Practice and Game Day Ready: Tools Every Athletic Leader Needs to Save Lives and Prevent Tragedy

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NIAAA

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Speaker Disclosures

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- Primary Investigator on research grants from NFHS Foundation and NATA
- Co-investigator on NIH grant examining Implementation of NCAA SCT Testing Policy

- Dr. Kucera directs National Center for Catastrophic Sport Injury Research (NCCSIR) which is funded through:
- Contracts with NCAA and NFHS
- Research donations from AFCA, AMSSM, NATA, NOCSAE

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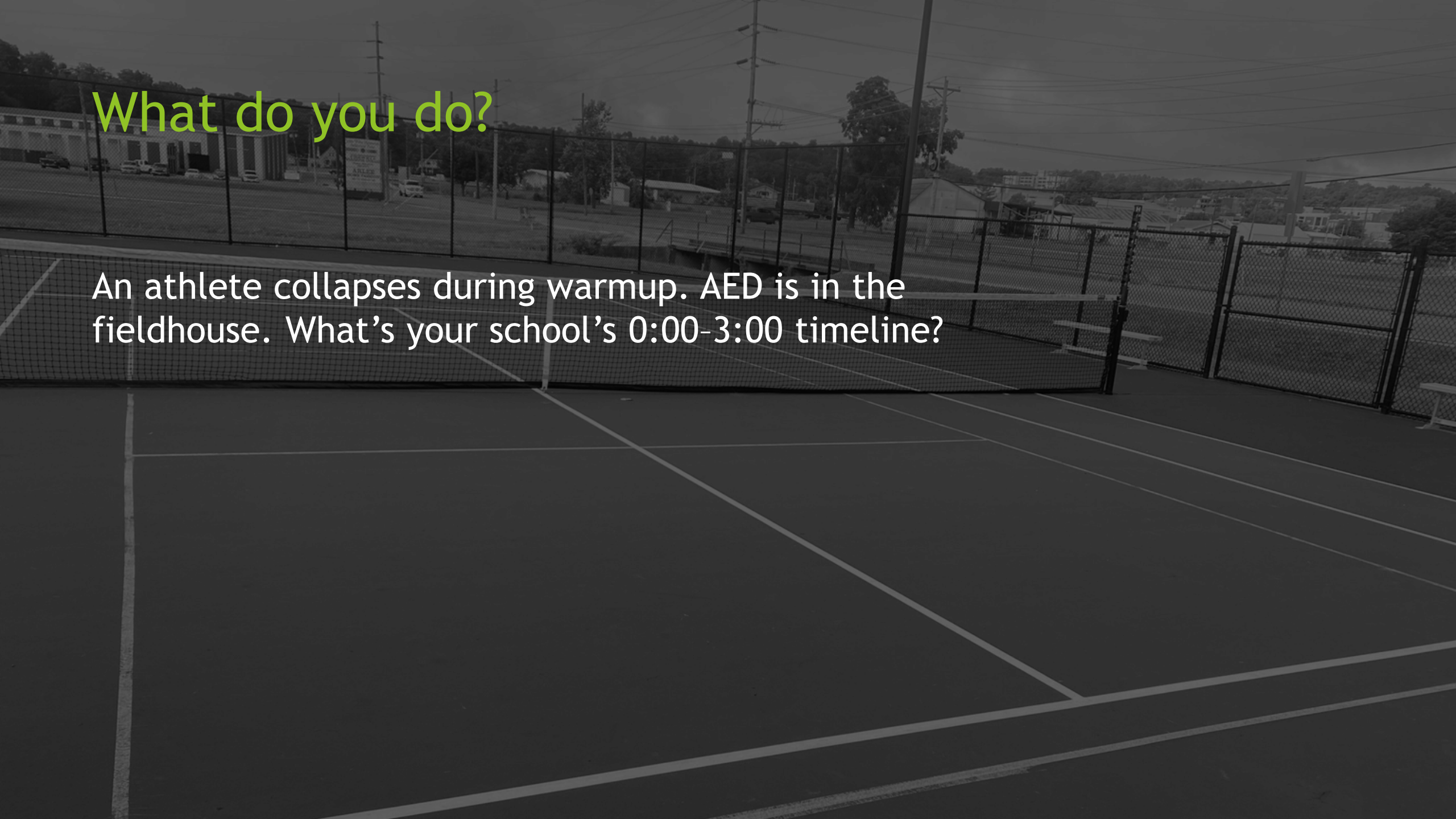
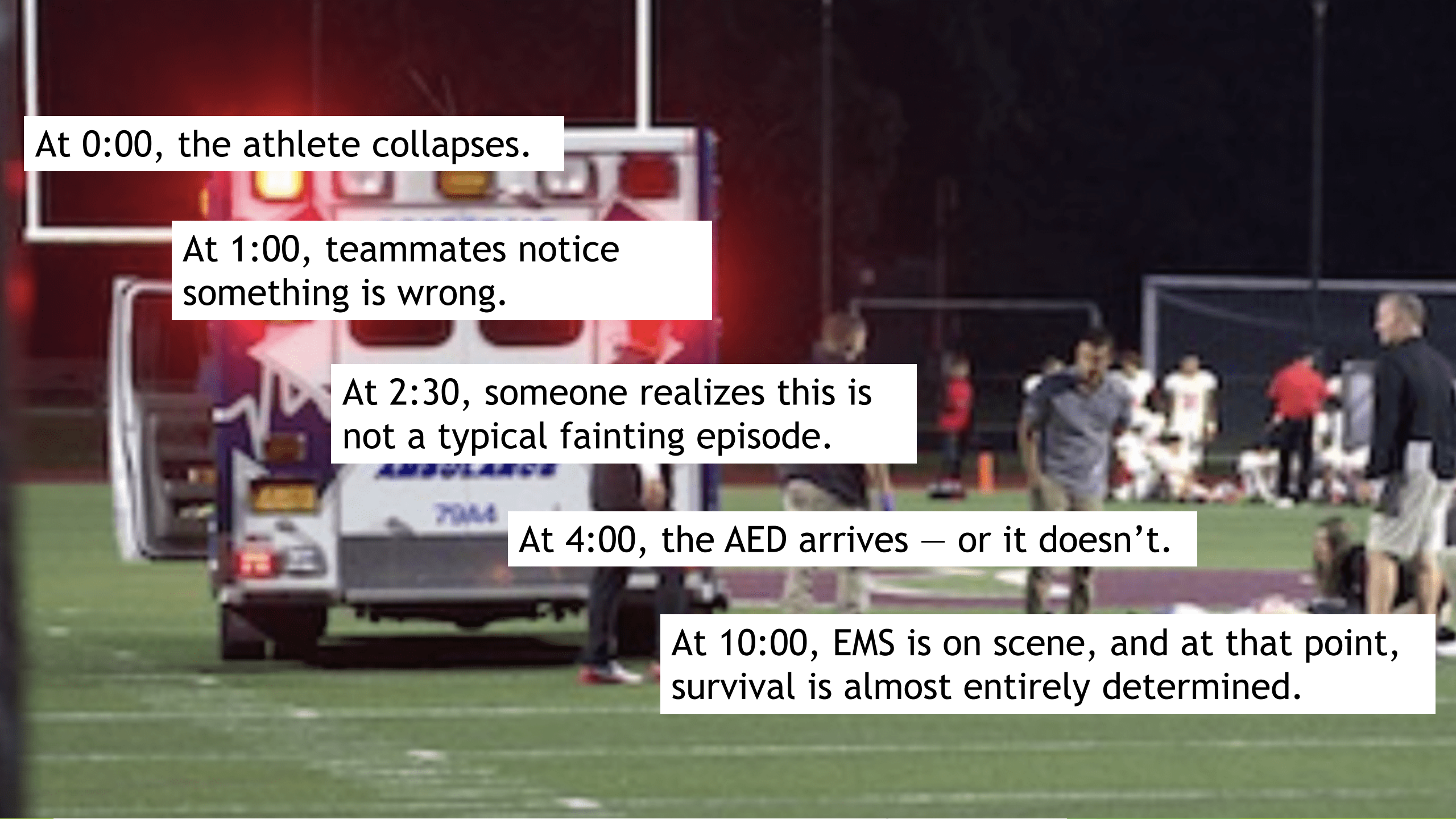
- Primary Investigator on research grants from NFHS Foundation, Mayo Clinic

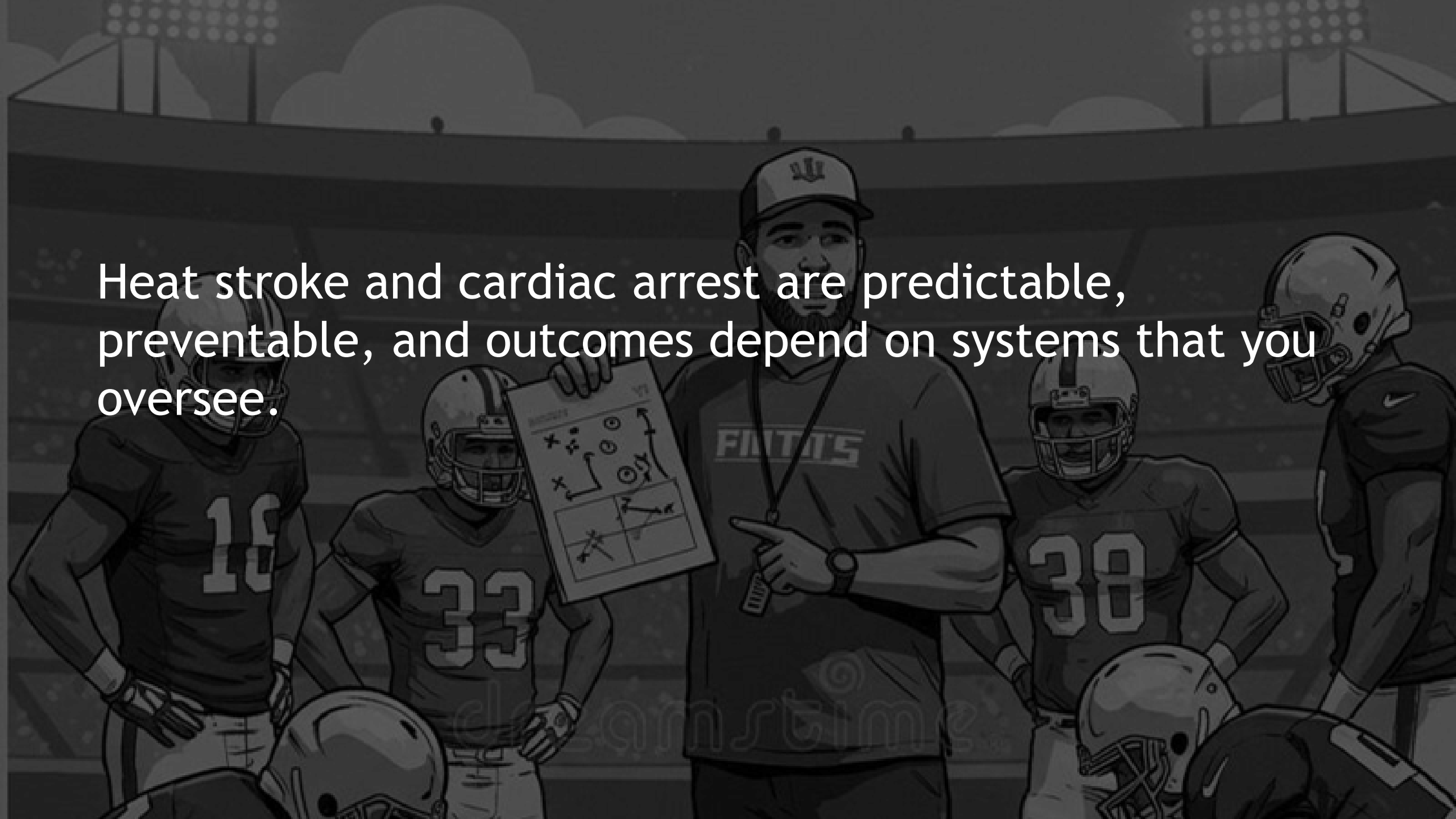
These disclosures are provided in accordance with U.S. Department of Health and Human Services Rule 42 CFR Part 50 and 45 CFR Part 94 (U.S. Federal Register Vol.76 No. 165)



What do you do?

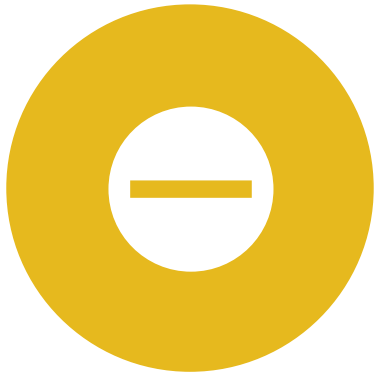
An athlete collapses during warmup. AED is in the fieldhouse. What’s your school’s 0:00–3:00 timeline?


At 0:00, the athlete collapses.
At 1:00, teammates notice something is wrong.
At 2:30, someone realizes this is not a typical fainting episode.
At 4:00, the AED arrives — or it doesn't.
At 10:00, EMS is on scene, and at that point, survival is almost entirely determined.


Heat stroke and cardiac arrest are predictable, preventable, and outcomes depend on systems that you oversee.

AGENDA

THE RISKS



THE NON-NEGOTIABLES

WBGT
AED
EAP

THE AD ACTION PLAN

- ***Created in 1982 at the University of North Carolina at Chapel Hill***
- ***Mission:*** to conduct surveillance of catastrophic injuries and illnesses related to participation in organized sports in the United States at the collegiate, high school, and youth levels of play.
- ***Goal:*** to improve the prevention, evaluation, management, and rehabilitation of catastrophic sports-related injuries.

Director: Kristen L. Kucera, PhD, MSPH, ATC, LAT

Medical Director: Robert Cantu, MD

Research Assoc: Barbara Goettsch, MSW

Website: https://nccsir.unc.edu/

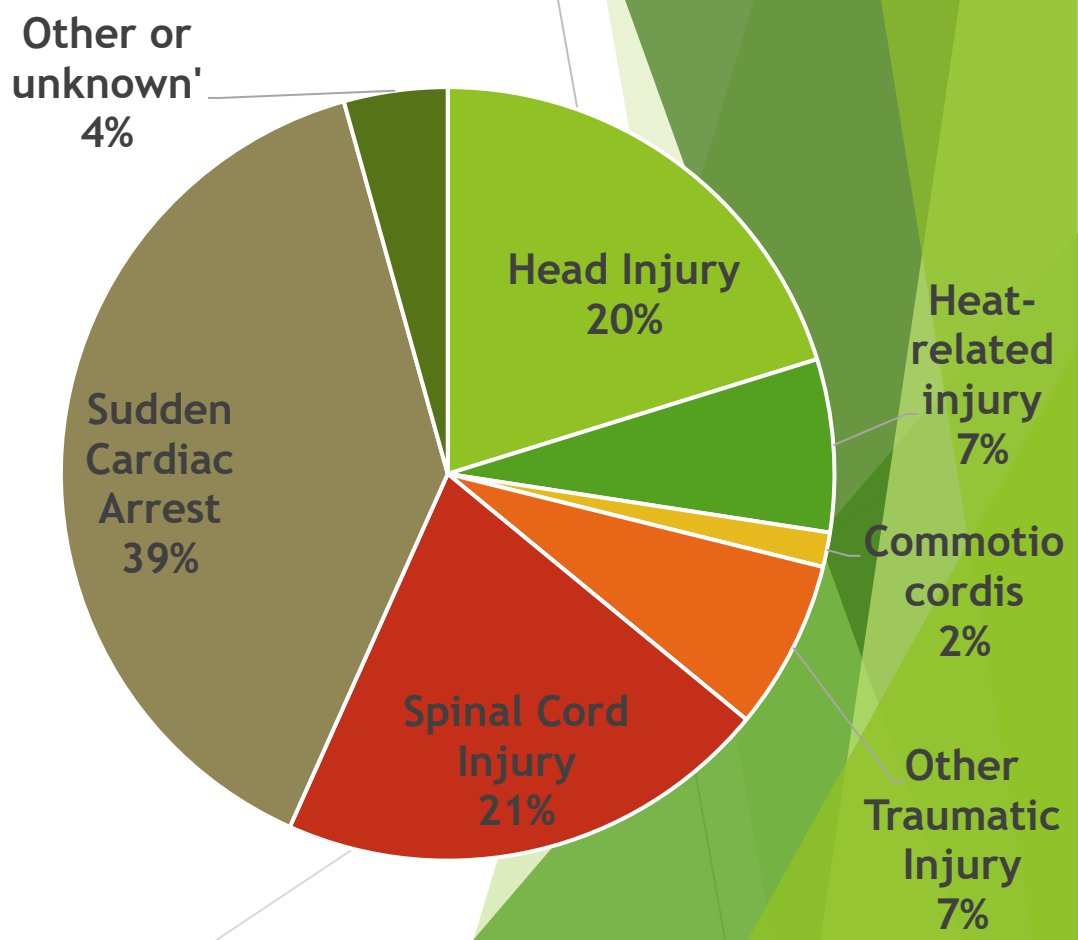
Sport-Related Catastrophic Injury or Illnesses

Sports-related conditions that directly result in either

- Fatality
- Permanent disability
- Life-threatening, with recovery

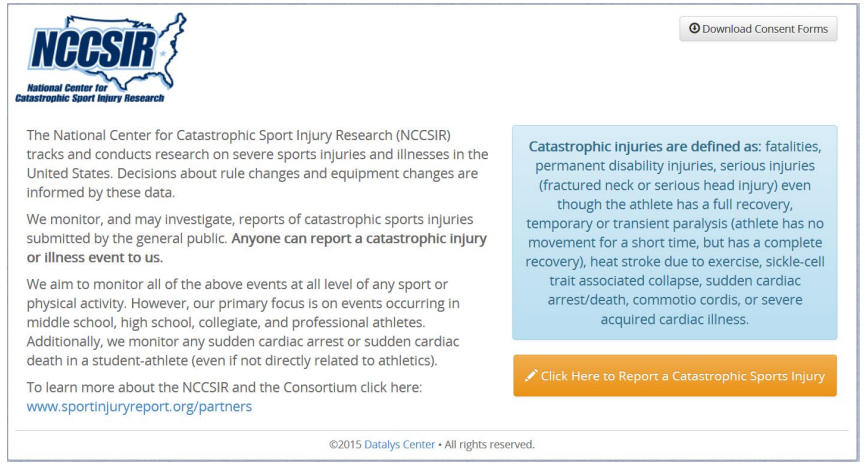
Organized and sponsored sport participants

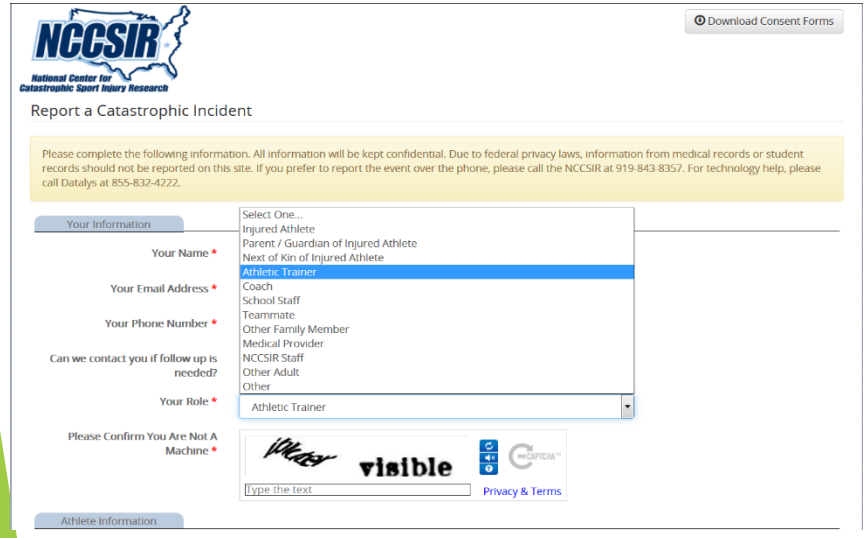
- College/university
- High school
- Middle school
- Youth sport
- Professional/semi-professional/amateur



http://nccsir.unc.edu/definition-of-injury/

Web-based Reporting Process



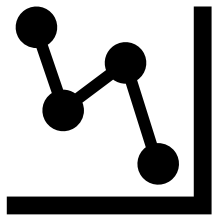


1) Go to **nccsir.unc.edu** or **sportinjuryreport.org**

2) Click the reporting box

3) Select a role from the drop-down box and complete the form

Data Informs →Injury Prevention & Management

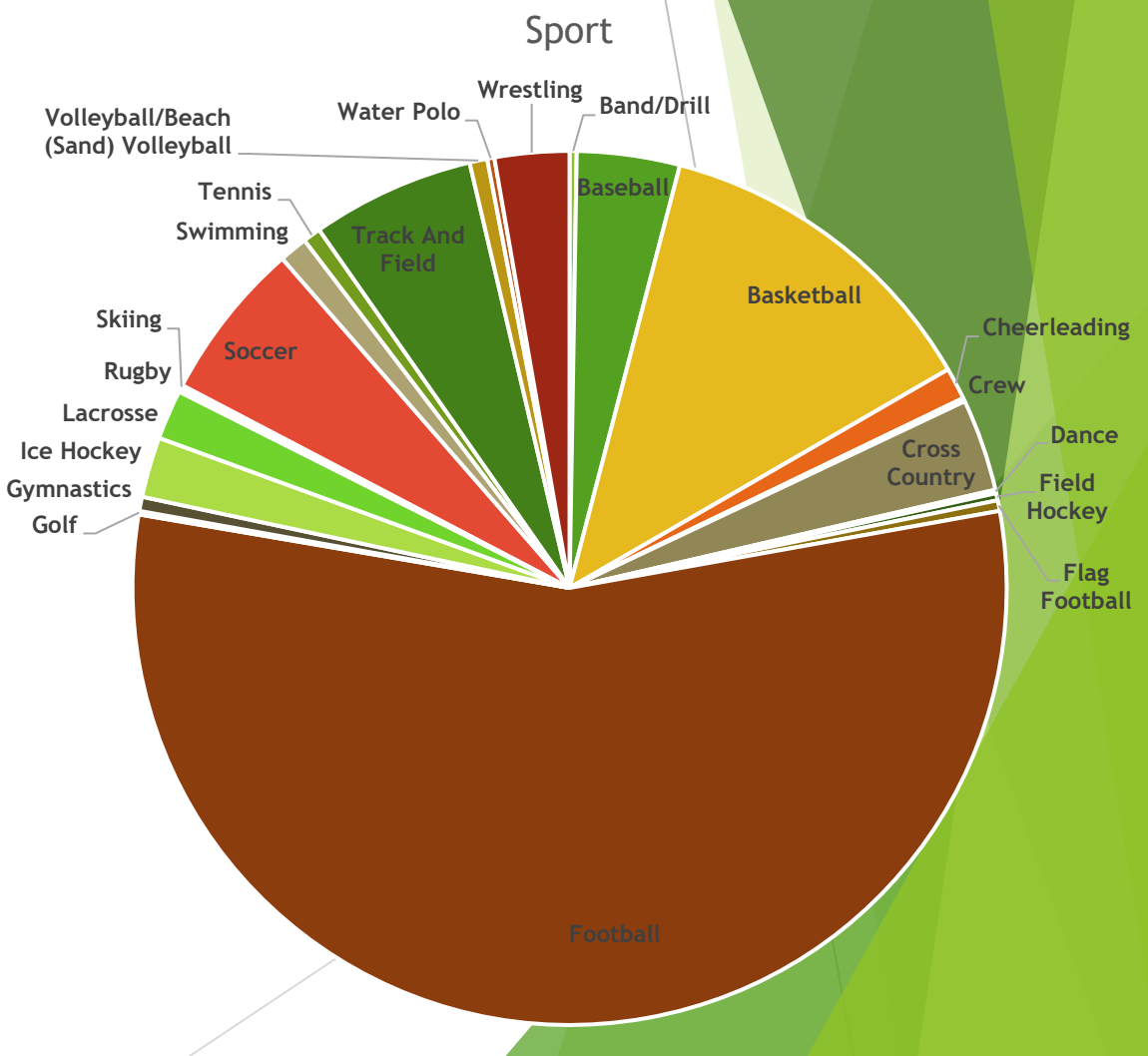


Leading to →Safer Play

WHAT THE NATIONAL DATA SHOWS

- **Since 2013 there were 762 catastrophic sport-related injuries & illnesses captured by NCCSIR**
- ~63 events annually
- 26% (n=198) were fatal
  - Survival has improved over time in cardiac and heat stroke

- 23 sports impacted – football & basketball most frequent



THE THREE NON-NEGOTIABLES OF ATHLETIC SAFETY

01

Prevention - Know the Conditions → WBGT

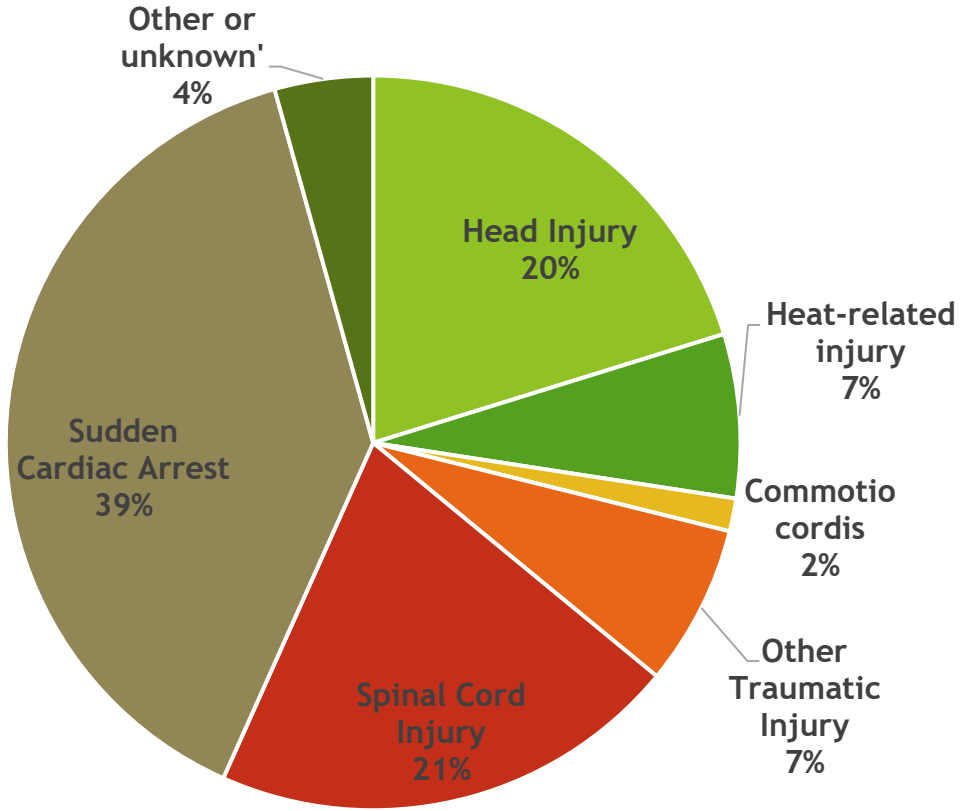
02

Response - Have the Right Tools → AED, Cooling tools

03

Policy - Ensure Rapid Response → Trained staff + clear policies

WHAT THE NATIONAL DATA SHOWS



- **Know the Conditions**
- **Respond with the right tools**
- **Ensure you can do this quickly**

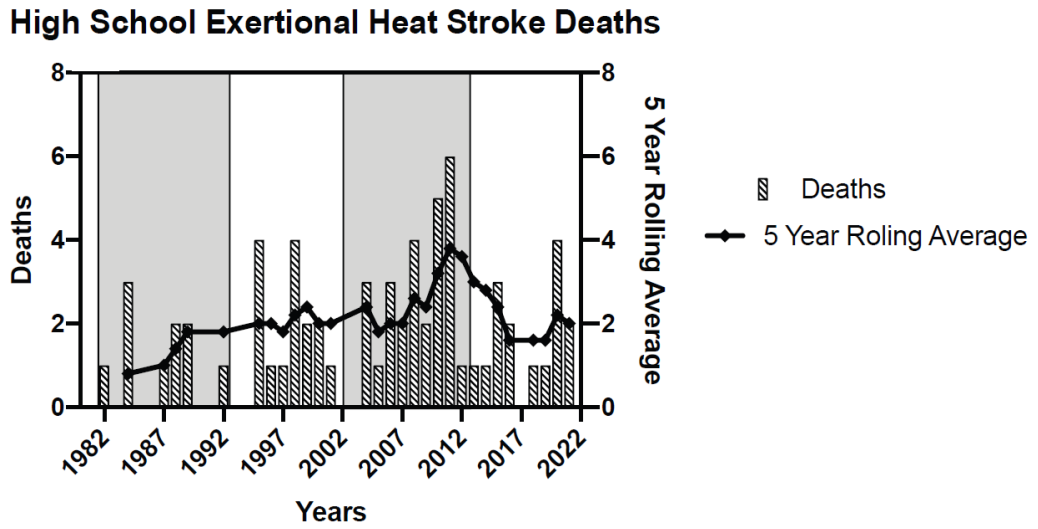
- **We are better prepared at Games than Practice**
- **Heat stroke Practice > Games**
- **SCD Practice= Games**

#1 – Know the Conditions

Heat Safety Starts Before Practice Begins

Key Findings - Heat

- 48 exertional heat strokes during HS sports from 2013-2024
- ~4 per year
- 60% survived, 19 athletes died
- ~94% occur during football with 6% in basketball, soccer, & track/XC
- # of deaths has declined over time



Note: 5-year rolling average represents the average yearly deaths based on previous 5-year numbers. Gray blocks distinguish separate decades.

Stearns et al. Sports Health 2025
doi:10.1177/19417381241298293

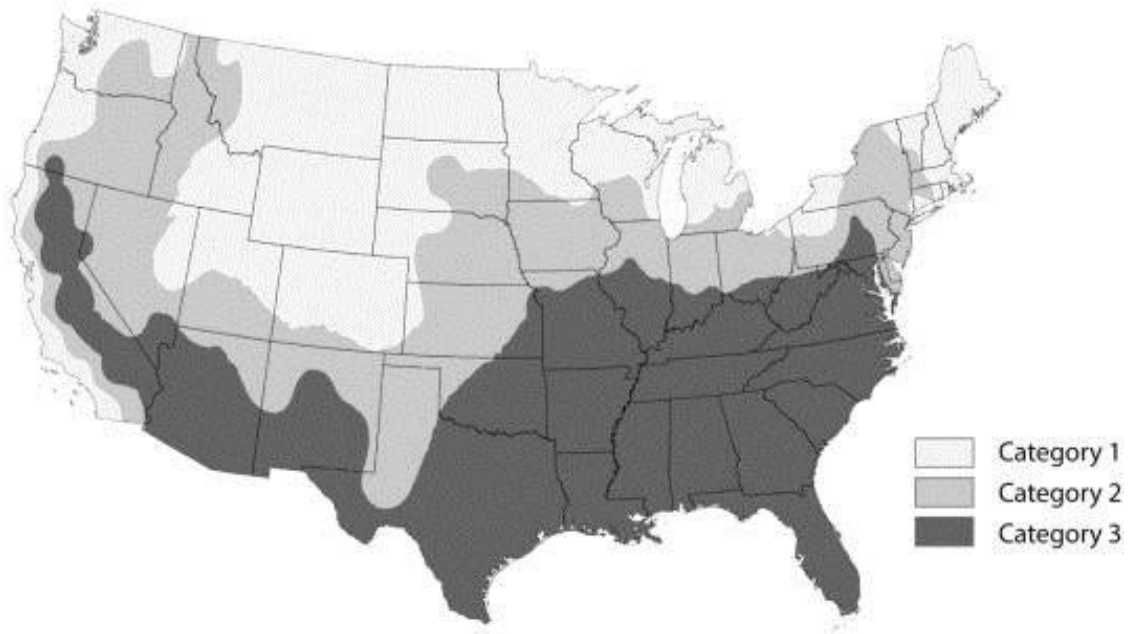
Pillar: Prevention (WBGT)

- WBGT > heat index
- Activity modification thresholds
- Highest risk: preseason + conditioning

What am I measuring?
WBGT vs Heat Index

	Temperature	Heat Index	WBGT
Measured in the sun	?	✗	✓
Measured in the shade	?	✓	✗
Uses air temperature	✓	✓	✓
Uses relative humidity	✗	✓	✓
Uses wind	✗	✗	✓
Uses cloud cover	✗	✗	✓
Uses sun angle	✗	✗	✓

Data sparks action



WBGT by Region (F)			Proposed Activity Guidelines
Cat 1	Cat 2	Cat 3	
<72.3	<75.9	<78.3	Normal activities, monitor fluids
72.3-76.1	75.9-78.7	78.3-82.0	Normal activities, monitor fluids
76.2-80.1	78.8-83.7	82.1-86.0	Plan intense or prolonged exercise with discretion
80.1-84.0	83.8-87.6	86.1-90.0	Limit intense exercise and total daily exposure to heat and humidity
>84.0	>87.6	>90.0	Cancel exercise

University of Georgia Guidelines, based on regions. Grundstein, Andrew & Williams, Castle & Phan, Minh & Cooper, Earl. (2015). Regional heat safety thresholds for athletics in the contiguous United States. Applied Geography. 56. 55-60. 10.1016/j.apgeog.2014.10.014.

WBGT in action

1:56 5G 60

HEAT - 3114668
Guideline: Custom
Edit

Dashboard | List | Multi-device

App Synced: 1:56:35 PM
Sync rate: 5 seconds

Temperature	84.3 °F
Heat Index	81.5 °F
Relative Humidity	28.8 %
Wind Speed	0.0 mph
Station Pressure	30.09 inHg
Dew Point	48.5 °F
Altitude	-167 ft
Density Altitude	1577 ft
Barometric Pressure	30.09

Capture | Start recording

Devices | Realtime | History | Options

1:56 5G 59

HEAT - 3114668
Guideline: Custom
Edit

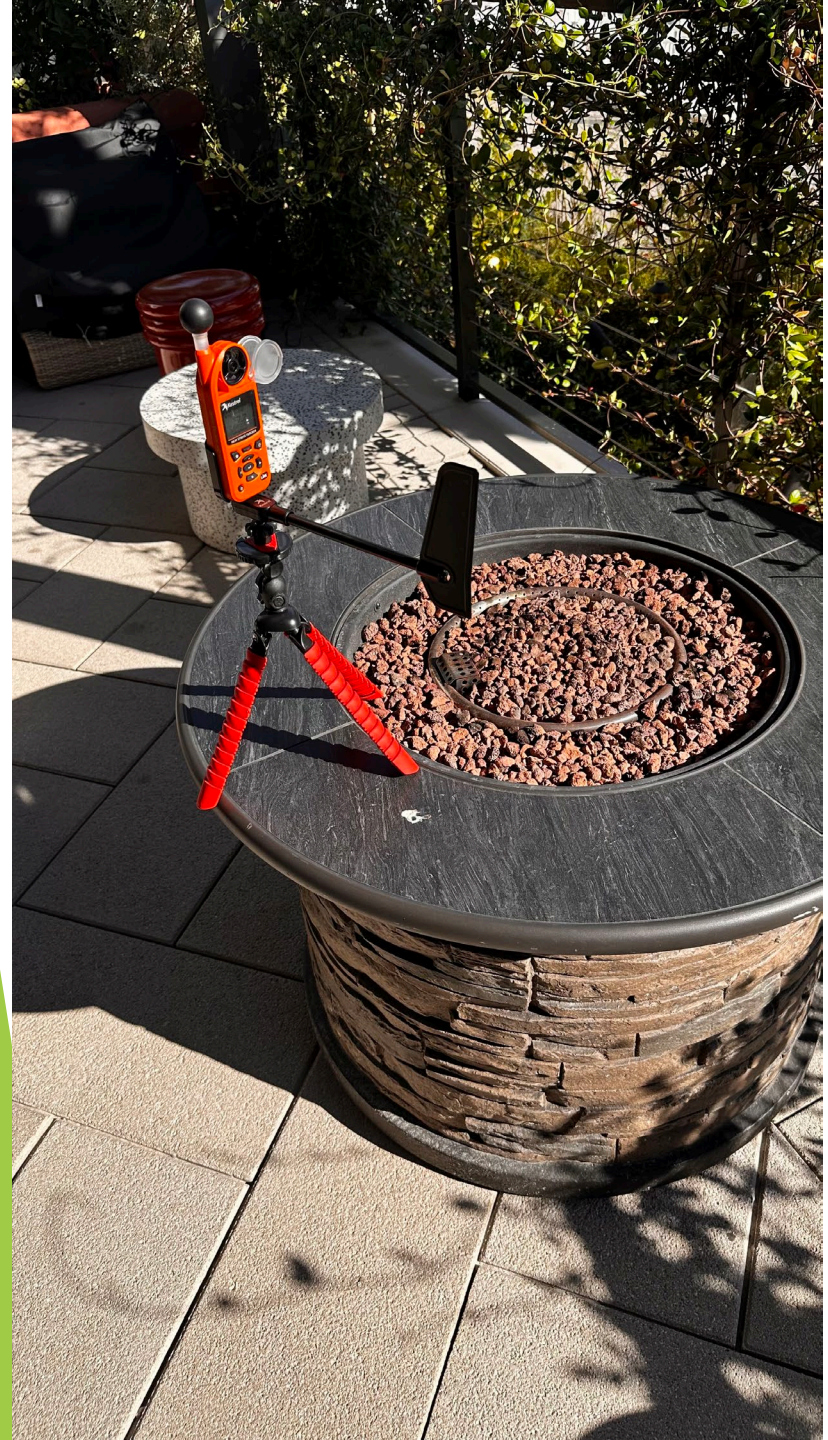
Dashboard | List | Multi-device

App Synced: 1:56:45 PM
Sync rate: 5 seconds

Compass True Direction	Deg
Crosswind	0.7 mph
Headwind	-0.7 mph
Wind Chill	85.5 °F
Wet Bulb Temp	63.3 °F
NWB Temp	66.1 °F
Globe Temperature	103.0 °F
Wet Bulb Globe Temperature ● Black Zone	74.8 °F
Thermal Work Limit	208.8 w/m2

Capture | Start recording

Devices | Realtime | History | Options



2:10 5G 54

HEAT - 3114668
Guideline: Custom
Edit

Dashboard | List | Multi-device

Syncing Log: 1% Sync rate: 5 seconds

Temperature	83.4 °F
Heat Index	80.8 °F
Relative Humidity	32.1 %
Wind Speed	0.9 mph
Station Pressure	30.11 inHg
Dew Point	50.5 °F
Altitude	-174 ft
Density Altitude	1511 ft
Barometric Pressure	30.11

Capture | Start recording

Devices | Realtime | History | Options

2:10 5G 54

HEAT - 3114668
Guideline: Custom
Edit

Dashboard | List | Multi-device

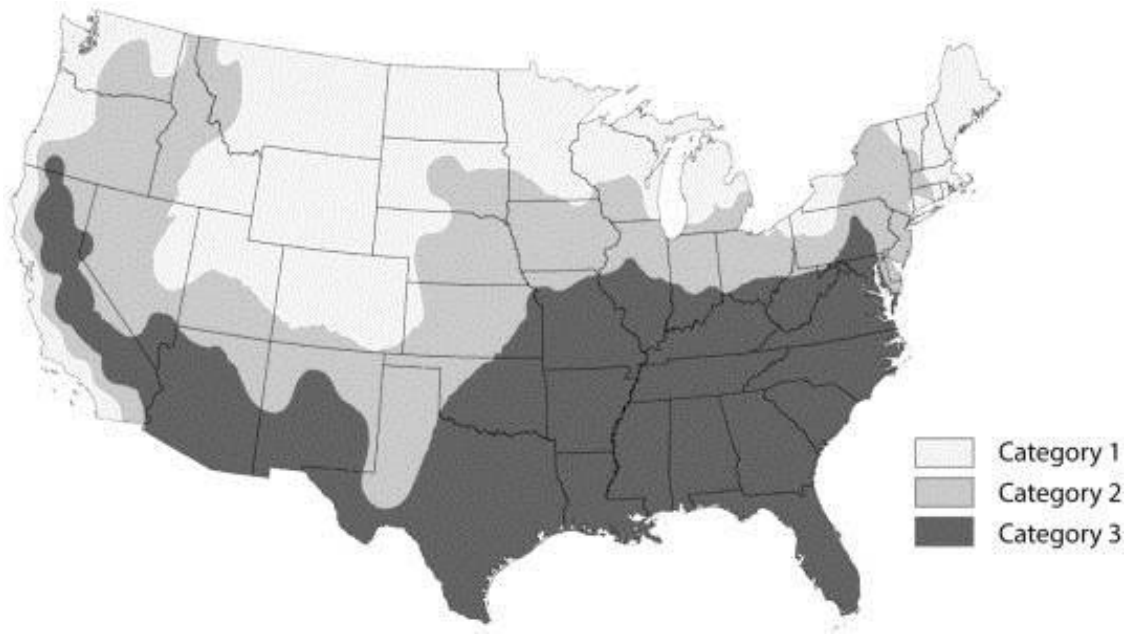
Syncing Log: 1% Sync rate: 5 seconds

Compass True Direction	Deg
Crosswind	0.5 mph
Headwind	0.7 mph
Wind Chill	83.3 °F
Wet Bulb Temp	63.1 °F
NWB Temp	68.5 °F
Globe Temperature	106.5 °F
Wet Bulb Globe Temperature ● Black Zone	77.3 °F
Thermal Work Limit	175.6 w/m2

Capture | Start recording

Devices | Realtime | History | Options

Data sparks action



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Effect of Radiation

Time	Grass in shade	Grass in sun	Air Temp	Cement	Red Brick	Blacktop
7am	70	74	76	78	78	80
8	72	77	77	80	81	81
9	78	85	88	93	95	89
10	82	86	90	99	105	103
11	85	98	92	105	115	121
12pm	88	100	93	112	125	130
1	90	103	94	115	130	135
2	91	105	95	125	135	140
3	91	105	95	124	134	140
4	89	102	95	118	131	137
5	87	98	93	112	122	131
6	85	96	91	106	110	122
7	83	86	90	100	105	112
8	80	80 (dusk)	87	95	98	103
9	78	78 (dark)	84	90	92	93

TURF

170

The WBGT only matters if it triggers an action. Your job is to make sure that action is written down, taught, and enforced.

NFHS Foundation Study

What We Learned from the National WBGT Program

1. Do WBGT Programs Actually Work?

- **Yes — when schools have clear policies, assigned roles, and daily routines.** Our study showed:
- WBGT devices were **used more often and more accurately** when ADs set expectations.
- Barriers included unclear responsibility and inconsistent practice modification.

2. What Changes in Schools After Implementation?

- Adoption of WBGT improved:
- **Staff knowledge and confidence**
- **Heat-modification decisions**
- **Emergency planning for heat illness and heat stroke**
- **Consistency across coaches and teams**
- Schools became more **predictable and safer** in hot conditions.

What This Means for You as an AD

Leadership determines whether WBGT becomes a checklist or a life-saving system.

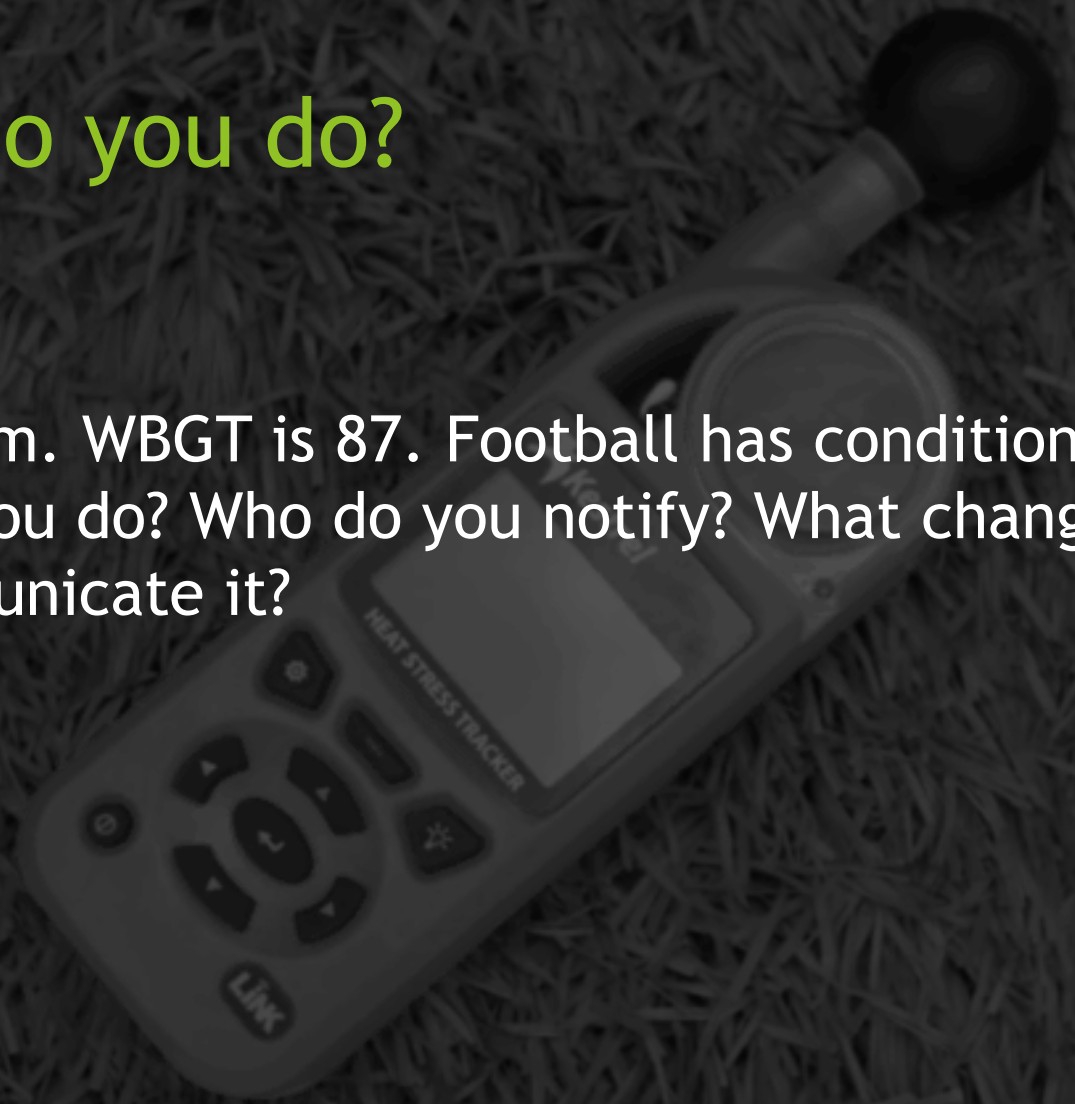
Success requires:

- Daily use
- Clear thresholds
- Enforcement
- Rehearsed emergency plans

The schools that saved lives didn't just have a WBGT device — they had a system.

What do you do?

It’s 3:17 pm. WBGT is 87. Football has conditioning at 4:00. What do you do? Who do you notify? What changes? How do you communicate it?

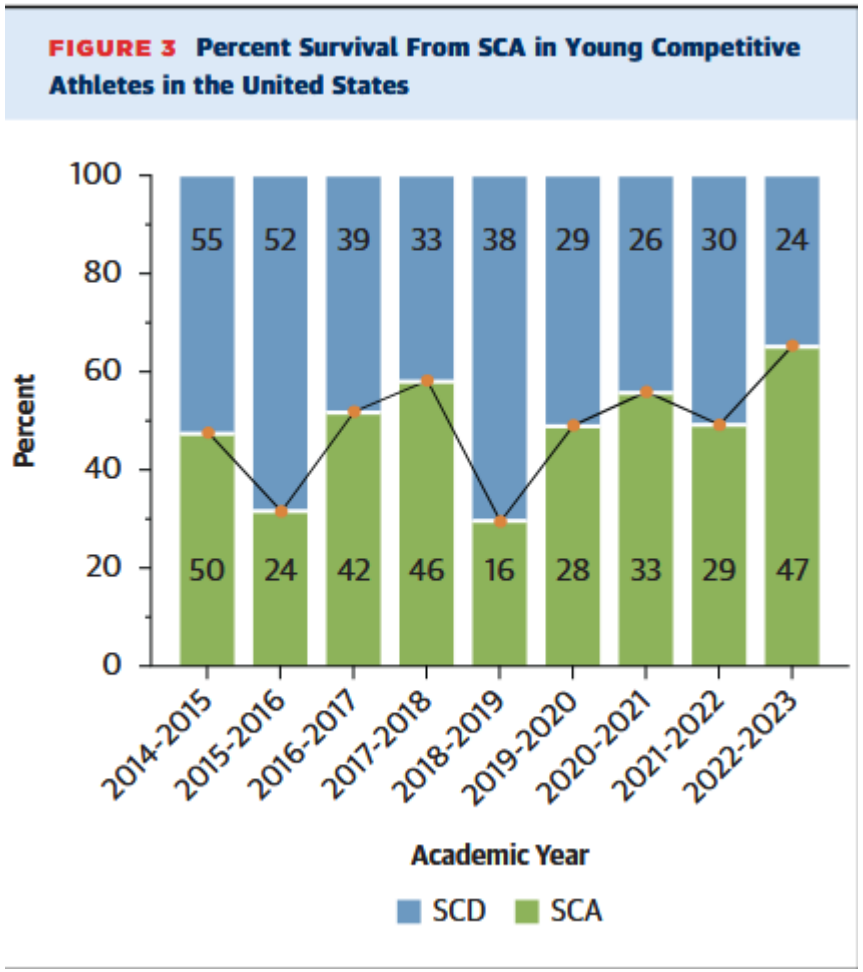


#2 – Have the Right Tools

AED, Cooling Tub

Key Findings - Cardiac

- Sudden cardiac arrest is the leading cause of death in young athletes.
- The single greatest predictor of survival is whether an AED is applied within (three) minutes.
- Survival with an AED in under three minutes can exceed 70–80%.
- Without early AED use, survival drops into the single digits.
- This is not about medical training — it's about access, speed, and preparation.

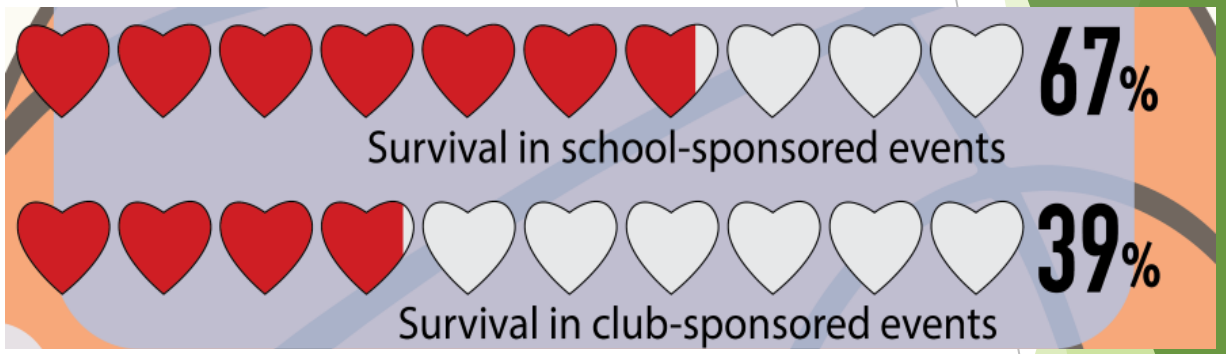


Key Findings - Cardiac

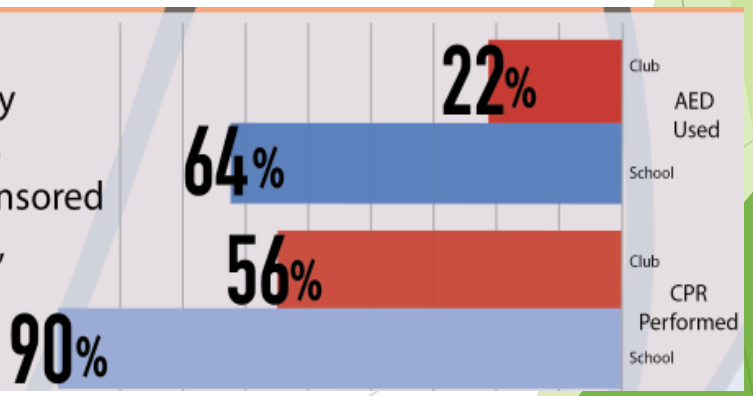
- 299 sudden cardiac arrests during HS sports from 2014-2023
- ~33 per year
- 58% survived
- ~75% occur during football, basketball, track/XC, and soccer
- Survival has improved over time

Petek et al. JACC 2025
doi:10.1016/j.jacc.2025.03.006

Key Findings - Cardiac



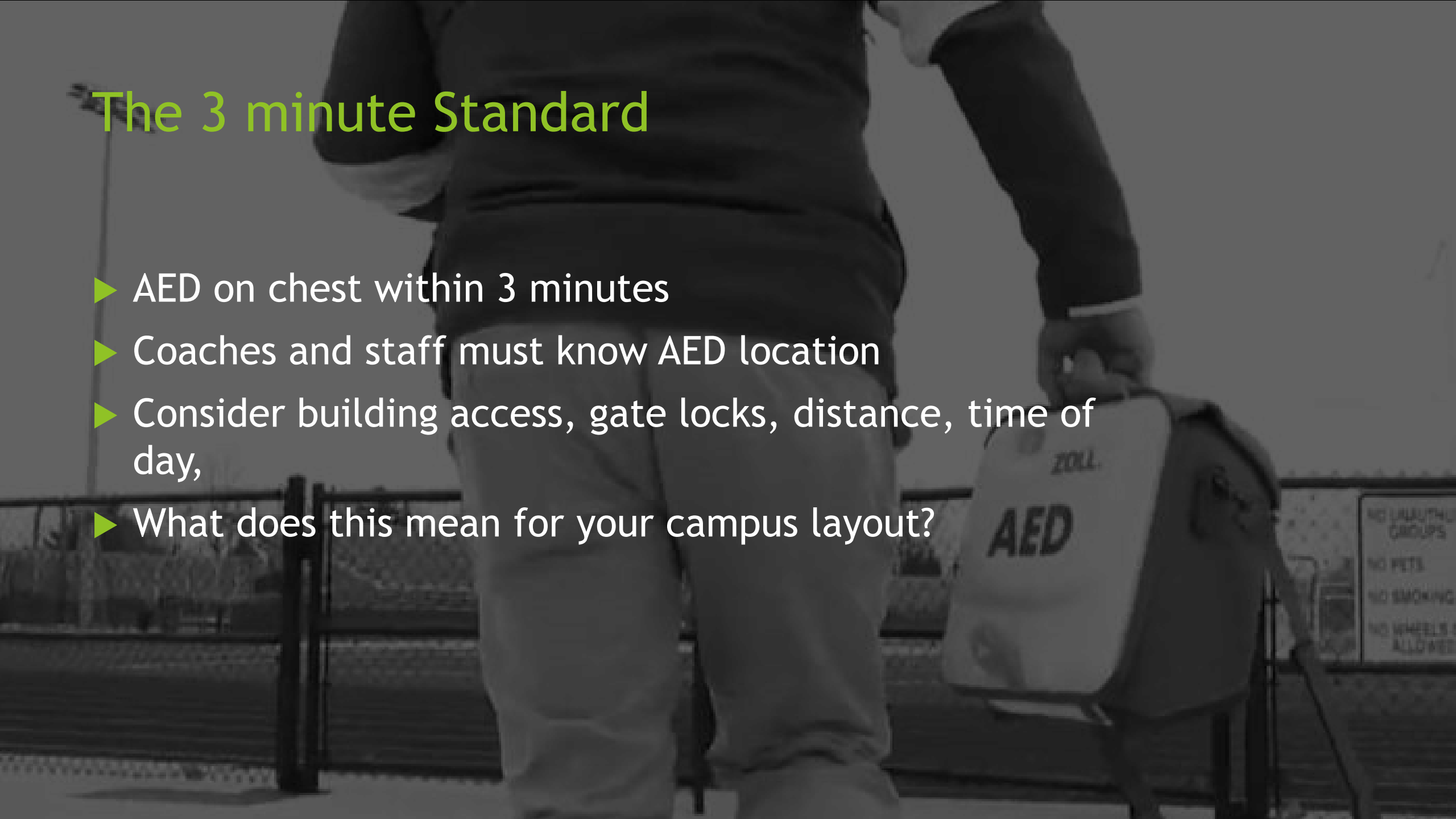
Improved emergency response planning is needed for club-sponsored basketball programs, including CPR and AED training.



Austin et al. *CCQO* 2022
https://doi.org/10.1161/CIRCOUTCOMES.121.008640

The 3 minute Standard

- AED on chest within 3 minutes
- Coaches and staff must know AED location
- Consider building access, gate locks, distance, time of day,
- What does this mean for your campus layout?



AED RESPONSE

- **Goal:** Make the system-level gaps visible.
- How to practice deployment (direct someone to retrieve it, not everyone runs to the victim)
- R*ole assignment* is not a medical skill

Cold Water Immersion

- **Cold-Water Immersion (CWI)** is the standard of care
- Seasonal
  - Need a tank/pool
  - Ice
  - Water
- Set up BEFORE hot days

Narcan


NARCAN
WHAT TO DO IN CASE OF A SUSPECTED
OPIOID EMERGENCY
LAY
SPRAY
STAY
911

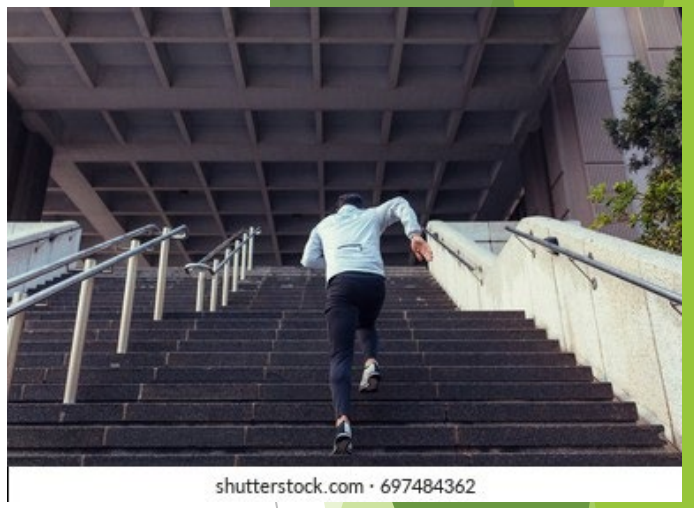

NARCAN NASAL SPRAY
4 mg

#3 – Ensure Rapid Response

EAP → Roles → Practice

EAP

- One for each venue
- Clear role assignment
- Seasonal rehearsals
- Fast, coordinated response



RESEARCH & DISCOVERY

June 25, 2025 | Anna Zarra Aldrich, College of Agriculture, Health and Natural Resources

Athletic Trainer Employment in High Schools Associated with Fewer Fatalities and Injuries

A growing body of research demonstrates the importance of having athletic trainers employed in high schools, including two new papers including UConn researchers

NCCSIR update to NOCSAE June 2025

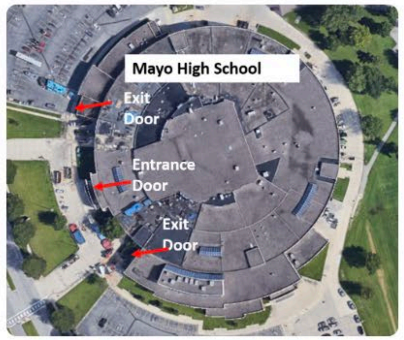
https://today.uconn.edu/2025/06/athletic-trainer-employment-in-high-schools-associated-with-fewer-fatalities-and-injuries/#

EAP Essentials: Every Venue, Every Sport

- **Each venue's EAP must identify:**
  - **AED Retriever:** Who gets it *immediately*
  - **EMS Caller:** Who calls 911 and stays on the line
  - **Coach/AT:** Leads the scene
  - **AD Oversight:** Ensures drills & compliance
  - **Simple field map:** AED routes + access points

Use AI to help you

Here is a map of my school. Acting as an AD, tell me where to put the AEDs.



if this is the map of the high school, tell me where i should put aeds

Below is a detailed, operationally focused AED placement plan for *Mayo High School* based on the building layout shown in your image, best-practice standards (AHA, NATA, NFHS), and the circulation patterns implied by a circular school design.

I will describe **exact recommended AED locations** using the three labeled doors as anchors so that your facilities team can implement immediately.

AED Placement Strategy for Mayo High School

Goal: Every location in or around the school should be reachable by an AED within **3 minutes** (preferably **1.5 minutes each way**).


---

1. Primary AED Locations Inside the Building

Because this is a *radial* building with long curved corridors, travel distance is your biggest risk factor. AEDs should be placed at **major spokes and high-traffic junctions**.

A. Main Entrance Lobby (Central Location) – Mandatory

- Place 1 AED **immediately inside the main entrance door** labeled in your image.
- This is the highest-traffic, highest-visibility location and the fastest reach point for incoming responders (police, EMS, athletic trainers).

Why: Almost all schools place at least one AED at the main entrance. It ensures immediate access for both staff and community events.

B. Near the North Exit Door (Top-Left in Your Image)

- This area appears to serve parking lots and student drop-off.
- Place an AED just **inside** that exit in a main hallway.

Why: Cardiac events often occur near arrival/departure points. Spectators also congregate here for events.

C. Near the South Exit Door (Bottom-Left in Your Image)

- Place an AED inside that exit corridor or just inside the nearest hallway.

Why: This dramatically reduces travel distance along the lower half of the building, which is otherwise far from the main entrance AED.

---

2. Secondary Indoor AEDs for High-Risk / High-Population Areas

Even with the three perimeter AEDs, a circular building requires more internal coverage.

D. Gymnasium / Athletics Wing

If this school has:

- a main gym
- weight room
- locker rooms
- athletic training room

You must place **at least one AED**:

- Mounted **outside the main gym entrance**, visible and accessible even when the gym is locked.

Why: >50% of school SCA events occur during sports or physical activity.

E. Cafeteria / Auditorium Zone

These areas draw high-density crowds:

Heat Stroke Response: Cool First, Transport Second

- Exertional Heat Stroke = **100% survivable** with rapid cooling
- **Cold-Water Immersion (CWI)** is the standard of care
- **Set up BEFORE hot days**

Recognizing Sudden Cardiac Arrest

- Sudden collapse
- Abnormal breathing
- Seizure-like movements
- No purposeful movement

This is not about medical expertise.
This is about choreography — which only happens with repeated practice.

Case Study

- Training in CPR and Automated External Defibrillator (AED)
- Access to AED
- Emergency action plans – written and reviewed annually
  - **Athletic director and athletic trainer had just revamped their EAP prior to Fall season**

‘A miracle everything fell into place’: Coaches, trainer, AED save sophomore’s life

Coaches, trainer, AED save sophomore’s life

LOCAL NEWS

OCT 19, 2024

MICHAEL BOYTIM
mboytim@altoonamirror.com

SHARE TWEET

2 articles remaining...

https://www.altoonamirror.com/news/local-news/2024/10/a-miracle-everything-fell-into-place-coaches-trainer-aed-save-sophomores-life/

Patterns of Failure

- No one assigned to check WBGT.
- No thresholds for modifying or canceling activity.
- AEDs stored too far from the field or locked inside.
- Emergency Action Plans that exist on paper but haven’t been practiced.
- Staff who hesitate because they’re not sure who’s supposed to act.

- These are not failures of ability — these are failures of systems.

Patterns of Success

- A daily WBGT check and clear, enforced activity-modification policies.
- AEDs placed within three minutes of every athletic venue.
- EAPs practiced until the response becomes second nature.
- A shared language and clear roles across the entire athletic department.

- These schools aren’t lucky — they’re prepared.

Key Takeaways: What You Control as an AD

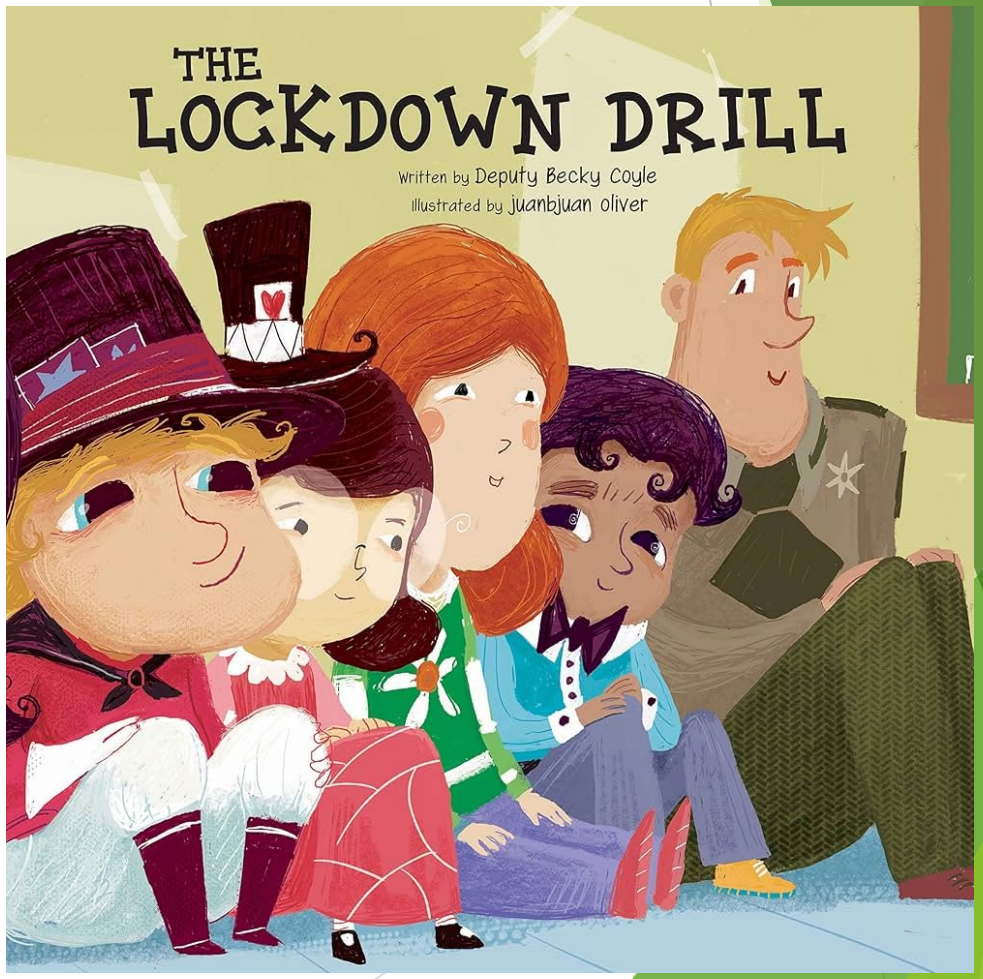
- ✓ AED placement & access (3-minute rule)
- ✓ WBGT policy & daily decision-maker
- ✓ EAP rehearsal expectations
- ✓ Role clarity for all staff
- ✓ CWI readiness on high-risk days

(cold water immersion)

Why Readiness Matters

- SCA = #1 cause of athlete death
- EHS = 100% survivable with rapid cooling
- Majority of catastrophic events occur at **practice**
- Leadership drives readiness

We have fire drills
We have lock down drills…



YOUR WEDNESDAY-MORNING CHECKLIST

- Confirm AED locations
- Check WBGT availability
  - Ensure staff know thresholds for activity modification
  - Identify who owns daily heat decisions
- Simple field maps
- USE AI!!

Continued

- For each venue, 10-minute EAP walk-through with appropriate coaches
- Role clarity:
  - AED retriever
  - EMS caller
  - Coach lead
  - AD oversight

AEDs for Athletes

AEDs Save Lives: What Every Athletic Leader Needs to See

- Demonstrates immediate AED use
- Essential coach and athlete/student training resource
- Integrate into the health curriculum

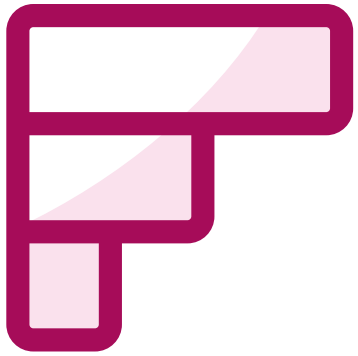

USA

Preparation is a leadership decision.

Join Us

Scan with your phone to join the polls

If there were another national distribution program, what 2 things would you want included?



Rank the biggest barriers to emergency readiness at your school.

What’s one resource you don’t have that would make the biggest difference?

Key Takeaways: What ADs Control

POLICY

RESOURCES & TRAINING

CULTURE

ACCOUNT-ABILITY

EQUIPMENT ACCESS

Thank you

- Thank you to the NFHS Foundation for funding the WBGT Distribution Evaluation Study
- Thank you to NIAAA for the invitation to speak

- Neha Raukar – Raukar.neha@mayo.edu
- Kristen Kucera -KKucera@email.unc.edu

Hands-On Session

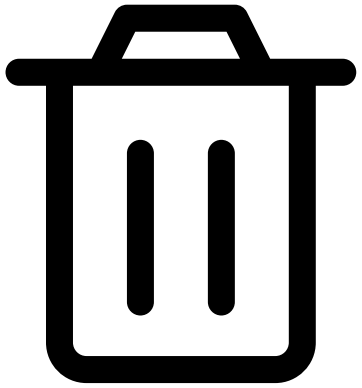
AED
WBGT

Narcan

Goal: Build confidence + competence in life-saving actions

Extra slides

What is your role in the school?



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What word describes your program’s emergency readiness today?

Have you ever activated your EAP?

What items do you need to respond to a medical emergency?

How quickly can an AED be retrieved, taken back, opened, and applied at your farthest practice venue?

Pillar: Preparedness (Heat Stroke)

- Cold-water immersion saves lives
- “Cool first, transport second”
- Need: tub + water + ice
- Plan setup BEFORE hot days

Do you use WBGT to guide practice modification?

Is cold-water immersion available during hot-weather practices?

Does your program have a written, venue-specific Emergency Action Plan?

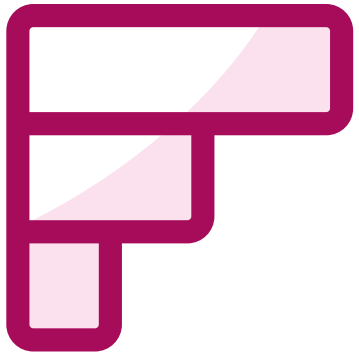
How often do you rehearse your EAP?

Pillar 3: Response (Recognizing SCA)

- ADD SOME STATS HERE

- SCA signs:
  - Sudden collapse
  - Abnormal breathing
  - Seizure-like activity
  - No purposeful movement
- **If you think twice → treat as SCA.**

How confident are you that each coach knows their emergency role?

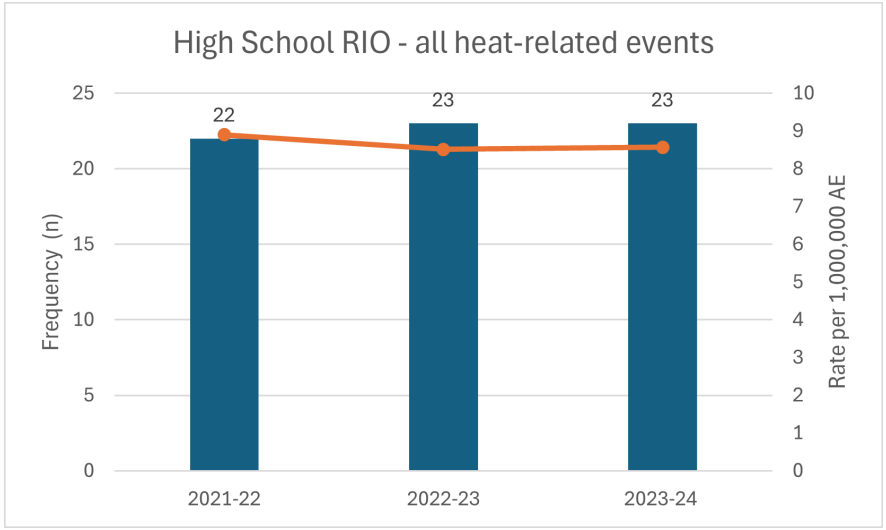


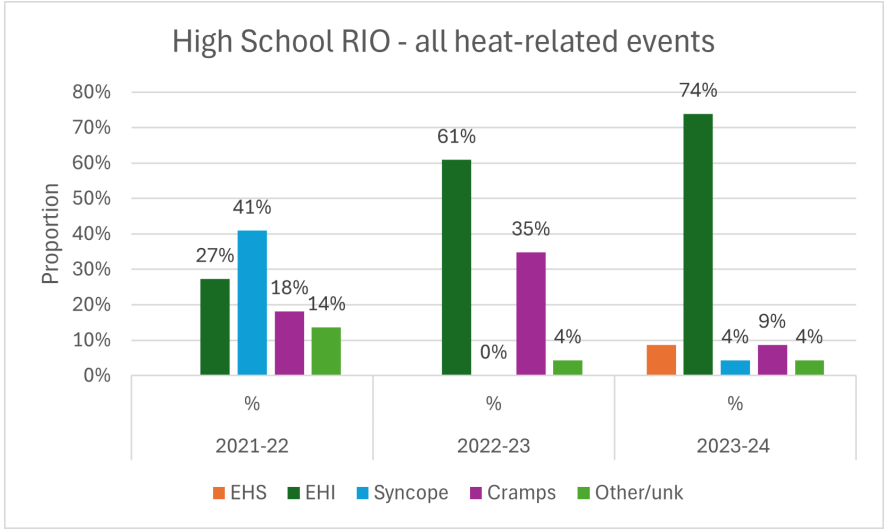
What will be your first step after today’s session?

What Items should you have for a medical emergency?

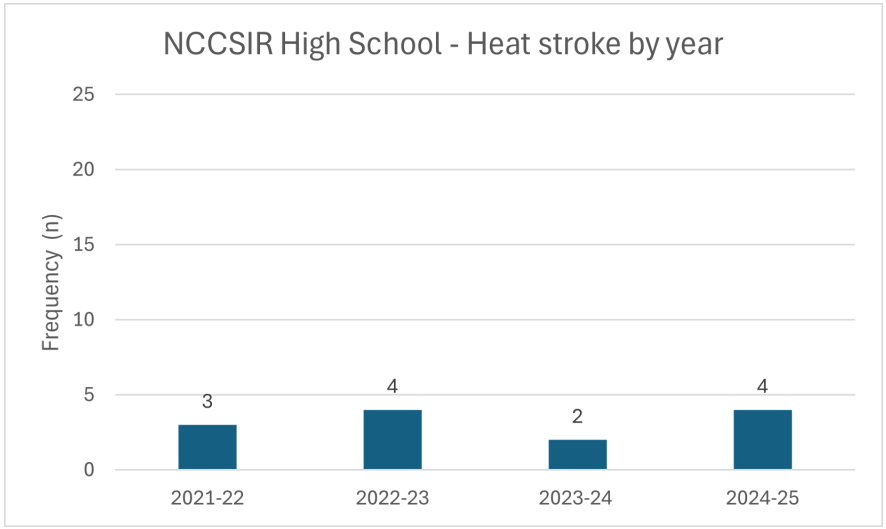
Phone to call to EMS (with cell service)	Lightning Detector	Wet Bulb Globe Temperature Device	AED
Dunk Tank	+/- medications (albuterol, Narcan, etc)	Backboard/c-collar	Personnel

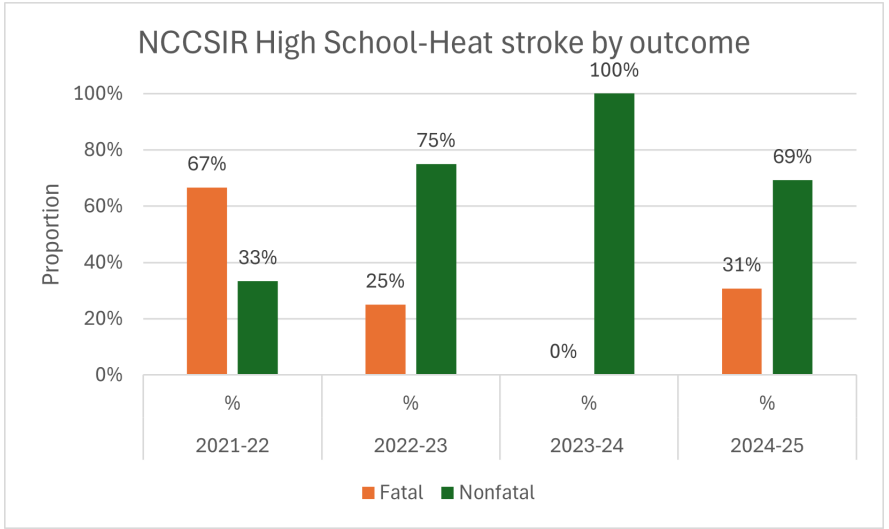
Surveillance: High School RIO EHI/EHS Events





Surveillance: NCCSIR EHS Events

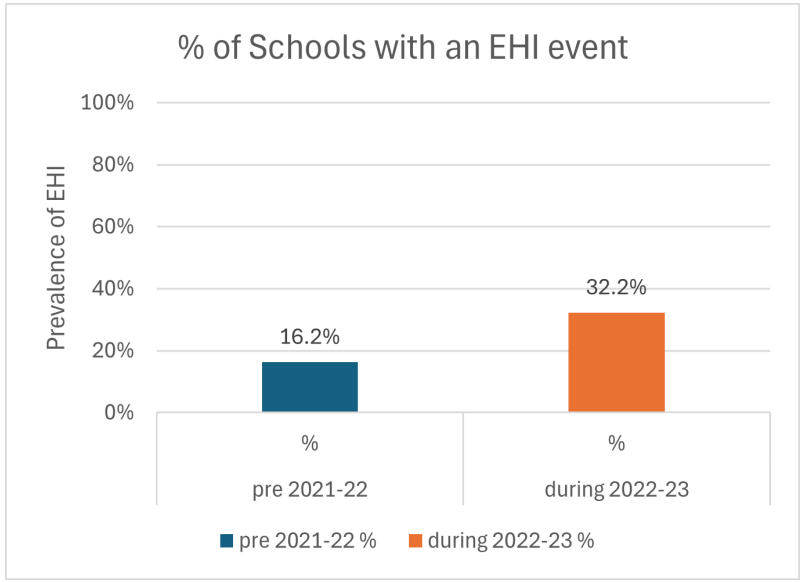


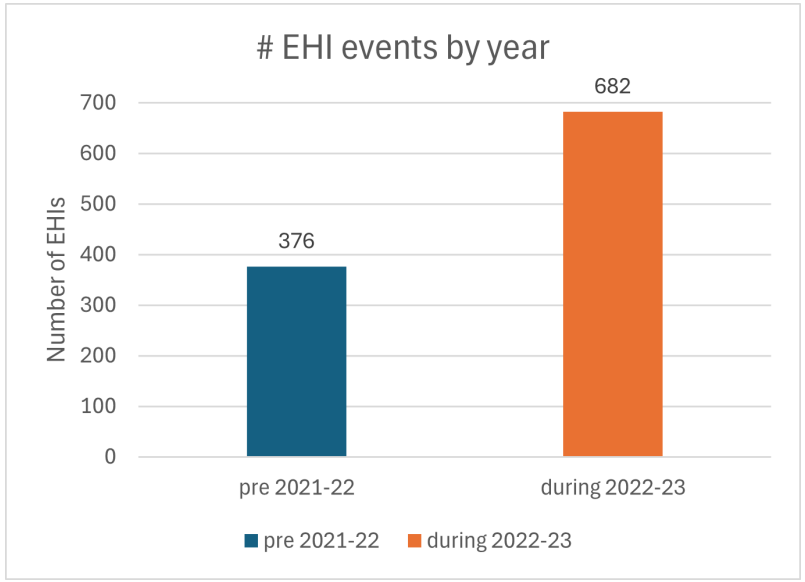


School Surveys: EHS Events 2021-2022 (before program) vs 2022-2023 (during program)

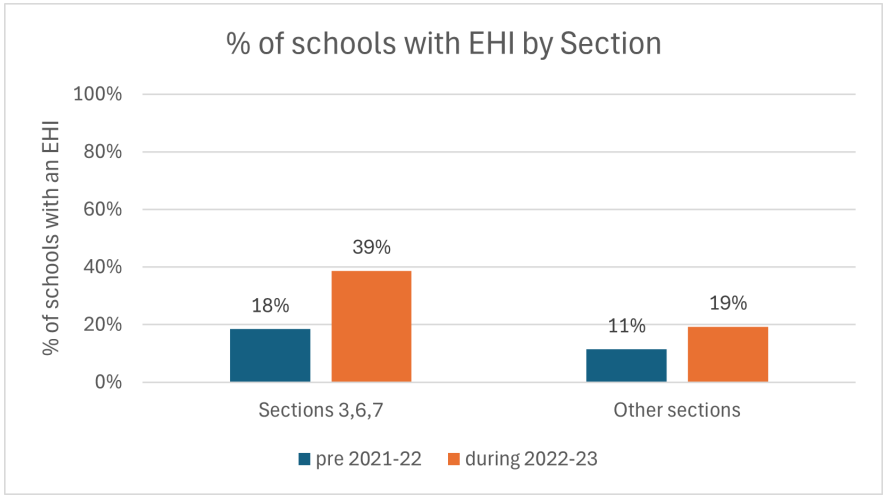
- Before program 2021-2022: Average 0.6 per school, total 376 events, 0 fatal
  - football (82.4%), cross country (34.3%), and soccer (13.9%)
  - cooling methods applied (70.1%), a cold-water immersion tub (53.3%), and activation of EMS (33.6%)
- During program 2022-2023: Average 1 EHS/school, total 682 events, 1 fatal
  - football (83.3%), cross country (32.6%), and soccer (11.9%)
  - other cooling methods (64.0%), a cold-water immersion tub (56.4%), and activation of EMS (39.6%

School Surveys: **EHI Total**
2021-2022 vs 2022-2023 (before vs during program)

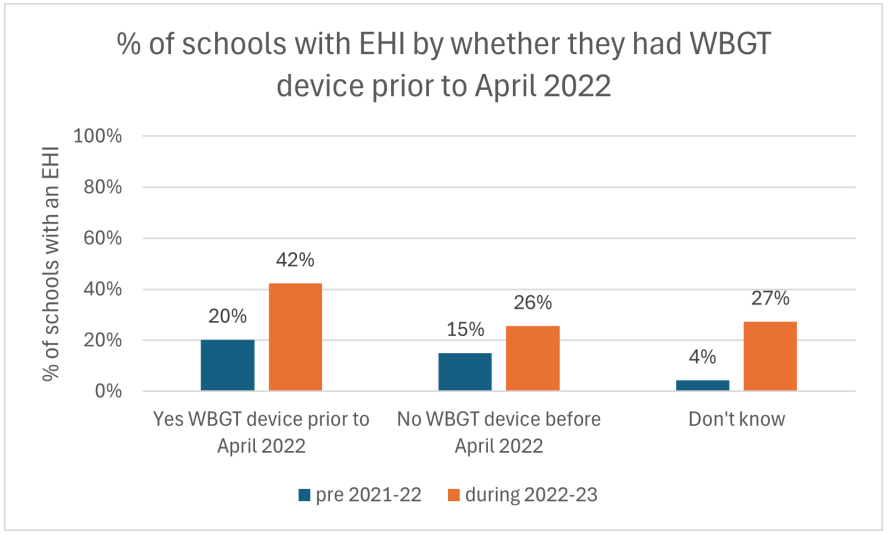


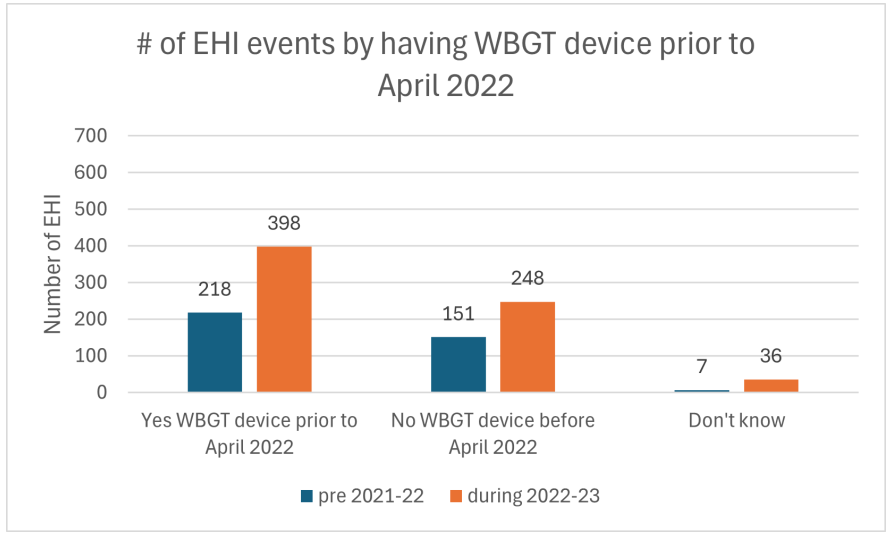


School Surveys: EHI by NFHS Section 2021-2022 vs 2022-2023 (before vs during program)



School Surveys: EHI by having WBGT device prior to 4/2022: 2021-2022 vs 2022-2023 (before vs during program)





School Surveys: EHI by WBGT program participation 2021-2022 vs 2022-2023 (before vs during program)