Prevention and Treatment of Exertional Heat Illness

Presentation to the House PreK-12 Innovation Subcommittee

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Overview

OPPAGA's research on the prevention and treatment of exertional heat illness included the following topics

1. Background Information
2. Florida's High School Requirements
3. Florida's Preparedness Practices
4. Florida Athletic Directors Survey Results

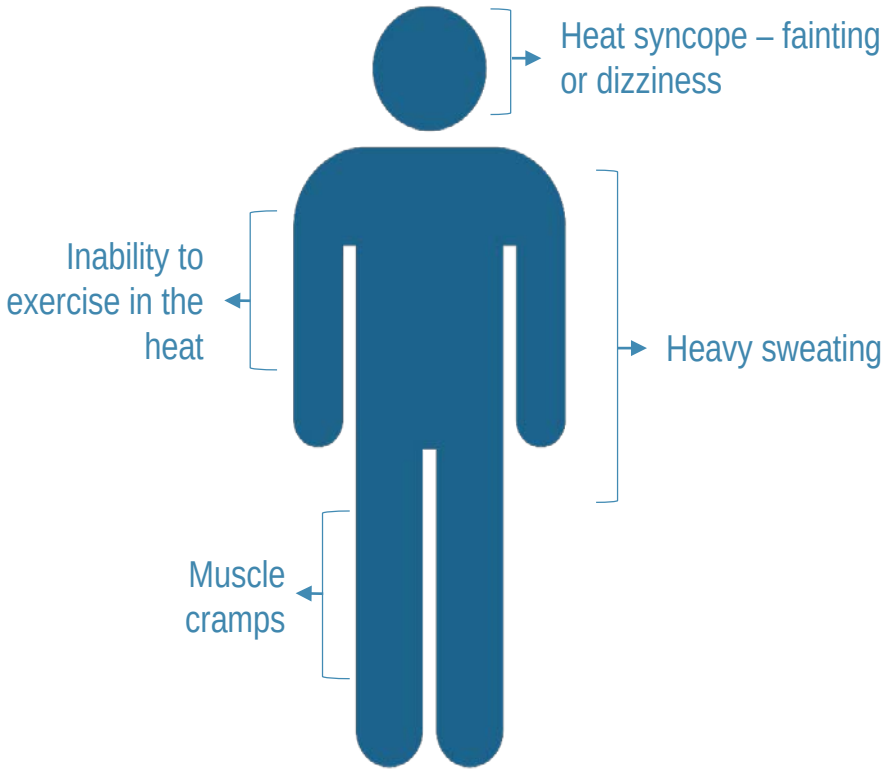
Background Information

Exertional Heat Illness

Exertional heat illness is associated with sustained high body temperature, resulting from dehydration, strenuous exercise, and environmental heat exposure

According to the Centers for Disease Control and Prevention, between 2005 and 2009, 9,237 high school athletes annually suffered time-loss heat illness nationwide

EHI Symptoms



Exertional Heat Stroke

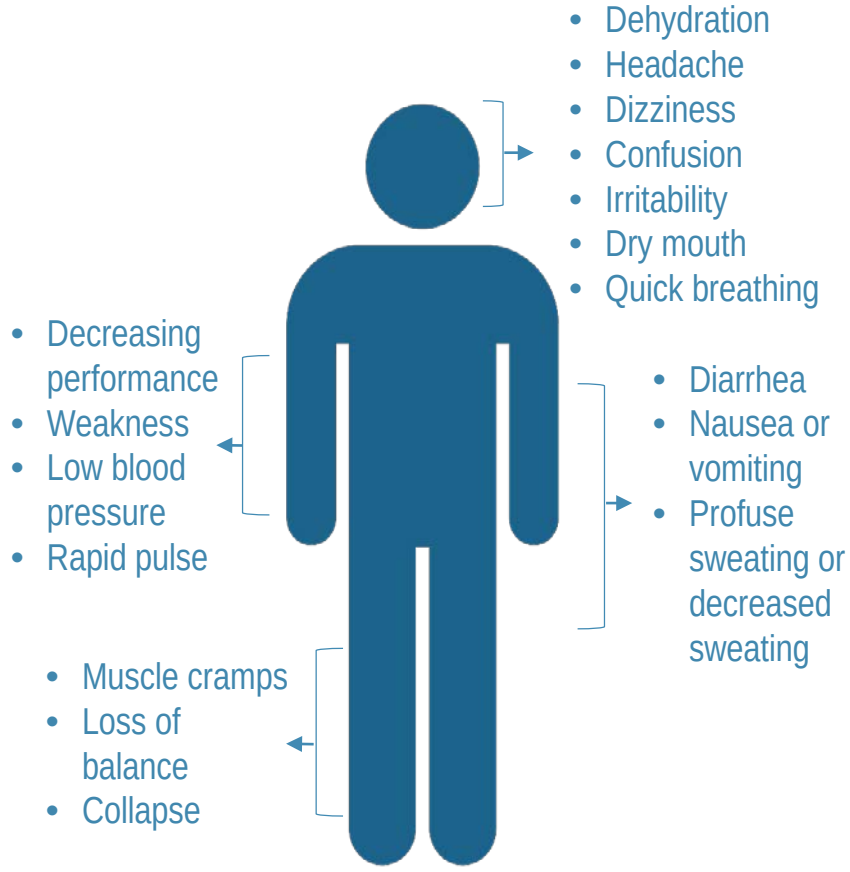
EHS is the most severe form of heat illness and occurs when the body's natural cooling system becomes overwhelmed

EHS can be diagnosed based on

- Central nervous system dysfunction
- High core body temperature greater than 104 ^{o} F

EHS can progress to multi-organ system failure and death unless promptly recognized and treated

EHS Symptoms



Best Practices for EHS Prevention

Preparation

Conduct an athlete physician-supervised, pre-participation medical screening assessment before the start of the season

Follow a heat acclimatization schedule; gradually acclimate athletes to heat over a 7 to 14-day preseason practice schedule

Measure environmental heat-stress conditions using the WetBulb Globe Temperature (WBGT) thermometer

Continual Cooling

Remove helmets during breaks

Incorporate rest breaks

Provide shade/cool areas

Encourage fluid consumption

Continue checking temperature

Best Practices for Treatment of EHS

Quickly cool the whole body to a temperature of 102 °F or below

Remove excess clothing and equipment

Assess rectal temperature at least once every 5-10 minutes

Immerse individual in a pool or tub of cold water and stir water while cooling, commonly called cold water immersion

After cooling, transport the individual to a medical facility

Florida's High School Requirements

Florida High School Athletic Association (FHSAA) Requirements

The FHSAA has EHI/EHS prevention requirements for member schools, which self-report adherence to the requirements

Coaches and athletes must annually review the National Federation of State High School Association's free education course on heat illness prevention

Schools must follow a heat acclimatization schedule for preseason practice

Schools must develop an Emergency Action Plan for managing serious and/or potentially life threatening injuries

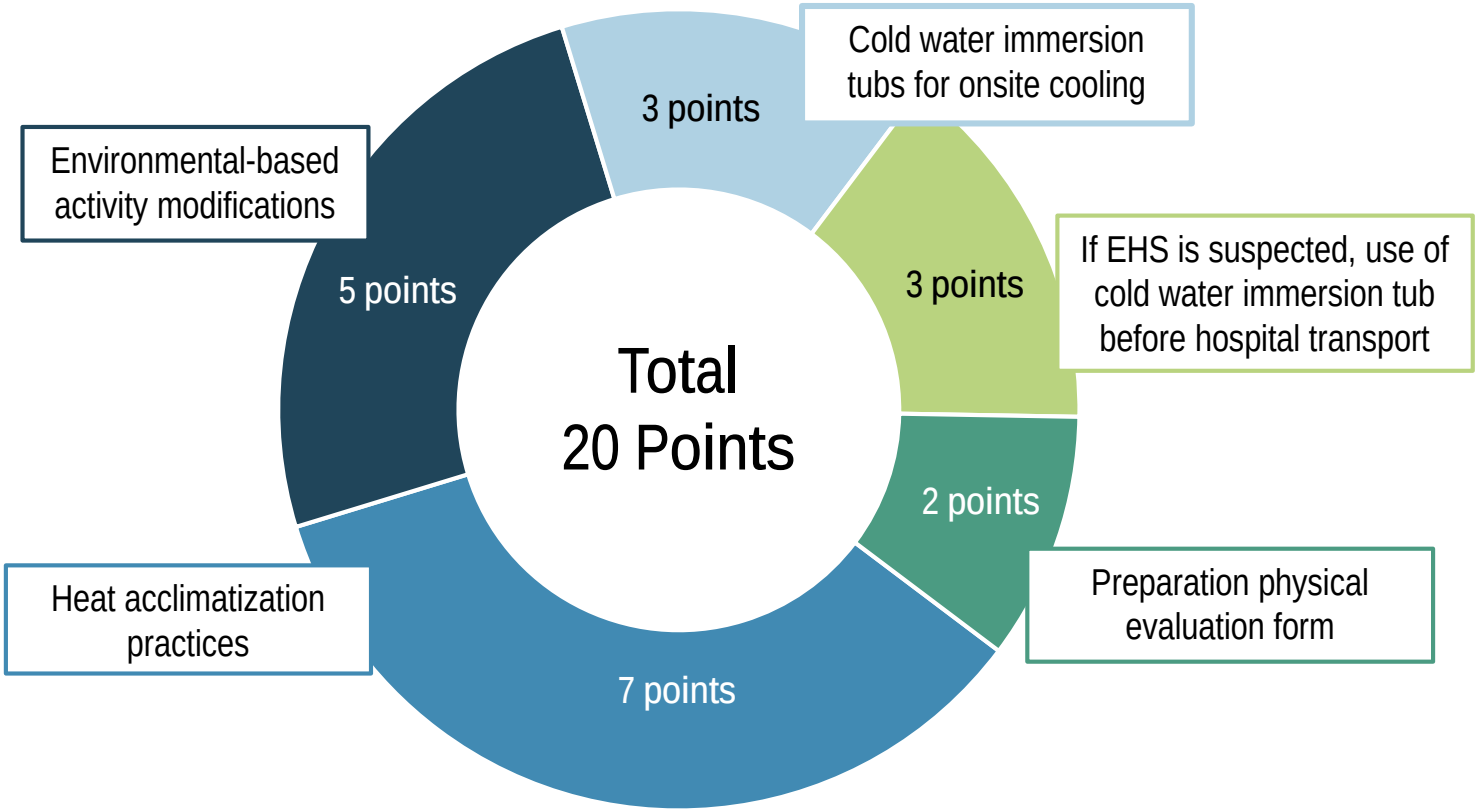
Students must undergo a preseason pre-participation physical evaluation

The FHSAA does not regulate the athletic activities of member schools held with their own students during the summer with the exception of football. However, some sports may practice outside of the academic school year

Florida's Preparedness Practices

2018 Evaluation of States' EHS Preparedness Practices

The Korey Stringer Institute evaluated states' high schools' use of best practices for preventing and treating EHS in five areas



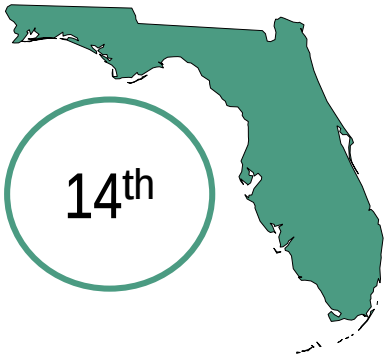
Florida High Schools EHS Preparedness

1 North Carolina

2 Hawaii

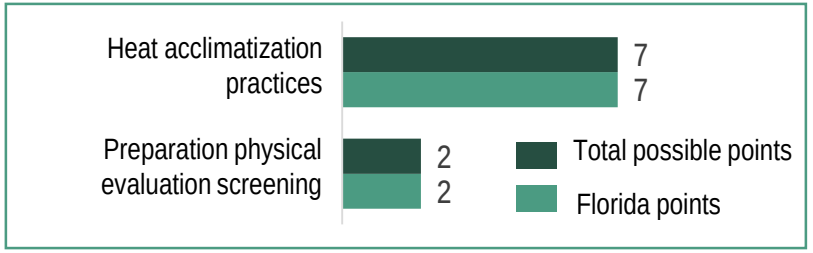
3 New Jersey

Florida

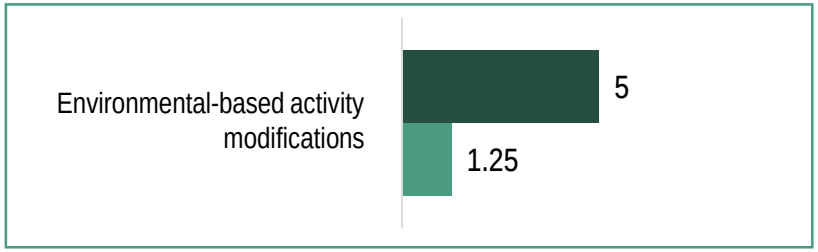


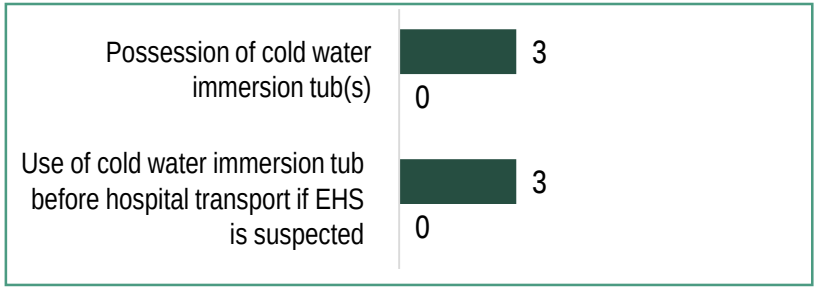
14th

Areas in Which Florida Scored Highest



Areas in Which Florida Scored Lowest





Florida Athletic Directors Survey Results

Safety Protocols

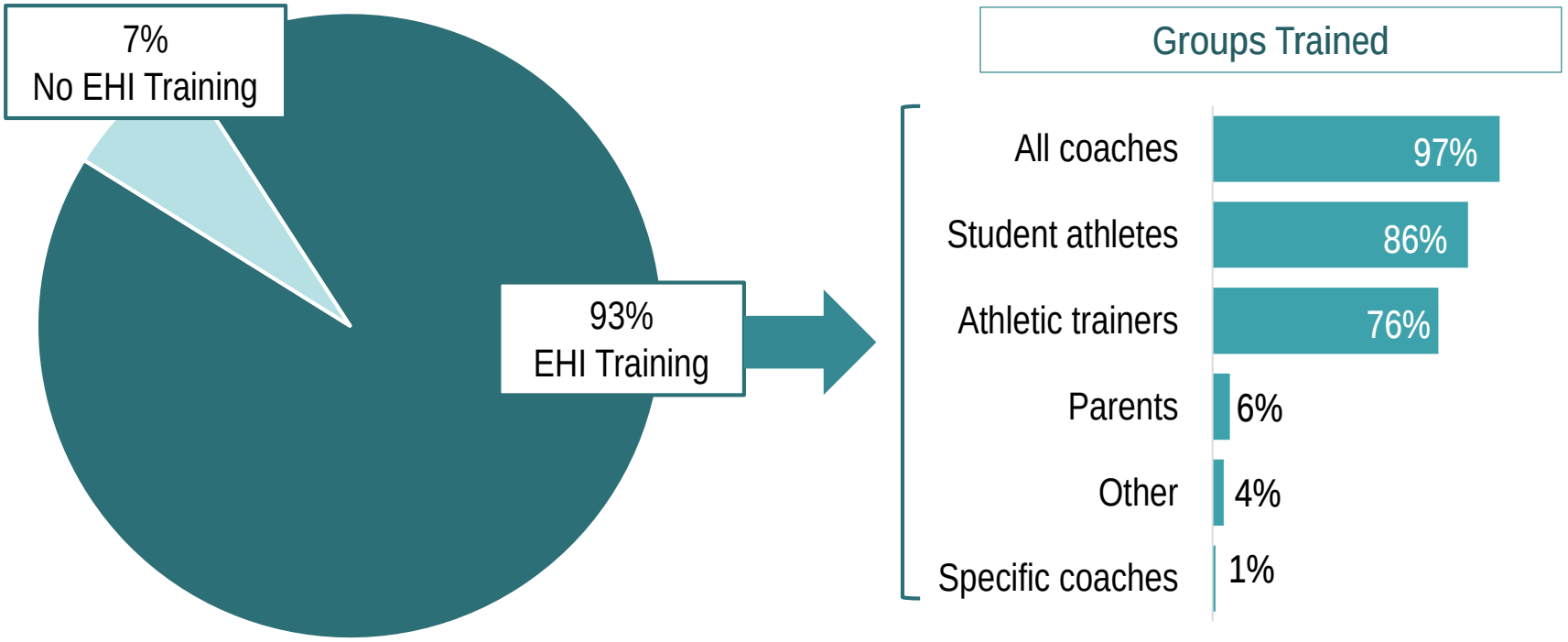
Most schools reported that they have protocols that address preventing and treating EHI

86% of schools reported that they have written **protocols** for the prevention of EHI

86% of schools reported that they have written **protocols** for the treatment of EHI

Training

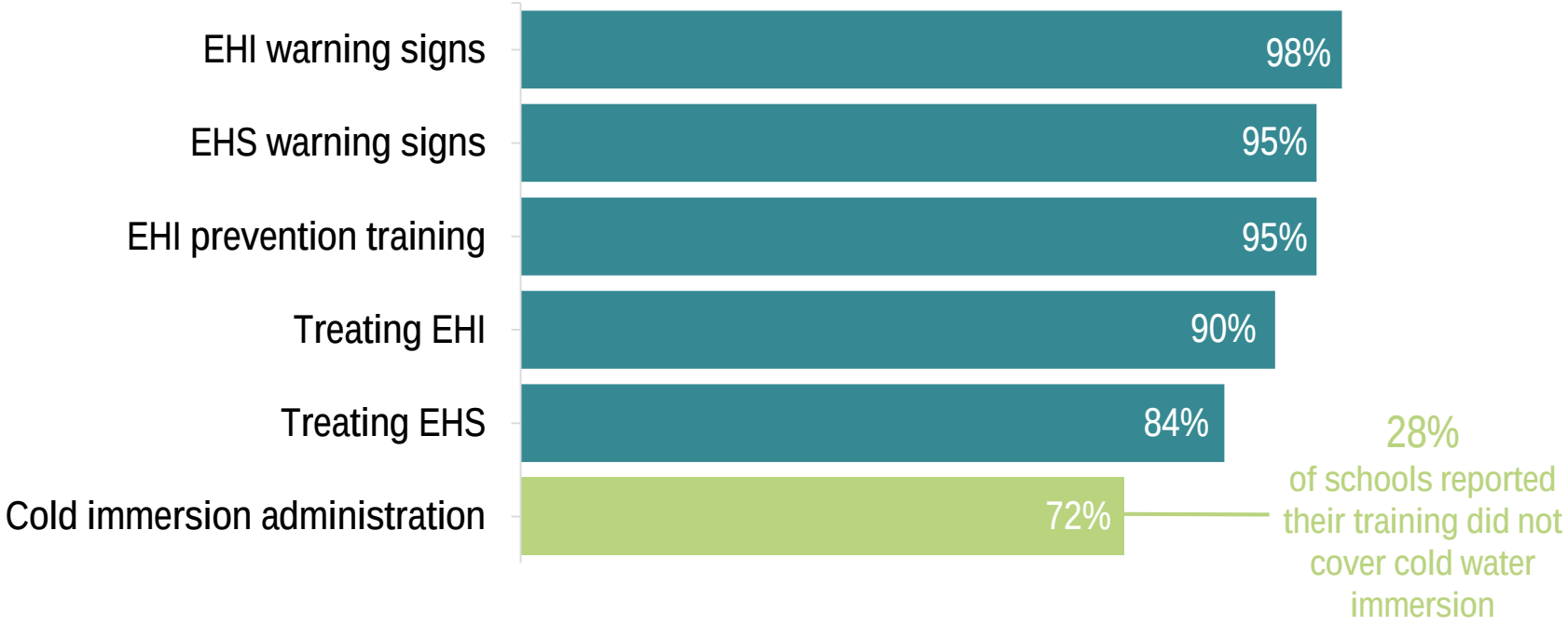
Most schools reported that sports-related staff received training on EHI during the 2017-18 school year



Of the schools that reported that they received training, 95% said that they used the National Federation of State High School Associations' (NFSHA) video on heat illness prevention

Training Topics Covered

While almost all schools reported that their training covered EHI and EHS warning signs, fewer reported that their training covered treatment of heat stroke and cold immersion administration



Cold Water Immersion Tubs

Cold water immersion tubs are considered very effective in treating exertional heat stroke, and include self-cooling machines and substitutes that use ice as the cooling agent

- EHS has a 100% survival rate when immediate cooling is initiated within 10 minutes of collapse
- 100 gallon or more CWI tubs allow for whole body ice water immersion
- This technique involves placing the athlete's trunk and limbs in cold water (35 ^{o} to 59 ^{o} F)
- The purpose is to lower the athlete's core body temperature to less than 102 ^{o} F

Types of Tubs

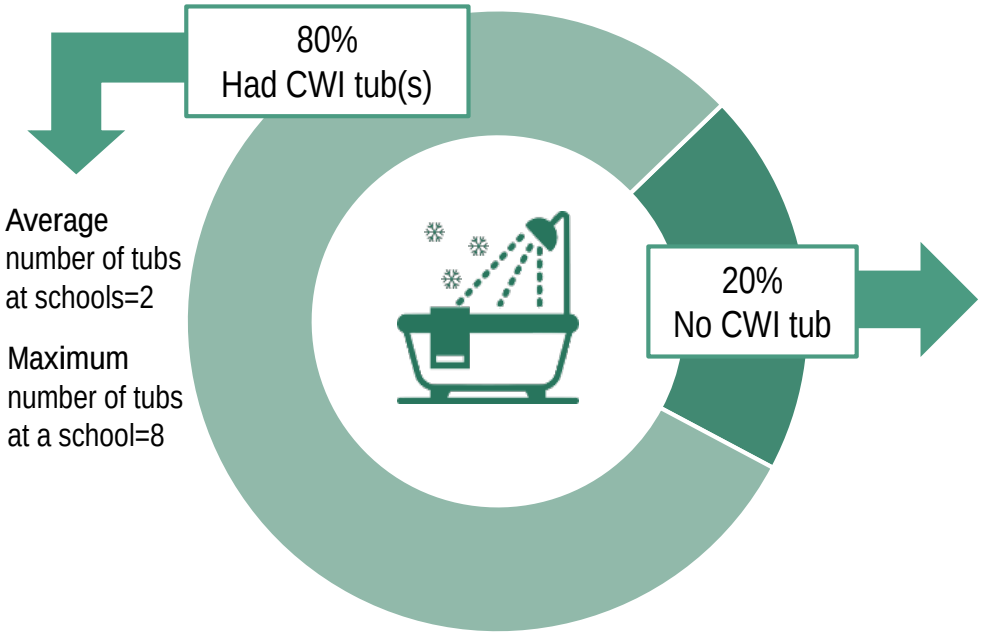
CWI Tub with Built-In Unit

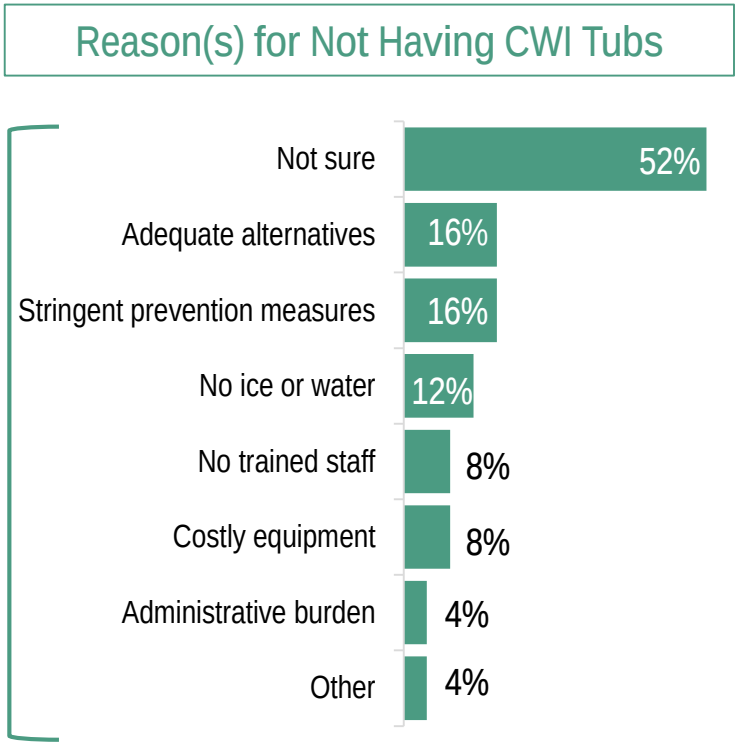
CWI Tub Substitute

Our survey asked a series of questions related to the availability and use of CWIs at schools

CWI Tub Availability

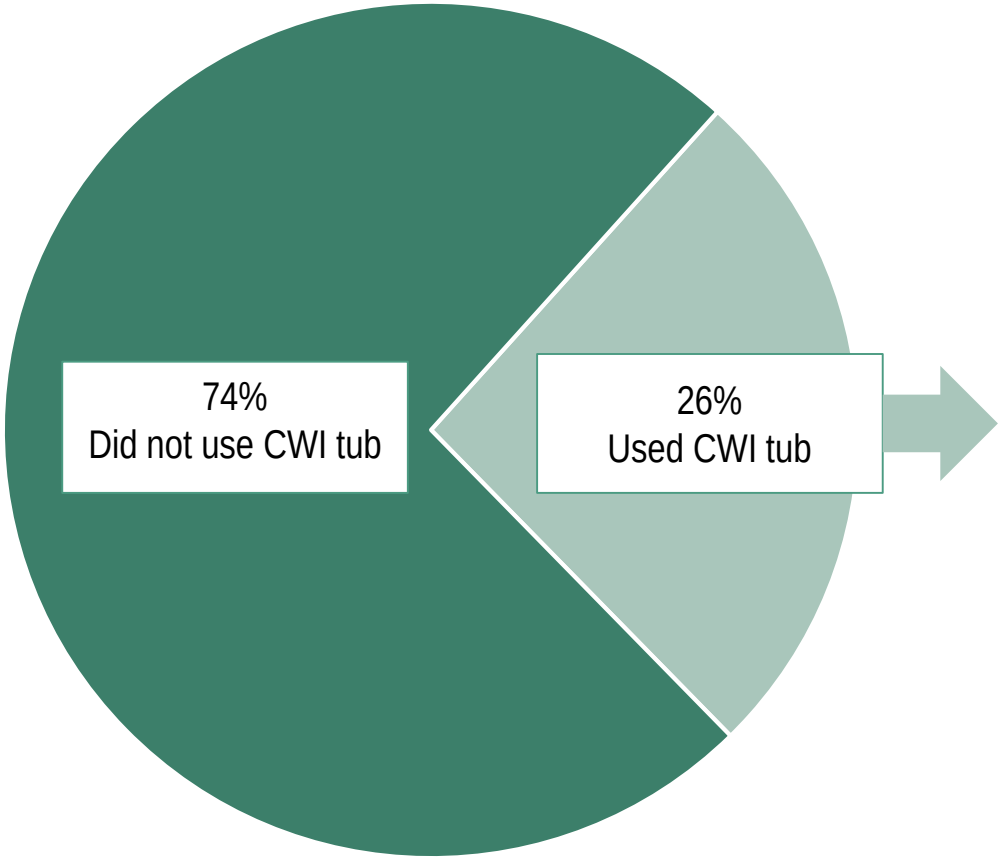
The vast majority of schools had one or more CWI tubs; others most often reported that they were not sure of the reason they did not have tubs





Treating EHI/EHS Using CWI Tubs

Approximately one-quarter (26%) of surveyed schools with a CWI tub reported using CWI tubs for EHI/EHS treatment during the 2017-18 school year



CWI Tub Uses for EHI or EHS Treatment

3	Average number of CWI tub uses per school
50	Maximum number of CWI tub uses at a school
28	Schools used a CWI tub more than once

Other Equipment and Supplies

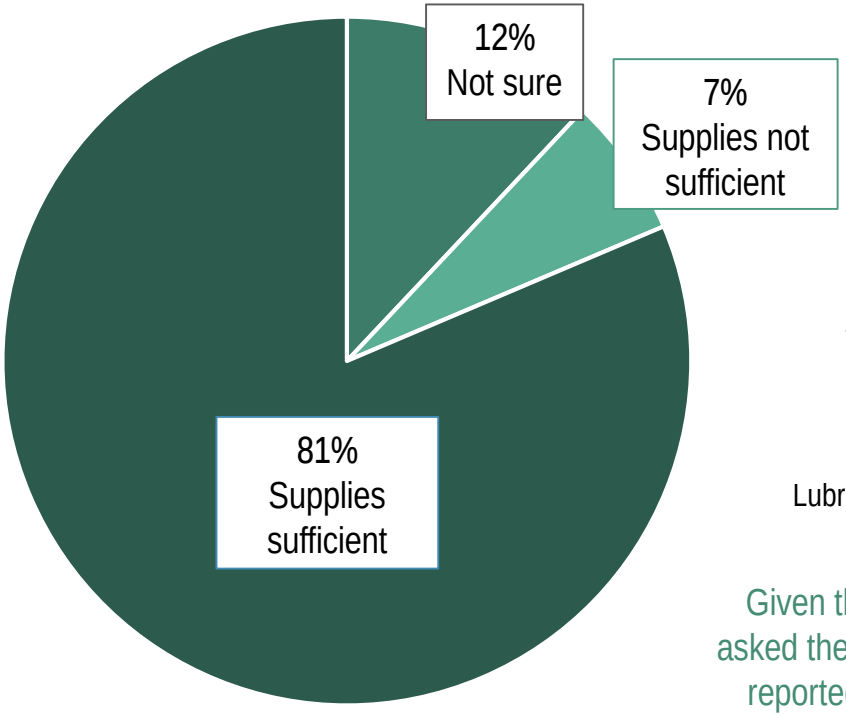
Several other types of equipment and supplies have been recognized as important to prevent and treat exertional heat illness

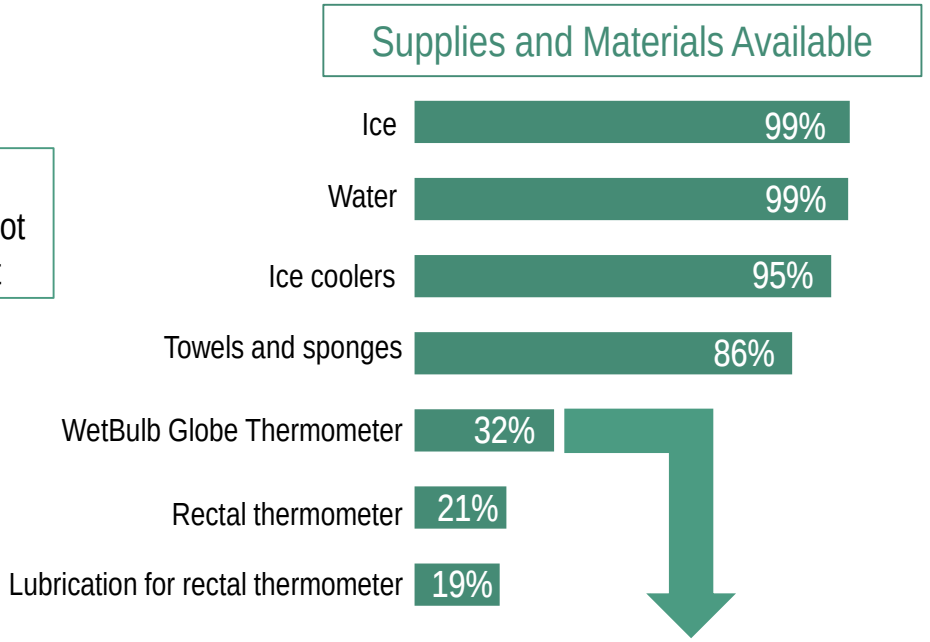
 WetBulb Globe Thermometer	→	Measures multiple metrics (ambient temperature, humidity, sun angle, wind, and cloud cover) and determines environmental heat levels for athletes
 Tents	→	Shelters athletes from radiant heat
 Rectal thermometer with lubricating gel	→	Assesses the core body temperature of athlete
 Ice and water	→	Used with tub, lowers the athlete's core body temperature
 Ice coolers	→	Stores ice during practice and games
 Towels/Sponges	→	Cools surface temperature of athletes

Our survey asked a series of questions related to the availability of this equipment at schools

Overall Availability of Supplies and Materials

Most schools reported that, overall, they believed their supplies were sufficient to prevent and treat exertional heat illness

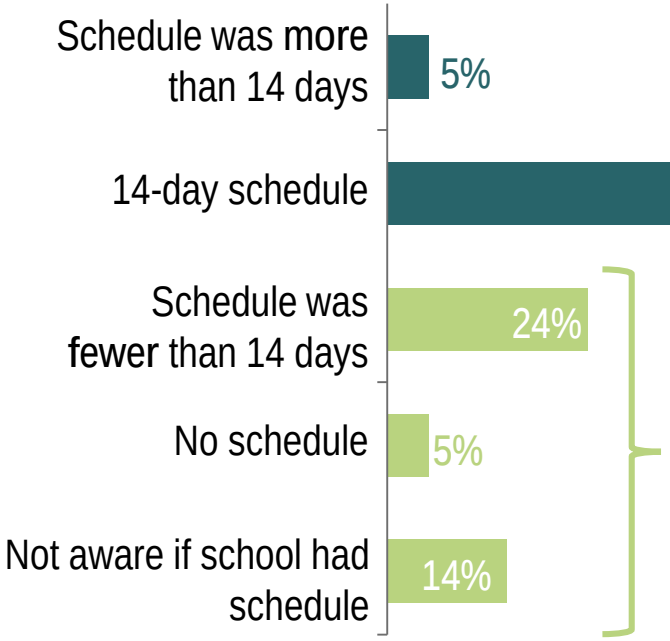




Given the importance of WBGT in the literature that we reviewed, we asked the reason why schools did not have them. Most often (47%) they reported using some other item instead, but 51% said that they were unsure or unaware of WBGTs. Few schools (8%) cited cost.

Heat Acclimatization Schedules

Although the FHSAA requires all member schools to use a 14-day, graduated heat acclimatization schedule, nearly one-third of schools reported that they did not meet this requirement, and 14% did not know if they had a schedule



43%

of athletic directors reported acclimatization schedules that did not meet FHSAA requirements or they were not aware of their schedules

Prevalence of EHI and EHS for the 2017-2018 School Year

Over one-third (95 of 258) of schools that responded to our survey reported treating students for EHI during 2017-18 school year; no school reported student fatalities resulting from EHS

Schools are not required to report incidents of exertional heat illness or exertional heat stroke

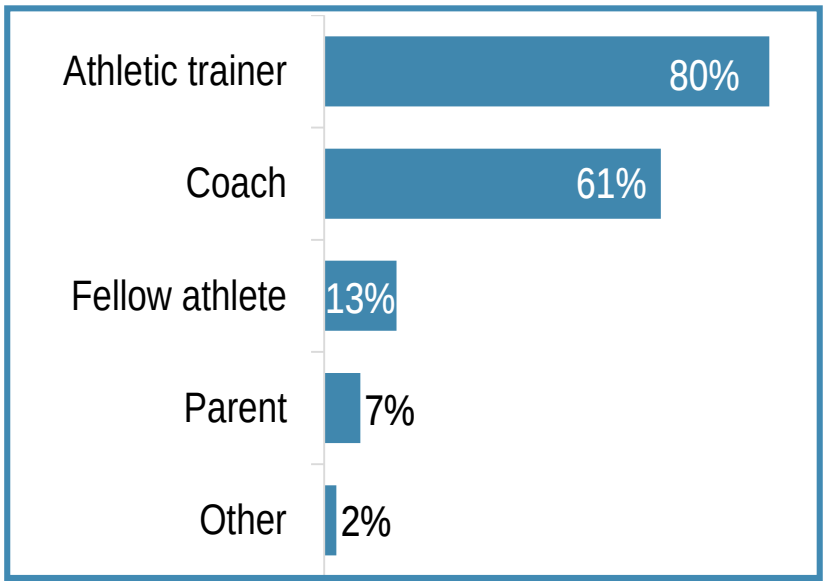
Incidents Schools Reported in Our Survey

461 students from 95 schools were treated for EHI

85%
of students were treated by school staff

18
students from 10 schools were treated for EHS

0
student fatalities from EHS



Questions?

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Summary of Findings

Best Practices

- Florida ranks 14th among states based on an independent assessment of its use of **nationally recognized best practices** for the prevention and treatment of EHS
- National experts recommend that schools take proactive steps to prevent exertional heat illness including
  - following a heat acclimatization schedule;
  - frequently measuring student athletes' temperatures;
  - incorporating rest breaks; and
  - encouraging fluid consumption
- National experts explain that **cold water immersion** is **necessary** for **EHS treatment**

Survey Results

- **Over** 80% of Florida schools that responded to OPPAGA's survey **have protocols** that address prevention and treatment of EHI and provide training to sports-related staff regarding the protocols
- **Eighty percent of** schools had one or more **cold water immersion tubs or substitute tubs** and believed that their schools had sufficient supplies and materials needed to prevent and treat EHI
- Of the 206 schools that reported having at least one cold tub, **53** (26%) reported **not receiving cold water immersion training**.
- **Forty-three** percent of athletic directors reported use of heat acclimatization schedules that did not meet state requirements. Of those, 14% did not know the length of their schools' schedules
- Athletic directors from about one-third (95 of 258) of schools that responded to our survey reported treating students for EHI during the 2017-18 school year; **no school reported student fatalities resulting from EHS**