather than to spend a whole lot of money on one unfortunate athlete. So if you want to see this penetrate the rural communities, there has to be education, legislation, and then there has to be capacity to put resources in place, whether it is licensed or certified athletic trainers, while working harder with community health care providers to become more knowledgeable.

We struggle with this now. It should not deter us from the effort. But this is the work piece. This is the work piece that faces us. Once we get the awareness, we have to work on implementation.

Mr. BISHOP OF NEW YORK. Thank you, Dr. Herring.

Dr. HERRING. Thank you.

Mr. BISHOP OF NEW YORK. Ms. Woolsey?

Ms. WOOLSEY. Well, thank you. I am not going to repeat everything everybody said and ask you—I don't think—the same questions. This has been a great panel. Thank you very much.

I am most worried about parents at the moment, about taking hold of these issues and understanding them, particularly for—well, not for football players—your parents have already done what they have done and are supportive—but youth athletes.

And that is because all of my four children were athletes, and one in particular was—well, he was all-star, all-American college defensive tackle for small schools for 2 years. And he had to come

home after he graduated, take me for a walk and say, "Mother, I am through with football. Get over it." I mean, so you know how supportive we all were and how much we cared.

He didn't start football until he was in high school. He has a son, who is 10, who has been playing flag football for the last 3 years. He is going to be very good. I mean, he is big, good. He is great. I mean, he will be very good. But his dad is very smart. He is his coach in both basketball and football, and he is not going to let him play Pop Warner, because this kid would be playing at 10 years old against 13-year-olds because of his size.

And I so, so respect that. And Teddy doesn't care. He loves football. He knows he is going to play sports his whole life and, you know, whether he plays Pop Warner or not doesn't matter. But how many parents make those decisions? We watch it. We see these kids out there, you know, playing on a level that is dangerous at their young age. How do we prevent that for the most part—one question for parents.

The other is how do we get teachers to understand that after a brain injury, just reading is putting pressure on the brain, so we don't punish these young athletes for needing to rest their brain? So I think that could be one of the most difficult things to accomplish so that they don't become, you know—and then don't get blamed as, you know, trying to cop out, et cetera, Doctor?

Mr. GIOIA. If I could address the teacher issue because, you know, I think both Alison and Sarah, you know, are good examples of this. When we go into an unprepared system, the teachers are not aware. When we go into a prepared system, I can't tell you how gratifying it has been over the years to hear the number of families that now come into our clinic and say, "The school is doing a great job. The school nurse or the school administration or the guidance counselor got an e-mail out to the teachers, explained what was going on with the concussion, and they are managing the academic demands very well."

Now, we have a long way to go, and we need to do this systematically, but it works. And once teachers understand this, they do jump on board when we also provide them with some good guidance, and we use these care plans to really specify what are those limits, how much can we handle. And when the administration in the school sets the tone saying, "This is how we are handling this," from top to bottom it then works. But it is a process.

And again, I think our new Heads Up toolkit for the schools is a great first vehicle for getting that information out there and preparing schools. And I think, again, that is where this legislation really provides that vehicle to take place.

Ms. WOOLSEY. Okay.

Thank you, Mr. Chairman. I will let everything go on.

Mr. BISHOP OF NEW YORK. Thank you.

Mr. Polis?

Mr. POLIS. Thank you, Mr. Chairman.

First, I would like to thank our panel for their terrific stories, in particular some of the personal stories shared, of course, by Ms. Conca-Cheng and Dr. Brearley. Those are always difficult to share, but they are powerful, so I appreciate you sharing those stories with us.

In the past couple of decades in my home state of Colorado, we have had at least three high school student athletes who died from on the field brain-related trauma—most recently, just a couple of years ago when a 15-year-old freshman football player, Jacob Snakenberg, collapsed on the field during a football game.

And while the Colorado High School Activities Association, which we call CHSAA, requires that coaches now complete concussion education and mandates the schools to have return to play policies, we don't have any requirements like that for elementary or for middle school.

Now, I know that there are legislators in our state that are going to be looking at solutions to that during the next legislative session, but I strongly believe that we need to protect all student athletes from the risk of these injuries in all public schools across the country, which is why I have joined Mr. Bishop and Mr. Miller as a co-sponsor of this very important legislation.

I would like to open this up to the panel, but can you share with us why you think it is necessary or why we should pass a federal law on this issue? Not every state has acted. Why not push in each and every state? What are the dangers of not taking any federal action?

Rev. BREARLEY. I would like to answer that question. And first of all, I think we need to understand that we need to approach this in as many ways as we possibly can. I think at the federal level there is an opportunity to give a minimum of guidelines or requirements for student athletes. And then states and school districts should themselves have the opportunity to adopt additional standards.

And part of my request that Congress use its offices to promote discussion is because in an era when people are very leery of big government and in sports, where they don't want to be told what to do, I think erring on the side of caution of giving a baseline—from the federal government giving a baseline of what would be a minimum would be helpful. And then states and school districts themselves can adopt additional precautionary measures, especially since we are all concerned about unfunded mandates.

Mr. POLIS. Have any of you seen—you have all taken some time on this issue and seeing what different districts and schools are doing. Have any of you observed any best practices, where you sort of looked at a school or district and said, "Wow, they are doing a really good job in prevention of concussions and making sure that people who have had the injuries are not back on the field." Who is kind of really pushing the envelope on this? And how can we then replicate what they are doing nationally?

Mr. GIOIA. Well, you know, there are a number of us trying. And at this point, actually, in your state and in the Denver area, you have the REAP Program, which is something that has been a very important program and a first step. And we are actually collaborating with Colorado here in Maryland and with Oregon, with Pennsylvania, with some other states, to look at what are those best practices, because there are multiple elements, as you mentioned.

There is the prevention aspect. There is really the athletic aspect. There is the student and academic aspect. And all of that

takes time and people and energy. And we are trying to coordinate all of those activities together. I don't think we could say there was one single best practice site right now, but I think in various areas we are all doing some pretty good things, and we are trying to coordinate that effort.

Mr. POLIS. And to follow up on that, what metrics do you use? And how do you sort of figure out what is working and what isn't working? You know, obviously, due to small sample size, we know when somebody dies, it hasn't worked. But, I mean, beyond that, what metrics can be used to show that something is working?

Mr. GIOIA. Well, you know, again, you have got this catastrophic thing we hope we can minimize. And quite honestly, I think that what we are going to see with these programs is we are going to see an increase in the numbers of injuries that are recognized and reported. And in fact, if we don't, we may be doing something wrong, because we know this is an under recognized problem.

But then the question is to what extent—when, you know, what is the timeframe then from identifying the injury to doing the active and appropriate both medical and academic kind of service delivery? We can begin then to look at what are the times taken to recovery that are supported by these things. So we can begin to build metrics, really, in terms of that student athlete's recovery profile, but also the time that the system took to put the things in place.

Mr. POLIS. One thing that I think policymakers would love to rely on to know what works would be helping to figure out what metrics should we be looking at, and how can we figure out what works and what doesn't work.

Mr. GIOIA. Yes.

Mr. POLIS. And change what doesn't work.

Mr. BISHOP OF NEW YORK. The gentleman's time has expired.

Mr. Kildee?

Mr. KILDEE. Thank you, Mr. Chairman.

We have a similar situation in the military. My son was captain in the American Medical Service Corps and received his master's degree at Harvard in health care and now works for the House Armed Services Committee. And this is an increasing injury that comes back from Afghanistan and Iraq.

And as a matter of fact, I am wondering whether the medical people in sports are comparing any notes with the medical people in the military, since there is a similar problem. The question is that, you know, in the military very often it is the survival of the unit, and here in sports it is more winning the game.

One of the things that the Pentagon is discussing right now, for example, is do we give a Purple Heart to someone who has a closed head injury? The criteria for years has been that if you have been injured by enemy action, then you qualify for the Purple Heart. But very often unless there is blood, they are not sure what to do, and they are still debating that now.

But have you had any discussions with those physicians, who treat many of the head injuries now that are occurring in Afghanistan and Iraq?

Dr. HERRING. Thank you, Congressman Kildee. The answer is yes. The newly formed NFL Head, Neck and Spine Committee is

working closely with the DOD. When the commissioner comes to Seattle to host a course on sports concussion, General Chiarelli will be there.

Mr. KILDEE. Great.

Dr. HERRING. And the military's new program of "Take a Knee," using a sports metaphor when they are injured I think will be helpful. As someone who has taken care of brain injury a long time, I would be less than forthright if I didn't tell you that I hope that the sports concussion piece opens the door to understanding traumatic brain injury more comprehensively. And you are right. It is an invisible injury. But simply because there is not blood doesn't mean there shouldn't be a Purple Heart.

Mr. KILDEE. Thank you very much. I appreciate both your information and your specific response. Thank you very much.

Mr. BISHOP OF NEW YORK. Thank you.

Mr. Pascrell?

Mr. PASCRELL. Thank you, Mr. Chairman.

Mr. Chairman, I just want to begin by referring to what my good friend, Mr. Kildee, was just talking about, because in the last 3 years there has been movement on the Department of Defense to recognize Purple Hearts in those individuals without blood and without contusion—we have got to get, you know, beyond that—and are worthy of a Purple Heart and have been denied up until now.

So now we are beginning to look at each case individually. The DOD is listening very carefully. We can learn a lot from what has happened on the military side to help young ladies like Alison.

And by the way, Alison, there is somebody in New Jersey, Niki Popyer. I don't know if you have heard of her. She had 10 concussions in sports. She is a basketball player and went back and went back and went back in. And you know the story. Now she cannot play any sports, and all she needs is a slight bump on the head.

Every concussion, Mr. Chairman, is brain damage. I want everyone in this room to understand that. There is no way to say it otherwise. I am sorry. If I need to be stark, I will be stark.

But we have learned so much over the last 6 or 7 years through the fact of this signature injury of Iraq and Afghanistan, which is traumatic brain injury as well as post-traumatic stress disorder, which we are really just getting our hands on. It has been misdiagnosed many, many times. But it helps us with our young kids. It really does—what has happened in the past 5 years. And we can't lose sight of it.

I am glad that the NFL—Mr. Morey and Dr. Herring, I am glad that the NFL came to recognize this a few years ago, because it didn't before. I have talked to players in the NFL. Many of them were near vegetation. The problem was ignored, swept under the rug. So I am glad that we are addressing that vigorously. I am also glad that you support my legislation, of course, but more importantly than that, because we are all in this together, no one has the answer.

And I have read what you have said in your blog, Sean, and you are on target. And I know how you have been struggling with this issue—your organization, the Players Association.

In the contact ad what we did is ask for the professionals to come together, Mr. Chairman, and then decide the protocol and the guidelines, not the Congress of the United States. We are not good at this. We are not good at too many things. And we are certainly not doctors and professionals.

So we want them to come together, and we want them to put a protocol together so that protocol and those guidelines can be used, whether kids are in leagues that are scheduled and authorized or smaller leagues, other situations—kids 4, 5, 6 years old.

And we are not simply talking about football. Most of the injuries that I have gone over in the past 11 years since I got involved in this as a co-chair of the Traumatic Brain Injury Caucus are with women. We have paid very little attention to this. There is a different structure of the head. I am talking to the doctors, so I apologize for that.

There is different protection for women—perhaps much less protection. And so when we are going to send someone back into the battle, be it soccer, basketball, regardless of what the sport is, we need to take this into consideration.

And therefore, we must—as, Dr. Brearley, as you pointed out—must have a baseline. Now, how to get to the baseline? The only way to get to the baseline is have a neuropsychological testing of players before they go on into the field, onto the court. We blew it with our own armed services. We were late to protect them going into battle, and then we basically did a kabuki dance when they come out of battle.

Many of them are getting written tests. Think about this. Five hundred fifty thousand were provided a neuropsychological test to go in, but when they come out, they are given a written test. If I showed you the test, Dr. Gioia, you would be embarrassed. And so we are trying to change that——

Only 2,500 of the 5,500 that were tested have gotten a real neuropsychological test. Because appearances are so critical, the guy, the gal doesn't complain—no blood, no contusion, no nothing until later on. So we need that baseline. It is important. It is critical. And I believe it has saved lives both on the battlefield and on the sports field and will save many more lives.

And that is what, I guess, we are all about. If we don't save lives, what the heck are we doing here? You know, we are humoring each other. I believe——

Mr. BISHOP OF NEW YORK. Mr. Pascrell, may I ask you to conclude?

Mr. PASCRELL. I will conclude.

Mr. BISHOP OF NEW YORK. Thank you.

Mr. PASCRELL. I realize I am here only, you know, at your will.

We need to educate—I love the guy; I can say that to him—educate, prevent, care for in recovery, and please get the families involved early. This is critical both on the battlefield and off.

And I thank you, the speaker. I thank the committee for allowing me to come and say my piece.

Mr. BISHOP OF NEW YORK. And thank you for your leadership on this issue, Mr. Pascrell.

Mr. Kline, any concluding comment?

Mr. KLINE. Yes, thank you, Mr. Chairman.

I just wanted again to thank the witnesses. It has been terrific testimony. You all are working so hard in different aspects of this to spread the word and to develop real tools. So again, thank you very much for sharing your stories.

I yield back.

Mr. BISHOP OF NEW YORK. Thank you, Mr. Kline.

I also wish to thank the witnesses for your testimony. Let me give a particular word of thanks to Alison and to Dr. Brearley for sharing your personal stories. It is very powerful for us to hear them. Thank you very much.

Without objection, members will have 14 days to submit additional materials or questions for the hearing record. Without objection, the hearing is adjourned.

[Additional submission of Mr. Miller follows:]

Prepared Statement of the National Athletic Trainers' Association (NATA)

The National Athletic Trainers' Association (NATA), a not-for-profit society of health care professionals serving physically active children and adults, endorses the Protecting Student Athletes from Concussions Act of 2010. The NATA represents over 33,000 athletic trainers (ATs). As athletic trainers and health care professionals specializing in team sports, we are the first line of defense in the prevention, diagnosis and emergency treatment of head traumas and other athletic injuries. ATs are health care professionals who collaborate with physicians to optimize activity and participation of patients.

NATA supports the Act's goals of establishing requirements for prevention and treatment of concussions suffered as a result of participating in school sports and applauds the bill's efforts to make physical activity, well-being, and athletic safety a focus for America's youth.

All ATs have at least a bachelor's degree in Athletic Training from an accredited college or university, and 70% of our membership has a master's degree or higher. Certified ATs must pass a national certification exam. In most of the 47 states where they are licensed or otherwise regulated, the national certification is required for licensure. ATs maintain this certification with required continuing medical education. They work under a medical scope of practice and under the direction of physicians and adhere to a national code of ethics.

Although the issue of concussions in sports has received a great deal of attention in the media in recent months, it is not a new problem. Athletic trainers have been caring for concussed athletes and warning of the dangers posed by this unique injury for years.

NATA has a long history of working with research experts to explore the prevention and proper treatment of head injuries. In July 2009, NATA released a study in the Journal of Athletic Training entitled Head Impacts During High School Football: A Biomechanical Assessment. The study revealed that high school football players sustain greater head accelerations after impact than do college-level football players, which can lead to concussions and serious cervical spine injuries. Further, the study urged high school coaches to teach proper tackling techniques in order to reduce the risk of head and neck injuries among athletes.

While much focus has been given to players in the National Football League (NFL), it is important to remember that high school athletes represent the single largest segment of football players in the country and account for the majority of sport-related concussions. In a given year, between four and six percent of high school football athletes sustain concussions, corresponding to an estimated 43,200 to 67,200 injuries annually. In fact, there are five times as many catastrophic football injuries among high school athletes as college athletes. Estimates indicate, however, the true incidence of injury is likely much higher. Some research suggests that more than half of high school athletes who suffer concussions do not report their injuries to medical personnel. Even when faced with these disturbing trends and the fact that 7 million students participate in high school sports in America, NATA estimates that only 42 percent of public high schools in America have access to an athletic trainer. In fact, NATA estimates that across the country, the ratio of students to athletic trainers is 2,678 to 1.

According to a New York Times article (Sports Imperative: Protecting Young Brains, August 24, 2009), "at least four American high school students died last year from football head injuries. Most suffered from what is called second-impact

syndrome, a rare but catastrophic dysregulation of brain activity that can occur when a young player sustains another hit before the brain has recovered from an earlier concussion. In nearly all cases, such tragedies can be prevented if the symptoms of concussion are recognized and heeded, giving the injured brain time to fully heal."

Furthermore, studies also show that fifty percent of second impact syndrome incidents result in death. Other startling statistics include:

• Female high school soccer athletes suffer almost 40% more concussions than males (29,000 annually). Journal of Athletic Training, July—September 2003

• Female high school basketball athletes suffer 240% more concussions than males (13,000 annually). Journal of Athletic Training, July—September 2003

• 400,000 brain injuries (concussions) occurred in high school athletics during the 2008-09 school year. Compliance with return to play guidelines following concussion in US high school athletes, 2005-2008

• Concussion symptoms such as headache and disorientation may disappear in fifteen minutes, but 75% of those tested 36 hours later still had problems with memory and cognition. Journal of Athletic Training, July—September 2003

• 15.8% of football players who sustain a concussion severe enough to cause loss of consciousness return to play the same day. Center for Injury Research and Policy, The Research Institute at Nationwide Children's Hospital, Dr. Dawn Comstock

NATA's Policy Principles for Concussion Management

In consultation with the NATA Secondary School Athletic Trainers' Committee, the NATA Government Affairs Committee and the NATA Federal Legislative Council, NATA has developed a set of principles surrounding the issue of concussion management. NATA's principles include the following:

• Increasing student athletes' access to a certified athletic trainer is the first step in helping to prevent concussions and manage concussions once they occur. Legislation should incentivize schools and school districts to increase the accessibility of an athletic trainer to their student athletes.

• Conducting baseline testing of student athletes prior to engagement in contact sports provides the greatest opportunity to ensure accurate assessment of a player's condition after sustaining a concussion. Funding should be made available to schools and school districts to conduct appropriate baseline testing for symptoms, cognitive function and balance.

• Educating parents, coaches, teachers and other stakeholders about the signs and symptoms of concussions is critically important. Programs such as the Centers for Disease Control and Prevention's (CDC) "Head's Up" program are important tools. At the same time, concussion education and awareness programs should not provide a false sense of comfort that non-medical professionals are able to diagnose and treat concussions. Rather, a focus should be to educate stakeholders about making a proper referral if the signs and symptoms of a concussion are present in a student.

• State Task Forces that may be established to develop and implement state plans for concussion management should include representatives of the state's athletic training association, athletic association, medical society, and Department of Education.

• Athletic trainers serve as the lynchpin medical professional who seeks input from all members of the concussion management team regarding the return to play decision. Athletic trainers' standard practice is to ensure involvement of a team comprised of the student athlete, family/parent, treating physician and school personnel such as the coach, school nurse and teachers in their approach to concussion management with respect to a decision about return to play. The athletic trainer is responsible for coordinating the school's emergency action plan, concussion testing program, medical coverage and more. In the absence of an athletic trainer, these responsibilities often fall to unqualified, non-medical personnel.

• Although the best case scenario is for a school to have access to an athletic trainer on faculty or staff, in the absence of a licensed or certified athletic trainer, the treating physician should make return to play decisions in consultation with school personnel, the student athlete and his/her family.

[Whereupon, at 11:53 a.m., the committee was adjourned.]

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