



# **FATAL CATASTROPHIC INJURIES AND ILLNESSES IN NC YOUTH ATHLETES**

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**27 January 2020, CFTF Meeting**



# CFTF APPLICATION CO-AUTHORS

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# **SPORT-RELATED CATASTROPHIC INJURY OR ILLNESSES**

**Sports-related conditions that directly result in:**

- 1. Fatality**
  - 2. Permanent disability, such as paraplegia**
  - 3. Life-threatening, with recovery**
- 
- Examples of catastrophic sports injuries and other conditions include spinal cord injury, severe traumatic brain injury, exertional heat stroke, and sudden cardiac arrest**



# NC CASE STUDY

- A male 16 year old high school basketball player **collapsed from sudden cardiac arrest during a scrimmage game at a team camp. An athletic trainer for the facility began CPR and an AED was used to revive the athlete.** EMS transported him to the hospital where he had surgery to implant a defibrillator. A full recovery is expected.
- Prevention Opportunities :
  - **Pre-participation medical evaluation to detect medical conditions**
  - **Training in CPR and Automated External Defibrillator (AED)**
  - **Emergency action plans – written and reviewed annually**
  - **Access to AED**




# THE CONSORTIUM FOR CATASTROPHIC INJURY MONITORING IN SPORT

- **NCCSIR has existed since 1982**
- **Expanded in 2013 to develop a stronger national active surveillance program and improve reporting and monitoring of these catastrophic sports injuries.**
- **A national partnership between UNC-CH, U. of Washington, U. of Connecticut, Boston U., U. of Maryland, U of Colorado, & the Datalys Center, Inc.**
- **Support from national sport organizations (NCAA, NFHS, AFCA) and medical organizations (NATA, AMSSM) and research grants (NOCSAE)**



# HTTPS://WWW.SPORTINJURYREPORT.ORG



[Download Consent Forms](#)

The National Center for Catastrophic Sport Injury Research (NCCSIR) tracks and conducts research on severe sports injuries and illnesses in the United States. Decisions about rule changes and equipment changes are informed by these data.

We monitor, and may investigate, reports of catastrophic sports injuries submitted by the general public. **Anyone can report a catastrophic injury or illness event to us.**

We aim to monitor all of the above events at all level of any sport or physical activity. However, our primary focus is on events occurring in middle school, high school, collegiate, and professional athletes. Additionally, we monitor any sudden cardiac arrest or sudden cardiac death in a student-athlete (even if not directly related to athletics).

To learn more about the NCCSIR and the Consortium click [www.sportinjuryreport.org/partners](http://www.sportinjuryreport.org/partners)

**Catastrophic injuries are defined as:** fatalities, permanent disability injuries, serious injuries (fractured neck or serious head injury) even though the athlete has a full recovery, temporary or transient paralysis (athlete has no movement for a short time, but has a complete recovery), heat stroke due to exercise, sickle-cell trait associated collapse, sudden cardiac arrest/death, commotio cordis, or severe acquired cardiac illness.

[Click Here to Report a Catastrophic Sports Injury](#)

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# NC CHILD FATALITY TASK FORCE ISSUE APPLICATION OBJECTIVE

- **Increased awareness, coordination, and collaboration between agencies and organizations at the state level has considerable potential to assist and inform surveillance and prevention efforts.**



# TARGET POPULATIONS

## Organized and sponsored sport participants

- Collegiate & university
- High school
- Middle school
- Youth sport

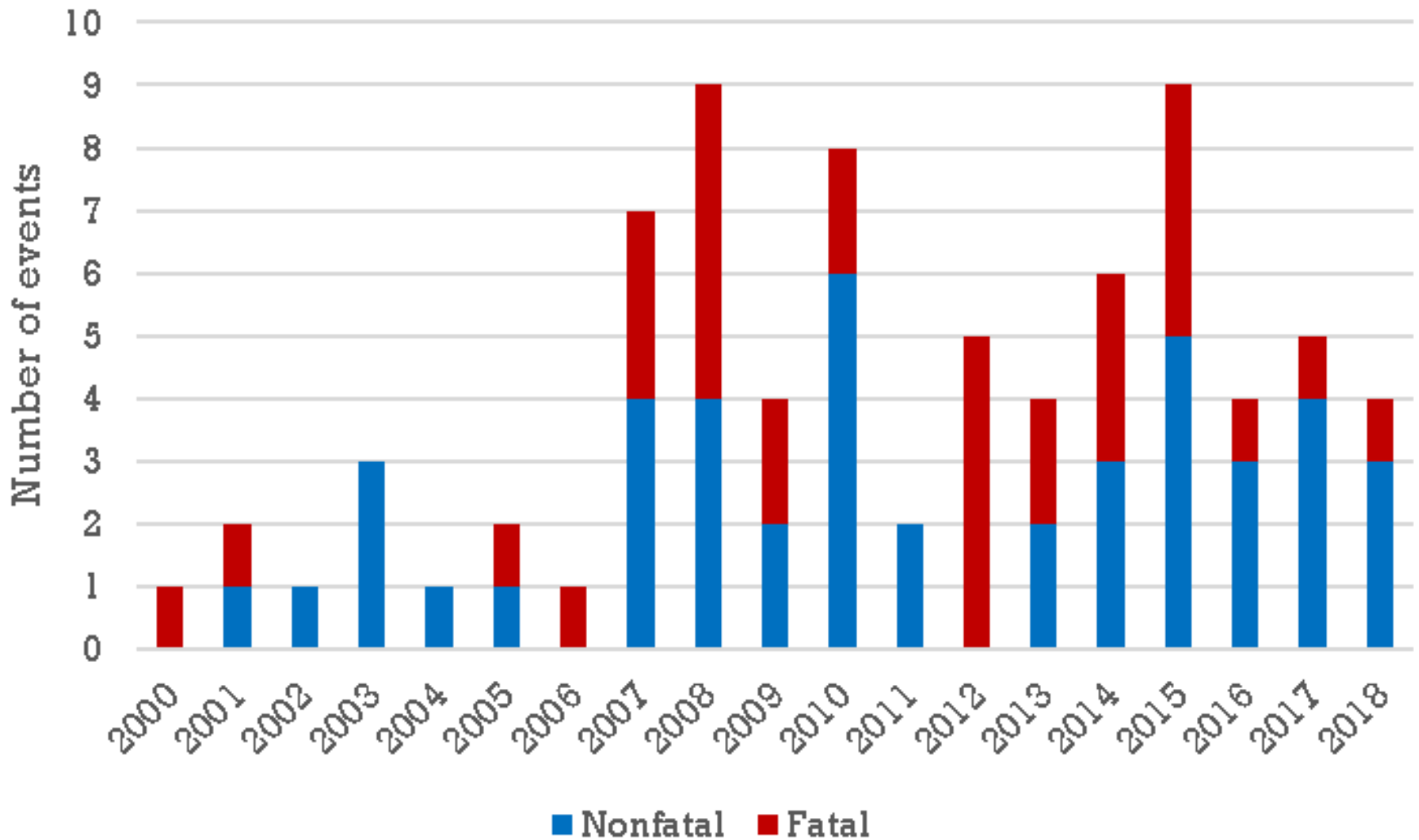


# CATASTROPHIC INJURIES AMONG NC SPORT PARTICIPANTS

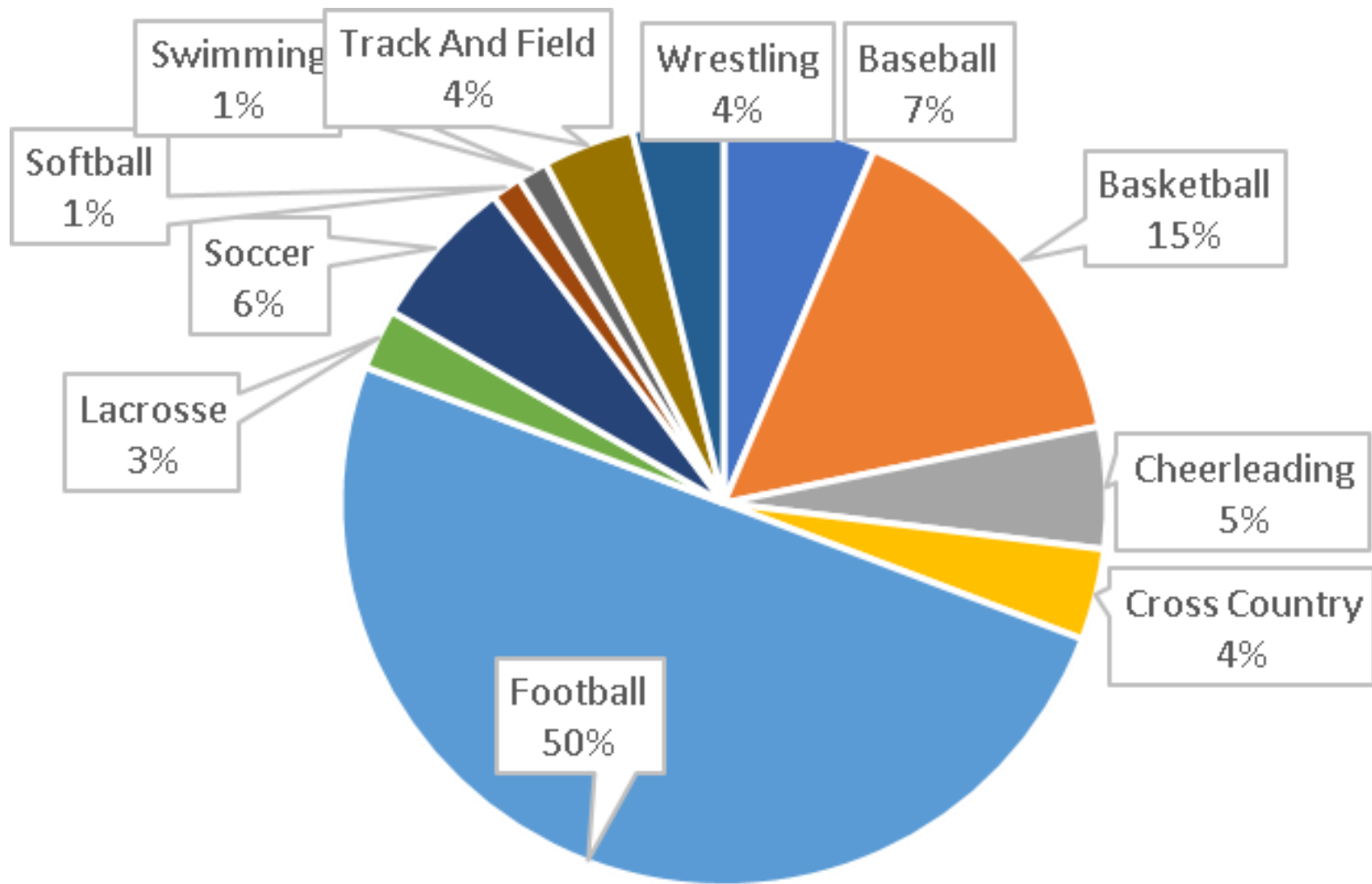
- **198,252 NC high school athletes (2018-19 school year)<sup>1</sup>**
  - **12<sup>th</sup> highest for U.S. high schools**
  - **Unknown number of middle school and youth sport participants**
- **Among NC sport participants from 2000-2018\*:**
  - **33 sport-related deaths**
  - **45 non-fatal catastrophic events**
  - **Past 5 years: 29 events and 11 deaths**
    - **3 in 2014, 4 in 2015, 2 in 2016, and 1 each 2017 and 2018**



# NC CATASTROPHIC EVENTS BY YEAR



# CATASTROPHIC EVENTS BY SPORT

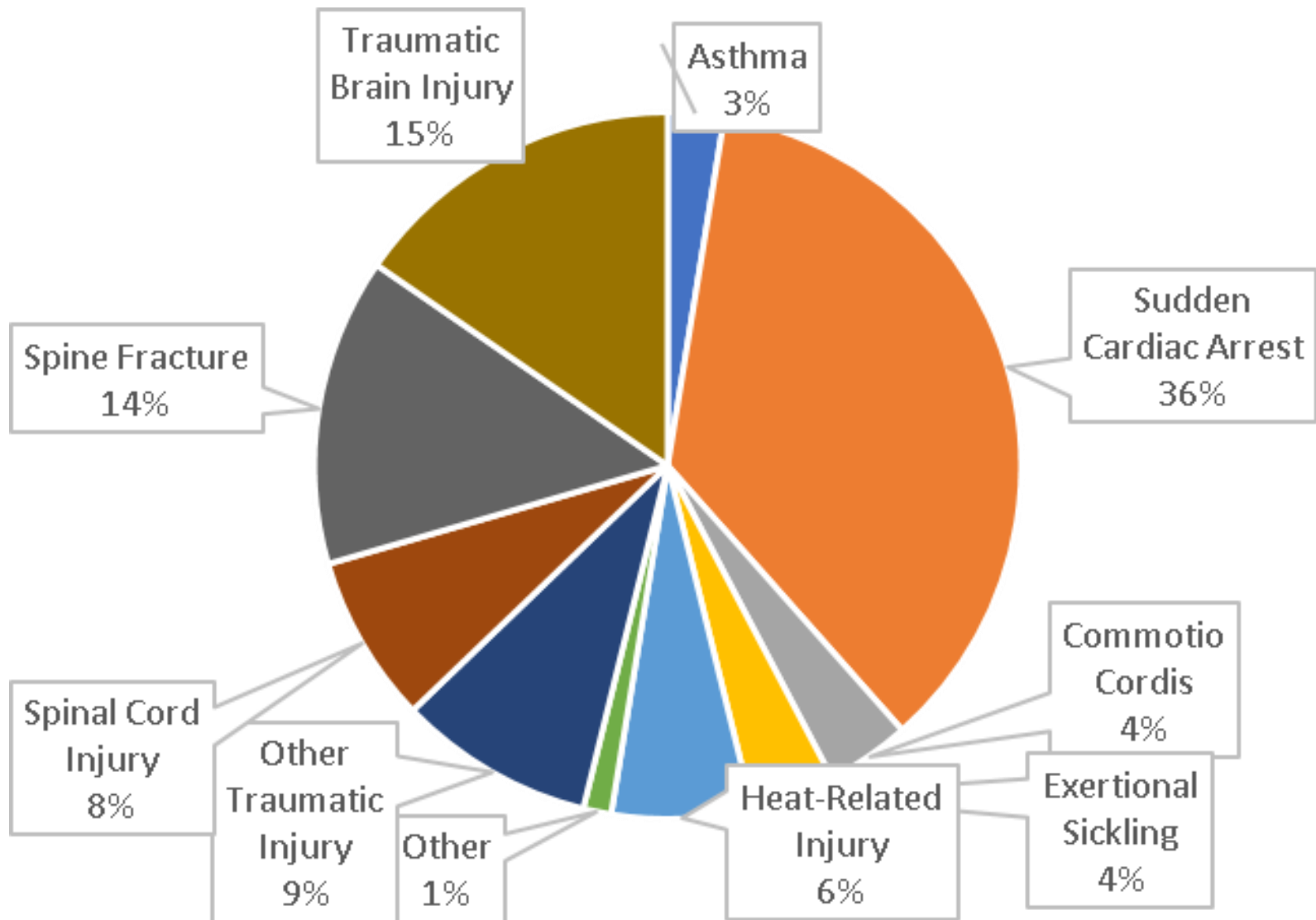


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\*Data from National Center for Catastrophic Sport Injury Research (NCCSIR)



# CATASTROPHIC EVENTS BY TYPE



NCCSIR, CFTF 1/27/2020

\*Data from National Center for Catastrophic Sport Injury Research (NCCSIR)



# US HIGH SCHOOL STATE-LEVEL POLICY ASSESSMENT

- **Korey Stringer Institute 2017 study assessed if state meets 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 <sup>2</sup>**
- **In 2017 North Carolina led the nation in having the most comprehensive health and safety school policies**
  - **79% compliant with ideal being 100% <sup>2</sup>**
  - **In 2019 NC is ranked 3rd with 79% compliance**
  - **<https://ksi.uconn.edu/high-school-state-policies-2/>**



# **CURRENT NC LEGISLATION: GFELLER-WALLER LAW 2011**

- **Evidence-based**
- **For sport and activity, one of the most comprehensive of the laws in US**
  - **Requires student be removed from competition following concussion**
  - **Cannot be returned to competition until cleared by medical professional**
  - **Requires parent and athlete education on concussion**
  - **Only applies to public high schools and middle schools**



# ***This Expert Consensus Statement<sup>3</sup> is an example of the Evidence Base for NC's Current Gfeller-Waller Law***

*Journal of Athletic Training* 2013;48(4):546–553  
doi: 10.4085/1062-6050-48.4.12  
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*consensus statement*

## **The Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs: Best-Practices Recommendations**

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\*National Athletic Trainers' Association; †Korey Stringer Institute; ‡Gatorade Sports Science Institute; §American College of Sports Medicine; ||National Council on Strength and Fitness; ¶American Orthopaedic Society for Sports Medicine; #American Academy of Pediatrics; \*\*National Federation of State High School Associations; ††American Medical Society for Sports Medicine; ‡‡National Interscholastic Athletic Administrators Association; §§National Strength and Conditioning Association; llllAmerican Osteopathic Academy of Sports Medicine; ¶¶American College of



# NC CASE STUDY

- Male 16 year old high school player was injured during the second quarter of the game and died later the same day. **He collapsed on the sideline after being tackled while running the ball. He received a concussion in practice two days before the game and did not have clearance from a physician.** Cause of death was a traumatic brain injury due to second impact syndrome.
- Prevention Opportunities :
  - **Recognize concussion, treat, remove from play**
  - **Return concussed athletes to play only when symptom free and fully healed**
  - **Clearance from medical professionals**
  - **Implement emergency action plan**
  - **Access to advanced medical care onsite**

NCCSIR, CFTF 1/27/2020

Data from National Center for Catastrophic Sport Injury Research (NCCSIR)



# FIRST CFTF ISSUE PRESENTATION IN 2017

- Presented the issue application
- CFTF asked the Injury and Violence Prevention Branch of the NC Division of Public Health to convene a stakeholder group to examine this issue
- A steering committee has been established:
  - National Center for Catastrophic Sport Injury Research
  - Injury Prevention Research Center at UNC
  - Injury and Violence Prevention Branch of the Division of Public Health



# CONVENING A STAKEHOLDER GROUP TO:

- 1. Determine the feasibility of developing a formalized structure for reporting catastrophic events and concussions that occur in schools and youth sports**
- 2. Improve messaging and policy, such as emergency preparedness, for schools and youth sports organizations**
- 3. Promote implementation of evidence-based and -informed prevention strategies**



# GOAL 1: IMPROVE REPORTING

- **Feasibility of reporting by schools and youth sports organizations**
- **State agency support for, and messaging about, current and available reporting web portals for these events**
- **Form a data work group to:**
  - **Utilize other NC data sources to determine the burden of sport-related catastrophic events and concussion**
  - **Explore adding a sport-relatedness data field on medical examiner reports and other data sources**



# GOAL 2: IMPROVE MESSAGING AND POLICY

- **Improving messaging and policy, such as emergency preparedness, for schools and youth sports organizations**
  - **Disseminate best-practice information**
  - **Train personnel in CPR, AED use, and injury prevention**
  - **Develop Emergency Action Plans (EAP)**
  - **Ensure access to AEDs and regular maintenance of AEDs**



# GOAL 3 PROMOTE IMPLEMENTATION

- **Promote implementation of evidence-based and -informed prevention strategies for schools and youth sports organizations**
  - **This is a longer term goal for which initial thought and planning will provide a foundation for a future stakeholder group**



# PLAN FOR ACHIEVING THESE GOALS

- **A formalized and solidified infrastructure in place for collaboration towards these goals**
- **Division of Public Health co-ordinate a series of stakeholder meetings to discuss and refine goals and objectives**
- **First meeting was held Nov 15, 2019**
- **Second meeting will be held Feb 20, 2020**



# STAKEHOLDERS ENGAGED

**Over 30 organizations including:**

- **NC High School Athletic Association**
- **NC Department of Public Instruction**
- **NC Athletic Trainers' Association**
- **NC Medical Society**
- **Brain Injury Association of North Carolina**
- **NC State Board of Education**
- **NC Association of County Commissioners**
- **NC League of Municipalities**
- **NC Safe Kids**



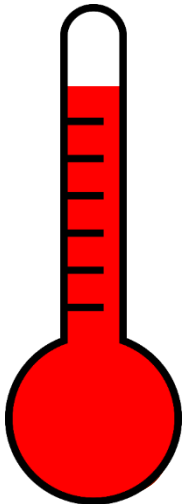
# FIRST STAKEHOLDER MEETING FEEDBACK

- Number and scope of catastrophic injuries that occur
  - % sudden cardiac arrest fatalities
- So many disconnected organizations trying to address the same issues
- There is no go to website toolbox kit for nonschool-based programs
- Resources already available (e.g., NCHSAA EAPs)
- How much more effective we will be if we coordinate and collaborate more!



# NC CASE STUDY

- A male 15 year old high school sophomore football defensive tackle **passed out at the end of football practice**. EMS was called and he was transported to the hospital where he was diagnosed with heat stroke. **His body temperature was 106 when he arrived. He spent 14 hours in the ICU.** A full recovery is expected.
- Prevention Opportunities :
  - **Emergency action plans – written and reviewed annually**
  - **Cool first, then transport**
  - **Advanced medical care**



# THANK YOU

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2. Casa 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.
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