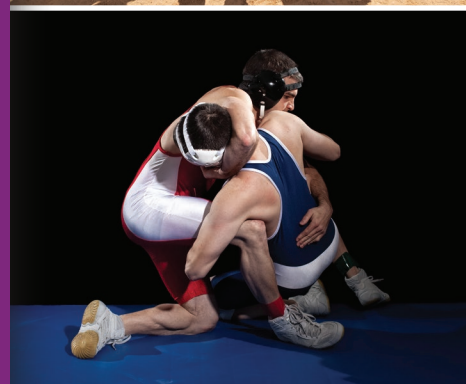


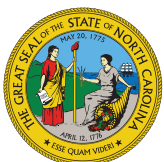


Catastrophic Sports Injury & Illness Prevention Workgroup: Phase I Report

The National Center for Catastrophic Sports Injury Research and the Injury Prevention Research Center at the University of North Carolina, Chapel Hill in collaboration with the North Carolina Division of Public Health's Injury and Violence Prevention Branch.



February 28, 2023



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**
Division of Public Health



INJURY PREVENTION
RESEARCH CENTER



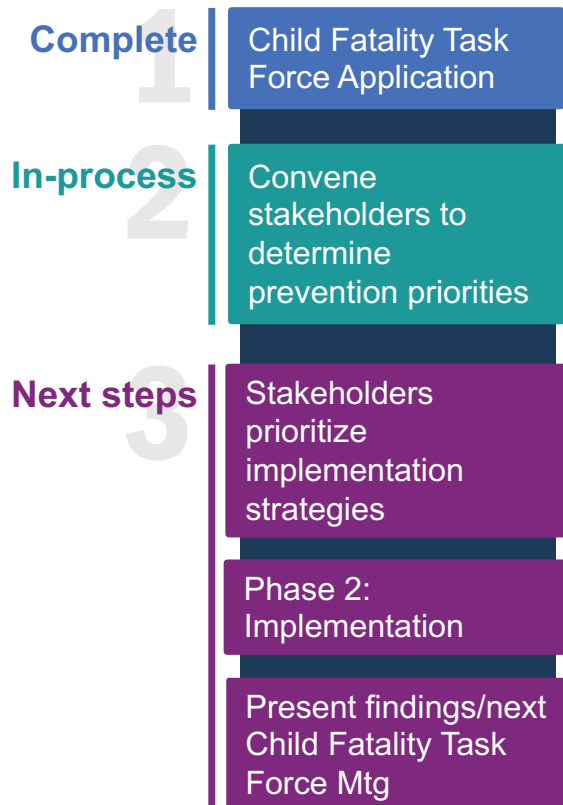
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Catastrophic Sport Injury Prevention

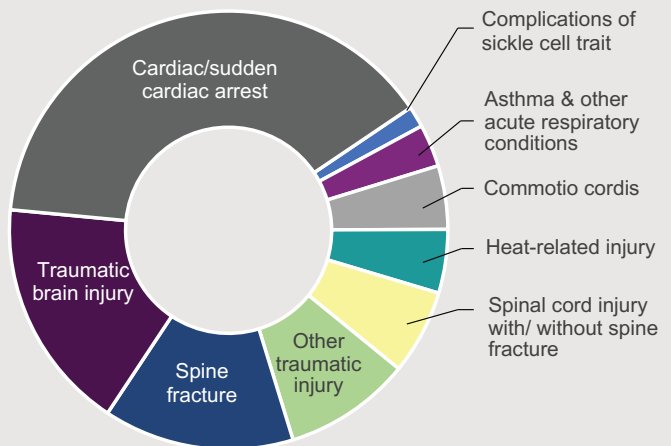
North Carolina
Working Group

PROCESS & PROGRESS



Most Prevalent Catastrophic Injuries in NC

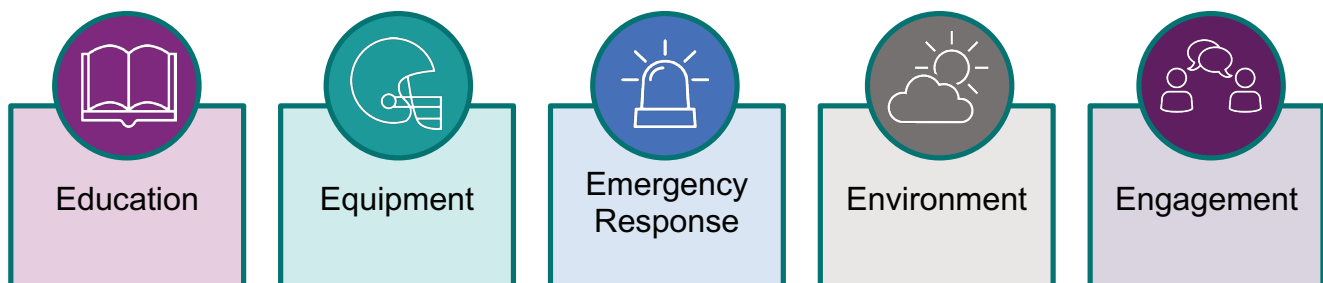
Includes **FOOTBALL** and **CHEER**
(High school, middle school, and youth)



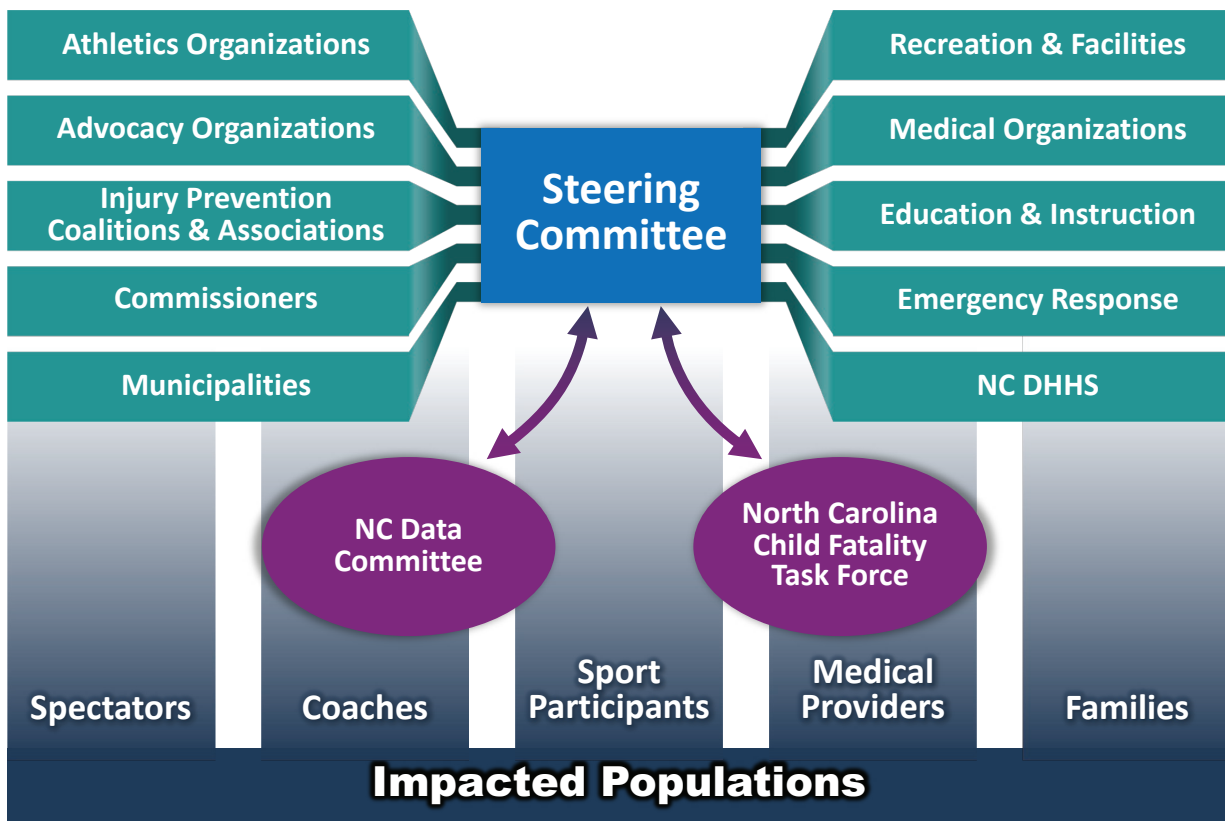
**Events from 2000/01 through 2019/20. Data from the National Center for Catastrophic Sport Injury Research (NCCSIR)*

PRIORITIES

The 5 “E’s”



STAKEHOLDERS



THE 5 “E’s” EXPLAINED



Background

Surveillance and prevention of fatal catastrophic injuries and illnesses in youth sports have become a pressing priority in North Carolina (NC). Despite the benefits of exercise for our children, those who participate in contact sports and other vigorous physical activity are at risk of catastrophic injury or illness. Catastrophic injury or illness are defined as 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.

There are over 7.9 million secondary school athletes who participate in sports as a means of physical activity in the United States each year. In North Carolina, there were 203,474 high school athletes during the 2017-18 school year. Participation in sports has many benefits; however, the risk of injury remains present. Although catastrophic injury in sports is very rare, it is highly burdensome to families and communities that have a child experience a devastating event such a sports-related fatality or catastrophic injury. Additionally, implementation of catastrophic sports injury prevention strategies will simultaneously prevent less severe injuries, which impact many more youth participating in sports and can still have serious or long-term consequences. Ongoing surveillance from the National Center for Catastrophic Sport Injury Research (<https://nccsir.unc.edu>) indicate that, from 2000-2018, there were 33 sport-related deaths among NC sport participants - and 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. In 2008, six deaths were reported. Two of these deaths were related to head trauma and 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 (www.ncleg.gov/Sessions/2011/Bills/House/PDF/H792v4.pdf), 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.

Gathering basic public health information about sudden deaths and catastrophic injuries and conditions in youth sports is vital to the identification of effective policies and prevention strategies, but it also has many challenges. Increased awareness, coordination, and collaboration between various organizations, agencies and associations have considerable potential to assist and inform surveillance and prevention efforts. The development of strategies that prevent these fatal events will have a wider beneficial impact by preventing more frequent non-fatal injuries. Reporting of these events and knowledge of the circumstances surrounding these events are essential to implementing better prevention and management strategies.

In 2017, researchers at the University of North Carolina at Chapel Hill requested the assistance of the North Carolina Child Fatality Task Force (CFTF or “Task Force”) to examine opportunities to improve surveillance and prevention of fatal catastrophic injuries and conditions among NC youth under the age of 18 who participate in organized athletic activities. The Task Force agreed that further investigation of this important issue was needed. The Division of Public Health, Injury & Violence Prevention Branch (IVPB) offered support to the Task Force to facilitate this effort and convene a Catastrophic Sports Injury and Illness Prevention Workgroup to address both fatal and non-fatal injuries and illnesses. The project’s Steering Team developed a mission statement along with a definition and list of included catastrophic sports injuries, illnesses, and conditions with case examples for each to aid the workgroup (Appendix A). A separate group was created that included individuals that oversee a variety of data sources including surveillance, registries, health insurance claims, services, etc. The Data Group is described on page 11 of this report.

Purpose and Goals

The purpose of the workgroup is to increase awareness, coordination, and collaboration among youth sports stakeholders at various agencies and organizations in North Carolina. Focus areas include improving data collection and surveillance; identifying and promoting the implementation of evidence-based prevention strategies; enhancing emergency planning and preparedness; and developing related policies. The workgroup addressed the following goals:

1. Determine a formalized reporting structure for catastrophic sports injuries/illness that occur in schools and organized sports.
2. Improve catastrophic sport injury/illness messaging for schools and organized sports.
3. Ensure organizational policy aligns with current evidence-based practices for schools and organized sports.

Participant Information

Participants in the workgroup had the following **opportunities**:

1. To make a significant difference and be part of a group to effectively address the incidence of catastrophic sports fatality and/or significant injury and illness
2. To participate in an innovative approach to strategic planning, community mobilization and policy development
3. To network with others from diverse communities and perspectives with a shared commitment to preventing injury and illness in youth athletics at the local and state levels.

Participants in the Catastrophic Sports Injury and Illness Prevention Workgroup **committed** to the following:

1. Attendance at four meetings/year for a period of one year for the Assessment phase (Phase I) of the project. Phase II will be an implementation planning phase with more details forthcoming after the assessment phase is completed. Participants are welcome to reassess their commitment once Phase II is better defined
2. Participation between regular meetings on committees or work groups as needed
3. Integration of issues of equity, inclusion, and diversity in all approaches and activities.

CONVENERS

The National Center for Catastrophic Sport Injury Research & The Injury Prevention Research Center at the University of North Carolina at Chapel Hill

RESEARCHERS/EDUCATORS AND CONSULTANTS

Kristen Kucera – National Center for Catastrophic Sport Injury Research, Injury Research Prevention Center, and Department of Exercise and Sport Science, University of North Carolina at Chapel Hill

Johna Register-Mihalik – National Center for Catastrophic Sport Injury Research, Injury Research Prevention Center, and Department of Exercise and Sport Science, University of North Carolina at Chapel Hill

Steve Marshall – Injury Research Prevention Center and Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina at Chapel Hill

Alan Dellapenna, Ingrid Bou-Saada, Janice White, and Sara Smith – NC Division of Public Health, Injury and Violence Prevention Branch

WORKGROUP MEMBERS

Ken Brown – NC High School Athletic Association

Ellen Essick, Burt Jenkins and Les Spell – NC Department of Public Instruction

Scott Pokorny and Michael Brown – NC Division of Mental Health/Developmental Disabilities/Substance Abuse Services

Elle Evans Peterson – NC Parent Teacher Association

Jim Bazluki and Nina Walker – NC Athletic Trainers' Association

Jeff Hinshaw – NC Emergency Medical System-Wake Forest Baptist Hospital

Josh Bloom – Carolina Family Practice & Sports Medicine

Ashley Rodriguez – North Carolina Medical Society

Walker Robinson – North Carolina Pediatric Society

Daniel Pietrzak – Brain Injury Association of NC

Heather White – Boys & Girls Club of NC

Ann Nichols – School Nurse Association of North Carolina

JB Buxton – North Carolina State Board of Education

Matt Carusona and Kris Kloepping – NC Recreation and Park Association, Statewide Athletics Committee

Davis Ezell – NC Office of Emergency Medical Services

Kathy Capps – NC League of Municipalities

Sarah Jacobson – American Heart Association

Meghan Fulton – Independent School Athletic Association

Bob Conder – NC Neuropsychological Society

Lindsay Bailey and Christina Carmichael – State Trauma Advisory Committee (STAC)

Bob Gfeller – Advocate/parent

Sheree Vodicka – NC Alliance of YMCAs

Summer Faircloth – YMCA of the Triangle

John Feasel – The Redwoods Group

Jill Benson – NC College of Emergency Physicians

Lewis Margolis – Safe Kids NC, Advisory Committee

Laurie Leach and Paul Cohen – WakeMed Health & Hospitals

Steven Curfman – Coach, North Carolina FC Youth

Logistics/Process

There are three phases to this work: assessment, implementation planning, and implementation. This report summarizes the results of Phase I – Assessment.

The workgroup convened three meetings: two in person (~3 hours each) and one virtual (~1.5 hours). Researchers, educators, and consultants researched and collated information for the workgroup and provided structure, tools and information needed to facilitate meetings. Some specific elements in the process include:

- Presentation and examination of research related to catastrophic sport injury and illnesses to NC youth and evidence-based practices for prevention
- Contribution of input from workgroup members related to the stated goals; current prevention initiatives in NC; feasibility and impact of specific evidence-based practices for prevention; barriers and solutions; and recommendations for Phase II – Implementation Planning
- Small group work and online surveys to facilitate the review and ranking prioritization of evidence-based practices (EBPs) and other considerations surrounding the environment and context of organized sports
- Large group discussion and sharing of knowledge and information from all perspectives and
- In-person and online discussion to facilitate group approval of recommendations and this final report.

The last meeting of the workgroup was held virtually on February 2, 2021. A facilitator led the large group through a review of the first two meetings. Goals for the present meeting were discussed and agreed upon. Survey results that had been sent to the workgroup were reviewed. Attendees were assigned to small groups to review the evidence-based practices (EBPs) that were prioritized in the previous meeting. The goal of the small group activity was to identify barriers to implementation of EBPs and brainstorm solutions to those barriers. The result of that work is enumerated below.

Best Practices

Over the three meetings the workgroup completed surveys, engaged in small group work, and large group discussions to: review 23 EBPs for catastrophic sports injuries and illnesses prevention; describe the feasibility and impact of the EBPs; rank the EBPs for further group consideration; and examine barriers and brainstorm solutions related to the ranked EBPs.

Through this process, 13 of 23 EBPs (Appendix B) were targeted for small workgroup discussion, including five EBPs rated by most of the small groups as high impact/high feasibility (Table 1) and eight EBPs that were not rated by small groups as high impact/high feasibility. However, a majority of surveyed stakeholders indicated these EBPs should be considered. Ten EBPs were not prioritized at this time (Table 2).

TABLE 1: SUMMARY OF BARRIERS AND SOLUTIONS FOR HIGH IMPACT/HIGH FEASIBILITY EBPS.

ESTABLISH A VENUE SPECIFIC EMERGENCY ACTION PLAN (EMERGENCY ACTION PLAN [EAP] 1)

- **Barriers:** Having a venue-specific EAP is high-impact, and while challenging, should be feasible. Making it venue specific is one of the challenges. Leagues use many different fields — is the league or the owner of the field responsible for the EAP?
- **Solutions:** Develop EAP templates that may be used by any school or sport organization. Post the EAP at the site (field/court). Set up structure to address time — make it part of administrative/team meeting and accountability — checklist/audit. Schools can provide templates, model, and share with community-based organizations. Ensure organization understands the value for the safety of the children.

HAVE AN EAP IN PLACE FOR ATHLETES WITH HEAD OR NECK INJURIES THAT IS IN ACCORDANCE WITH STATE LAWS (HNI1)

- **Barriers:** Accountability and enforcement--time and personnel to ensure that this is done. What is the enforcement if it is not done? Elementary level, private schools, rec leagues are not subject to Gfeller Waller state law. Parents/athletes disclosing injury and ensuring follow up after athlete is injured.
- **Solutions:** Develop EAP templates that may be used by any school or organized league. Have a clear process, documentation, easy to access, and fewer choices. Private schools and the North Carolina Independent Schools Athletic Association (NCISAA) voluntarily follow the G-W law, rec leagues can too. Does not need legislative mandate. Incorporate in the overall EAP. See resources below for general EAP templates.

REVIEW THE EMERGENCY ACTION PLAN AT THE START OF EACH NEW SPORTING SEASON (EAP5)

- **Barriers:** Accountability and enforcement--time and personnel to ensure that this is done. What is the enforcement if it is not done? Recreational leagues--There is concern over “review” versus “update” the EAP. Review possible but update every year less so.
- **Solutions:** Post the EAP at the site (field/court). Set up structure to address time — make it part of administrative/team meeting and accountability — checklist/audit. Make it part of coach annual education. Schools can provide templates, model, and share with community-based organizations.

EDUCATE COACHES TO RECOGNIZE THE SIGNS/SYMPTOMS OF POTENTIAL CATASTROPHIC INJURY OR SUDDEN DEATH (EAP4)

- **Barriers:** Accountability and enforcement--time and personnel to ensure that this is done. What is the enforcement if it is not done? Training coaches is challenging — particularly volunteers.
- **Solutions:** Make it part of coach annual education but use free resources/online trainings. If all associations overseeing athletics require it, the training will get done. Laminated card with bulleted points provided to coaches and included in EAP.

KEY: The light blue background indicates high impact/high feasibility.

The light purple indicates high impact/low feasibility.

EDUCATE COACHES, OFFICIALS, AND PARENTS ABOUT HEAD & NECK INJURY POLICIES ON A PERIODIC BASIS (HNI2)

- **Barriers:** Providing educational materials is not a guarantee they will use it. Schools and rec leagues are very different and cannot be handled the same way. Coaches (rec leagues) may not want responsibility. Parents not understanding is challenging.
- **Solutions:** Set up structure to address time — make it part of administrative/team meeting and accountability — checklist/audit. Make it part of coach annual education but use free resources/online trainings. **Change wording from “periodic” to a more specific time frame like “at the start of each new sporting season”.

ENCOURAGE THAT PARENT OR GUARDIAN DISCLOSE HEALTH CONDITIONS TO COACHES (PLTC [POTENTIALLY LIFE-THREATENING CONDITIONS]1)

- **Barriers:** Mistrust, concern over privacy and confidentiality of the information. Challenging for volunteer coaches — differences between school and recreational sport. Lack of parent awareness of potential consequences of some medical conditions like exertional sickling, allergies, etc.
- **Solutions:** Make it part of sign-up initial process and educate parents and coaches on importance and how to keep confidential. Have a card for every child that includes medical conditions, contact information for parent/caregiver, and if applicable permission to treat if the parent is not there. Provide parents a list of critical medical conditions to disclose with brief information about why important and needed and potential consequences.

AN AED (AUTOMATIC EXTERNAL DEFIBRILLATOR) SHOULD BE ONSITE AND AVAILABLE (SCA [SUDDEN CARDIAC ARREST]2)

- **Barriers:** Cost, maintenance, and accountability are challenging. Who provides it: league or owner of field/venue? Location challenges — locked office, some outdoor locations can be far from the office. Available for practice and not just tournaments/competitions. Training in AED use may be a barrier.
- **Solutions:** Grants or subsidize with local taxes. Charge nominal fee to participants to support. Require CPR/AED training for coaches to prepare them for emergency situations. Large tournaments require the host/venue to provide the AED. However, AEDs are simple to use, and no training is required.

HAVE A HEAT-ACCLIMATIZATION PROGRAM IN PLACE FOR PRE-SEASON TRAINING WHEN HOT CONDITIONS ARE PRESENT (EHS [EXERTIONAL HEAT STROKE]1)

- **Barriers:** Accountability and enforcement--time and personnel to ensure that this is done. What is the enforcement if it is not done? Resistance, practicalities, and cultural shift from “The way it has always been done.”
- **Solutions:** Provide education that includes situational case studies based on “right/wrong” decisions made similar to lifeguard training. Have uniform policy which is always followed — mentor from other organizations who already do this. Include cooling procedures to prevent death from heat stroke (cooling tub, tarp with ice, ice bags).

KEY: The light blue background indicates high impact/high feasibility.

The light purple indicates high impact/low feasibility.

ASSESS ENVIRONMENTAL CONDITIONS BEFORE PRACTICE AND ADJUST LOCATION OR TIME OF PRACTICE ACCORDINGLY (EHS3)

- **Barriers:** Canceling more straightforward than rescheduling. Time and availability of alternate spaces and getting to those spaces. Schools and rec leagues have similar challenges regarding times and alternate spaces. Rescheduling practices versus games is different.
- **Solutions:** Use phone apps to assist with checking conditions. Some conditions may not require canceling or moving, just more water breaks, shorter periods of play, etc. Designate a person to check weather and conditions for each team, league, etc. Educate parents.

CREATE AND ENFORCE A COMPREHENSIVE LIGHTNING SAFETY POLICY (L [LIGHTNING]1)

- **Barriers:** Accountability and enforcement — time and personnel to ensure that this is done. What is the enforcement if it is not done? There is not always a safe place available.
- **Solutions:** Refer to model policies and make policy part of infrastructure. Should be clear what is used to monitor conditions and who makes ultimate decisions. Use joint agreements for fields. Plan for how to communicate (via texts).

STOP PRACTICE OR COMPETITION AND FIND A SAFE LOCATION IMMEDIATELY AFTER HEARING THUNDER OR SEEING LIGHTNING (L2)

- **Barriers:** How to monitor, measure, and enforce--who makes the decision? What is the enforcement if it is not done? Some fields have no structure as a “safe place”.
- **Solutions:** Designate a person who makes the decision in each setting. Post the policy and examples of and location of safe structure at venue (e.g., enclosed building, vehicles). Designate individuals who can help organizations with implementation of policy.

DISCLOSE THE LOCATION OF THE LIGHTNING SAFE STRUCTURE IN THE VENUE SPECIFIC EAP (L3)

- **Barriers:** Accountability and enforcement--time and personnel to ensure that this is done. What is the enforcement if it is not done? There is not always a safe place available.
- **Solutions:** Designate a person who makes the decision in each setting. Post the policy and examples of and location of safe structure at venue (e.g., enclosed building, vehicles). Designate individuals who can help organizations with implementation of policy.

COACHES ARE NOT PERMITTED TO RETURN AN ATHLETE TO PLAY IF THERE IS A SUSPECTED HEAD OR NECK INJURY (HNI5)

- **Barriers:** Resistance from coaches. Parents cannot return athlete to play either. Challenging for rec leagues — paying for physician clearance, following up with athlete.
- **Solutions:** Clear policy, clear rules, part of initial sign up and educational process for coaches and parents. Use free apps with signs of concussion. Provide education that includes situational case studies based on “right/wrong” decisions made similar to lifeguard training.

Note: language of the listed barriers and solutions is kept as close as possible to the original participant comments; EAP=emergency actional plan; CPR= cardiopulmonary resuscitation; AED=automated external defibrillator

KEY: The light blue background indicates high impact/high feasibility.

The light purple indicates high impact/low feasibility.

TABLE 2: THE FOLLOWING 10 EBPS WERE DISCUSSED BUT NOT PRIORITIZED BY THE GROUP FOR CONSIDERATION AT THIS TIME. NOTE: The light purple background indicates high impact/low feasibility.

EAP2 ENSURE THAT THERE IS ACCESS TO EMERGENCY MEDICAL EQUIPMENT AT EACH VENUE WHERE SPORTING EVENTS WILL BE HELD

EAP3 RECOMMEND TRAINING FOR MEMBERS IN FIRST-AID, CPR, AND AED FOR COACHES AND OFFICIALS

SCA1 ATHLETES SHOULD UNDERGO CARDIO-VASCULAR SCREENING BEFORE BEGINNING SPORT

SCA3 EDUCATE COACHES AND OFFICIALS TWICE YEARLY ON THE STEPS TO MANAGE SCA

HNI3 ENSURE THAT PROTECTIVE EQUIPMENT IS USED PROPERLY AND FITS CORRECTLY

HNI4 MANAGEMENT OF ANY ATHLETE WITH A HEAD OR NECK INJURY SHOULD BE DIRECTED BY A MEDICAL PROFESSIONAL

HNI6 HAVE A RETURN TO PLAY PLAN IN PLACE THAT MUST BE COMPLETED PRIOR TO RETURNING FULLY

EHS2 EDUCATE COACHES, PARENTS, AND OFFICIALS ON THE POLICY ON A PERIODIC BASIS

EHS4 HAVE A RETURN TO PLAY PLAN IN PLACE THAT MUST BE COMPLETED PRIOR TO RETURNING FULLY

EHS5 COOLING TUB WITHIN 10 MINUTES

KEY: The light blue background indicates high impact/high feasibility.

The light purple indicates high impact/low feasibility.

General/global barriers and solutions that applied to many of the EBPs:

- Schools and recreation leagues are very different, and one size does not fit all
 - **Barrier:** Limited access to individuals with medical expertise within recreational organizations.
 - **Solution:** Securing additional funding to increase safety often difficult but necessary. A statewide commitment to these initiatives at various levels would be helpful.
- Enforcement and monitoring
 - **Barrier:** Time, funding, and personnel to ensure that this is done.
 - **Solutions:**
 - Toolkit with free sources for each best practice may make this much more feasible
 - Acknowledgment from coaches and officials that they've seen/reviewed the EAP. Create apps or other ways for them to indicate they have done it.
- Bi-lingual challenges
 - **Barrier:** Translation of documents/forms and other interactions
 - **Solution:** YMCA has all paperwork on webpage and a place to translate them for participants; access to staff translators – not many but there are some.
- A time for people (coaches, officials, etc.) to gather and review/practice EAPs, etc.
 - **Barrier:** Need multiple ways for information to be shared as not everyone has access to internet or smartphone. Paper mailed to home, meeting, online trainings, virtual, etc.
 - **Solutions:**
 - Annual coaches meeting: Review safety practices, EAPs, privacy of medical information.
 - Consider team huddles or medical time outs at the beginning of competitions to review EAPs and procedures.
- Size and spread of the playing fields over geographic area
 - **Barrier:** Makes it difficult for many of the EBPs (venue specific EAP, AED location, monitoring weather, lightning safe structures).
 - **Solution:** None proposed.
- Education for coaches, officials, parents, athletes, and others
 - **Barrier:** How to keep information confidential (particularly for volunteers).
 - **Solution:** Provide education that would include case studies based on decisions made (e.g., athlete dies because they were returned inappropriately AND/OR someone lives because the right procedure was followed).
- Engaging athletes in the process
 - **Solutions:**
 - Monitor and recognize unsafe conditions (field conditions, weather conditions, situations, etc.).
 - Getting ice for heat-related tarp or cooling tubs.
 - Training in recognition of catastrophic signs/symptoms in themselves or others.
 - Multiple ways for information to be shared as not everyone has access to internet or smartphone. Paper mailed to home, meeting, online trainings, virtual, etc.
 - Case studies based on decisions – show both negative and positive outcomes (see comments above).

Emphasis on Context & Environment

It became clear through this assessment phase that different types of organized sports, communities, and segments of the population require different strategies. The organizing body/entity and physical environment are important considerations for feasibility and impact of EBPs. Organized school sports are different from competitive youth leagues, which are different from recreational sports leagues. Among school-based sports, differences exist between public versus private, large versus small programs, and high school versus middle school levels. Furthermore, some catastrophic injuries and illnesses are more relevant for different types of sports, environments, and levels. For example, a majority of catastrophic traumatic brain and spinal cord injuries occur during football. Intervention frameworks ideally should consider these different contexts, environments, levels, and sports. Expanding traditional frameworks (e.g., RE-AIM: Reach Effectiveness, Adoption, Implementation, and Maintenance) to include the sports context (e.g., RE-AIM Sports Setting Matrix) can improve the delivery of interventions.¹

Assessment and implementation of EBPs for catastrophic injury and illness prevention makes it clear that one size does not fit all. Being mindful of state and local conditions allows for a more comprehensive and equitable approach to prevention. Navigating COVID-19-related restrictions may have increased accessibility of EBPs for school and sport organizations. For example, many states policies limit player contact during football practices to reduce head impacts and concussion risk. COVID-19-related restrictions on practice-related contact likely encouraged more schools to adopt this EBP, which may shift acceptability post-pandemic.

¹ Finch CF, Donaldson A. A sports setting matrix for understanding the implementation context for community sport. *Br J Sports Med.* 2010;44(13):973-978. doi:10.1136/bjsm.2008.056069

Sport Injury Data Group Members

As part of the Assessment Phase, a separate group was created that included individuals that oversee a variety of data sources including surveillance, registries, health insurance claims, services, etc. Data from this group will help establish the burden of catastrophic injuries and illnesses in NC youth participating in organized sport activities. This data will also help determine whether implemented prevention efforts have had an impact. The Data Group consisted of the individuals and organizations listed below.

RESEARCHERS/EDUCATORS AND CONSULTANTS

Alan Dellapenna, Ingrid Bou-Saada, Janice White, Dana Dandeneau and Scott Proescholdbell – NC Division of Public Health, Injury & Violence Prevention Branch

Kristen Kucera and Courtney Haley – National Center for Catastrophic Sport Injury Research

GROUP MEMBERS

Scott Pokorny and Abha Varma – NC Division of Mental Health/Developmental Disabilities/Substance Abuse Services

Anna Waller – Carolina Center for Health Informatics

Katie Harmon – UNC Highway Safety Research Center

Sharon Schiro – NC Office of EMS Trauma Registry

Alison Miller – Office of the NC State Medical Examiner

Robert Lee – NC Center for Health Statistics

Kenneth Bausell and Michelle Merritt – NC Division of Health Benefits

The first meeting of this Data Group occurred on June 29, 2019. Fourteen participants from the above organizations participated. Each person described the data source on which they worked. Advantages and challenges of each data source for catastrophic sports injury and illness surveillance and data collection were discussed. The complex issues related to the transition from ICD9-CM to ICD10-CM classification and changes were also discussed. Members were asked to bring to the second meeting ideas about how further collaboration may improve data collection and garner more usable information regarding catastrophic sports injuries and illnesses.

The second meeting occurred on September 18, 2019. Twelve members of the group attended. Discussion included specific NC databases and their capture of sports injury and illness data, coding mechanism of injury, and data latency. Group members were asked to think about how data sources may crosswalk information in a useful way.

No further meetings were held. When the COVID-19 pandemic struck, epidemiologists and data managers were recruited to assist the state with gathering accurate information for the pandemic and were not available to continue the work of this Data Group. We hope to include the Data Group in Phase II – Implementation Planning.

Recommendations

The following recommendations are provided based on the collective work of Phase I – Assessment:

1. Identify others who may be good additions for Phase II - Implementation Planning
2. Reconvene the Data Group to determine best ways to improve data use for catastrophic sports injuries and illnesses
3. Engage influencers and champions for these EBPs to engage local communities. This will be discussed further in Phase II - Implementation Planning
4. Develop a dissemination plan for the Infographic developed in Phase I
5. Develop a toolkit to assist schools and leagues with templates for forms
6. Develop a virtual place to house resources and materials developed during these stakeholder meetings.

Existing Resources

Numerous resources exist that can assist with the implementation of these recommendations.

EAP templates

- CDC: www.cdc.gov/niosh/docs/2004-101/emrgact/emrgact1.html
- KSI: <https://ksi.uconn.edu/wp-content/uploads/sites/1222/2015/03/Sample-EAP1.pdf>
- NCHSAA:
 - www.nchsaa.org/sites/default/files/attachments/gen-guide-develop-eap.pdf
 - Go to link and scroll down to “For Schools”: www.nchsaa.org/health-and-safety

Concussion Policies and forms

- NCHSAA: www.nchsaa.org/parents-students/health-safety/concussion-awareness
- DPI: <https://ncschoolpsychology.med.unc.edu/index.php/nctbi/concussion-resources/>

Pre-game safety check

- NCHSAA: www.nchsaa.org/sites/default/files/attachments/NCHSAA_Instructions_For_Pre-game_EAP_Review_Report_.pdf

Next Steps

With Phase I – Assessment Phase complete, we will move on to Phase II – Implementation Planning Phase. Each member of the workgroup will be asked if they would like to participate in the Implementation Planning Phase. Phase I participants were asked about their organization's implementation of the 23 EBPs considered. Over 50% of respondents indicated they were already implementing 20 of the 23 EBPs (Appendix C).

List of Appendices

- **Appendix A:** Definitions, Mission, and Goals
- **Appendix B:** All 23 Evidence Based Practice (EBP) Recommendations for Prevention of Catastrophic Sport Injury or Illness in alpha order
- **Appendix C:** Workgroup members organization and individual implementation intentions for 23 evidence-based practices

APPENDIX A. DEFINITIONS, MISSION, AND GOALS

Definition of Catastrophic Injury and Conditions: Sports-related injuries and conditions that directly result in a fatality, a permanent disability, such as paraplegia, or is life-threatening. Examples of catastrophic sports injuries and conditions resulting from illness or environmental factors are listed below.

INJURIES

Traumatic Brain Injury
Spinal Injury
Spinal Cord Injury
Comotio Cordis
Internal Organ Injury

ENVIRONMENTAL CONDITIONS

Exertional Heat Stroke
Lightning Strike

ILLNESSES

Sudden Cardiac Arrest
Asthma
Exertional Sickling
Hyponatremia
Rhabdomyolysis
Anaphylaxis

Mission Statement: The Catastrophic Sports Injury Stakeholder Group (CSISG) will increase awareness, coordination, and collaboration among stakeholders at various agencies, organizations, and associations in North Carolina. Focus areas will include data collection and surveillance; promoting the implementation of evidence-based and -informed prevention strategies; policy development; and emergency planning and preparedness.

Goals: The work group's goal is to prevent catastrophic sports injuries and conditions among school-aged children and youth by:

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

APPENDIX B. EVIDENCE BASED PRACTICE (EBP) RECOMMENDATIONS FOR PREVENTION OF CATASTROPHIC SPORT INJURY OR ILLNESS

EBP Recommendation - Listed in order of EBP		Average	
		Impact X-axis (RANGE 1-12)	Feasibility Y-axis (RANGE 1-10)
EAP 1	Establish a venue specific EAP	7.5	7.5
EAP 2	Ensure that there is access to emergency medical equipment at each venue where sporting events will be held	7.5	3.5
EAP 3	Recommend training for members in First-Aid, CPR, and AED for coaches and officials	7.5	7.5
EAP 4	Educate coaches to recognize the signs of symptoms of potential catastrophic injury or sudden death	7	4
EAP 5	Review the EAP at the start of each new sporting season	8.5	9
SCA 1	Athletes should undergo cardio-vascular screening before beginning sport	7.5	2.5
SCA 2	An AED should be onsite and available for use within a short period following SCA onset	9.5	3.5
SCA 3	Educate coaches and officials twice yearly on the steps to manage SCA	7	5
HNI 1	Have an EAP in place for athletes with head or neck injuries that is in accordance with state laws	9.5	7.5
HNI 2	Educate coaches, officials and parents about the policy on a periodic basis	10.5	7
HNI 3	Ensure that protective equipment is used properly and fits correctly	8.5	2
HNI 4	Management of any athlete with a head or neck injury should be directed by a medical professional	11	2
HNI 5	Coaches are not permitted to return an athlete to play if there is a suspected head or neck injury	10.5	7
HNI 6	Have a return to play plan in place that must be completed prior to returning fully	9.5	4.5
EHS 1	Have a heat-acclimatization program in place for pre-season training when hot conditions are present	7	4.5
EHS 2	Educate coaches, parents, and officials on the policy on a periodic basis	5.5	5.5
EHS 3	Assess environmental conditions before practice and adjust location or time of practice accordingly ¹	7	6
EHS 4	Have a return to play plan in place that must be completed prior to returning fully	10	5
EHS 5	Cooling tub within 10 minutes	9	4
PLTC 1	Encourage that parent or guardian disclose health conditions to coaches	9	5
L 1	Create and enforce a comprehensive lightning safety policy	8	7
L 2	Stop practice or competition and find a safe location immediately after hearing thunder or seeing lightning	10	7
L 3	Disclose the location of the safe structure in the venue specific EAP	8	6

Average X (Impact) and Y (Feasibility) axis coordinates across 4 groups for each of the 23 EBP recommendations: colored shading rated by a majority of the groups (at least 3 groups) – **The light blue back-ground indicates high impact/high feasibility and light purple indicates high impact/low feasibility.**

Master list of 23 recurring recommendations across both youth and secondary school sports derived from the following 4 consensus and position statements on evidence-based best practice (EBP) recommendations for preventing sudden death in sport:

- Casa D, Guskiewicz K, Anderson S, et al. National Athletic Trainers' Association position statement: preventing sudden death in sports. *J. Athl. Train.* 01 2012;47(1):96-118. <https://tinyurl.com/y5rmec5r>
- Casa D, Almquist J, Anderson S, et al. The inter-association task force for preventing sudden death in secondary school athletics programs: best-practices recommendations. *J. Athl. Train.* Jul-Aug 2013;48(4):546-553. <https://tinyurl.com/yxegjh4a>
- Adams W, Scarneo S, Casa D. State Level Implementation of Health and Safety Policies to Prevent Sudden Death and Catastrophic Injuries within Secondary School Athletics. *Orthopedic Journal of Sports Medicine.* 2017;5(9):1-8. <https://tinyurl.com/y4bcw3vj>
- Huggins RA, Scarneo SE, Casa DJ, et al. The Inter-Association Task Force Document on Emergency Health and Safety: Best-Practice Recommendations for Youth Sports Leagues. *J. Athl. Train.* 2017;52(4):384-400. <https://tinyurl.com/y5bl87m6>

APPENDIX C. WORKGROUP MEMBERS ORGANIZATION AND INDIVIDUAL IMPLEMENTATION INTENTIONS FOR 23 EVIDENCE-BASED PRACTICES



NC Stakeholder Group, February 25, 2021



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