



HEAT STRESS

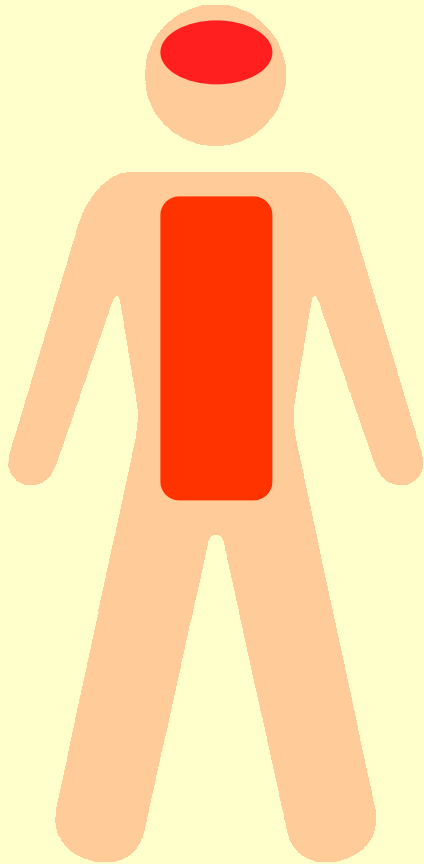
Contents

- **Normal cooling mechanisms** ➤
- **Heat-related illnesses** ➤
- **First aid** ➤
- **Evaluating the risk of heat illness** ➤
- **Controlling heat stress** ➤

Normal cooling mechanisms

- **When body core temperature rises**
 - Blood flow to skin increases
 - Sweating increases
 - Heart rate increases to move blood - and heat - to the skin
- **When this works well**
 - Core temperature drops or stabilizes at a safe level

What is the body core?



- **The deep organs, especially heart, lungs, and other vital organs**
- **The arms, legs, and the tissues close to the skin are referred to as the periphery**
- **The core and the periphery compete with each other for blood supply**

WHY COOLING MECHANISMS FAIL

- **So much sweat is lost that**
 - dehydration results
 - the body cannot cool itself by sweating, and the core temperature rises
- **Salt loss causes heat cramps**
- **So much of the blood flow goes to the skin that other organs cannot function properly**

Heat Stress

- **The buildup in the body of heat**
 - generated by the muscles during work
 - coming from warm and hot environments
- **Heat exhaustion and heat stroke occur when the body is subjected to more heat than it can cope with**



HEAT-RELATED ILLNESSES

Heat Cramps

- **Painful muscle cramps, usually in legs or abdomen, which warn that heat stress is developing**
- **Stop activity, rest in cool place, drink juice or sports beverage**
- **Get medical attention if no improvement in one hour**

Heat Exhaustion

- **The body's response to the excessive loss of water and salt in sweat**
- **Symptoms:**
 - Heavy sweating
 - Worker is pale and tired
 - Nausea and vomiting
 - Headache, blurred vision
 - Dizziness and fainting



Heat Stroke

- **The body becomes unable to control its temperature**
- **Temperature by mouth can rise above 105°F in 10 to 15 minutes**
- **Death or permanent damage may occur if treatment is not given promptly**
- **Heat stroke kills 4,000 Americans yearly**

Heat Stroke

- **Symptoms**

- Oral temperature over 103°F
- No sweating
- Red, hot, dry skin
- Throbbing headache
- Dizziness
- Nausea
- Unconsciousness



FIRST AID



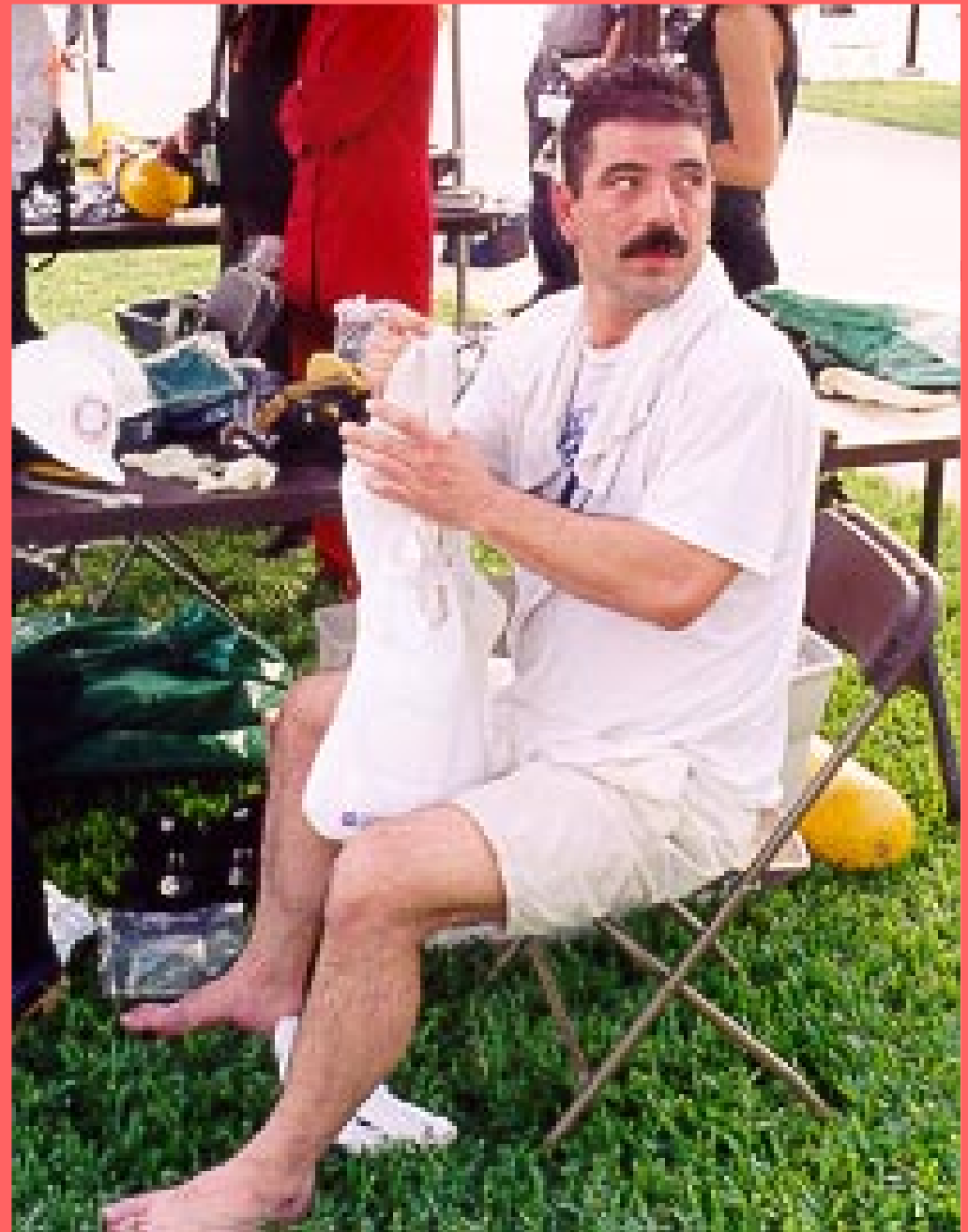
Heat Exhaustion First Aid

- **Call 911**
- **Help the victim cool off**
 - Rest in cool place
 - Drink cool water
 - Remove unnecessary clothing or loosen clothing
 - Shower or sponge with cool water



Remember

- It takes at least 30 minutes to cool the body once a person has become overheated



Heat Stroke First Aid

- **Call 911**
- **Immediate, aggressive, effective cooling**
 - immerse victim in tub of cool water
 - place in cool shower
 - spray with cool water from a hose
 - wrap in cool, wet sheets and fan rapidly
- **Do not give anything by mouth - it won't stay down**
- **Transport to hospital**

EVALUATING THE RISK OF HEAT ILLNESS



Risk Factors for Individuals

- **Overweight**
- **Very small body size**
- **Poor nutrition**
- **Poor physical condition**
- **Previous heat illnesses**
- **Lack of heat acclimatization**
- **Increasing age over 40**
- **Heart disease, high blood pressure**
- **Diabetes**

Risk Factors for Individuals

- **Skin disease**
- **Liver, kidney, and lung problems**
- **Pregnancy**
- **General fatigue, lack of sleep**
- **Diarrhea, vomiting**
- **Dehydration**
- **Infections**
- **Fever**
- **Sunburn, skin rash**
- **Recent illness or injury**

Risk Factors for Individuals

- Recent inoculation or immunization
- Alcohol consumption during previous 24 hours
- Malnutrition
- Sleeping pills, medications which limit sweating
- Excessive consumption of caffeine
- Use of illegal drugs
- Low-salt diet



Weather



- **Temperatures above 70°F during the day, 80°F at night**
- **Direct sunlight can equal an increase up to 13° in air temperature**
- **High humidity**
- **Little air movement**

Risk Factors of the Job

- Heavy work
- Prolonged shifts
- Heavy clothing
- Protective gear and respirators
- Exposure to any toxic agent



CONTROLLING HEAT STRESS



A Program To Prevent Heat Illness Will:

- **Protect health**
 - illness can be prevented or treated while symptoms are mild
- **Improve safety**
 - workers with heat stress symptoms are more accident-prone
- **Increase productivity**
 - people work less efficiently when they are over-heated

Train Workers and Supervisors

- **To control heat stress**
- **To recognize, treat, and prevent heat illnesses**
- **Take into account weather, workload, protective gear, and worker's condition**

Workload

- **Body generates more heat during heavy work**



Clothing and PPE



- **The more clothing worn, the longer it takes evaporation to cool the skin**
- **Coated and non-woven personal protective garments block evaporation of sweat**

Selecting PPE

- Use lightest weight garments and respirators available
- Light-colored garments absorb less heat from the sun
- If cooling vests are used, they must be selected carefully and washed daily



Managers' Responsibilities

- **Monitoring environmental conditions**
- **Making work assignments**
- **Adjusting work practices as necessary**



Managers' Responsibilities



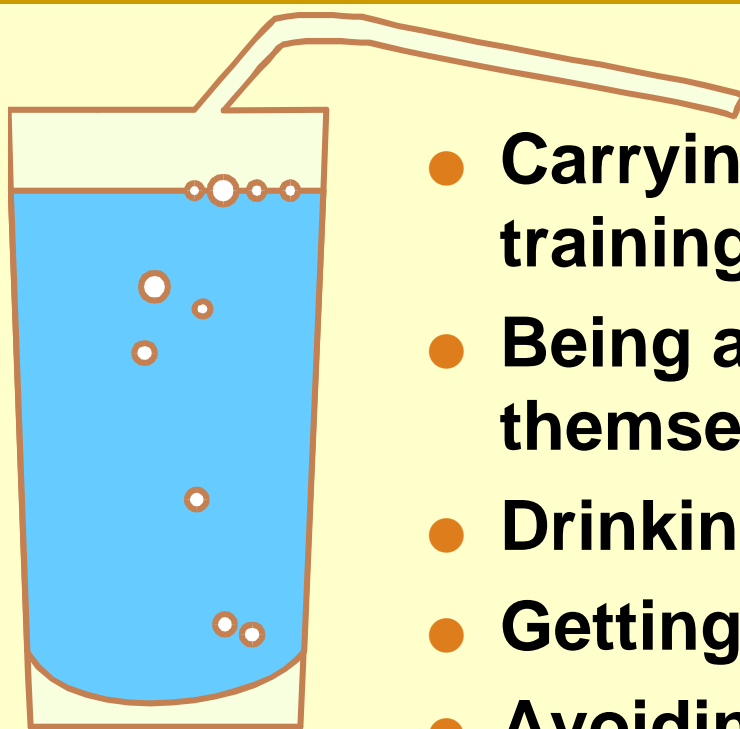
- **Observing worker**
 - drinking enough water?
 - rested?
 - taking medication?
 - seems to have consumed alcohol?
- **Treating heat stress problems**

Managers' Responsibilities



- **Overseeing acclimatization and heat stress training of new workers**
- **Conducting periodic safety meetings during hot weather**

Workers' Responsibilities



- **Carrying out instructions and training for controlling heat stress**
- **Being alert for symptoms in themselves and others**
- **Drinking enough water**
- **Getting adequate rest and sleep**
- **Avoiding alcohol, illegal drug use, and excessive caffeine**

End

