
Combating Heat and Cold Stress for Ag Workers

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Objectives



Definition, Vulnerable
Persons & Warning
Signs



Prevention Strategies
& Treatment



Worker Safety



Key Resources

Workers At Greater Risk (Heat Stress)

Workers at risk of heat stress include **outdoor workers** and workers in hot environments such as **firefighters**, bakery workers, farmers, construction workers, miners, boiler room workers, factory workers, and others.

Workers at greater risk of heat stress include those who are **65 years of age or older**, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

Q: Heat & Cold Stress Deaths ARE..

A: Heat & Cold Stress Deaths ARE..

- a. Preventable
- b. Increased risk for very young and the very old

What are some heat stress sources?

Heat Stress Sources



High Temperature

Humidity

Physical Excretion

Protective Gear

Lack of Shade

Dehydration

Lack of Acclimatization

What is “Heat Stress” and Why is it Dangerous?

Heat Stress – *an umbrella term used to describe a condition or process that can raise one’s core body temperature:*

Heat Stroke

Heat
Exhaustion

Heat
Syncope

Heat
Cramps

Heat Rash



Any person can experience one or more of these symptoms.

Heat Rash

What IS HAPPENING to the body?

- Red, blotchy rash with clusters of small pimples or blisters.
- May cover large area of the body.



What are the signs?

- Red, blotchy skin.
- Small pimples or blisters. Found in folds of skin or belt area.
- Could be prickly or intensely itchy.

What do I do?

- Remove constrictive clothing
- Keep area dry
- Treat with corn powder or calming lotion
- See doctor if symptoms persist more than a few days

HEAT CRAMPS

What is happening to the body?

- Intermittent, involuntary spasms of larger muscles



What are the signs?

- Spasms and pain in muscles in arms, legs, or abdomen

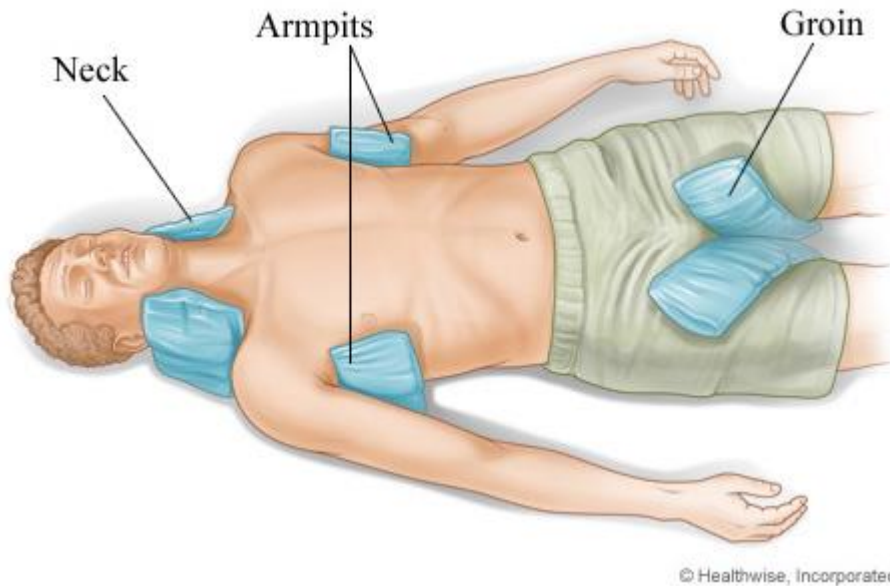
Help! What to do?

- Stop activity
- Rest in a cool shaded area
- Massage area
- Drink water, clear juice, or electrolyte containing sports drink

Heat Syncope (Fainting)

What is happening to the body?

- Blood pools in the skin or lower part of body causing a decreased flow of blood to the brain.



What are the signs?

- Dizziness. Lightheaded Sensation. Fainting.

What do I do?

- Move to a cool, shaded area
- COOL THE SKIN
- Lie down
- Drink water, clear juice, or electrolyte containing sports drink

Heat Exhaustion

What is happening to the body?

- Excessive loss of body salts. Amount of water lost in sweat exceeds water intake.



[This Photo](#) by Unknown Author is licensed under [CC BY-NC](#)

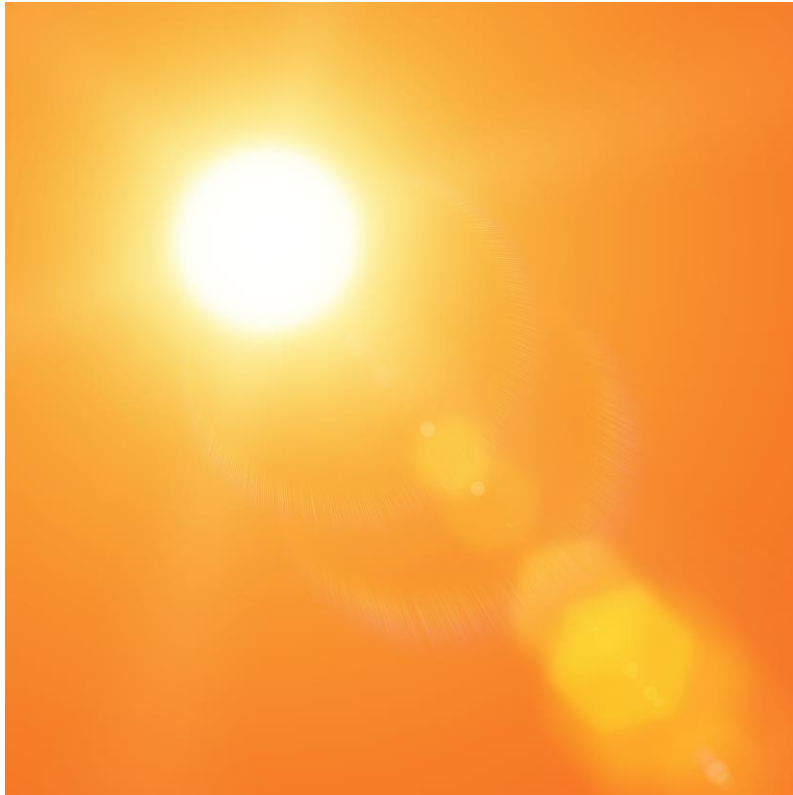
What are the signs?

- Skin becomes pale and cool or flushed.
- Headaches
- Sweating
- Cramping
- Nausea, vomiting
- Dizziness and confusion

Treatment

- **Go to a clinic or ER, for medical evaluation and treatment**
- **If medical care is unavailable, call 9-1-1**
- Move to a cool, shaded area
- Sit or lie down with legs elevated
- Loosen clothing. Apply cool compress, including shoes and socks
- Sip cool water or electrolyte beverage
- Do not be left alone

Heat Stroke



What is happening in the body?

- **LIFE THREATENING MEDICAL EMERGENCY.**
- Central nervous system failure.
- Ability to sweat is lost.
- Body temperatures rise rapidly.

What are the signs?

- High body temperature.
- Altered mental state or behavior (Confusion, agitation, slurred speech, irritability, delirium)
- Alteration in sweating.
- Nausea and vomiting.
- Flushed skin.
- Rapid breathing.
- Racing heart rate.
- Headache.

Heat Stroke

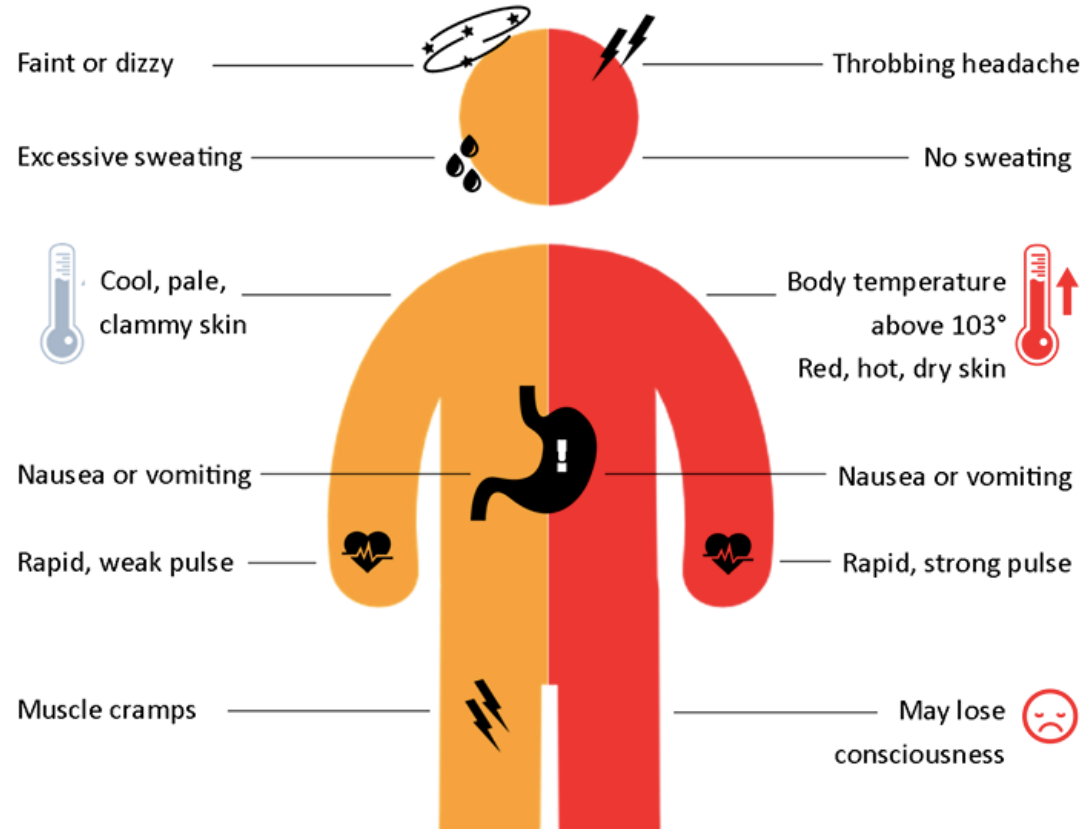
What to do?

- If you think a person may be experiencing heatstroke, **seek immediate medical help**. Call 911 or your local emergency services number.
- Take immediate action to cool the overheated person while waiting for emergency treatment.
- Get the person into shade or indoors.
- Remove excess clothing.
- Cool the person with whatever means available

HEAT EXHAUSTION

OR

HEAT STROKE



- Get to a cooler, air conditioned place
- Drink water if fully conscious
- Take a cool shower or use cold compresses

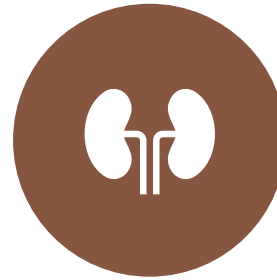
CALL 9-1-1

- Take immediate action to cool the person until help arrives

Why is it important to prevent Heat Illness?



Heat illness can be a matter of life and death. Around 34 workers each year die from heat illnesses (US EPA)



Heat **stroke** can cause damage to organs and bodily functions.



Heat exhaustion increases likelihood of accidents.



Having a serious injury or death occur at work affects everyone at a worksite.

Heat Stress Prevention





Dehydration.....

Symptoms (Mild or Moderate)

- Thirst- Dry or sticky mouth- Not urinating very much
- Dark yellow pee- Dry, cool skin – Headache- Muscle cramps

SYMPTOMS (Severe)

- Not peeing/very dark yellow pee- Very dry skin
- Dizziness- Rapid heartbeat- Rapid breathing- Sunken eyes- Sleepiness, lack of energy, confusion or irritability
- Fainting

Water. Rest. Shade



Drink plenty of fluids.

Take it easy during the hottest parts of the day.

Get acclimated.

How much water should I drink?



Try to drink up to 4 cups every hour

2 gallons of water every eight (8) hours

Check to make sure you have enough water for the amount of time you are working.

Remember 4 cups every 30 minutes in extreme heat, even when you aren't thirsty.

Cold Stress Sources

Cold Stress Sources – continued



Low Temperatures



Wind Chill



Wet Conditions



Inadequate Clothing



Physical Exertion



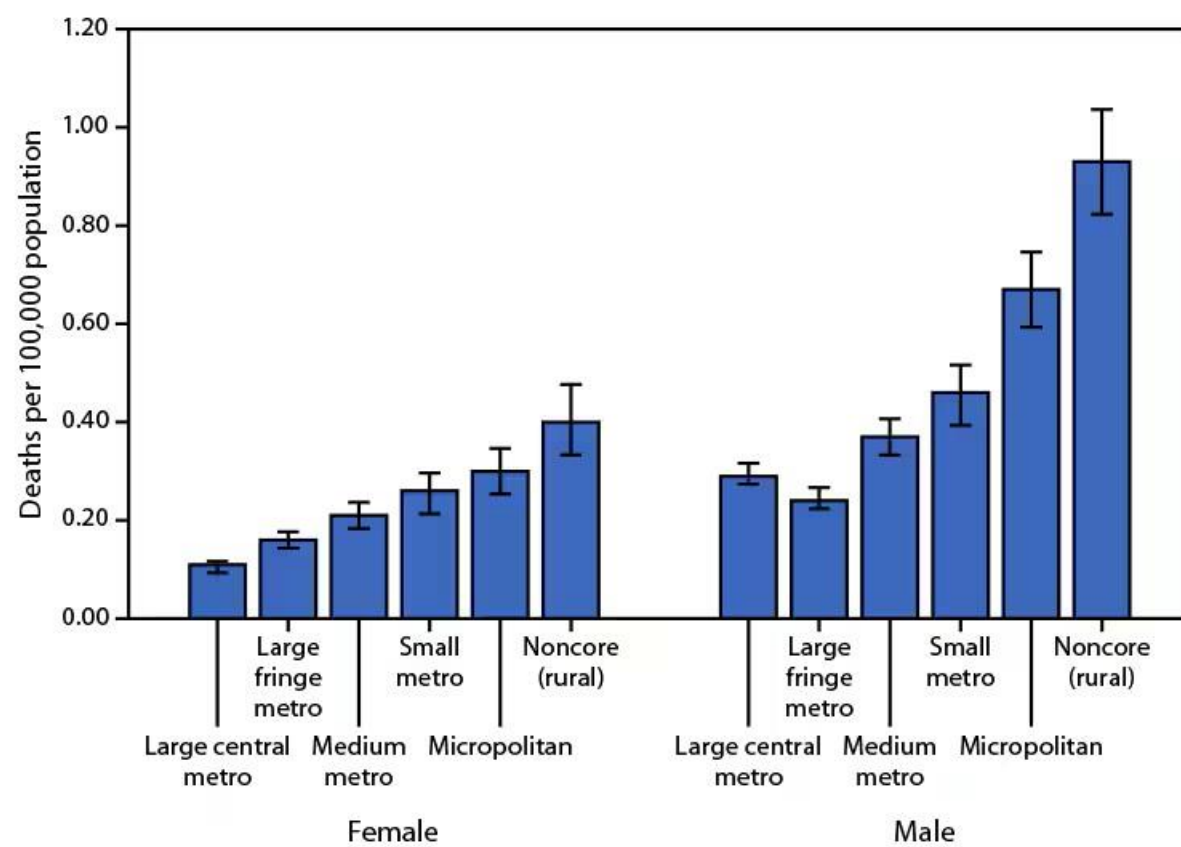
Lack of Shelter



Inadequate Nutrition



QuickStats: Death Rates* Attributed to Excessive Cold or Hypothermia,[†] by Urbanization Level[§] and Sex — National Vital Statistics System, 2018–2020



Types of Cold Stress

Immersion/Trench Foot

Frostbite

Hypothermia

Chilblains

Types of Cold Stress- Immersion/Trench Foot



What are the symptoms of trench foot?

- Redness of the skin
- Numbness, Tingling
- Pain
- Swelling
- Leg cramps
- Blisters
- Bleeding under the skin, and gangrene.

First Aid

Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible.

Remove wet shoes/boots and wet socks.

Dry the feet and avoid working on them.

Keep affected feet elevated and avoid walking on feet as this may cause tissue damage and seek medical attention.

Types of Cold Stress- Frost Bite



Frostbite is caused by the freezing of the skin and tissues.

What are the symptoms of frostbite?

- Reddened skin develops gray/white patches in the fingers, toes, nose, or ear lobes
- Tingling, aching, a loss of feeling, firm/hard, and blisters may occur in the affected areas.

Types of Cold Stress- Hypothermia



Hypothermia causes about 600 deaths each year in the United States.

An important mild symptom of hypothermia is uncontrollable shivering, which should not be ignored

Call 911 immediately in an emergency:

- Move the worker to a warm room or vehicle.
- Remove any wet clothing and replace with dry clothing.
- Give warm sweetened drinks if alert (no alcohol)

Types of Cold Stress - Chilblains



What are the symptoms of Chilblains?

- Redness, itching
- Possible blistering
- Inflammation, and possible ulceration in severe cases.

First Aid

- Avoid scratching.
- Slowly warm the skin.
- Use corticosteroid cream to relieve itching and swelling.
- Keep blisters and ulcers clean and covered.

Common Factors for Both Heat and Cold Stress:



What can be done at your work site to address heat/cold stress?



Mitigation Strategies

Education and Training

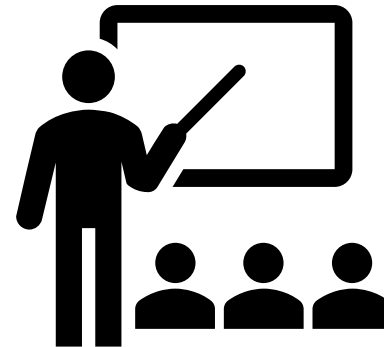
Hydration and Nutrition

Appropriate Clothing

Workplace Modifications

Work Scheduling

Monitoring and Supervision



How can Cold Stress be Prevented?

- Employers should:
 - Monitor workers physical condition.
 - Schedule frequent short breaks in warm dry areas, to allow the body to warm up.
 - Schedule work during the warmest part of the day.
 - Use the buddy system (work in pairs).
 - Provide warm, sweet beverages. Avoid drinks with alcohol.
 - Stay well nourished by snacking on high carbohydrate foods.
 - Avoid touching cold metal or wet surfaces with bare skin.
 - Provide engineering controls such as radiant heaters.

Resources

NEW Resources!! (CDC)



[HEATRISK FORECAST
TOOL](#)



[HEATRISK
DASHBOARD](#)



[CDC CLINICAL
GUIDANCE](#)

Protect Yourself from the Cold



You are at risk if you work outside or in cold conditions



Dress Appropriately

Wear clothes meant for cold, wet, and windy conditions such as:

- ❄️ Loose-fitting layers
- ❄️ Hats, socks, shoes, and gloves
- ❄️ Outerwear that will keep you dry



Extreme exposure to the cold can eventually lead to **hypothermia**.

Drink Warm Beverages & Take Breaks



- ❄️ Take frequent breaks in heated areas, if possible.
- ❄️ Drink plenty of warm, sweet beverages (sugar water, sports drinks).
- ❄️ **AVOID** caffeine (in coffee, tea, sodas, or hot chocolate) and alcohol.

Know the Warning Signs

Health Problems:



Trench Foot



Frostbite



Hypothermia

Hypothermia—Don't ignore the signs!



Uncontrollable Shivering



Slurred Speech



Clumsiness



Fatigue



Confusion

Hypothermia is a medical emergency

Call 911

Getting help can be the difference between **life** and **death**.



You are at a higher risk if you take certain medications, are in poor physical condition, or suffer from illnesses such as diabetes, hypertension, or cardiovascular disease.

Work in pairs so that you and a co-worker can spot danger signs in each other.



Follow these tips and stay safe in the cold.



OSHA-NIOSH Heat Safety Tool App



Features:

- A visual indicator of the current heat index and associated risk levels specific to your current geographical location
- Precautionary recommendations specific to heat index-associated risk levels
- An interactive, hourly forecast of heat index values, risk level, and recommendations for planning outdoor work activities in advance
- Editable location, temperature, and humidity controls for calculation of variable conditions
- Signs and symptoms and first aid information for heat-related illnesses

Heat Stress Hydration -CDC NIOSH

Drinking enough fluids is one of the most important things you can do to prevent heat illness. Water is generally sufficient.

Urine Color Test

Hydrate Before Work

- Being hydrated when you start work makes it easier to stay hydrated throughout the day.
- If you are dehydrated when you start work, you may not be able to catch up with your body's need for water.

Hydrate During Work

- Drink before feeling thirsty. **By the time you feel thirsty, you are behind in fluid replacement.** Dehydration is a primary contributor to heat exhaustion.
- Your work performance may suffer when you are dehydrated, even if you don't notice.
- When working in the heat, drink 1 cup (8 ounces) of water every 15–20 minutes.
 - This translates to $\frac{3}{4}$ –1 quart (24–32 ounces) per hour.
- Drinking at shorter intervals is more effective than drinking large amounts infrequently.
- Do not drink more than 48 oz (1½ quarts) per hour! Drinking too much water or other fluids (sports drinks, energy drinks, etc.) can cause hyponatremia, a dangerous emergency because the concentration of salt in the blood becomes too low.

Hydrate After Work

- Most people need several hours to drink enough fluids to replace what they have lost through sweat. The sooner you get started, the less damage is done to your body from dehydration.
- Hydrating after work is even more important if you work in the heat on a regular basis. Chronic dehydration increases the risk for a number of health conditions, such as kidney stones.

How much?

1 quart = 32 ounces

HEAT STRESS Hydration

What to Drink

Water

Water will almost always maintain hydration during work in the heat, as long as you eat regular meals to replace salt lost in sweat.

What to Avoid

Energy Drinks

- Some energy drinks contain much more caffeine than standard servings of coffee, tea, or soft drinks.
- Drinking several energy drinks per day can raise your caffeine levels enough to affect your heart. High caffeine levels can be risky when added to the strain placed on your body by heat.
- Many energy drinks contain as much or more sugar as soft drinks, which adds hundreds of extra calories to your diet.

Alcohol

- Alcohol can cause dehydration.
- Drinking alcohol within 24 hours of working in the heat can increase the risk of heat illness.

Do I need sports drinks?

In general, eating regular meals with adequate water intake is sufficient to maintain water and electrolyte balance.

For prolonged sweating lasting several hours, sports drinks with balanced electrolytes are another option to replace salt lost in sweat.

Heavy consumption of sports drinks will add unnecessary calories to your diet due to the added sugar.

about salt tablets?

The CDC does not recommend taking salt tablets. In most cases, salt can be replaced by eating regular meals and snacks throughout the day. Skip meals.

about caffeine?

The amount of caffeine in tea, coffee, and soft drinks probably will not have an effect on hydration.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

DHHS (NIOSH) Publication No. 2017-126

CDC NIOSH

OSHA.GOV/WinterWeather

- ❖ Follow these work practices to stay safe in cold weather:
 - ❖ Know the symptoms of cold stress; reddening skin, tingling, pain, swelling, leg cramps, numbness, and blisters.
 - ❖ Dress properly; wear at least three layers of loose-fitting clothing, insulated gloves and boots, and cover your head.
 - ❖ Monitor your physical condition and that of your coworkers.
 - ❖ Stay dry and pack extra clothes; moisture can increase heat loss from the body.
 - ❖ Take frequent breaks in warm, dry areas.
 - ❖ Drink warm liquids.



Thank YOU! Any
Questions?