

2024 Medical Guidance for the Chili Pepper Board
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How hot was the 2023 race?

2023 temperatures: Sept 29: low 60, high 90. Sept 30 low 56, high 89.
Historical averages: Low 54 and High 77.
No WBGT data available for the race day.

What standard are we striving to meet for our athletes?

There are three guidelines I recommend we abide by. Conveniently, their core recommendations are aligned, and they form the foundation of practices that will be recognizable by our athletes, coaches, and trainers. The ones we will review are The American College of Sports Medicine (a physician-oriented group), the National Athletic Trainers Association (a kinesiology oriented group), and the Razorbacks (WPS).

What takeaways should we respect from the ACSM guidelines on Heat Illness?

American College of Sports Medicine Expert Consensus Statement on Exceptional Heat Illness: Recognition, Management, and Return to Activity. *Current Sports Medicine Reports, Sept 2021.*

- Sports, military and labor site administrators should be prepared for exertion heat illness evaluation and management. That's us.
- The prehospital chain of survival sequence improves exertion heat illness outcomes and communication between care teams. *Use of volunteers to maintain course awareness, the grid system for efficient retrieval of athletes, clear interface with the event medicine crew and with Central EMS.*
- Cooling rates >0.15 degrees Celsius per minute are best for survival without complications. *We will achieve this by preparing for ice water immersion, which is the only field treatment modality that reaches this rate of temperature correction.*
- Regional environmental conditions influence the risk of exertional heat illness. *Most of our teams are from a climate similar to our own. We should be aware of teams traveling from much cooler climates and offer them some stewardship in heat acclimatization.*
- Heat acclimatization reduces physiological strain and improves physical performance in the heat. *By late summer most of the athletes are fully acclimatized. The most protective adaptations occur in 8 days of exercising outdoors for at least one hour. These adaptations persist for a couple of weeks even if spent entirely out of the heat.*
- Heat acclimatization is a primary reduction strategy for exertion heat illness rates.
- Motivated, healthy athletes are at high risk for EHS.

The figure in this guideline that offers concrete recommendations for risk appraisal and event cancellation uses wet-bulb-globe temperature as the metric.

- Considerations on the population: our athletes would nearly all fit the definition for "highly fit and fully acclimatized to high heat conditions". Exceptions would be those with prior heat stroke, recent heat exhaustion, high body mass index, or underlying medical conditions we likely won't know about, but should be known to the teams' trainers.
- Considerations on the activity: Our event fits into "Continuous Activity & Competition". The runners' motivation to compete is a risk factor. Competition pushes athletes to ignore and overcome the body's protective sense of fatigue as core temperatures rise to unsafe levels.

What takeaways should we respect from the NATA Position Statement on Heat Illness?

- Assist with identifying high risk athletes and spectators. Give questionnaire from table 2 (see below) to coaches and families if red (73-82) or black (82+) flag conditions expected on race day.
- Figure 3: collapsed runner algorithm. UAMS has one they use, essentially the same. This algorithm is to be determined by the Medical Director of the race, so we are lucky to have such a solid, professional team of experienced clinicians. It makes a big difference.
- Treatment guideline for collapsed runner: threshold to treat as exertional heat stroke is 104°F

What points should we respect from the Razorbacks athletics heat illness guidelines?

- Prevention by individuals - acclimatize, hydrate, have medical screenings.
- Caution at WBGT >82°, consider canceling or moving events.
- Review EAP for every facility you go to.
- If treating with an ice bath, treat until core temp <102 before transporting anywhere.
- Use rectal temperatures.
- See the referenced Brown et al article about WBGT risk zones.
 - 73-82 is high risk, advise high risk people to opt out.
 - Over 82 is black flag kind of conditions.
- “Athletic trainers have unrestricted authority to restrict an athlete from participating if exertion heat illness is suspected.”

Disposition: do cooled patients go home or to the hospital?

- For athletes: The Falmouth Road Race data suggest athletes can go home and expect good outcomes if they return to baseline after cooling at the scene. *No CPXCF policy should mandate 100% transport.* This decision is between the medical director and the athletes and families.
- For spectators: Decrease “medicalization” of being hot by offering respite areas. Facilitate Central EMS contact as needed for collapses, confusion, kids, elderly.

What is the difference between wet-bulb-globe temperature (WBGT) and heat index?

WBGT is the most thorough estimation of heat strain. While heat index is influenced by temperature and humidity, WBGT considers other factors that influence evaporation (wind, sunshine), and radiant heat burden heat (direct sunniness, shadiness, heat being radiated from the ground). Measuring WBGT is therefore extremely localized, and will be different on two sides of the same building. It will be pretty dependable across our course though, with some cooler shaded zones and hotter full-sun microenvironments. Heat index is easy to use because it pops up on everyone’s phones, and easy to understand because it’s in common use. WBGT requires a gadget that calculates it. Cheap ones with painful setup run \$40 on Amazon; simple and sturdy ones run more like \$500.

What can be refined about our interface with Central EMS?

The use of grid coordinates for dispatching vehicles to locations on the course.
Access for ambulances to get to a casualty retrieval point.

What is our relationship like with the Kendrick Fincher foundation?

Kenneth Fincher was 13 when he died of complications of heat stroke, sustained in football practice at Springdale’s Elmwood Junior High. The foundation’s goal is to improve safety

through education and resources for heat protection and hydration. They may provide cooling stations, information if they are available.

Is there a realistic risk for cold-related injuries?

Low likelihood. Even if conditions are 15 degrees below average, with rain and wind, the conditions would be miserable but not dangerous so long as athletes can get dry. Hypothermia from prolonged wet exposure to moderately cold temperatures is possible, but people would likely self-rescue to the parking lot, given our setting. More of a risk to long-exposed volunteers than athletes.

What can be done with the schedule to minimize heat illness risk?

Shifting high risk runners into lower risk cooler times of day. There are several variables to consider here. Risk factors for heat illness include female sex, higher body mass index (our athletes are almost all in the lower end of this), lower experience, poor acclimatization (likely more of a risk for off-the-couch runners in the Open race, less for the teams), and dehydration prior to exercise. The races that happen later in the day have a higher likelihood of being shortened or canceled due to heat, so the Festival has to also consider which races are its most important to complete and consider putting them in earlier, cooler time slots.

What physical preparations could we trigger based on conditions?

- Additional EMS truck - if multiple transports are anticipated.
- Additional ice baths - to serve a 1% heat stroke incidence, we need to have 5 baths, each requiring about 40 gallons of water and 30lbs of ice, flat ground & shade, available for each finish.
- Misting tents (requires power plus water)
- Shade tents
- Swamp coolers (requires power plus water)
- Shortening the distances
- Canceling the races

Proposed timetable:

30 days out:

- Establish availability of cooling tubs with Central EMS, University, and FHS. Know how they will be sourced if needed, and how they will be moved to and from the site.
- Establish logistics and funding for ice. Is this a UAMS medical event expenditure or a Chile Pepper expenditure?
- Plan for which races can be shortened, and draw those course maps.

10 days out:

- Check the forecast. If high temperatures are expected to be 85 or higher, communicate with teams and families about possible course changes, need for acclimatization, emphasize hydration prior to the race, and link to Kendrick Fincher Foundation for further information.
- Consider sourcing additional shade tents, misters, or other respite zones.

3 days out:

- Obtain WBGT apparatus from U of A, practice its setup.

Race Day:

- Set up WBGT at a representative location on the course.
 - Set up 5 tubs with 200 gal water, 150lbs ice for initial setup and another 150lbs available to maintain coldness.
 - If tubs are unavailable, then tarpaulins may be used to make “ice tacos”.
 - Expect a standard treatment time of 10-12 minutes for each person treated with ice water immersion.
 - If WBGT is 73-82, consider this “red flag” conditions and consider shortening the courses and advise coaches and trainers to consider pulling any high-risk athletes by NATA guidelines (see below)
 - If WBGT is over 82, consider this “black flag” conditions and consult with the race medical director about canceling events.
 - Communicate course adjustments.
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Risk mitigation for coaches/trainers. This questionnaire can be sent as a basis for helping teams calibrate risk for their athletes. Hopefully the trainers will already know this about their runners, but we may be able to help them by sending this as a prompt to the coaches if high risk conditions are forecasted.

From the National Athletic Trainers Association heat guidelines:

Sample Preparticipation Physical Examination Questions Related to Exertional Heat Stroke

1. Have you ever previously been diagnosed with exertional heat stroke? If yes,
 - a. How long ago?
 - b. Have you had any complications since then?
 - c. How long did it take you to return to full participation?
 - d. Did you have any complications upon your return to play?
 - e. Was an exercise heat tolerance test conducted to assess your thermoregulatory capacity?
2. Have you ever been diagnosed with heat exhaustion? If yes,
 - a. When?
 - b. How many times?
3. Have you ever had trouble or complications from exercising in the heat (eg, feeling sick, throwing up, dizzy, lack of energy, decreased performance, muscle cramps)?
4. How much training have you been doing recently (in the past 2 weeks)? Has this been performed in warm or humid weather?
5. Have you been training during the last 2 months? Would you say you are in poor, good, or excellent condition?
6. Describe your drinking habits. (Are you conscious of how much you consume? Is your urine consistently dark?)
7. Would you consider yourself a heavy or a salty sweater?
8. How many hours of sleep do you get per night? Do you sleep in an air-conditioned room?
9. Do you take any supplements or ergogenic aids?