

EXERTIONAL HEAT ILLNESS PREVENTION

MINIMIZING EXERTIONAL HEAT ILLNESS IN TRIATHLON

The incidence of exertional heat stroke (EHS) varies from event to event and increases with rising ambient temperature and relative humidity.

- *Event should be scheduled to avoid extremely hot and humid months, based on the historical local weather data.*
- *During summer months all events should be scheduling during the cooler hours of the days (eg. early morning or late afternoon).*

The LOC and the Medical Staff should provide the following in any case :

- Tent with fans and air conditioned
- Tents, awnings, umbrellas, etc.
- Water (1 liter/4 athletes)
- Sports drink cooled
- Towels immersed in ice water
- Ice (1 kg /4 athletes)
- IV fluids (NS or 5% dextrose in NS)
- Improve the aid/drink stations numbers during the run course (every 2 km)

The TD and the Medical delegate must work with the Race Medical Doctor (RMD) and the LOC to ensure that during competitions, adequate shelters (tent, awnings, umbrellas, etc) are provided for athletes and officials in the field where prolonged exposure is likely to occur.

Practice and competitions could be modified on the basis of air temperature, relative humidity, sun exposure, heat acclimatization status, age and equipment requirements by decreasing the duration and intensity of exercise.

The risk of heat related illness is greatest when high-environmental temperatures occur early in the competitive season when participants may be inadequately prepared and have not yet acquired natural acclimatization to heat. EHS also can occur with other temporary factors like viral illness or medications.

MONITORING THE ENVIRONMENT

The LOC shall work with local meteorology sources to provide statistical information on prior weather patterns, in order to assist competition organizers in developing the competition schedule. Event organizers should monitor the weather conditions before and during practice and competition. Factors that affect heat injury risk include ambient temperature, relative humidity, wind speed and solar radiant heat.

Environmental heat stress can most reliably be predicted by using the wet bulb globe temperature (WBGT) index. The WBGT is an index of environmental heat stress and is used to estimate the risk of heat related illness. Variables measured are ambient heat, humidity and radiant heat stress from direct sunlight. The measuring device is commercially available and when WBGT is not available on site the race organizers can obtain WBGT readings from their local weather service during hot weather months or with standardized algorithms or charts to estimate heat risk.

WBGT is a standardized method to determine heat stress that does not take in account individual response, heat acclimation or lack of acclimation, and the body's ability to dissipate heat while swimming and cycling.

ACTIVITY MODIFICATION IN HIGH-RISK WEATHER CONDITIONS

Using the WBGT index to assess on-site environmental heat stress at regular intervals and the appropriate announcement of its readings is an important starting point to decrease the incidence of heat related illness.

If WBGT index is between 26-28°C (79-82°F) the EHS risk for unfit, nonacclimatized individual is high. Caution should be taken and athletes should be advised of the danger and to increase their normal fluid intake.

If WBGT index is above 28°C (82°F) or the ambient temperature is above 35°C (95°F) the level for EHS risk is cancelled and uncompensable heat stress exist for all athletes.

Difference of local climate and individual heat acclimatization status may allow activity at higher levels than outlined above in acclimatized fit and elite athletes.

The ITU TD and Medical delegate, the RMD and the LOC should work together to monitor weather conditions and a specific contingency plan should be implemented to consider the scenario of extreme meteorological situations that could force to modify (reducing race length), to rescheduling the event until less stressful conditions prevail, or even cancel the competition.

In case the decision must be taken considering also the level of medical assistance, the facilities in the medical tent, the evolution of the weather conditions following the forecast, the period of competitive season, the race distance, and the category, fitness and age of the athletes.

In general better performance and less adverse results are obtained when the environmental conditions are going to improve, rather than worsen, during the event. As an example, in hot environmental conditions, start times would be better set for late afternoon, rather than early morning (increased thermal stress in sunny morning).

During the ITU WTS and World Cup races weather information and the WBGT index should be provided at the Sport Informations Centers and at the athletes' lounge. The information should be posted by the time that the athletes' lounge is open for the athletes' check in. A WBGT index is converted in a colored flag system to visually signal the thermal injury risk of current weather conditions to athletes in four levels. The information can be delivered in a form of written announcement (sample below)

Risk Categories in Wet Bulb Globe Temperatures Readings		
Colour flag	Heat index	Risk
Black	28°C (82°F) and more	Extreme
Red	23-28°C (73-82°F)	High
Yellow	18-23°C (64-73°F)	Moderate
Green	Lower than 18°C(64°F)	Low

THE UPPER WATER TEMPERATURE LIMIT

The IOC/FINA/ITU research "Thermal stress in open water swimming : establishing competition parameters for athlete safety" concluded that because no intolerance or unusually high exercising core temperature were observed in maximal effort swims in lab test at 30-32° C water T° such temperature are to be considered safe.

Considering the potential variability in physiological responses to thermal stress exists between swimmers subjected to lab test versus the race environment *the research suggests a more conservative upper limit water T° of 31°C (87.8°F), because swimming in open-water competition might produce higher core temperature than is produced in lab trials.*

RETURN TO PLAY AFTER HEAT ILLNESS

Athletes who have a significant heat related illness appear to be at increased susceptibility for subsequent events. An athlete's return to sports depends on the severity of heat related illness and the clinical course of the recovery. In milder cases with rapid recovery, return to sports is recommended only after an evaluation of potential risk factors, complete resolution of symptoms, and normalization of all vital signs and laboratory tests. After treatment of the acute heat stroke event it has been suggested that an athlete wait at least 1 week to return to practice sports, with a gradual and closely monitored return to activity.

Heat stroke is not necessarily caused by high environmental temperature per se, and is not predicted by any particular core temperature, which again puts some responsibility on the coach and athlete to be cognizant of their health status and make decisions appropriately.

HEAT STRESS ILLNESS PREVENTION

Date:

Time:

Air Temperature:

Humidity:

WBGT:

Colour code:



Risk: Extreme