



# Environmental (Heat) Emergencies In Soccer

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The Body Must Adapt To Exercise In The Heat....but do so with a great deal of caution



Anything for a gold medal, baby. Yesterday was a little tough



SERENA WILLIAMS  
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# HEAT RELATED ILLNESS

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- Heat-related illnesses, such as **heat exhaustion** and **exertional heat stroke (EHS)**, can be serious and potentially life-threatening conditions which can be brought on or intensified by physical activity.
- Heat Exhaustion = About Fluid Loss
- Exertional Heatstroke = Medical emergency!
- Fact: You do not need to have heat exhaustion first to have EHS
- Fact: You can be 100% hydrated and still have EHS
- Recognizing the signs and symptoms as early as possible allows for treatment and rapid recovery
  - weakness or fatigue, headache, nausea and dizziness
  - **altered mental status, such as confusion, irritability, aggressive behavior, dizziness**
  - slurred speech
  - hallucinations
  - loss of balance, collapse
  - throbbing headache
  - **body temperature above 104 degrees Fahrenheit**



# Prevention Is Key!!

- Develop a Heat Policy with Heat Acclimatization Guidelines Based on Environmental Conditions
  - (see Recognize to Recover Environmental Heat Materials)
- Monitor Changing Environmental Conditions using WBGT or a WBGT Heat Stress Device
- Follow Heat Acc Guidelines and MAKE MODIFICATIONS!!!
  - Preseason Practices and Conditioning
- YOU CAN PLAN AHEAD!
  - Use resources such as the [WBGT Forecast Tool From the NWS](#)
- HYDRATION HELPS BUT IS NOT A GUARANTEE
- On-site Medical Personnel (AT, MD, etc.)
- Have proper equipment to cool (ice, tub, towels, water, shade)



# Wet Bulb Globe Temperature Best Practice Modifications

**STEP 1 FIND THE WET BULB GLOBE TEMPERATURE (WBGT)**  
 Measure the temperature and humidity at your site. Find the estimated WBGT corresponding below.

**WET BULB GLOBE TEMPERATURE (WBGT) FROM TEMPERATURE AND RELATIVE HUMIDITY**

		TEMPERATURE IN DEGREES FAHRENHEIT																								
		88.0	89.8	91.6	93.4	95.2	97.0	98.8	100.6	102.4	104.2	106.0	107.8	109.6	111.4	113.2	115.0	116.8	118.6	120.4	122.2					
RELATIVE HUMIDITY (%)	0	59.0	60.8	62.6	64.4	66.2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
	5	60.8	62.6	64.4	66.2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2	
	10	62.6	64.4	66.2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2		
	15	64.4	66.2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2			
	20	66.2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2				
	25	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2					
	30	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2						
	35	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2							
	40	73.4	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2								
	45	75.2	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2									
	50	77.0	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2										
55	78.8	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2												
60	80.6	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2													
65	82.4	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2														
70	84.2	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2															
75	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2																
80	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2																	
85	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2																		
90	91.4	93.2	95.0	96.8	98.6	100.4	102.2																			
95	93.2	95.0	96.8	98.6	100.4	102.2																				
100	95.0	96.8	98.6	100.4	102.2																					

NOTE: This table is compiled from an approximate formula which only depends on temperature and humidity. The formula is valid for full sunshine and a light wind. Table adapted from Bureau of Meteorology

**STEP 2 FIND YOUR REGIONAL CATEGORY**  
 Determine which region category you are in based on the map.



**CATEGORY 1**  
 **CATEGORY 2**  
 **CATEGORY 3**

## TRAINING & MATCH PLAY LIMITS

### CANCELLATION OF TRAINING

Depending on your region category, recommend cancellation of training or delay until cooler when WBGT for

Cat 1 >86.2°F

Cat 2 >89.9°F

Cat 3 >92.0°F

### MATCH PLAY HYDRATION BREAKS: WBGT OF 89.6°F

Provide hydration breaks of 4 minutes for each 30 minutes of continuous play (i.e., minute 30 and 75 of 90 minute match)

**STEP 3 FIND YOUR ALERT LEVEL AND WORK TO REST RECOMMENDATIONS**

Based on your WBGT and Regional Category determine your Alert Level and Work to Rest Recommendations using the table below.

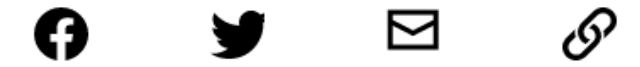
ALERT LEVEL	WBGT BY REGION (°F)			EVENT CONDITIONS	RECOMMENDED WORK TO REST RATIOS (ACTIONS & BREAKS)
	CAT 1	CAT 2	CAT 3		
<b>BLACK</b>	>86.2°	>89.8°	>92.0°	Extreme Conditions	No Outdoor Training, delay training until cooler, or Cancel Training.
<b>RED</b>	84.2-86.1°	87.8-89.7°	90.1-91.9°	High Risk for Heat Related Illness	Maximum of 1 hour of training with 4 by 4 minute breaks within the hour. No additional conditioning allowed.
<b>ORANGE</b>	81.1-84.1°	84.7-87.7°	87.1-90.0°	Moderate Risk for Heat Related Illness	Maximum of 2 hours of training with 4 by 4 minute breaks each hour, OR a 10 minute break every 30 minutes of training.
<b>YELLOW</b>	76.3-81.0°	79.9-84.6°	82.2-87.0°	Less than Ideal Conditions	3 Separate 4 minute breaks each hour, OR a 12 minute break every 40 minutes of training
<b>GREEN</b>	<76.1°	<79.8°	<82.1°	Good Conditions	Normal Activities. 3 Separate 3 minute breaks each hour of training, OR a 10 minute break every 40 minutes

If World Cup  
Can Do It, Why  
Can't You?

## World Cup Match So Hot Officials Call for First-Ever Water Break

Players on both teams sweated it out in Manaus during crucial World Cup game.

By RHEANA MURRAY  
June 22, 2014, 8:45 PM



They are the two words that anyone who ever huffed and puffed around a soccer field as a kid longed to hear while waiting for the whistle to blow: Water break! For the first time in history, the best players in the world heard the same thing on Sunday, although no one's mom remembered to bring the orange slices. In the 40th minute of the thrilling 2-2 tie between the United States and Portugal, the





# The Top 5 Things Your Club Should Do To Prevent Heat Illness

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1. Develop a comprehensive heat policy
2. Be able to recognize the signs and symptoms of heat illness
3. Measure the environmental conditions using WBGT and MODIFY your sessions to reduce the risk of heat illness
4. Acclimatize your players to exercise in the heat gradually
5. Recognize heat illness immediately, remove the athlete from the heat, start cooling on site if possible, and activate your EAP

# Key Soccer Resources

- U.S. Soccer Recognize to Recover Heat Guidelines ([click here](#))
- Korey Stringer Institute
  - [Heat Stroke Prevention](#)
  - [Heat Stroke Risk Factors](#)
  - [Heat Stroke Recognition](#)



**RECOGNIZE TO RECOVER™**



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