



SECTION 29– HEAT ILLNESS PREVENTION

29.1 HEAT ILLNESS OVERVIEW

29.2 ACCLIMITIZATION

29.3 HEAT STRESS SIGNS AND SYMPTOMS

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29.1 HEAT ILLNESS OVERVIEW

A. Objective/ Purpose

To maintain a healthy indoor and outdoor working environment during extreme temperatures and to protect employees from heat related illnesses and injuries.

B. Scope

Workers who are exposed to or may be exposed to extreme heat or work in hot environments during the course of their job duties. Exposure to extreme heat can result in occupational illnesses and injuries. The scope of this procedure is to identify steps to prevent heat related illness and injury.

C. References

- Occupational Safety and Health Administration (OSHA) - [Heat; Overview: Working in Outdoor and Indoor Heat Environments](#)
- National Institute for Occupation Safety and Health (NIOSH) - [Heat Stress](#)
- [Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments \(cdc.gov\)](#)
- [National Weather Service Heat Index Chart](#)
- National Institute for Occupation Safety and Health (NIOSH): [Acclimatization](#)
- Region V OSHA Heat Initiative Webinar Series with Douglas L. Park, assistant secretary of labor USDOL OSHA; May 2022.

D. Responsibilities

- **The Department of Environmental Health, Safety and Risk Management (EHS/RM)**
 - Developing, implementing, and administrating the Heat Illness Prevention procedure
 - Conduct risk assessments of any heat related concerns
 - Provide Heat Illness Prevention training to employees who require it
 - Review, update and evaluate effectiveness of Heat Illness Prevention Programing as appropriate
 - To provide technical support and consultation to any department working in extreme heat environments
 - Investigate any injuries or illnesses related to work Heat Illness
- **Directors, Supervisors and Management**
 - Make sure that employees understand and are able to recognize potential signs and symptoms of heat related illnesses
 - Provide access to rest areas, and cool potable drinking water to employees
 - Monitor the heat index and implement and/or enforce the proper protective measures for employees as specified in this procedure
 - Properly acclimatize any employees who require it
 - Notify the EHS/RM, of any new employees that require heat illness training and/or any current employees that need a refresher course
 - Evaluate the effectiveness of the Heat Illness Prevention Program and the employee's ability to follow this procedure
 - Ensure that all safety equipment is supplied to employees, if needed
 - Notify the EHS/RM if anyone is working in an unsafe manner or if there are any job tasks that require a heat exposure assessment
 - Report any heat stress related injuries or illnesses to EHS/RM- [Incident Investigation Report](#)



- **Employees**
 - Understand heat stress signs and symptoms, and how to minimize their exposure to them
 - Report any additional hazards to their supervisor and/or EHS/RM
 - Comply with procedures outlined in this documentation
 - Notify supervisor with any questions, equipment requirements or difficulties
 - Report all accidents, and near misses
 - Attend required training

E. The following are Locations/Activities of Concern for Possible Heat Illness

Indoors	Outdoors
Electrical or Mechanical Spaces	Landscaping
Manufacturing Labs	Mail & Package Delivery
Kitchens	Athletic Activities and Events
Laundry Rooms	Roofing Work
Boiler Rooms	
Underground Utility Tunnels	
Warehouse/ Fleet Shop	

F. Heat Illness Prevention Strategies- Supervisors and employees may use a combination of any or all of the following strategies based on the heat conditions and type of work:

- **Acclimatization** - is required for employees new to working in hot environments (see Section 29.2).
- **Work Hours** - Supervisors may change working hours by adjusting start and stop times to limit working outdoors during peak heat times.
- **Job Rotation or Job Task Rotation** - Supervisors may rotate employees or their tasks to reduce heat exposure.
- **Buddy System** - Assigning two employees to work together to help in monitoring for heat illness in each other.
- **Work and Rest Schedule** - based on a combination of environmental factors, clothing, and workload. [See CDC/NIOSH Work/Rest Schedule.](#)
- **Water Breaks** - CDC water intake recommendations ([Heat Stress: Hydration](#)): Employees exposed to high heat conditions shall be encouraged to drink one cup (8 oz.) of water every 15 to 20 minutes OR 1 quart per hour, and to drink even if they are not thirsty. It is recommended that if an employee is working for a shorter duration, like 1-2 hours, drink water. If an employee is working for longer than 2 hours, drink electrolyte and carbohydrate containing “sports drinks” instead of just water.



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- **Personal Protection Equipment (PPE)** - may include, cooling hats, sweatbands, neck shades, bandanas, sun shields, vest and cooling pad inserts.
- **Weather Monitoring -**
 - Weather forecasts in advance of outdoor work or activities: [National Weather Service](#) website (NWS) has announced a heat advisory or warning, for local areas.
 - The following definitions are for:
 - **Excessive Heat Outlook:** BE AWARE – Potential exists, a heat wave may develop in the next three to seven days.
 - **Excessive Heat Warning:** A dangerous heat wave (daytime highs from 105-110°F) is forecast within the next 36 hours.
 - **Excessive Heat Watch:** BE PREPARED – Conditions are favorable for a heat wave (high heat index) in the next 24 to 72 hours.
 - **Heat Advisory:** TAKE ACTION – An uncomfortable, potentially dangerous heat wave (daytime highs from 100-105°F) is forecast within the next 36 hours. High of 100° or higher for at least 2 days and nights at 75°.
 - Monitoring throughout the Day: Supervisors and employees are encouraged to use the [OSHA/NIOSH free heat index tool](#) . This app provides the user with the Heat Index values for its current location, as well as the temperature, and humidity. It also has a tab for signs and symptoms of heat related illness as a quick reference guide.
- **Illness Monitoring** - by supervisors, yourself, and others (also see Section 29.3 Heat Illness Signs and Symptoms)
 - Signs of a medical emergency and call 911. Cool the person with water or ice, stay with them until paramedics arrive:
 - Abnormal thinking or behavior
 - Slurred speech
 - Seizures
 - Loss of consciousness
 - Other signs of heat illness and related actions:
 - Signs: headache, nausea, weakness, dizziness, heavy sweating or hot/dry skin, elevated body temperature, thirst, and/or decreased urine output.
 - Take these actions: drink cool water, remove unnecessary clothing, move to cooler area, cool with water/ice or fan, do not leave alone, seek medical attention at Northwest Community Healthcare (NCH) in building M.
 - Report to your supervisor and complete the EHS/RM injury report form- [Incident Investigation Report](#)



29.2 Acclimatization

Acclimatization: The physiological changes that occur in response to a succession of days of exposure to environmental heat stress and reduce the strain caused by the heat stress of the environment; and enable a person to work with greater effectiveness and with less chance of heat injury.

New and returning workers need to build their tolerance to heat (acclimatize) and take frequent breaks.

Heat Acclimatization Program for the following Employees:

- New Roads and Grounds Employees
- Temporary Workers – 3rd Party Contractors
- Those returning to work from absences of 2 weeks or more
- Those working during a heat wave

Unacclimatized Worker;

- Do not sweat efficiently
- Sweat will contain more salt
- Body temperature and heart rate increase more quickly when working
- Blood flow not optimized for heat dissipation

Acclimatized Worker;

- Sweating rate is higher, which helps dissipate heat through evaporative cooling
- Sweat contains less salt, which prevents development of electrolyte imbalances
- Maintain lower body temperature and heart rate
- Increased blood flow to skin to lose heat through body surface

Acclimatization Schedule

- Gradually increase the time spent in hot environmental conditions over a 7-14 day period.
- For new workers, the schedule should be no more than 20% exposures (full intensity) to heat on day 1, and an increase of no more than 20% exposure on each additional day.

Example;

- Brand new employee with no previous experience with manual labor and working in high heat temperatures

DAY 1-3	DAY 4-6	DAY 7-9	DAY 10-12	DAY 13-15
20% Exposure	40% Exposure	60% Exposure	80% Exposure	100% Exposure
90 minutes	180 minutes	270 minutes	360 minutes	450 minutes

- New Employee with some experience with manual labor and working in high heat temperatures

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
20% Exposure	40% Exposure	60% Exposure	80% Exposure	100% Exposure

- For workers who have had previous experience with the job and working in high heat temperatures, the acclimatization schedule should be no more than:

DAY 1	DAY 2	DAY 3	DAY 4
50% Exposure	60% Exposure	80% Exposure	100% Exposure



Maintaining Acclimatization

“Workers are able to maintain their acclimatization even if they are away from their jobs for a few days, like over a weekend. However, if they are absent for a week or more they need to gradually reacclimate to the hot environment.”

- Acclimatization can often be regained in 2-3 days upon returning to job
- It is better maintained by individuals who are physically fit
- Air conditioning will not affect acclimatization



29.3 Heat Illness Signs and Symptoms/Medical Monitoring Program

The Medical Monitoring Program is designed to minimize the risk to workers' health and safety from any heat hazards in the workplace. Supervisor and employees should be aware of and monitor for the following health related effects of heat.

Heat Stress

The net heat load to which a worker is exposed from the combined contributions of metabolic heat, environmental factors, and clothing worn which results in an increase in heat storage in the body. Heat stress occurs when the human body is no longer able to control its internal temperature. Heat stress may lead to heat exhaustion and heat stroke. External heat sources, level of workload exertions, PPE, and duration of a task will all effect the likelihood of a possible heat disorder.

Sources that contribute to heat stress can include:

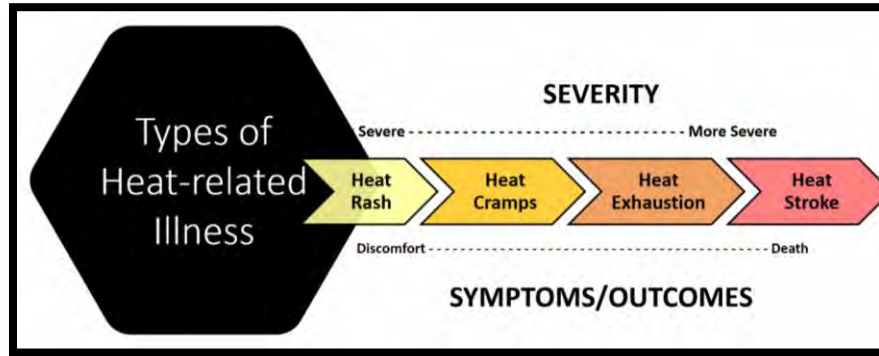
- Metabolic Heat
 - Level of Exertion
 - Length of Time
- Environment
 - Temperature
 - Humidity
 - Air Flow
- Clothing and PPE
 - Long Sleeves
 - Long Pants
 - Hard Hats
 - Respirators

Possible Factors that can contribute to heat related illness:

- Physical Condition & Health Problems
- Medication
- Pregnancy
- Lack of Recent Exposure
- Advanced Age
- Previous Heat-Related Illness
- High Temperature and Humidity
- Direct Sun Exposure
- Indoor Radiant Heat Sources
- Limited Air Movement
- Not Enough Fluids
- Physical Exertion
- PPE and Clothing

Signs of Heat-Related Illness and First Aid Solutions

Harper College has Northwest Community Healthcare (NCH) Outpatient Care Center in Building M. Employees may immediately go to NCH for any medical concerns for heat-related illnesses. When you are able and it is safe to do so, contact your supervisor to report what happened. The supervisor will fill out an injury report form- [Incident Investigation Report](#) and submit it to the Department of Environmental Health Safety and Risk Management.



- **Sunburn**-reddening, inflammation and in severe cases, blistering and peeling of the skin caused by overexposure to the ultraviolet rays of the sun.
 - Symptoms: Redness and pain. In severe cases swelling of skin, blisters, fever, headaches
 - First Aid: Ointment for mild cases if blisters appear, do not break.
 - Note: Serious, extensive cases due to work related event, should be seen by NCH.
- **Heat Rash “Prickly Heat”** a condition which results when blocked sweat pores trap sweat.
 - Symptoms: Clusters or red bumps on skin, skin will feel prickly or sting due to overheating, itchy, often appears on neck, upper chest, and skin folds
 - First Aid: Move to cooler location, keep affected area dry
- **Heat Cramps:** A heat-related illness characterized by spastic contractions of the voluntary muscles (mainly arms, hands, legs, and feet), usually associated with restricted salt intake and profuse sweating without significant body dehydration.
 - Symptoms: Muscle Pain or Spasms; Usually in the abdomen, arms, or legs
 - First Aid:
 - Stop all activity and sit in a cool place
 - Drink clear juice or sports drink, or drink water with food.
 - Do not return to strenuous work for a few hours after cramps subside.
 - Seek medical care at NCH if cramps do not subside after 1 hour.
- **Heat Exhaustion:** A heat-related illness characterized by elevation of core body temperature above 38°C (100.4°F) and abnormal performance of one or more organ systems, without injury to the central nervous system. Heat exhaustion may signal impending heat stroke.
 - Symptoms: Headache, Nausea, Irritability, Heavy Sweating, Decreased Urine Output, Dizziness, Weakness/fatigue, Thirst, Elevated Body Temperature, pale or flushed complexion, muscle cramps, clammy moist skin and/or fast and shallow breathing.
 - First Aid:
 - Take individual NCH in Building M OR CALL 911
 - Do not leave the worker alone
 - Move to cool area and give liquids. Encourage frequent sips.
 - Remove unnecessary clothing
 - Rest in a cool, shaded, or air-conditioned area
 - Drink plenty of water or other cool beverage
 - Take a cool shower/ bath or sponge bath.
- **Heat Syncope:** Collapse and/or loss of consciousness during heat exposure without an increase in body temperature or cessation of sweating, similar to vasovagal fainting except that it is heat induced.



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- Symptoms: Fainting, Dizziness
- First Aid:
 - Stop all activity and sit in a cool place
 - Slowly drink water, clear juice or sports drink.

- **Heat Stroke:** An acute medical emergency caused by exposure to heat from an excessive rise in body temperature [above 41.1°C (106°F)] and failure of the temperature-regulating mechanism. Injury occurs to the central nervous system characterized by a sudden and sustained loss of consciousness preceded by vertigo, nausea, headache, cerebral dysfunction, bizarre behavior, and excessive body temperature.
 - Symptoms: Confusion, Altered Mental Status, Slurred Speech, Loss of Consciousness, Red/ Hot Dry Skin OR Profuse Sweating, Seizures, Very High Body Temperature, Rapid Heart Rate, chills
 - First Aid:
 - MEDICAL EMERGENCY – CALL 911
 - Move worker to shady, cool area – Stay with worker until help arrives
 - Remove outer clothing
 - Cool quickly with a cold water or ice bath; wet skin or soak clothing in cool water
 - Fan air around worker

- **Rhabdomyolysis “Rhabdo”:** The breakdown of damaged muscle which results in the release of muscle cell contents into the blood, which can lead to organ damage. Can occur anytime muscle is damaged or killed and may not appear for several days after the injury. Risk factors include heat exposure, physical exertion, and direct trauma.
 - Symptoms: Muscle cramps that are more severe than expected, Dark Urine (tea or cola colored), Feeling weak or tired.
 - If you have any of these symptoms at any time, do not ignore them and seek immediate medical treatment. CALL 911.

- **Other Heat Related Concerns;**
 - Slips, Trips and Falls/ Injuries
 - Fogged Up Safety Glasses/Goggles
 - Hot Equipment Burns
 - Dizziness or other heat-related illness symptoms
 - Kidney Injury
 - Skin Cancer