

# HEAT ILLNESS TRAINING

By: Contra Costa Water District



## Course Outline

- Define Heat Stress, Heat Exhaustion & Heat Stroke
- Identification, Evaluation and Treatment
- Precautions and Prevention of Heat Related Sickness (importance of acclimation)
- Heat Index
- District Procedures for Controlling Exposure to Heat Illness



## Heat Stress, Exhaustion and Stroke

### Heat Stress:

- You may notice that you are tired and less mentally alert, which increases the danger of accidents
- You may sweat; the body produces sweat so that evaporation will cool you off
- Heat rash is possible; occurs when your sweat glands swell and get plugged up
- A sunburn can occur if you're in direct sunlight too long without using a sunscreen product on your skin; sunburn can be painful and may even lead to skin cancer
- Heat cramps are common as fluids and electrolytes are lost through sweating



## Heat Stroke vs Heat Exhaustion

### Heat Stroke

**Heat stroke** is defined as a body temperature of greater than 105.1 °F (40.6 °C). Some possible symptoms are:

- Dizziness and confusion
- Red, hot, dry skin
- Nausea and vomiting
- Very little sweating
- Rapid pulse
- High body temperature
- Convulsions
- Fainting

Heat Stroke  
1. Dry, hot skin  
2. Very high body temperature



Heat Exhaustion  
1. Moist clammy skin  
2. Normal or subnormal temperature

### Heat Exhaustion

Your whole body (especially your circulatory system) is extremely stressed. Some possible symptoms are:

- Pale, flushed face and neck
- Clammy skin
- Heavy sweating
- Fatigue
- Shortness of breath
- Headache, dizziness, or fainting
- Nausea and vomiting
- Rapid heartbeat and breathing

➤ **Possible Death: Approximately 50% of heat stroke victims die**



## Heat Illness Treatment

- **Heat cramps:** Stop work, drink fluids, and rest in a cool area. Drinking electrolyte solutions may also help
- **Heat exhaustion:**
  - Give first aid by moving the person to a cool place to rest, remove as much clothing as possible
  - Give the person water; Drinking electrolyte solutions may also help
  - Don't allow the person to get chilled, and treat for shock if necessary
  - Get medical help
- **Heat stroke:** Call 911 to get medical help immediately; Immerse the person in cool water or ice



## Precautions and Prevention of Heat Illness

- Pay attention to the early symptoms and signs of heat stress in yourself and co-workers
- When possible, perform strenuous work during cooler parts of the day
- Rotate strenuous, hot job tasks with other co-workers so no one is exposed too long
- Whenever possible, seek shade
- Keep first aid supplies and equipment available
- Drink a lot of cool water (or an electrolyte solution).
  - You may need a quart an hour or more, depending on conditions
  - Drink even if you don't feel thirsty



## Precautions and Prevention of Heat Illness (Con't)

- Take frequent breaks in an air-conditioned or shaded area
- Wear appropriate, loose fitted cotton or lightweight clothing when you're in the sun
- Use a sunscreen product to protect your skin from ultraviolet rays. Sunscreen should have a sun protection factor (SPF) of at least 15
- Stay physically fit





## Heat Acclimation



- Acclimating your body to heat and work environment is one of the best ways to prevent heat illness
- Acclimation usually takes 4 to 7 days of regular exposure to heat. But everyone is different
- You shouldn't do strenuous work all day on a hot job until you've become acclimated
- When you are acclimated, your body temperature and heart rate will be lower. You will sweat more, but your sweat will be less salty so you won't lose as much salt
- You lose acclimation in a few weeks if you stop working in the heat
- **Cal/OSHA investigated 25 incidents of heat-related illness in 2005. In almost half of the cases, the worker involved was on their first day of work and in 80% of the cases the worker involved had only been on the job for four or fewer days**





# Heat Index

NOAA's National Weather Service

Heat Index  
Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

  Caution    
   Extreme Caution    
   Danger    
   Extreme Danger

- The "heat index" is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels
- The heat index is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources
- **Why humidity matters:** Relative humidity is a measure of the amount of moisture in the air. Sweat does not evaporate as quickly when the air is moist as it does in a dry climate. Since evaporation of sweat from the skin is one of the ways the human body cools itself on a hot day, high humidity reduces our natural cooling potential and we feel hotter



## Procedures for Evaluating and Controlling Heat Illness

- When possible, use the buddy system; watch your coworkers for signs of heat stress
- Know what to do if you or your coworkers show any symptoms of heat illness
- Notify your supervisor and stop work if you have or notice any symptoms of heat illness
- At the beginning of the work shift, supervisors shall notify their field employees of forecasted temperatures that approach hazardous levels. Caution must be used when temperatures range between 85-105 degrees
  - Schedule more frequent breaks
  - Ensure employees are drinking sufficient fluids and sufficient fluids are available (at least one quart per hour per employee)
  - Ensure shade is available to employees (within ¼ mile of worksite)
  - Rotate strenuous activities



## Procedures for Evaluating and Controlling Heat Illness (Con't)

- Prolonged physical activity at temperatures over 105 degrees is considered to be dangerous. Supervisors are encouraged to schedule very physical activity during cooler parts of the day and put in place extra precautions to prevent heat illness
- At 95 degrees and above, supervisors monitor or check-in with employees conducting construction and/or grounds maintenance activities hourly
- Supervisors must know how to contact emergency medical services (Dial 911) and be able to provide clear and precise directions to the work site



## Children & Pets - Reminder

- Children, elderly adults, or disabled individuals left alone in a vehicle are at particular risk of succumbing to heat stroke
- Pets are even more susceptible than humans to heat stroke in cars, as many cannot produce whole body sweat
- Between 1998 and 2011, at least 500 children in the United States died from being inside hot cars, and 75% of them were less than 2 years old
- Place a stuffed toy or other child's toy in the front seat as a reminder that at least one child is present

