



Testimony of
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On

HR. , Protecting Student Athletes from Concussions Act

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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. We must provide effective treatments that maximize the student's recovery and minimize any long-term post-concussion problems. The "Protecting 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.

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

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.

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

Sport-related concussion to the student-athlete is an injury to the developing brain that presents a unique set of risks and challenges for their future. Specifically, learning in school is the job of the child and adolescent, and is particularly challenged by this injury given: (1) the direct effects of the concussion on neurocognitive functioning; and (2) the adverse effects of the cognitive/learning demands on the brain's dysfunctional biological software. A portion of students have persisting problems with school learning and performance long after the acute effects of the

concussion. We do not yet understand the reasons for these poor long-term outcomes, and must study them further. A high percentage of student-athletes with concussion/mild TBI experience short- and medium-term problems with school learning and performance. These academic problems, even if temporary, can have potential negative consequences for the student down the road. And, if unidentified and untreated, these problems can have significant long-term consequences for the student. To address this problem, it is essential that we implement a national system of care for student-athletes with concussion/mild TBI. This system must include directed efforts at prevention, education of key stakeholders, early acute identification and treatment, and effective reintegration of the student-athlete into the school system.