



DEPARTMENT OF  
ENVIRONMENTAL SAFETY,  
SUSTAINABILITY & RISK

# Heat Safety Program

University of Maryland

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## I. Introduction

The University of Maryland Heat Safety Program was developed to provide the UMD community with the training and tools to help protect themselves from heat-related illnesses.

The program was prepared using criteria provided by the Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH) and the Maryland Occupational Safety and Health (MOSH).

## II. Scope

The Heat Safety Program applies to UMD personnel (faculty, staff and students) whose activities, conducted indoor and outdoor, exposes them to a heat index in the work area that equals or exceeds 80 °F for more than 15 consecutive minutes per hour. The program is not applicable to activities performed by emergency responders, student athletes, or visitors. This program is also not applicable to buildings, structures, and vehicles that have a mechanical ventilation system or fan that maintains the heat index below 80 °F.

Contractors should utilize their own heat safety programs.

## III. Regulations and Guidelines

Although currently there is not a specific OSHA standard for heat stress, employees are protected under the [General Duty Clause](#). Additionally, MOSH *Heat Stress Illness Prevention* criteria, as well as guidance provided by OSHA, the Centers for Disease Control and Prevention (CDC), and the National Institute of Occupational Safety and Health (NIOSH) were included in the development of this program.

## IV. Definitions

Heat Acclimatization	The improvement in heat tolerance that comes from gradually increasing the intensity or duration of work performed in a hot setting. The best way to acclimatize the body to the heat is to increase the workload performed in a hot setting gradually over a period of 1 – 2 weeks.
Heat Illness Prevention and Management Plan	A written plan for how the department will adhere to the elements of the Heat Safety Program.
Heat Stroke	The most serious heat-related illness. It can occur when the body can no longer control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down.

	Heat stroke can cause permanent disability or death if the person does not receive emergency treatment.
Heat Exhaustion	A heat-related illness characterized by elevation of core body temperature above 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.
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.
Heat Rash	Skin irritation caused by excessive sweating during hot, humid weather.
Heat Index	A measure of <b><u>how hot it feels</u></b> when relative humidity is considered with actual air temperature.

## VI. Roles and Responsibilities

ESSR – Occupational Safety and Health (OSH)	<ul style="list-style-type: none"> <li>● Administrator of the UMD Heat Safety Program (i.e. Develop, implement, monitor for compliance, and review the Heat Safety Program.)</li> <li>● Monitor injuries, illnesses and incidents related to heat safety and assist in developing corrective actions and lessons learned.</li> </ul>
Department Leadership	<ul style="list-style-type: none"> <li>● Ensure the department has appropriate heat-illness prevention resources available to employees.</li> <li>● Communicate responsibilities to supervisors within the department.</li> </ul>
Supervisor and Manager	<ul style="list-style-type: none"> <li>● Plan for, implement and monitor heat-illness control measures for employees under their supervision.</li> <li>● In cases where employees report risk factors that may make them more susceptible to heat stress, consider modified duty or direct the employee to submit for workplace accommodation through the University of Human Resources <a href="#">existing policy</a>.</li> <li>● Complete the Heat Illness Prevention and Management Plan.</li> <li>● Report all incidents to ESSR and participate in incident investigations.</li> </ul>
Employee	<ul style="list-style-type: none"> <li>● Complete all required training for the Heat Safety Program.</li> <li>● Notify Supervisor or Manager of any health conditions (see Section VII) that you deem could impact the duties.</li> <li>● Utilize heat-illness control measures.</li> <li>● Monitor self-conditions as well as check in on colleagues.</li> <li>● Report incidents to supervisor regarding all heat-related illnesses.</li> <li>● Report hazardous conditions related to heat exposure.</li> </ul>

## HEAT SAFETY PROGRAM ELEMENTS:

The Heat Safety Program addresses six (6) key areas of heat-illness prevention:

1. **Conducting a Risk Assessment** to identify areas and tasks with potential heat exposure hazards, considering temperature, humidity, radiant heat sources, and ventilation. Identify personal risk factors for increased risk of heat-related illnesses.
2. **Training and educating UMD staff and students** on heat-illness prevention strategies, as well as recognizing and reporting the signs and symptoms of heat-related illnesses.
3. **Monitoring weather and workplace conditions.**
4. **Completing a Heat Illness Prevention and Management Plan** when weather or workplace conditions will exceed a heat index of 80 °F for more than 15 consecutive minutes per hour.
5. **Implementing heat-illness prevention strategies** to reduce heat stress. This includes:
  - a. Reducing worker exposures to heat stress conditions.
  - b. Establishing a heat acclimatization plan to help workers adapt to working in the heat.
  - c. Ensuring workers are provided adequate water, shade and rest periods.
  - d. Monitoring workers for early signs and symptoms of heat stress.
6. **Planning for heat-related medical emergencies** and ensuring victims receive prompt medical attention.

## VII. Risk Assessment

When there is the possibility of heat-related illness occurring, you must determine the risk to workers. The assessment must include a survey of the work areas with potential heat exposure, as well as determination of the radiant heat sources, air movement, temperature and humidity associated with the activities.

Another consideration included for this assessment involves the personal risk factors. It is the responsibility of the employee to communicate conditions necessitating adjustments to assigned work.

- Some **health conditions** may cause you to be less likely to sense and respond to changes in temperature.
  - Diabetes
  - High blood pressure
  - Heart disease
  - Kidney disease
  - Mental health conditions
  - Overweight or obese

- Asthma and chronic obstructive pulmonary disease (COPD)
- Have had prior heat-related illnesses
- Certain **medications** may cause you to be less likely to feel heat conditions and/or limit your ability to sweat or retain water to cool your body.
  - Antihistamines
  - Blood pressure medications
  - Diarrhea medications
  - Diuretics (water pills)
  - Muscle relaxants
  - Psychiatric medications
  - Sedatives
- Some **physical characteristics** may cause you to become dehydrated faster and/or limit your ability to cool your body.
  - Older age (60 years and older)
  - Lower level of physical fitness
  - Pregnancy
  - History of prior heat illness
  - Working in direct sunlight

*Review the Personal Risk Factors and Heat Exposure Fact Sheet located on the Heat Safety Program website at <http://essr.umd.edu>.*

## **VIII. Training and Education**

To ensure workers are prepared to work safely under hot and humid conditions, all staff and students who may be exposed to heat stress and heat-related illnesses during work activities must receive training on an annual basis prior to the start of the season for hot conditions (generally May of each year). New hires who start during the season of hot conditions must complete training during their first week of hire and prior to working under hot and humid conditions. Retraining of staff and students must occur immediately following any incident at the worksite involving a suspected or confirmed heat-related illness.

Training must be completed in the university's Learning Management System. In-person training may be scheduled through the ESSR – OSH unit. Training records must be made available to regulatory agencies upon request.

*See Heat Safety Training course summary for further information about this course.*

## **IX. Monitoring Weather and Workplace Conditions**

Both employees and supervisors are responsible for monitoring the daily weather and workplace conditions to determine if workers will be exposed to heat indices > 80 °F. The National Weather Service ([www.weather.gov](http://www.weather.gov)) should be used to monitor weather conditions. An additional tool is the

[OSHA-NIOSH Heat Safety Tool App](#) (available in English and Spanish for Android and iPhone devices).

Heat Index for Indoor environments can be monitored by measuring the temperature, humidity and using a heat index chart.

### A. Outdoor Environments

When measuring heat index for outdoor environments, the NIOSH-OSHA Heat Safety Tool App, or sources provided above may be used for accurate data.

OSHA-NIOSH Heat Safety Tool App.  
**FOR OUTDOOR USE ONLY**

In addition to the heat index, the app also displays protective measures that should be taken at that risk level to protect workers from heat-related illness-reminders about drinking enough fluids, scheduling rest breaks, planning for and knowing what to do in an emergency, adjusting work operations, gradually building up the workload for new workers, training on heat illness signs and symptoms, and monitoring each other for signs and symptoms of heat-related illness.

NWS Heat Index		Temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127											
100	87	95	103	112	121	132											

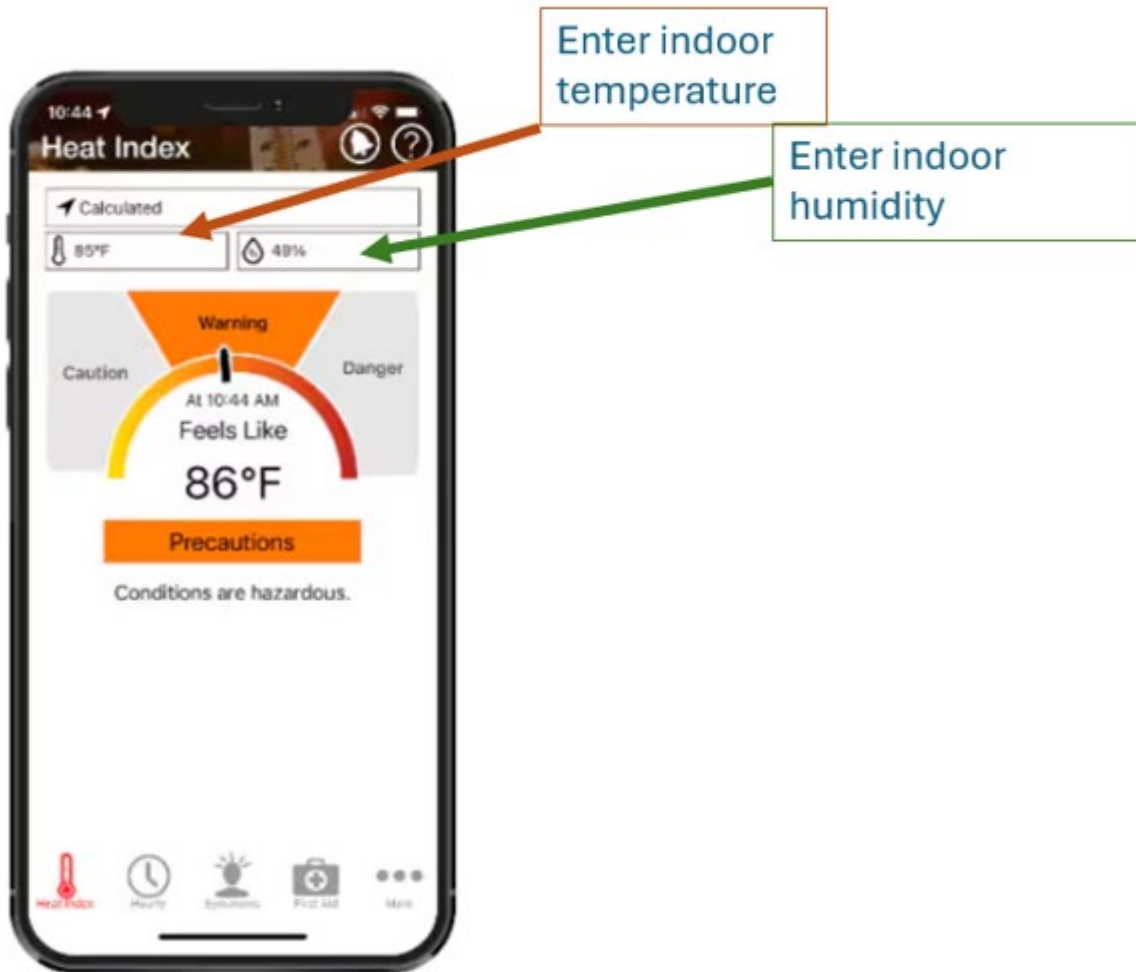
Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution    
 Extreme Caution    
 Danger    
 Extreme Danger

Utilizing the NWS Heat Index chart, once you measure the temperature and relative humidity, you locate each of your values on the chart and see where those values intersect to determine the heat index.

## A. Indoor Environments

Employees working in buildings and structures that do not have mechanical ventilation must directly measure the temperature and humidity at the same time and location in areas where employees perform work. When measuring the heat index in indoor environments a thermometer and hygrometer (humidity meter) is required. Once you have readings for both the temperature and relative humidity, you can utilize the NWS Heat Index chart, or enter in the temperature and humidity levels into the NIOSH-OSHA Heat Safety Tool App. The resulting heat index will be automatically calculated.



Additionally, a heat index monitor can be used to get a direct reading.

For further information, please contact the ESSR- OSH unit ([osh@umd.edu](mailto:osh@umd.edu)).



## **X. Heat Illness Prevention and Management Plan**

When weather or workplace conditions will exceed 80 °F, affected departments or units must complete a Heat Illness Prevention and Management plan.

Using the ESSR template included in Appendix A, supervisors or managers must complete, implement, and maintain a written copy of the plan.

The plan must also be made available to employees, ESSR OSH, and to MOSH upon request.

## **XI. Implementing Heat-Illness Prevention Strategies**

### Workloads

Depending on the workload of the employee, the heat prevention strategies may need to be adjusted to include more frequent breaks in the shade and drinking water.

### Acclimatization

The goal of acclimatization is to gradually increase exposure time under hot environmental conditions over several days. This allows the body to adjust to hot conditions, which will result in more efficient evaporative cooling. For a period of 14 days, Supervisors and Managers must provide for acclimatization of exposed staff and students and shall observe employees regularly for the symptoms of heat-related illnesses.

Employees must be acclimatized when an employee is newly exposed to heat in the workplace and when the employee returns to work after seven or more consecutive days of absence from the workplace.

*Review the Heat Acclimatization Fact Sheet located on the Heat Safety Program website at <http://essr.umd.edu>.*

A heat acclimatization schedule must be developed and implemented which complies with one of the following:

- (1) A schedule which gradually increases exposure time over a 5 - 14-day period, with a maximum 20% increase each day
- (2) A [schedule](#) which uses the current National Institute for Occupational Safety and Health's recommendations for acclimatization
- (3) A schedule which uses a combination of gradual introduction and alternative cooling and control measures that acclimate an employee to heat

The acclimatization schedule must be in writing and include the following elements:

- (1) Acclimated and unacclimated employees
- (2) Environmental conditions and anticipated workload
- (3) Impact of required clothing and personal protective equipment to the heat burden on employees

- (4) Personal risk factors that put an employee at higher risk of heat-related illness
- (5) Re-acclimatizing employees as necessary
- (6) The use of alternate cooling and control measures

Ventilation

In indoor environments, increased air flow or convection using fans, etc. in the work area. Changes in air speed can help workers stay cooler by increasing both the convective heat exchange and rate of evaporation.

Shade

Shaded and/or air-conditioned space nearby for rest and water breaks must be provided.

Hydration

To prevent dehydration, employees must drink adequate water at frequent intervals (i.e. one 8-ounces of cool water every 15 to 20 minutes). Pure and potable water must be made available to workers at no additional cost. Water quantities need to be sufficient and at least 1 quart per worker per hour for the entire shift.

Resting

Modify the work-rest schedule to shorten heat exposure periods by including frequent breaks. Shorter, more frequent breaks are more effective than longer, less frequent rest breaks.

Personal Protective Clothing

- Reflective clothing can reduce radiant heat reaching the worker.
- Cooling vests
- Lightweight, breathable clothing (when working with non-hazardous materials or equipment).

**XII. Responding to Heat-Related Medical Emergencies**

When workers are exposed to heat stress conditions, it is critical to ensure adequate supervision, first aid and medical services are readily available in the event a worker suffers from a heat-related illness.

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**Heat Stroke**

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<b>Cause:</b>	<ul style="list-style-type: none"> <li>● Body is unable to cool itself and regulate core body temperature.</li> <li>● This is a serious and life-threatening condition that requires immediate medical attention. <b>CALL 9-1-1</b></li> </ul>
<b>Preventative Measures:</b>	<ul style="list-style-type: none"> <li>● Acclimatization to heat helps reduce salt and water loss.</li> <li>● Drink adequate amounts of water throughout the day.</li> <li>● Take small breaks in shade.</li> <li>● Protect skin against sunburn which reduces the body’s ability to cool itself.</li> </ul>

<b>Signs and symptoms:</b>	<ul style="list-style-type: none"> <li>● Elevated core body temperature above 103.2 F</li> <li>● Hot, dry skin or heavy sweating</li> <li>● Mental confusion, agitation and/or irrational behavior</li> <li>● Clumsiness</li> <li>● Slurred speech</li> <li>● Seizures or convulsions</li> </ul>
<b>First Aid:</b>	<ul style="list-style-type: none"> <li>● Call 9-1-1 Immediately</li> <li>● Provide immediate and aggressive cooling to the body.</li> <li>● Elevate feet above heart level.</li> <li>● Pack ice in groin and armpit areas.</li> <li>● Soak skin with cool water and fan rapidly and vigorously.</li> <li>● Administer CPR, if trained and as needed, until EMS arrives</li> </ul>

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## Heat Exhaustion

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<b>Cause:</b>	<ul style="list-style-type: none"> <li>● Body is unable to cool. This is a serious condition that can lead to a life-threatening heat stroke.</li> </ul>
<b>Preventative Measures:</b>	<ul style="list-style-type: none"> <li>● Acclimatization to heat helps reduce salt and water loss.</li> <li>● Drink adequate amounts of water throughout the day.</li> <li>● Take small breaks in shade.</li> <li>● Protect skin against sunburn which reduces the body's ability to cool itself.</li> </ul>
<b>Signs and symptoms:</b>	<ul style="list-style-type: none"> <li>● Elevated core body temperature of 99.6 to 101.4 F</li> <li>● Weak but rapid pulse</li> <li>● Excessive sweating, headache, fatigue dizziness</li> </ul>
<b>First Aid:</b>	<ul style="list-style-type: none"> <li>● Seek immediate care (call 9-1-1).</li> <li>● Move to a cool location.</li> <li>● Have them drink small amounts of cool water.</li> <li>● Spray skin with cool water and fan rapidly.</li> <li>● Monitor body temperature and continue cooling efforts.</li> </ul>

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## Heat Cramp

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<b>Cause:</b>	<ul style="list-style-type: none"> <li>● Depletion of salt and water in the body due to excessive sweating. This is a precursor to more serious heat exhaustion and/or heat stroke.</li> </ul>
<b>Preventative Measures:</b>	<ul style="list-style-type: none"> <li>● Acclimatization to heat helps reduce salt and water loss.</li> <li>● Drink adequate amounts of water throughout the day.</li> <li>● Salt your foods to taste.</li> </ul>
<b>Signs and symptoms:</b>	<ul style="list-style-type: none"> <li>● Muscle cramps, spasms and/or pain</li> <li>● Common to major muscles used for work (arms, legs, abdominals and back muscles)</li> </ul>
<b>First Aid:</b>	<ul style="list-style-type: none"> <li>● Move the person to a cool location.</li> <li>● Provide the person with an electrolyte replacement fluid to replace lost salt and water.</li> </ul>

	<ul style="list-style-type: none"> <li>● Seek medical treatment if cramps persist or other heat-illness symptoms develop (elevated body temperature, elevated heart rate, headache, dizziness, etc.).</li> </ul>
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## Heat Rash

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<b>Cause:</b>	<ul style="list-style-type: none"> <li>● Irritation of skin due to excessive sweating.</li> </ul>
<b>Preventative Measures:</b>	<ul style="list-style-type: none"> <li>● Wear loose fitting clothing that allows sweat to dissipate.</li> <li>● Wear freshly laundered clothing each day.</li> <li>● Avoid working in sweat-soaked clothing for prolonged periods.</li> <li>● Wash sweat-soaked areas with mild soap and water and dry thoroughly at breaks and after your shift ends.</li> </ul>
<b>Signs and symptoms:</b>	<ul style="list-style-type: none"> <li>● Itchy and painful clusters of red blisters.</li> <li>● Common to neck, chest, groin, armpits and creases of the elbows and knees.</li> </ul>
<b>First Aid:</b>	<ul style="list-style-type: none"> <li>● Move person to a cool location.</li> <li>● Have person take a cool shower.</li> <li>● Thoroughly dry the skin following the shower.</li> <li>● Continue to ensure skin is cleaned and dried.</li> <li>● Seek medical attention if rash persists for more than two days or if rash becomes infected.</li> </ul>

### XIII. Assessment of the Outdoor and Indoor Heat-Related Injury and Illness Prevention Plan

To help our community to identify job-related risk factors for heat exposure, assess preparedness, determine where challenges exist, and develop effective ways to control their heat-related risk, unit self-assessment, as well as safety inspections by ESSR, will continually improve the means for protecting our community from heat-related illnesses and injuries. This checklist provided in Appendix B helps UMD to identify job-related risk factors for heat exposure, assess preparedness, determine where challenges exist, and develop effective ways to control heat-related risk and make our workplaces safer. The criteria included in this checklist will be assessed by ESSR OSH each Spring to serve this purpose. It is recommended that the units use this checklist for self-assessment to ensure that a compliant plan is in place.

### XIV. Records Retention

Each department must maintain completed *Outdoor/Indoor Heat Illness Prevention and Management Plans* for 1 calendar year, making them available for inspections/audits by regulators. This requirement is in accordance with the [UMD Records Retention Schedule](#) as well as MOSH requirements regarding the having these Plans available upon request.

## **XV. Heat Safety Program Resources**

The following documents support the UMD Heat Safety Plan:

- Heat Safety Training
- Heat Safety Training Course Summary Sheet
- Heat Illness Prevention and Management Plan template
- Heat Illness Prevention Checklist

### Fact Sheets

- Personal Risk Factors and Heat Exposure
- Heat Acclimatization
- Ways to Protect Yourself and Others
- Work Safely in Heat
- Keep Workers Well-Hydrated

## **XVI. ESSR Contact**

Email: [askESSR@umd.edu](mailto:askESSR@umd.edu)

Website: [essr.umd.edu](http://essr.umd.edu)

Appendix A

**Department Heat Illness Prevention and Management Plan (Linked Separately)**

## Appendix B

### **Checklist for Outdoor and Indoor Heat-Related Injury and Illness Prevention (Linked Separately)**