

Northwestern

Heat Illness Prevention

Environmental Health and Safety

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## I. Purpose

This program establishes the guidelines and procedures to protect individuals from heat-related exposures and illnesses.

## II. Scope

This program applies to all Northwestern University employees, students, and contractors who are exposed or who have the potential to be exposed to heat hazards on campus property.

## III. Responsibilities

### A. Environmental Health and Safety (EHS)

- i. Adhere to the requirements of this program.
- ii. Review and revise this program, as necessary.
- iii. Coordinate and provide training to employees who are exposed or who have the potential to be exposed to heat hazards on campus property (see **Section VIII – Training**).
- iv. Review worksite conditions and conduct exposure monitoring, as necessary.

### B. Departments

- i. Adhere to the requirements of this program.
- ii. Ensure that employees complete all required training (see **Section VIII – Training**).
- iii. Monitor indoor and outdoor worksites for potential heat-related hazards and exposure to direct sunlight.
- iv. Implement and oversee a heat illness prevention plan in *heat priority areas* (see **Section V – Heat Illness Prevention Plan Activation**).
- v. Oversee the acclimatization of new employees and employees who have been off the job for a period of time.
- vi. Consult EHS for guidance and to evaluate heat hazards, as necessary.

### C. Employees

- i. Adhere to the requirements of this program.
- ii. Complete all required training (see **Section VIII – Training**).
- iii. Monitor their own personal risk factors, signs, and symptoms for heat-related illness.
- iv. Notify supervisor or EHS of work areas that may contain heat-related hazards, or if experiencing signs or symptoms consistent with possible heat-related illness.
- v. Follow departmental instructions and training to prevent heat-related illness.

### D. Contractors

- i. Adhere to the requirements of this program.
- ii. Ensure that employees are adequately trained to prevent heat-related illnesses (see **Section VIII – Training**).
- iii. Monitor indoor and outdoor worksites for potential heat-related hazards and exposure to direct sunlight.
- iv. Implement and oversee a heat illness prevention plan in *heat priority areas* (see **Section V – Heat Illness Prevention Plan Activation**).

- v. Notify Northwestern project managers or representatives of work areas that may contain heat-related hazards and employees who may be experiencing signs or symptoms consistent with possible heat-related illness.
- vi. Oversee the acclimatization of new employees and employees who have been off the job for a period of time.

#### IV. Evaluation and Determination of Heat Hazards

- A. When the heat index is 80° Fahrenheit (F) or higher in indoor (e.g., mechanical rooms, utility tunnels, steam vaults, utility plants) and outdoor environments, serious heat-related illnesses and injuries become more frequent, especially in workplaces:
  - i. Without easy access to cool water or cool/shaded areas.
  - ii. When working in direct sunlight or areas where other radiant heat sources are present.
  - iii. Where unacclimatized workers are performing strenuous work (e.g., intense arm and back/lifting work, carrying, shoveling, manual sawing, pushing and pulling heavy loads, and walking at a fast pace).
  - iv. In full sunshine, which can increase heat index values by up to 15°F.
- B. A **heat priority area** exists when:
  - i. The [heat index](#) is expected to be 80°F or more, or
  - ii. The National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS) has announced a heat warning, heat advisory, excessive heat outlook, excessive heat watch, excessive heat warning, excessive heat advisory, or heat wave for the local area.

C. **Heat priority areas** are categorized into four risk levels as follows:

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (caution)	Basic heat safety and planning
91° to 103°F	Moderate	Implement precautions & heightened awareness
103° to 115°F	High	Implement additional precautions
More than 115°F	Very high / extreme	Aggressive protective measures

- D. Departments and contractors must evaluate indoor and outdoor worksites to determine the heat index and likelihood of heat-related illness with prolonged exposure or strenuous activity, utilizing such methods as:
  - i. Monitoring local weather forecasts.
  - ii. Utilizing the OSHA-NIOSH Heat Safety Tool [App](#).
  - iii. Utilizing instruments such as heat index monitors (also known as heat stress monitors) to determine the heat index in indoor and outdoor environments.
  - iv. Utilizing the NOAA heat index [calculator](#).
- E. When determining the likelihood of heat-related illness and risk level, consideration must be given to:
  - i. The type of work (i.e., light, moderate, or heavy).
  - ii. The duration of the work.
  - iii. Employee acclimatization status.
  - iv. Required clothing and personal protective equipment (PPE).
  - v. Working in direct sunlight and areas with poor air circulation.
- F. Departments are encouraged to consult EHS for guidance and to evaluate heat hazards, as necessary.

## V. Heat Illness Prevention Plan Activation

- A. When individuals are exposed to **heat priority areas** (see **Section IV.B.**), departments and contractors must implement the necessary combination of control measures and appropriate actions, at no cost to individuals, to prevent heat-related illness.
- B. Control measures and actions for the applicable **heat priority area** risk levels can be found in pages 11-22 of the Occupational Safety and Health Administration (OSHA) [Heat Index Guidelines](#).
- C. When individuals are required to work in direct sunlight or areas with poor air circulation, are unacclimated, must perform strenuous activity, or must wear heavy clothing or equipment, use the protective measures in the next highest risk level.
- D. Example control measures and actions can be found in **Appendix 1**.

## VI. Shade in Outdoor Environments

When a work environment is classified as a **heat priority area** and exposes or has the potential to expose individuals to heat and direct sunlight, departments and contractors must ensure the following:

- A. Provide adequate area(s) with shade, as close as possible to the work area(s), that are either open to the air or provided with ventilation or cooling.
- B. Individuals must be allowed and encouraged to take a preventative cool-down rest in the shade when they feel the need to do so to protect themselves from overheating.
- C. An individual who takes a preventative cool-down rest must:
  - i. Be monitored and asked if they are experiencing symptoms of heat-related illness,
  - ii. Be encouraged to remain in the shade, and
  - iii. Not be ordered back to work until any signs or symptoms of heat-related illness have abated, but in no event less than 5 minutes in addition to the time needed to access the shade.
- D. The interiors of cars, trucks, or similar vehicles are not considered shade, unless the vehicles are air-conditioned or kept from heating up in the sun in some other way.
- E. When temperatures are below 80°F, shaded areas must still be made available, and provide timely access to shade upon an individual's request.
- F. When working outside and when feasible, employees must wear loose-fitting clothing that allows free air circulation over the body.
- G. If an individual exhibits signs or reports symptoms of heat-related illness while taking a preventative cool-down rest period, the appropriate first aid or emergency response must be implemented (see **Section VII – Emergency Response**).
- H. When it is infeasible or unsafe to have a shade structure, or to otherwise provide shade on a continuous basis, alternative procedures (e.g., use of misting machines) may be utilized if the alternative procedures provide equivalent protection.

## VII. Emergency Response

When a work environment is classified as a **heat priority area** and exposes or has the potential to expose individuals to heat and direct sunlight, departments and contractors must ensure that:

- A. Effective communication by voice, observation, or electronic means (e.g., radios) is maintained so that individuals at the work site can contact a supervisor or emergency medical services when necessary.
- B. Immediate action, commensurate with the severity of the illness, is taken if a supervisor observes, or any individual reports, any signs or symptoms of heat-related illness in any individual.
  - i. If the signs or symptoms are indicators of severe heat-related illness (e.g., decreased level of consciousness, staggering, vomiting, disorientation, irrational behavior, or convulsions), contact emergency medical services (e.g., 911) immediately.
  - ii. An individual exhibiting signs or symptoms of heat-related illness must be monitored and not be left alone or sent home without being offered onsite first aid and/or being provided with emergency medical services in accordance with this program.
  - iii. In the event of an emergency, clear and precise directions to the work site must be provided as needed to emergency responders.

## VIII. Training

- A. Departments and contractors must ensure that individuals and their supervisors that have the potential to be exposed to heat-related hazards must receive heat-related illness prevention training on:
  - i. The hazards of heat-related illnesses.
  - ii. Different types of heat-related illnesses.
  - iii. Recognition of signs and symptoms of heat-related illnesses.
  - iv. Environmental and personal risk factors for heat-related illnesses.
  - v. Avoiding heat-related illnesses by recognizing and avoiding situations that can lead to heat-related illnesses.
  - vi. Employer responsibilities to provide water, shade, and cool-down rest periods.
  - vii. The concept, importance, and methods of acclimatization.
  - viii. First aid and emergency procedures and reporting procedures.
  - ix. Monitoring weather.
  - x. The importance of hydration.
- B. Northwestern employees must complete heat-related illness prevention training upon hire and annually, which will be provided [online](#) or by other means deemed necessary by EHS.

## IX. Recordkeeping

- A. EHS maintains Northwestern employee training records in the myHR Learn system but may maintain other training records outside of the myHR Learn system.
- B. Contractors are responsible for maintaining their training records, which must be available upon request.
- C. Training records must be maintained for at least 3 years.

## X. Regulatory Authority and Related Information

Northwestern and contractors will comply with Occupational Safety and Health Administration (OSHA) standards, and any other applicable codes and standards, including:

[National Institute for Occupational Safety and Health \(NIOSH\) Recommended Heat Standard:](#)

[Occupational Exposure to Heat and Hot Environments](#)

[NIOSH First Aid for Heat Illness](#)

[OSHA Technical Manual \(OTM\) Section III: Chapter 4 – Heat Stress](#)

[OSHA Heat Illness Prevention Campaign](#)

[OSHA-NIOSH InfoSheet: Protecting Workers from Heat Illness](#)

[Centers for Disease Control \(CDC\) Workplace Safety and Health Topics: Heat Stress](#)

[NIOSH Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments](#)

[American Conference of Governmental Industrial Hygienists \(ACGIH\)](#)

[National Weather Service \(NWS\)](#)

[National Oceanic and Atmospheric Administration \(NOAA\)](#)

[OSHA-NIOSH Heat Safety Tool App](#)

## XI. Contact

For questions contact Environmental Health and Safety at [ehs@northwestern.edu](mailto:ehs@northwestern.edu) or (847) 467-6342.

## Appendix 1 – Heat Illness Prevention Example Control Measures

Departments and contractors must implement the necessary combination of controls when individuals are exposed to heat hazards to prevent heat-related illness. Below are examples of control measures.

- A. Engineering controls
  - i. Air-conditioning.
  - ii. Increase ventilation (e.g., opening windows or using cooling fans).
  - iii. Eliminate steam leaks.
  - iv. Shut down hot machinery/equipment, when feasible.
  - v. Run local exhaust ventilation where heat is produced (e.g., laundry vents).
  - vi. Use reflective shields to block radiant heat.
  - vii. Insulate hot surfaces (e.g., furnace walls).
  - viii. Provide shade for outdoor work sites (see **Section VI – Shade in Outdoor Environments**).
- B. Administrative controls
  - i. Acclimatization of individuals (i.e., a process by which a person gradually increases their exposure time to hot environmental conditions, causing beneficial physiological changes by properly regulating body temperature that minimizes heat-related illnesses) by:
    - a. Gradually increasing new individual workloads and exposure time to hot environmental conditions (e.g., staggered approach over 7-14 days, beginning work with 20% of the normal workload and time spent in the hot environment, and then gradually increase the time over a 7- to 14-day period. The same should be done for individuals returning from an absence of three or more days, starting with 50% of the normal workload and time spent in the hot environment, then staging acclimatization over three consecutive days).
    - b. Ensuring more frequent breaks as they acclimatize to ambient conditions.
    - c. Monitoring them for signs of heat-related illness.
  - ii. An individual who has been newly assigned to a **heat priority area** must be closely observed by a supervisor or designee for the first 14 days of exposure.
  - iii. Provide plenty of cool drinking water (50-60°F) and allow employees to take frequent water breaks in cooler environments when needed.
  - iv. Provide training (see **Section VIII – Training**).
  - v. Schedule hot jobs for cooler parts of the workday.
  - vi. Schedule routine maintenance and repair work during cooler seasons of the year when possible.
  - vii. Reduce the physical demands of the job, when feasible.
  - viii. Use work/rest and rotation schedules to limit exposure.
  - ix. Utilize a ‘buddy system’ for individuals to monitor each other for heat-related illness and notify supervisors of signs and symptoms.
- C. Personal protective equipment (PPE)
  - i. Hats and sunblock for work outdoors in direct sunlight
  - ii. For indoor work, loosely worn reflective clothing designed to deflect radiant heat, such as vests, aprons, or jackets.
  - iii. In environments where respirator usage is necessary, consult EHS to determine the appropriate clothing and measures to prevent heat-related illness while still protecting employee respiratory systems.



- iv. Dermal patches for monitoring core temperature to identify when individuals need to be removed from the work area.
- v. Heart rate monitoring to identify when individuals need to be removed from the work area. Both sustained (180 bpm minus age) and recovery (120 bpm after a peak work effort) heart rates are recommended guidelines to prevent heat-related illness.