

NC Child Fatality Task Force Issue Application for 2019-2020



Surveillance and Prevention of Fatal Catastrophic Injuries and Illnesses in NC Youth Athletes

Dr. Kristen L. Kucera, PhD, MSPH, ATC;
Dr. Johna Register-Mihalik, PhD, ATC;
Dr. Stephen W. Marshall PhD

Organization name and web address: National Center for Catastrophic Sports Injuries (<http://nccsir.unc.edu/>) and Injury Prevention Research Center (iprc.unc.edu); both located at the University of North Carolina at Chapel Hill (unc.edu)

- 1. Briefly state the issue and/or proposal you are requesting the CFTF to consider. Briefly describe the direct relationship between this issue/proposal and the goal of the Child Fatality Prevention System to prevent future child deaths, abuse, and neglect, and to promote the safety and well-being of children.**

Surveillance and prevention of fatal catastrophic injuries and illnesses in youth sports have become a pressing priority in NC. Children who participate in contact sports and other vigorous physical activity are at risk of catastrophic injury or illness. Catastrophic injury or illness are defined to be sports-related injuries and conditions that directly result in a fatality, a permanent disability, such as paraplegia, or are life-threatening. Some examples of catastrophic sports injuries include spinal cord injury, severe traumatic brain injury, heat stroke, and sudden cardiac arrest. Fortunately, these injuries are rare. However, they exact a devastating toll on the affected families and communities. Gathering basic public health information about sudden deaths and catastrophic injuries and conditions in youth sport has many challenges. Increased awareness, coordination, and collaboration between various agencies and organizations at a statewide level has considerable potential to assist and inform surveillance and prevention efforts.

- 2. What is the evidence that this issue/proposal is likely to positively impact the safety and well-being of children? For example, point to a study/data that supports the effectiveness of this proposal. What is the anticipated scope of this positive impact? You may provide a fact sheet to help answer these questions**

There are over 7.9 million secondary school athletes who participate in sport as a means of physical activity in the United States each year. In North Carolina there are 203,474 high school athletes (2017-18 School Year).¹ Participation in sport has many benefits; however, the risk of injury remains present. Although catastrophic injury in sport is very rare, it is highly burdensome to communities and families that have a child experience a devastating event such a sports-related fatality. Our data indicate that, from 2000-2018, there were 33 sport-related deaths among NC sport participants--an average of 2.2 deaths per year during the last five years. The most common causes were cardiac-related, severe traumatic brain injuries, and exertional heat stroke. Of particular note are the six deaths observed in 2008. Two of these deaths, related to head trauma, claimed the lives of two NC high school football players: Jaquan Waller and Matthew Gfeller. Their names are included in the Gfeller-Waller Concussion Awareness Act, which was drafted and implemented to protect the safety of student-athletes in North Carolina and was signed into law on June 16, 2011 by Governor Beverly Purdue.

Additional prevention efforts, beyond the protections provided for in the Gfeller-Waller Act, have been proposed in the NC General Assembly. Increased prevention efforts for these events and more comprehensive protocols to manage these events may improve outcomes for children and families as well as decrease the number of events occurring. Such efforts would include improved auditing of school policies and school emergency response plans, increased education and training for adults associated with youth sports, and education about the importance of timely reporting of these events. Such efforts have the potential to reduce the cost, as well as the psychological, emotional, and physical burden to all involved. Reporting of these events and knowledge of the circumstances surrounding these events are essential to implementing better prevention and management strategies.

3. Explain why this issue/proposal requires state-level attention and identify which of the following types of state-level action your issue/proposal would involve: new or revised legislation; funding; agency collaboration; agency policy change; other (if so, what?). [Please see important note on first page related to limitations.]

State-level policies are very important in creating and maintaining a safe, prepared, and responsive environment for high school athletes. Many state-level policies are set by the North Carolina High School Athletic Association (NCHSAA). A recent survey of high school state-level policies showed North Carolina led the nation in having the most comprehensive health and safety school policies (79% compliant with ideal being 100%), followed by Kentucky at 71%.² These scores were based on a state meeting best practice guidelines addressing the four major causes of sudden death for that age group: cardiac arrest, traumatic head injuries, exertional heat stroke, and exertional sickling occurring in athletes with sickle cell trait.³

We believe that the involvement of the NC Child Fatality Prevention System, in collaboration with UNC researchers and officials of responsible sports organizations such as the NCHSAA, will assist our state in maintaining and improving its national leadership in this area. In 2011, the state legislature mandated school safety standards for concussion (Gfeller-Waller Act). Some previously proposed new legislation would have weakened the protections in the Gfeller Waller Act for student-athletes by allowing parents—instead of licensed medical professionals—to return a concussed athlete to competition.

All high schools and youth sports organizations should be prepared to respond appropriately in the event of a potential catastrophic injury or condition. As with any crisis, preparedness is of the utmost importance. Schools and youth sports organizations should develop emergency action plans, following national best practice standards, for dealing with potential catastrophic events. Such plans need to be read and practiced by all who may need to use them, so that they actually will be utilized in the event of an emergency. The presence of trained clinical professionals is critical. Key elements of response include:

- Do not move suspected spinal cord injuries or fractures. Do not remove helmets.
- Call for EMS immediately, but do not wait for EMS to arrive before taking action.
- Immerse heat-induced conditions in ice water immediately to cool the core of the affected athlete.
- In the event of sudden cardiac arrest, have an AED that is accessible, stored in a safe place, properly maintained, and charged.

At this time, we are requesting to update the NC Child Fatality Task Force on our original proposal set forth in 2017. At that time, the Division of Public Health, Injury & Violence Prevention Branch offered support to the NC Child Fatality Task Force to facilitate this effort and convene a *Catastrophic Sports Injury Stakeholder Group (CSISG)* to address both fatal and non-fatal injuries and conditions. The

project's Steering Committee has developed a definition of catastrophic injuries and conditions and a mission statement. Additionally, a list has been developed of catastrophic sports injuries, illnesses, and conditions with case examples for each.

4. Explain the specifics of the type of action(s) you identified above including cost, if any, and agency involvement.

A Steering Committee has been created which includes members of The North Carolina Division of Public Health, Injury and Violence Prevention Branch which has provided direction for this effort, UNC's National Center for Catastrophic Sport Injury Research and UNC's Injury Prevention Research Center. Meetings were held to define the scope of the work, identify key stakeholders to engage in this effort, and to articulate the mission and goals. *The Catastrophic Sports Injury Stakeholder Group (CSISG)* will increase awareness, coordination, and collaboration among stakeholders at various agencies, organizations, and associations in North Carolina. The Stakeholder Group's goal is to prevent both fatal and non-fatal catastrophic sports injuries and conditions among school-aged children and youth by:

- 1) Developing a formalized structure for reporting catastrophic events that occur in schools and youth sports and determine the feasibility of the integration of concussion reporting;
- 2) Improving messaging and policy, such as emergency preparedness, for schools and youth sports organizations; and
- 3) Promoting the implementation of evidence-based and -informed prevention strategies.

In addition, a Data Committee has been convened to look at all possible data sources and how they may better serve the sports community to improve surveillance and reporting.

The Steering Committee appreciates the support of the NCCFTF and will come back to the Task Force with specific recommendations after the Stakeholder Group has met and recommendations have been agreed upon.

5. If your proposal involves seeking funding, explain why state funding (as opposed to other funding sources) is being sought. [Please see important note on first page related to limitations.]

An appropriate coalition of state agencies, including the Division of Public Health, Department of Public Instruction, and NCHSAA, could conduct many of the above-listed activities without additional state funding, now that there is a collaborative coordinating structure in place.

6. If your proposal involves a new or changed law, are there other states you are aware of that have laws of the type you are proposing? If so, please list the states and cite the statutes that address those laws.

As stated above, new legislation that would impact the Gfeller-Waller Act has been proposed. At least 17 other states have proposed and enacted additional legislation to extend the reach of their current concussion laws to include organized youth and recreational sports and education and prevention measures to address cardiac and heat-related events. Such extensions in NC should involve the appropriate stakeholders to ensure that any proposed legislation is appropriate and will have the greatest positive impact.

7. Is the existing infrastructure of agencies/organizations sufficient to support your proposal? If not, what would be needed?

The agencies/organizations already exist and are engaged, but NC has only recently developed a

formalized and solidified infrastructure to collaborate towards this goal. The Division of Public Health, Injury & Violence Prevention Branch offered support to the NC Child Fatality Task Force to facilitate this effort and convene a *Catastrophic Sports Injury Stakeholder Group* (CSISG) to address both fatal and non-fatal injuries.

8. Are there other organizations who have expressed support/endorsement for your issue/proposal and if so who? (Do not include contact information here; see #11 below.)

This proposal is supported by:

- UNC's National Center for Catastrophic Sports Injury - Lead
- UNC's Injury Prevention Research Center
- North Carolina Division of Public Health, Injury and Violence Prevention Branch

9. Please indicate whether there are any organizations identified in question #8 above who have expressed interest and willingness to actively advance this issue OR take a leadership role in advancing this issue. (Do not include contact information here; see #11 below.)

The North Carolina Division of Public Health, Injury and Violence Prevention Branch have taken a leadership role in advancing this issue along with UNC's National Center for Catastrophic Sport Injury Research and UNC's Injury Prevention Research Center.

10. Please identify any other key stakeholders not mentioned above who might have some interest in this issue/proposal, including organizations likely to raise concerns about it.

- Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center, UNC-CH
- North Carolina High School Athletic Association
- North Carolina Medical Society
- NC Pediatric Society
- NC League of Municipalities
- North Carolina Athletic Trainers' Association
- North Carolina Department of Public Instruction
- North Carolina State Board of Education
- Brain Injury Association of North Carolina
- Independent School Athletic Association
- NC Neuropsychological Society
- NC College of Emergency Physicians
- YMCA

References:

¹2017-18 High School Athletics Participation Survey. The National Federation Of State High School Associations; [http://www.nfhs.org/ParticipationStatistics/PDF/2017-18 High School Athletics Participation Survey.pdf](http://www.nfhs.org/ParticipationStatistics/PDF/2017-18%20High%20School%20Athletics%20Participation%20Survey.pdf).

²US News and World Report. Sports Study: High School Athletes Not Being Fully Protected: Many states are not fully implementing key safety guidelines for high school athletes. Aug. 8, 2017; <https://www.usnews.com/news/news/articles/2017-08-08/sports-study-high-school-athletes-not-being-fully-protected>.

³Casa DJ, Almquist J, Anderson SA, et al. The Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs: Best-practices recommendations. J Athl Train 2013;48:546-53.

⁴Burt CW, Overpeck MD. Emergency visits for sports-related injuries. Ann Emerg Med 2001; 37(3):301-8.



Child Fatality Task Force Fact Sheet Surveillance and Prevention of Fatal Catastrophic Injuries and Illnesses in NC Youth Athletes

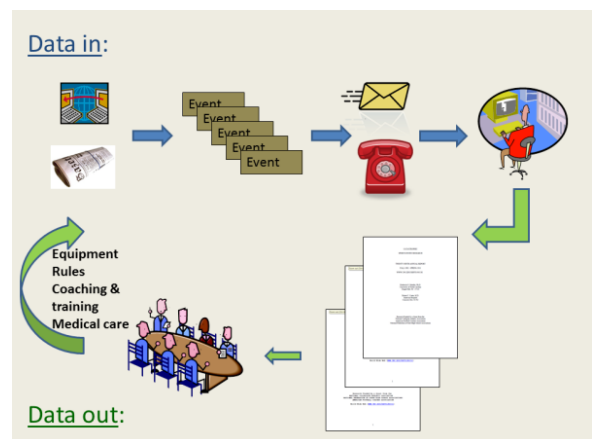
Background:

Participation in organized sports is at an all-time high in the United States with almost 8 million high school-level participants and roughly 500,000 college, university, and junior college level participants.¹ In 2017-2018 North Carolina had the 12th highest number of participants in high school sports at 203,474.¹ The benefits of participation in sports go above just the physical impacts of improved cardiovascular fitness, strength, and balance, and encompass the psychological and social impacts as well. These benefits do not come without some risks.

The Centers for Disease Control and Prevention estimates over 2.6 million emergency department visits per year are due to youth sports injuries.⁴ The mission of the National Center for Catastrophic Sport Injury Research (NCCSIR) is to conduct surveillance of fatal and non-fatal catastrophic injuries and illnesses related to participation in organized sports in the United States at the collegiate, high school, and youth levels of play. Catastrophic sports injuries and illnesses are defined as severe conditions that result in death, permanent or temporary disability as well as events that would have resulted in death without immediate medical action such as sudden cardiac arrest. The most common types of catastrophic events include traumatic head and neck injuries, heat stroke, and sudden cardiac arrest. The need for information about how to prevent these serious events is high.

Improving surveillance of catastrophic sports injuries:

- The NCCSIR is a primary source for published and unpublished catastrophic sport injury information.
- The NCCSIR has historically obtained information largely from publicly available news media reports and national and state sport organizations like the National Federation of State High School Associations.
- NCCSIR gathers any available information about the event including the sport played, activity at time of event, type and severity of the injury, and the outcome and summarizes this information in annual reports submitted to national organizations and individuals charged with ensuring the safety of sports for the participants. [Fig 1.]
- In order to understand how to prevent these events in the future, it is critical that we know how many and how often catastrophic events occur.
- In order to be most *effective*, surveillance systems should strive to *actively capture* the health outcomes as they occur.
- NCCSIR and the Consortium for Catastrophic Injury Monitoring in Sport have developed a national centralized reporting site where anyone can report a catastrophic sport injury or illness: **sportinjuryreport.org**. Anyone – parents, athletes, athletic trainers, coaches, school administrators and others – can report the event and basic information



about what happened at sportinjuryreport.org. However, endorsement of reporting is needed to ensure as many events as possible are captured in such a system.

North Carolina Statistics (Table 1)

- 203,474 high school participants¹
- From 2000-2018, 33 fatal sport-related and 45 non-fatal catastrophic injuries/illnesses captured all sport levels
 - Total 29 events past 3 years and 11 deaths (3 in 2014, 4 in 2015, 2 in 2016, 1 in 2017, and 1 in 2018)
- Fatal events: majority sudden cardiac arrest, TBI, and heat stroke; football, basketball;
- Non-fatal events: spinal cord injury, TBI, and sudden cardiac arrest; football, cheerleading

North Carolina Catastrophic Fatal & Nonfatal Injuries/illnesses, 2000/01-2018/19					
	Fatal	Non-fatal	Traumatic Injury	Exertional/systemic	Total
<i>n</i>	33	45	39	39	78
Sudden Cardiac Arrest	58%	20%	--	72%	36%
Head Injury	15%	24%	41%	--	21%
Spinal Cord Injury	--	38%	44%	--	22%
Heat-related injury	15%	7%	--	21%	10%
High School Sponsored	55%	71%	74%	54%	64%
Collegiate/University	18%	22%	18%	23%	21%
Middle School	15%	2%	8%	8%	8%
Youth League	9%	4%	--	13%	6%
Jul-Aug	36%	20%	13%	41%	27%
Sep-Oct	21%	40%	51%	13%	32%
Nov-Dec	9%	16%	13%	13%	13%
May-Jun	12%	9%	5%	15%	10%
Football	49%	51%	67%	33%	50%
Basketball	24%	9%	3%	28%	15%
Baseball	9%	4%	8%	5%	6%
Cheerleading	--	9%	10%	--	5%
Soccer	6%	7%	3%	10%	6%
Male	91%	89%	92%	87%	90%
Competition/Game	42%	53%	67%	31%	49%
Practice	46%	42%	33%	54%	44%
Conditioning Session	6%	--	--	5%	3%

Data from the National Center For Catastrophic Sport Injury Research (NCCSIR)