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# Heat Stress Safety Program

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## Introduction

Employees who are exposed to excessive heat or who work in hot environments may be at risk of heat stress. Various factors can contribute to heat stress such as air temperature, physical activity, individual susceptibility, radiant heat, humidity, air flow, and clothing type. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. The University of North Carolina at Pembroke's Environmental Health and Safety office (EHS) has developed this program to protect employees from heat-related illnesses while at work.

## Scope

This program applies to all university employees who are exposed to or may become exposed to excessive heat during the course of their job duties.

## Responsibility

### Environmental Health & Safety (EHS):

- assisting departments in implementing the provisions of this program;
- revising and updating the program as necessary;
- validating program implementation;
- providing training and education resources regarding heat stress and illnesses; and
- performing heat stress exposure assessments for employees when necessary.

### Facilities Operations (FO):

- determining and reporting indoor heat index values to affected departments as specified in this program; and
- providing fans for air movement when applicable.

### Departments and Supervisors:

- ensuring employees are trained in identifying the signs and symptoms of heat-related illnesses;
- providing provisions for rest areas and accessible drinking water to employees;
- providing fans for air movement when applicable;
- monitoring the heat index and pursuing, implementing, and enforcing the proper protective measures for employees as specified in this program;
- notifying EHS of specialized job tasks or environments as defined in this program that require a heat exposure assessment;
- reporting the results of all heat stress monitoring to employees; and

- following their respective campus procedure for reporting occupational injuries and illnesses.

### Employees:

- working in accordance with the provisions of this program;
- understanding the signs and symptoms of heat-related illnesses;
- notifying the supervisor if conditions exist that may lead to heat-related illness; and
- notifying the supervisor if they begin to experience symptoms of heat-related illnesses.

## Program Elements

### Protecting Employees

EHS has developed protective criteria for employees based upon the heat index and other measures of heat stress exposure. The heat index combines both air temperature and relative humidity into a single index. The higher the heat index, the hotter the environment will feel, and the greater the risk that employees will experience heat-related illness. Individual susceptibility to heat-related illness can vary widely between employees. Employees gradually acclimatize when exposed to hot conditions for several weeks. When the heat index is high, special precautions are needed to protect un-acclimatized employees while they adjust to the heat, particularly on the first few days they are exposed to hot conditions. Supervisors should monitor employees closely for signs of heat stress during this period and they should adopt appropriate work-rest schedules for these employees, starting with longer rest periods that are reduced over a two week period. Re-acclimatization may also be necessary when employees are away from hot conditions for a few days.

### Outdoor environments

Outdoor temperatures become elevated during the summer months. EHS has divided heat index levels into four bands or risk levels that require specific protective measures when working outdoors (See [Appendix A](#)). Additional protective measures are necessary when one of the following risk factors are present: employees must wear heavy or non-breathable protective clothing (e.g. vapor barrier coveralls), employees work in direct sunlight, employees perform tasks that generate radiant heat (e.g. welding), or when employees perform prolonged strenuous activity. However, when a combination of these risk factors occur simultaneously, see [Other environments and job tasks](#) for additional precautions.

### Office, laboratory, and housing environments

The temperature in offices, laboratories, and housing may become elevated when equipment malfunctions and outdoor temperatures are high. When temperatures exceed 83 degrees Fahrenheit in office, laboratory, or housing environments, employees should contact FO immediately. The heat index (i.e. calculated from temperature and humidity measurements) should be monitored by FO closely during these conditions. Additional protective measures are necessary when one of the following risk factors are present: employees must wear heavy or non-breathable protective clothing (e.g. vapor barrier coveralls), employees perform tasks that generate radiant heat (e.g. welding), and when employees perform prolonged strenuous activity. However, when a combination of these risk factors occur simultaneously, see [Other environments and job tasks](#) for additional precautions.

### **Other Environments and Job Tasks**

UNC - Pembroke has a very diverse set of work environments and job tasks. If the work environment or work condition is not specifically addressed in Outdoor environments or Office, laboratory, and housing environments, or if an employee reports and/or experiences heat-related symptoms in a particular environment or during a specific job task, a [Wet-Bulb Globe Temperature](#) (WBGT) based heat exposure assessment may be necessary to ensure safe work conditions or to identify appropriate protective measures. If heat stress is identified as a concern by an employee or by EHS for a particular work environment or job task that is not addressed in Outdoor environments or Office, laboratory, and housing environments, EHS will perform a heat exposure assessment for that specific work environment or job task. Utilizing the results of the heat exposure assessment and the most recent guidelines specified by the [American Conference of Governmental Industrial Hygienists](#) (ACGIH), EHS will provide specific recommendations and precautions for the specialized job task and/or environment.

### **Heat-related illnesses and emergencies**

If employees report or supervisors observe signs or symptoms of heat-related illness, stop all activity immediately. Heat stroke is a medical emergency. Call 911 immediately if an employee shows any signs of heat stroke. If an employee is believed to be experiencing heat-related symptoms, [Appendix B](#) provides a list of recommended actions. These recommended actions should only be used as a guide to respond appropriately to known or reported symptoms. EHS should then be contacted prior to the continuation of work by other employees.

### **Training**

Contact EHS at [safety@uncp.edu](mailto:safety@uncp.edu) for heat stress prevention training.

### **References**

- [OSHA, Using the Heat Index to Protect Workers](#)
- [OSHA, Acclimatizing Workers](#)

- [OSHA, Protective Measures to Take at Each Risk Level](#)
- [OSHA, Preparing for and Responding to Heat-Related Emergencies](#)
- [National Weather Service \(NWS\) Weather Prediction Center](#)
- [American Conference of Governmental Industrial Hygienists \(ACGIH\), TLVs and BEIs \(2013\)](#)

# Appendices

## Appendix A



Appendix A

# Working in Outdoor Environments

Heat Index	Risk Level	Protective Measures
84 – 91°F	LOW	<ul style="list-style-type: none"> <li>Remind employees that drinking water is available; and</li> <li>Plan ahead for times when the heat index is higher, including heat stress prevention training.</li> </ul>
91 – 103°F	MEDIUM	<p>In addition to the protective measures listed above:</p> <ul style="list-style-type: none"> <li>Remind employees to drink water often (about 4 cups/hour);</li> <li>Review heat-related illness topics with employees: how to recognize heat-related illness, how to prevent it, and what to do if someone gets sick;</li> <li>Schedule frequent breaks in cool, shaded or air conditioned areas;</li> <li>Acclimatize employees to conditions slowly; and</li> <li>Set up a buddy system and watch workers for signs of heat-related illness.</li> </ul>
103-115° F	HIGH	<p>In addition to the protective measures listed above:</p> <ul style="list-style-type: none"> <li>Alert employees of high risk conditions;</li> <li>Actively encourage employees to drink plenty of water;</li> <li>Limit physical exertion;</li> <li>Establish and enforce work/rest schedule;</li> <li>Adjust work activities (reschedule work, pace/rotate jobs);</li> <li>Use cooling techniques; and</li> <li>Watch/communicate with workers at all times.</li> </ul>
>115° F	VERY HIGH	<p>Reschedule non-essential activity for days with a reduced heat index or to a time when the heat index is lower.</p> <p>Move essential work tasks to the coolest part of the work shift; consider earlier start times, split shifts, or evening and night shifts.</p> <p>If essential work must be done, in addition to the protective measures listed above:</p> <ul style="list-style-type: none"> <li>Alert workers of extreme heat hazards;</li> <li>Establish, enforce and closely monitor work/rest schedules; and</li> <li>Establish a water drinking schedule.</li> </ul>



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UNIVERSITY OF NORTH CAROLINA PEMBROKE



## Learn the Signs of Heat - Related Illnesses

Heat - Related Illness	What to look for	What to do
Heat Stroke	<ul style="list-style-type: none"> <li>• High body temperature (103°F or higher)</li> <li>• Hot, red, dry, or damp skin</li> <li>• Fast, strong pulse</li> <li>• Headache</li> <li>• Feeling dizzy</li> <li>• Nausea</li> <li>• Feeling confused</li> <li>• Losing consciousness (passing out)</li> </ul>	<ul style="list-style-type: none"> <li>• Call 911 right away- heat stroke is a medical emergency</li> <li>• Move the person to a cooler place</li> <li>• Help lower the person's temperature with cool cloths or a cool bath</li> <li>• Do <b>not</b> give the person anything to drink</li> </ul>
Heat Exhaustion	<ul style="list-style-type: none"> <li>• Heavy sweating</li> <li>• Cold, pale, and clammy skin</li> <li>• Fast, weak pulse</li> <li>• Nausea or vomiting</li> <li>• Muscle cramps</li> <li>• Feeling tired or weak</li> <li>• Feeling dizzy</li> <li>• Headache</li> <li>• Fainting (passing out)</li> </ul>	<ul style="list-style-type: none"> <li>• Move to a cool place</li> <li>• Loosen your clothes</li> <li>• Put cool, wet cloths on your body or take a cool bath</li> <li>• Sip water</li> </ul> <p>Get medical help right away if:</p> <ul style="list-style-type: none"> <li>• You are throwing up</li> <li>• Your symptoms get worse</li> <li>• Your symptoms last longer than 1 hour</li> </ul>
Heat Cramps	<ul style="list-style-type: none"> <li>• Heavy sweating during intense exercise</li> <li>• Muscle pain or spasms</li> </ul>	<ul style="list-style-type: none"> <li>• Stop physical activity and move to a cool place</li> <li>• Drink water or a sports drink</li> <li>• Wait for cramps to go away before you do any more physical activity</li> </ul> <p>Get medical help right away if:</p> <ul style="list-style-type: none"> <li>• Cramps last longer than 1 hour</li> <li>• You're on a low-sodium diet</li> <li>• You have heart problems</li> </ul>
Sunburn	<ul style="list-style-type: none"> <li>• Painful, red, and warm skin</li> <li>• Blisters on the skin</li> </ul>	<ul style="list-style-type: none"> <li>• Stay out of the sun until your sunburn heals</li> <li>• Put cool cloths on sunburned areas or take a cool bath</li> <li>• Put moisturizing lotion on sunburned areas</li> <li>• Do not break blisters</li> </ul>
Heat Rash	Red clusters of small blisters that look like pimples on the skin (usually on the neck, chest, groin, or in elbow creases)	<ul style="list-style-type: none"> <li>• Stay in a cool, dry place</li> <li>• Keep the rash dry</li> <li>• Use powder (like baby powder) to soothe the rash</li> </ul>