OTCO
Heat and Cold Stress
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Three ways to interact

- 3 Polling Questions.
- Type your Question in “Chat” at any time.
- Kahoot! (at the start and end).

What will we talk about today?

Heat Stress

- What causes it?
- What problems does it cause?
- How can I prevent it?

Cold Stress

- What causes it?
- What problems does it cause?
- How can I prevent it?

Heat Stress

What do I need to know about Heat Stress?

- Causes of Heat Stress
  - Predisposing factors
  - Increased body temperature
  - Dehydration
- Symptoms of Heat Stress
- What to do during a Heat Stress Emergency
- How to prevent Heat Stress

What actually happens as body heat increases?

- Body temperature and the heart rate rise painlessly.
- 2°F rise can affect mental function.
- 5°F rise can cripple or kill.
- Heat illness linked to
  - heart attacks,
  - falls,
  - equipment accidents.

What are the environmental risk factors?

- Air temperature
- Radiant heat from machinery and the roadway
- Direct sunlight
- Humidity
- Wind
- Little air movement

What are the human risk factors?

- Body metabolism
- Diet plans
- Poor nutrition
- Poor physical condition
- High and low % body fat
- Illness (diabetes, asthma)
- Pregnancy
- Over 40
- Previous heat illness
- Lack of acclimatization
- Dehydration

What are the job risk factors?

- Work intensity
- Work duration
- Location (roof, road, enclosure)
- Clothing (weight, impermeability)
- Respiratory protection

What are the Heat-related Illnesses?

- Heat Stroke
- Heat Exhaustion
- Rhabdomyolysis
- Heat Syncope
- Heat Cramps
- Heat Rash

What is Heat Stroke?

- Heat stroke is the most serious heat-related illness.
- Heat stroke can cause death or permanent disability if emergency treatment is not given.
- The body becomes unable to control its temperature.

What actually happens to the body during Heat Stroke?

- The body's temperature rises rapidly.
- The sweating mechanism fails.
- The body is unable to cool down.
- The body temperature can rise to 106°F or higher within 10 to 15 minutes.

What are the signs of heat stroke?

- Confusion, altered mental status, slurred speech
- Loss of consciousness (coma)
- Hot, dry skin
- Seizures
- Very high body temperature
- Fatal if treatment delayed

What First Aid steps should be taken for Heat Stroke?

- Call 911 for emergency medical care.
- Stay with worker until emergency medical services arrive.
- Move the worker to a shaded, cool area and remove outer clothing.

While waiting for the ambulance, what should be done for the Heat Stroke victim?

- Cool the worker quickly with a cold water or ice bath if possible; wet the skin, place cold wet cloths on skin, or soak clothing with cool water.
- Circulate the air around the worker to speed cooling.

What is Heat Exhaustion

- Heat exhaustion is the body's response to an excessive loss of the water and salt, usually through excessive sweating.
- Workers most prone to heat exhaustion are those that are elderly, have high blood pressure, and those working in a hot environment.

What are the symptoms and signs of Heat Exhaustion?

- Headache
- Nausea
- Dizziness
- Weakness
- Thirst
- Irritability
- Heavy sweating
- Elevated body temperature
- Decreased urine output

What should I do if a fellow worker suffers from Heat Exhaustion?

- Take worker to a clinic or emergency room for medical evaluation and treatment.
- If medical care is unavailable, call 911.
- Stay with worker until help arrives.

How do I treat a worker suffering from heat exhaustion?

- Remove worker from hot area and give liquids to drink.
- Encourage frequent sips of cool water.

How do I treat a worker suffering from heat exhaustion?

- Remove unnecessary clothing, including shoes and socks.
- Cool the worker with cold compresses or have the worker wash head, face, and neck with cold water.

Heat Stroke vs. Heat Exhaustion

HEAT STROKE

1. Dry, hot skin
2. Very high body temperature
3. Confusion

HEAT EXHAUSTION

1. Moist clammy skin
2. Normal or subnormal body temperature

What is Rhabdomyolysis?

- Rhabdomyolysis is a medical condition associated with heat stress and prolonged physical exertion, resulting in the rapid breakdown, rupture, and death of muscle.
- When muscle tissue dies, electrolytes and large proteins are released into the bloodstream that can cause irregular heart rhythms and seizures, and damage the kidneys.

What are the symptoms of Rhabdomyolysis?

- Muscle cramps/pain
- Abnormally dark (tea or cola colored) urine
- Weakness
- Exercise intolerance
- Or it may be Asymptomatic

What should a worker do with symptoms of rhabdomyolysis?

- Stop activity.
- Increase oral hydration (water preferred).

What should a worker do with symptoms of rhabdomyolysis?

- Stop activity.
- Increase oral hydration (water preferred).
- Seek immediate care at the nearest medical facility.
- Ask to be checked for rhabdomyolysis (i.e., blood sample analyzed for creatine kinase).

What is Heat Syncope?

- Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position.
- Factors that may contribute to heat syncope include dehydration and lack of acclimatization.

What are the symptoms of Heat Syncope?

- Fainting (short duration)
- Dizziness
- Light-headedness during prolonged standing or suddenly rising from a sitting or lying position

What should a worker do if experiencing Heat Syncope?

- Sit or lie down in a cool place.
- Slowly drink water, clear juice, or a sports drink.

What are Heat Cramps?

- Heat cramps usually affect workers who sweat a lot during strenuous activity.
- This sweating depletes the body's salt and moisture levels.
- Low salt levels in muscles causes painful cramps.
- Heat cramps may also be a symptom of heat exhaustion.

What are the symptoms of Heat Cramps?

- Muscle cramps, pain, or spasms in the abdomen, arms, or legs

What should I do if I have Heat Cramps?

- Drink water and have a snack and/or carbohydrate-electrolyte replacement liquid (e.g., sports drinks) every 15 to 20 minutes.
- Avoid salt tablets.
- Get medical help if the worker has heart problems, is on a low sodium diet, or if cramps do not subside within 1 hour.

What is Heat Rash?

- Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.

What are the symptoms of Heat Rash?

- Looks like red cluster of pimples or small blisters
- Usually appears on the neck, upper chest, groin, under the breasts, and in elbow creases

What should I do for Heat Rash?

- When possible, a cooler, less humid work environment is best treatment.
- Keep rash area dry.
- Powder may be applied to increase comfort.

What Heat Stress symptoms can I watch for in myself?

- Headache, the Universal Symptom of Dehydration

What Heat Stress symptoms can I watch for in myself?

- Headache, the Universal Symptom of Dehydration
- Thirst (but it's deceptive)
  - Signals only 2/3 of water loss
  - You may sweat off up to 2 quarts an hour

How can I prevent Heat Stress?

- Drink Water, 1-2 quarts per hour
- Use the OSHA/NIOSH Heat Index App
- Acclimatize yourself

What do I need to know about acclimatization?

- Before, you tire easily
- 1 to 3 weeks
- 75% occurs in first week
- Heart
  - slows down
  - beats more efficiently
- Sweating
  - starts earlier
  - is less salty

What can I do to reduce the chance of suffering from Heat Stress?

- Follow instructions of safety and health care professionals
- Be watchful for symptoms (self and others)
- Properly hydrate (before, during, after)
- Get adequate rest
- Avoid alcohol, unnecessary medication, and caffeine

Cold Hard Facts

What are the Hazards of Cold Stress?

- SYSTEMIC
  - Hypothermia
- LOCALIZED
  - Frostnip
  - Frostbite

What is Hypothermia?

- Acute problem resulting from prolonged cold exposure and heat loss
- “Hypo” (too little) “Thermia” (heat)
- 750 deaths/year in USA
- Generally doesn’t present the same level of danger as heat stress
  - Does not occur as quickly
  - Workers will simply come in out of the cold

What are the major causes of hypothermia?

- Cold Temperatures
  - 41 degrees F is cold enough with other contributing factors
- Improper clothing and equipment
- Wetness
  - Sweating, contact with water
  - Water conducts heat away from the body 25 times faster than air

What are Personal Risk Factors for Hypothermia?

- Excessive alcohol
- Nicotine
- Drugs: sedatives, narcotics
- Hypothyroidism
- Infections
- Exhaustion, heavy exertion
- Not eating or drinking enough

What are the Signs Hypothermia?

- Shivering
- Body temp <95 degrees F
- Slow weak pulse
- Slurred speech
- Difficulty in performing manual tasks
- Unconsciousness

What are the Behavioral Signs and Symptoms of Hypothermia?

- Loss of judgment and mental reasoning,
- Changes in personality
- Euphoria
- Confusion
- Combativeness
- “Umbles” – Stumbles, Mumbles, Fumbles, Grumbles

What is First Aid for Hypothermia?

- Move to warm area
- Remove wet clothing
- Modest external warming
  - Blankets/heat packs
- Drink warm sweet fluids (non-caffeinated)
- Transport to hospital

What are the Signs and Symptoms of Frostnip and Frostbite?

- Itching/burning/numbness
- Skin color change
  - White
  - Grayish yellow
  - Reddish violet
  - Black

What is First Aid for Frostnip and Frostbite?

- Move to warm area
- External warming
- Drink warm water or sweet fluids (non-caffeinated)
- Treat as burn (do not rub)
- Transport to hospital

How does the body adapt to cold?

- Vasoconstriction
  - Surface blood vessel constriction
  - Reduces heat loss/makes skin better insulator
- Shivering
  - Increases body temp as vasoconstriction fails
- Body burns more calories
- **Not as effective as sweating and acclimatization are for heat stress

What are some Clothing Tips to keep warm?

- Dress in Layers
  - Add or remove for comfort
  - Allows free movement and dexterity
- Layer closest to skin should be “water vapor permeable”
  - Wicks away moisture, allows evaporation, prevents accumulation

Besides dressing warmly, what else can I do to reduce cold stress?

- Increase activity.
- Stay hydrated.
- Eat well.
- Know when to seek a warm location.

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