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On

Improving Sports Safety: A Multifaceted Approach

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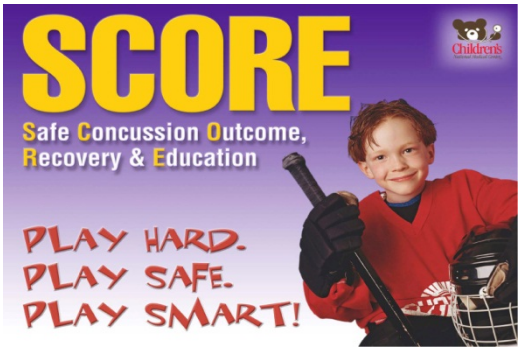

About Children's National Health System

Children's National Health System, based in Washington, DC, has been serving the nation's children since 1870. Children's National's hospital is Magnet® designated, and is consistently ranked among the top pediatric hospitals by U.S.News & World Report and the Leapfrog Group. Home to the Children's Research Institute and the Sheikh Zayed Institute for Pediatric Surgical Innovation, Children's National is one of the nation's top NIH-funded pediatric institutions. With a community-based pediatric network, eight regional outpatient centers, an ambulatory surgery center, two emergency rooms, an acute care hospital, and collaborations throughout the region, Children's National is recognized for its expertise and innovation in pediatric care and as an advocate for all children.

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 2012-2013, the SCORE program at Children's National treated more than 2,000 children in its concussion clinics.

Dr. Gioia is the founder and director of the SCORE Program. He has been a national leader on youth concussion for over a decade. He is an active collaborator with the CDC on their "Heads Up" toolkits as well as a CDC-funded researcher. He is actively involved in national and international organizations addressing better clinical care and research standards for

children and youth with mild TBI including: Steering Committee of the Pediatric Acquired Brain Injury (PABI) Plan; medical advisory boards for the Howard County Public Schools, Maryland State Public Secondary School Athletic Association, and USA Football; and the National Advisory Board of the Positive Coaching Alliance, and a member of the NIH Common Data Elements workgroup. He is the chair of the Policy & Legislation Workgroup on the National Council on Youth Sports Safety, chaired by former US Surgeon General Dr. David Satcher and Dr. Eliot Sorel. He is a member of the concussion workgroups within the National Academy of Neuropsychology, National Athletic Trainers Association, American Academy of Neurology, American Academy of Pediatrics, CDC, NIH, and testified on school outcomes for the 2013 Institute of Medicine report on youth sports concussion. He is the father of three former student-athletes, and a former high school& college football and rugby player.

Introduction to the Issue of Youth Sport Concussion

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 developmental opportunities that enrich the lives of our youth by teaching important lessons of teamwork, commitment, discipline, goal-setting, competition, and sacrifice among other things. Physical activity is also known to be critically important to the child's overall health and development. Students that engage in organized sports have been shown to perform better in school. For all of these important reasons, children and adolescents must remain physically active and engaged in organized sports activities. These essential developmental experiences are put at significant risk, whether temporary or long-term, when the child's brain is injured. It is the responsibility of the caretakers of our nation's children and adolescents to maximize their active but safe involvement in sports/recreation activities.

Using our best scientific evidence, we must balance the benefits of sports participation with careful attention to safety issues – especially when the precious resource of the student-

athlete's brain is at stake. In the past decade, significant attention has been directed to the risks associated with concussion by the national and international medical communities, including the international Concussion in Sports Groups' 4 consensus meetings between 2001-2012, 2007 CDC "Heads Up: Brain Injury in Your Practice" guidance, 2013 American Academy of Neurology evidence-based recommendations, 2010 and 2013 clinical reports of the American Academy of Pediatrics, 2012 statement of the National Academy of Neuropsychology, 2014 updated guidelines of the National Athletic Trainers' Association, the 2013 position statement of the American Medical Society of Sports Medicine, and the 2013 report of the Institute of Medicine.

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 the work with repeated concussions that if this injury goes undetected or ignored, the risk of long-term cognitive, social, and emotional problems increases. On the other end of the spectrum, it also appears that when concussions are identified early and managed properly, the vast majority of persons recover fully without risk for long-term problems. We also know that the length of time to full recovery can vary from hours to weeks in the vast majority of cases with a small number of persons who take longer to recovery. Early identification of concussion, protection from re-injury, and swift, proper management becomes our central goal.

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 as indicated by the recent IOM report. With current figures as likely underestimates, the Centers for Disease Control and Prevention (CDC) studied emergency department visits, hospitalizations and deaths between 2002-2006 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] These data do not include, however, concussions diagnosed in primary or specialty care office settings, or concussions that go unreported.

Other data sources tell us that the majority of TBIs (90%) are of a "mild" nature. With respect to sports, 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 recent 2013 Institute of Medicine provides epidemiology figures for youth sports concussions but recognize that our surveillance systems presently are inadequate to inform us of the true incidence of sport-related concussion. Central to the problem of injury identification is the lack of sports medicine professionals at most high school and youth sports practices and games where concussions can occur. As a result, the health and safety of our youth is in the hands of their coaches, parents, teammates, and the sports organizations.

To address the universal need for protection from the risks of concussion in youth and high school sports, all 50 states have now passed youth concussion laws, most of which espouse 3 core principles:

- All coaches be educated about concussion including its signs and symptoms, and its risks and consequences, and parents be informed about the risks of the injury,
- Any athlete suspected of displaying any sign or symptom of concussion must be removed from play,

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

- and cannot return to sports participation until cleared in writing by a healthcare professional with experience in concussion evaluation and management.

Based on our best medical evidence, the following guidance is provided on the management of concussions in youth:

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

Challenges and Solutions to Youth Sports Concussion:

We are posed with a major question and challenge within youth sports: "With concussion awareness at an all-time high, are youth sports teams/ organizations and parents more aware but still not sure what to do?" The simple answer to this question is, yes.

Presently, our greatest challenge is the universal, consistent and effective implementation of our youth sports concussion laws across all youth sports. One problem with our current laws is that only 17 states include non-high school youth sports in their laws. We are leaving out an important segment of the youth sports world as a result.

Maximizing key public health efforts to improve concussion recognition and active response requires a team approach. Coaches, youth sports organizations and parents play a critical and central role in this process and must be the focus of our action-oriented education and training programs. Preparation is the key: What do coaches and parents need to know, and what do they need to do? What tools can assist parents and coaches to do the right thing?

At Children's National Health System, over the past ten years, our SCORE program has delivered hundreds of action-oriented parent and coach concussion education and training

programs using CDC-based Heads Up materials, which I helped to co-author. We have learned much about the community's needs, and how to deliver it. Families and coaches now receive scenario-based training - i.e., a sports situation in which they must recognize and respond to a youth athlete with a suspected injury. We provide them with the essential knowledge and tools such as the free CDC-based Concussion Recognition & Response smartphone app that we developed at Children's National. Our goal is to prepare parents, coaches, youth sports organizations and teams to take responsible action should a suspected concussion occur by walking them through a typical scenario.

There are important examples of good work in taking head-safe, head-smart action such as USA Football's Heads Up Football program where coaches are educated in concussion recognition and response as well as techniques that take the head out of the line of fire. We need to go further with all youth sports. We do not have a coordinated, universal national strategy for educating and training coaches and parents across all youth sports in action-oriented, solution-driven methods to recognize and respond to suspected concussions. We have the tools. We have the programs. We have the awareness. But, we need the implementation mechanism - a more concerted, national effort to effectively infuse action-oriented (not simply awareness-oriented) methods of concussion education and training.

This need is the foundation of the work that several national organizations want to do – for example the newly formed National Council on Youth Sports Safety, the Youth Sports Safety Alliance, and the Sarah Jane Brain Foundation's PABI Plan. In concert with these organizations, and as a member, the Children's National SCORE Program has proposed a National Concussion Resource Center to institute a scalable national plan to make community-based solutions accessible to families and youth sports organizations. We need to build accessible resources in our community that are based on the latest scientific medical information about concussion risk and response.

We must build active partnerships between the youth sports organizations and medical care systems. We have willing teammates across the country such as USA Football, US Lacrosse, USA Hockey, and USA Rugby. We need to add teammates such as the professional sports leagues, sports manufacturing world to support the development of this national system. We are all in this together to build concussion safety measures into the fabric of youth sports, while maximizing participation.

Importantly, science and reason must drive our action-oriented approach to safety in youth sports, maximizing participation and safety efforts together. We must avoid responding to opinion and anxiety in setting the proper course. Key components to a National Resource Center are: action-oriented education and training programs delivered universally, community concussion helplines for families, leagues, schools and medical providers that have immediate questions, guidance after an injury to effective evaluation and treatment programs, and consultation with leagues around program implementation. And because scientific evidence must drive effectiveness, a National Concussion Resource Center needs a programmatic research structure to refine its efforts. We need a quarterback of the team. And we need funding to build the national concussion resource network, disseminating the medically-accepted, scientifically-based tools and methods.

In summary, how can we make youth sports safer? With concussion awareness at an all-time high, we can prepare parents, youth sports teams and organizations and athletes to take positive action through:

1. Action-oriented education and training:

- Parents, coaches, players - learn how to respond to suspected concussions.
- Medical professionals to improve access to quality evaluation & management
- Schools to assist with recovery

2. Prevention measures:

- Re-examine our games through a head-smart lens to reduce contact in general and eliminate unnecessary contact.
- Re-examine the games' rules and enforce those that protect the head and modify behavior in head-smart ways.

3. Continually apply our best medical science and monitor definitive research.

Concussions are serious injuries to the brain that threaten the development of our youth. But, we do not need to be scared away and avoid the developmentally-critical participation of our nation's children in sports activities. Instead, we can take confident control of the youth sports concussion program by instituting practical, action-oriented education and training to recognize and respond, and to prevent injuries to the extent possible. To do so, we need a coordinated medically-driven, scientifically sound national plan of action at the local community level, leveraging the many interested partners toward our common goal of maximum, safe sports participation for our youth.

Summary of Main Points

Sports and recreation provide important developmental opportunities that enrich the lives of our youth by teaching important life lessons. We must balance the benefits of sports participation with careful attention to safety issues. Science and reason must drive our action-oriented approach.

In youth sports, the health and safety is largely in the hands of coaches, parents, teammates, and the sports organizations. They need medical guidance, however, in early identification of concussion, protection from re-injury, and swift, proper management.

Coaches, youth sports organizations and parents must be the focus of action-oriented education and training programs. Awareness is not enough. Their preparation to act is the key.

Over ten years, the SCORE program at Children's National has learned about the needs of families and coaches, assisting in the development of the CDC Heads Up programs, and providing community scenario-based training – i.e., a sports injury situation focused on teaching how to respond to a suspected injury.

Our country needs a more universal mechanism to implement national, community-focused youth concussion solutions - a concerted, national effort to effectively infuse action-oriented - not simply awareness-oriented - methods of concussion education and training.

Our Children's National SCORE Program has proposed a multidimensional National Resource Center to address this need using our expertise and experience. Several national health organizations and youth sports governing bodies are focused on this issue; we have willing partners across the country.

We can take confident control of the youth sports concussion program by delivering medically-guided, scientifically sound, accessible youth concussion resources to our local communities. We must leverage the interest of many national partners toward our common goal of maximum, safe sports participation for our youth.