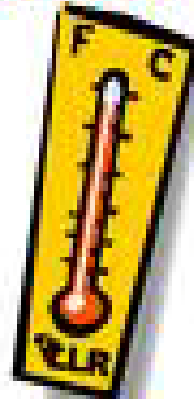


Heat Stress Hazards and Other Seasonal Safety Hazards

PREVENT HEAT STRESS

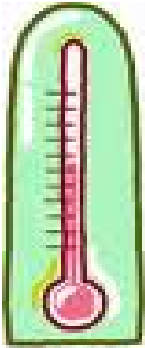


Myra Forrest

Main Points



- How the body handles heat
- Types of Heat Stress
- Causal / Personal Factors
- Prevention



How the Body Responds to Heat

- Body tries to maintain constant internal temperature of 98.6
- When internal temperature rises, it attempts to get rid of excess heat by:
 - Increasing blood flow to skin surface
 - Releasing sweat onto skin surface



Effects of Body's Response

- Reduced blood flow to brain
 - Reduced mental alertness and comprehension
- Reduced blood flow to active muscles
 - Fatigue, loss of strength
- Increased sweating
 - Slipperiness
 - Affects Vision



Increased Chance of an Accident !

When Cooling Mechanisms Fail

- High air temperature reduces effectiveness
- High humidity reduces evaporation of sweat
- Excess loss of salt
- Dehydration



Types of Heat Stress

- Heat Stroke
- Heat Exhaustion
- Heat Cramps
- Heat Collapse
- Heat Rash
- Heat Fatigue
- Dehydration
- Sunburn



Heat Stroke



- Body's system of temperature regulation fails - body temp. rises to critical levels
- Caused by a combination of highly variable factors - occurrence is difficult to predict
- Medical emergency – Can result in Death

Signs & Symptoms of Heat Stroke

- Confusion; irrational behavior; loss of consciousness; convulsions
- Lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., an internal temperature of 105.8°F
- If body temperature is too high, it causes death





Heat Stroke - Treatment

- Professional medical treatment should be obtained immediately – Call 911
- The worker should be placed in a shady area and the outer clothing should be removed.
- The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible



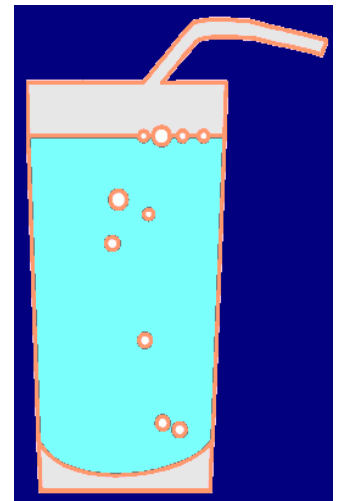
Heat Exhaustion

- Signs and symptoms - Headache, nausea, vertigo, weakness, thirst, and giddiness
- Heat exhaustion should not be dismissed lightly for several reasons
- Fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation
- Victim may be injured when he or she faints



Heat Exhaustion - Treatment

- Remove from the hot environment
- Fluid replacement
- They should also be encouraged to get adequate rest





Heat Cramps

- Caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating
- It is important to understand that cramps can be caused by both too much and too little salt



Heat Cramps - Treatment

- Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments
- Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur
- Recent studies have shown that drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery



Heat Collapse - "Fainting"

- In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities
- the onset of heat collapse is rapid and unpredictable
- Prevention -worker should gradually become acclimatized to the hot environment

Heat Rashes

- Most common problem in hot work environments
- Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive
- Prickly heat occurs in skin that is persistently wetted by unevaporated sweat,
- Heat rash papules may become infected if they are not treated
- In most cases, heat rashes will disappear when the affected individual returns to a cool environment.





Heat Fatigue

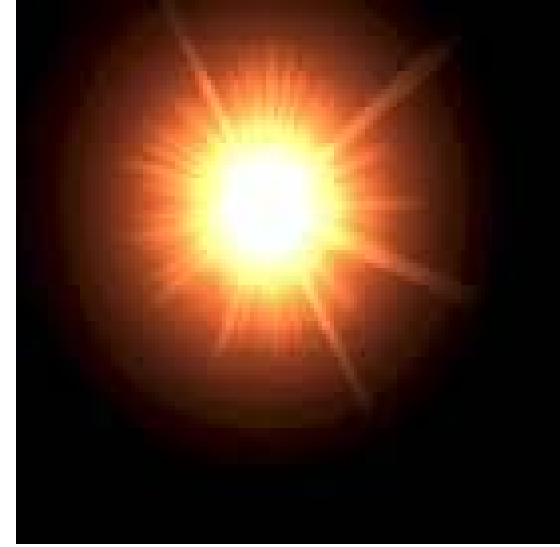
- A factor that predisposes an individual to heat fatigue is lack of acclimatization
- The signs and symptoms of heat fatigue include impaired performance of skilled sensor motor, mental, or vigilance jobs
- There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

Dehydration

- Excessive fluid loss
- Signs 7 symptoms – fatigue, weakness, dry mouth
- Treatment – fluids & salt replacement



Sunburn



- Symptoms
 - 1st Degree – red, painful skin
 - 2nd Degree- blisters / peeling skin
- Treatment – skin lotions/topical anesthetics
- Prevention – Limit sun exposure to bare skin



Causal / Personal Factors

- Age, weight, degree of physical fitness
- Degree of acclimatization, metabolism
- Alcohol, drugs, caffeine, & medication usage
- Medical conditions i.e. hypertension can affect a person's sensitivity to heat
- Type of clothing worn must be considered
- Prior heat injury predisposes an individual to additional injury.

Work-related Factors

- Workload
 - Type of work
 - Level of physical activity
 - Time spent working
- Clothing
 - Weight (heavy v. breathable)
 - Color (dark v. light)
 - Personal protective equipment and clothing



Environmental Factors

- Air temperature
- Humidity
- Radiant heat source
- Air circulation



Temperature (F) versus Relative Humidity (%)

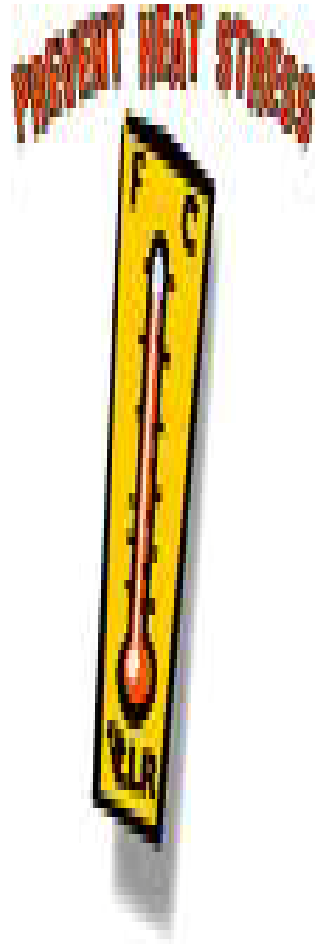
°F	90%	80%	70%	60%	50%	40%
80	85	84	82	81	80	79
85	101	96	92	90	86	84
90	121	113	105	99	94	90
95		133	122	113	105	98
100			142	129	118	109
105				148	133	121
110						135

HI

Possible Heat Disorder:

80°F - 90°F	Fatigue possible with prolonged exposure and physical activity.
90°F - 105°F	Sunstroke, heat cramps and heat exhaustion possible.
105°F - 130°F	Sunstroke, heat cramps, and heat exhaustion likely, and heat stroke possible.
130°F or greater	Heat stroke highly likely with continued exposure.

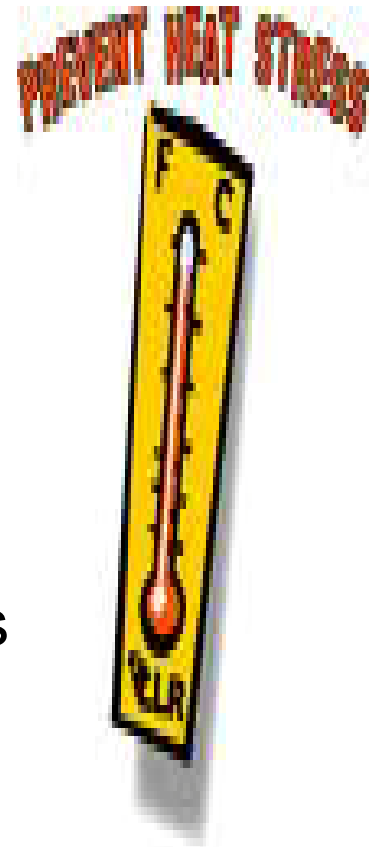
Preventing Heat Stress Hazards



- Know the factors that increase risk
 - The environment you're working in
 - The work you're doing
 - Your own conditioning
- Know what you can do to prevent heat stress

Prevention

- Drink plenty of fluids
 - Don't rely on your thirst
 - 5-7 oz. Every 20 minutes
- Acclimatization: adjust to the heat
 - The body takes 3-5 days to get used to the heat
 - Be careful if returning from vacation or absence
- Choose proper clothing
 - Choose light colors and lightest weight possible
 - Select proper personal protective equipment
- Take heat into account when scheduling tasks
 - Work/rest cycles
 - Heaviest tasks early morning or dusk
- Eat properly
- Sleep and rest





AMIC/MWCF Videos



- Heat Stress for Public Employees
- 7.107
- Heat Stress: Staying Healthy, Working Safely 7.097a
- Working Safety in Hot Environments 7.089
- Heat Illnesses 7.0626

Other Seasonal Hazards



- Winter – Dec, Jan, Feb



- Spring – Mar, Apr, May



- Summer – June, July, Aug



- Autumn – Sept, Oct, Nov