

1 INTENT

Working outdoors for prolonged periods of time may have a negative effect on the health and safety of employees. Extreme temperatures can overwhelm the body's internal temperature control system and result in heat- or cold-related illnesses such as hypothermia or heat stroke. In addition, high levels of ultraviolet radiation from the sun can cause both acute and long-term damage to health. The University at Albany Office of Environmental Health and Safety (EH&S) has established these *Heat/Cold Stress and Sun Safety Guidelines* to help inform supervisors and staff regarding the effects of temperature extremes and the sun on employees.

Currently, the Occupational Safety and Health Administration (OSHA) does not have a specific standard for temperature extremes or sun exposure. However, these hazards fall under the General Duty Clause of the Occupational Safety and Health Act of 1970, which states that “*each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.*” OSHA also refers to guidelines recommended by the U.S. National Oceanographic and Atmospheric Administration (NOAA), the National Institute for Occupational Safety and Health (NIOSH), and the American Conference of Governmental Industrial Hygienists (ACGIH).

The New York State Public Employee Sun Safety Law, enacted on August 18, 2006, mandates that New York State agency public employers must ensure that all state employees who spend more than five hours outdoors per work week as a part of their job function have access to sun safety information. This required information is provided in section 4 of this document and will be shared with all affected employees through training and other educational tools.

EH&S will maintain, review, and update the *Heat/Cold Stress and Sun Safety Guidelines* as needed.

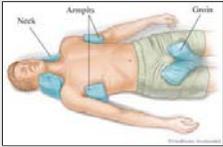
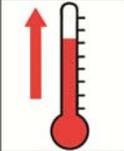
2 HEAT STRESS

University at Albany employees who are exposed to hot and humid conditions may be at risk of heat-related illnesses. These employees must know how to identify the symptoms of heat-related illnesses, and how to prevent and respond to these conditions.

2.1 Heat-Related Illnesses

The most common health problems caused by hot work environments include heat rash, heat cramps, heat exhaustion, and heat stroke. The definitions, symptoms, and first-aid measures for each of these conditions are provided in Table 1 below.

Table 1: Heat-Related Illnesses: Symptoms and First Aid

Heat-Related Illness	Symptoms	First Aid
<p>Heat Rash Skin irritation caused by sweat that does not evaporate.</p> 	<p>Clusters of red bumps on the skin, often on the neck, upper chest, or fold of skin</p>	<ul style="list-style-type: none"> Once skin is cool, heat rash tends to clear quickly. Try to work in a cooler, less humid environment when possible. Keep the affected area dry.
<p>Heat Cramps Muscle cramps caused by loss of body electrolytes and fluid.</p> 	<p>Muscle spasms/pain, usually in abdomen, arms, or legs</p>	<ul style="list-style-type: none"> Rest in shady, cool area. Drink water or other cool beverages. Wait a few hours before returning to strenuous work. Seek medical attention if cramps persist.
<p>Heat Exhaustion The body systems that regulate temperature become overwhelmed due to loss of water and electrolytes.</p> 	<ul style="list-style-type: none"> Headache, dizziness Irritability Nausea or vomiting Weakness Thirst Fast heart beat 	<ul style="list-style-type: none"> Get person to a shady, cool area. Loosen clothing; remove outer clothing. Wet the person's body with cool water. Apply icepacks to head, neck, armpits, and groin. Provide drinking water. 
<p>Heat Stroke If heat exhaustion continues untreated, it will progress to heat stroke. The body is no longer able to regulate its temperature.</p> 	<ul style="list-style-type: none"> Red, hot, <u>dry</u> skin Very high body temperature Confusion Seizures Fainting Loss of consciousness 	<ul style="list-style-type: none"> MEDICAL EMERGENCY. Alert supervisor and request medical assistance by calling 518-442-3131. While waiting for medical services: <ul style="list-style-type: none"> Stay with person until help arrives. Get person to a shady, cool area. Loosen clothing; remove outer clothing. Soak the person's body in cool water. Apply icepacks to head, neck, armpits, and groin. Provide drinking water. Do not try to give beverages to an unconscious person.

2.2 Heat-Related Illness Prevention

Heat-related illnesses are preventable. The following subsections describe ways to prevent heat-related illnesses while working in hot environments.

2.2.1 General Recommendations for Working in the Heat

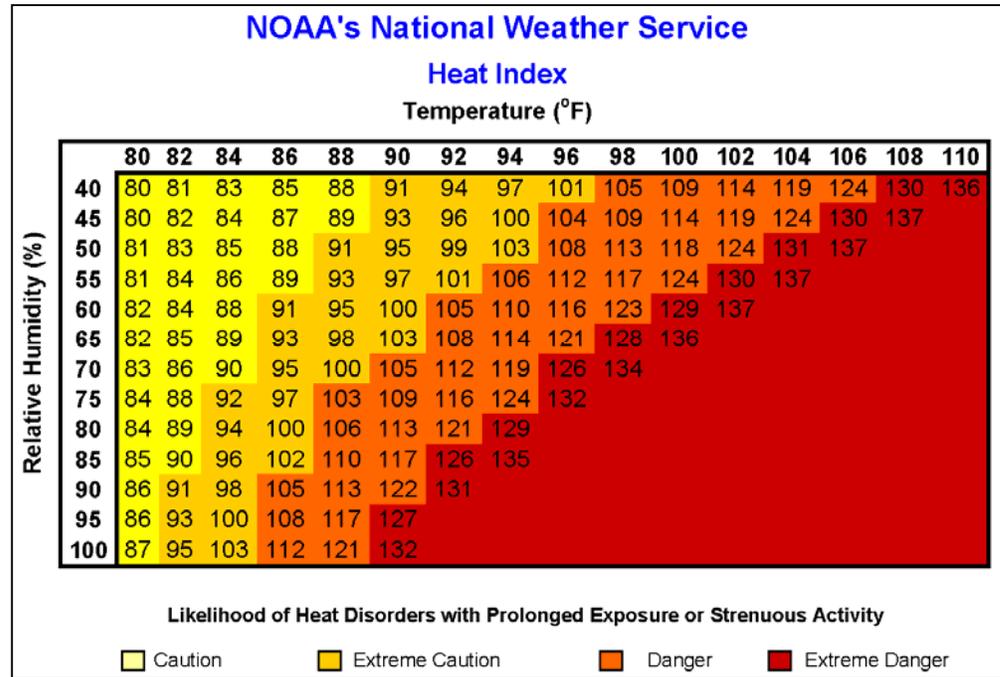
General recommendations for working in the heat are as follows:

- Watch for symptoms of heat-related illnesses (see Table 1 above) and report early.
- Use the buddy system (work in pairs).
- Wear light clothing and a hat.
- Drink plenty of water. It is better to drink small amounts every 15 minutes rather than drinking a large amount all at once. Carry a refillable water bottle and use the various fill stations around campus.
- Avoid caffeine and alcohol which can dehydrate the body.
- Seek shade where possible while working.
- Take breaks in a cool environment to rest and cool off. Do not over-exert yourself.



2.2.2 The Heat Index

The risk of heat-related illness becomes greater as the weather gets hotter and more humid. The heat index is a system developed by the U.S. National Oceanographic and Atmospheric Administration (NOAA) that combines both air temperature and relative humidity into a single value that indicates the apparent temperature in degrees Fahrenheit. The higher the heat index, the greater the risk that staff working outside or in an uncooled area will experience a heat-related illness.



The heat index should be used to guide decisions about protecting workers in hot weather, as described in section 2.2.3 below. It is important to note, however, that the heat index does not account for certain conditions that contribute additional risk, such as direct sunlight and physical exertion. Workers who are in direct sunlight, performing strenuous activity, using heavy or non-breathable protective clothing, and/or are new to an outdoor job may need additional precautions beyond those warranted by the heat index alone. Consult with the EH&S office to address such conditions.

The real-time outdoor heat index value can be obtained from the NOAA National Weather Service's local forecast for Albany, NY:
<http://www.weather.gov/aly/>



2.2.3 Protective Measures for Working in the Heat

The table below summarizes best practices to protect workers at various heat index risk levels. These protective measures are based on OSHA’s advisory document entitled “Using the Heat Index: A Guide for Employers.”

Table 2: Protective Measures for Working in the Heat

HEAT INDEX	RISK LEVEL	PROTECTIVE MEASURES	BEST PRACTICES
90°F or lower	Lower	Basic heat safety and planning	<ul style="list-style-type: none"> • Normal breaks • Drinking water available in staff break areas.
91°F to 103°F	Moderate	Implement precautions and heighten awareness	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Supervisors: <ul style="list-style-type: none"> ○ Be aware of the heat index anticipated for the day and identify precautionary actions as necessary. ○ Review with staff how to recognize heat-related illnesses, how to prevent them, and first aid (see Table 1 above). ○ Remind staff to drink small amounts of water often (before becoming thirsty) and avoid caffeine/alcohol. Rule of thumb: drink about 4 cups of water per hour. Encourage staff to use reusable bottles. ○ Watch workers for signs of heat-related illness. ○ Encourage staff to wear hat and sunscreen.
104°F to 115°F	High	Additional precautions to protect workers	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Adjust work activities: <ul style="list-style-type: none"> ○ Establish and enforce work/rest schedule: 15 minute break for every hour in the heat. ○ No strenuous work in the afternoon; focus on maintenance, inventory, and housekeeping. ○ When possible, reschedule outdoor activities to a time when heat index is lower. • Supervisors: <ul style="list-style-type: none"> ○ Alert workers of risk and work/rest schedule. ○ Watch/check in with workers frequently.
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Adjust work activities: <ul style="list-style-type: none"> ○ Establish and enforce work/rest schedule: 30 minute break for every hour in the heat. ○ Reschedule non-essential activity for another time/day when the heat index will be lower. Move essential work tasks to the coolest part of the work shift. ○ Shade work only.

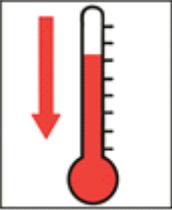
3 COLD STRESS

University at Albany employees who are exposed to cold temperatures are at risk of cold-related illnesses. These staff members must know how to identify the symptoms of cold-related illnesses and how to prevent and respond to these conditions.

3.1 Cold-Related Illnesses

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur. Types of cold stress include frostnip, frostbite, and hypothermia. The definitions, symptoms, and first-aid measures for each of these conditions are provided in Table 3 below.

Table 3: Cold-Related Illnesses: Symptoms and First Aid

Cold-Related Illness	Symptoms	First Aid
<p>Frostnip - The surface of the skin freezes (no permanent damage).</p>	<ul style="list-style-type: none"> • Skin pales or turns red • Prickling, tingling, numbness 	<ul style="list-style-type: none"> • Frostnip is cured by getting out of the cold. Get into a warm room ASAP. • Warm the affected area using body heat. • If symptoms persist for more than 30 minutes, seek medical assistance.
<p>Frostbite - The skin and the underlying tissues freeze (may cause permanent damage).</p> 	<ul style="list-style-type: none"> • Bluish or pale, waxy skin • Stinging or aching • Loss of feeling / use of area 	<ul style="list-style-type: none"> • MEDICAL EMERGENCY. Alert supervisor and request medical assistance by calling 518-442-3131. • Get into a warm room ASAP. • Warm the affected area using body heat. • Do not walk on frostbitten feet/toes. Do not rub the frostbitten area. • Immerse the affected area in warm (not hot) water. Affected areas are numb and can be easily burned.
<p>Hypothermia – Body temperature (normally 98.6°F) drops to 95°F or less.</p> 	<p>Early</p> <ul style="list-style-type: none"> • Shivering • Fatigue • Confusion and disorientation <p>Late</p> <ul style="list-style-type: none"> • No shivering • Blue skin • Slowed pulse and breathing • Loss of consciousness 	<ul style="list-style-type: none"> • MEDICAL EMERGENCY. Alert supervisor and request medical assistance by calling 518-442-3131. • Get into a warm room ASAP. • Remove wet clothing. • Gradually warm the body starting with the center. • Keep victim dry and wrapped in a warm blanket. • Give warm beverages. Do not try to give beverages to an unconscious person. • If victim has no pulse, begin CPR if trained.

3.2 Cold-Related illness Prevention

Like heat-related illnesses, cold-related illnesses are preventable. The following subsections describe how to prevent cold-related illnesses.

3.2.1 General Recommendations for Working in the Cold

General recommendations for working in the cold are as follows:

- Wear multiple layers of clothing. Multiple layers are better at trapping air near your skin, keeping heat close to you. It also allows you to remove/add items as needed. Make sure any item of clothing that you take off is secure so it is not stolen.
 - **Base Layer** – Base layer clothing is worn right next to your skin. The main purpose of the base layer is to wick moisture away from your body, keeping you dry and providing some additional warmth. Recommended base layer materials include synthetic fabrics (e.g., nylon, polyester, polypropylene), silk, or merino wool. Avoid cotton as a base layer because cotton fibers dry very slowly compared to the other fibers mentioned above. This means that once you start sweating, cotton will most likely remain damp and keep you cold until you change clothes.
 - **Mid/Insulating Layer** – This layer is mainly for insulation. Fleece jackets or sweatshirts, wool coats, and heavy wool sweaters make good insulating layers. Recommended mid layer materials include polyester, wool, and fleece.
 - **Outer Layer** – It is important to choose outerwear that will block the wind and keep you dry. Your outerwear should fit comfortably over your other layers without restricting your movement.



- Wear synthetic/wool insulating socks and insulated shoes.
- Wear a hat and gloves.
- Cover your mouth to protect lungs.
- Keep all clothing dry (bring an extra change of clothes).
- Use the buddy system (work in pairs).
- Take breaks in a heated area or vehicle to warm up.
- Stay hydrated with water and hot beverages. Avoid caffeine and alcohol, which dehydrate the body.

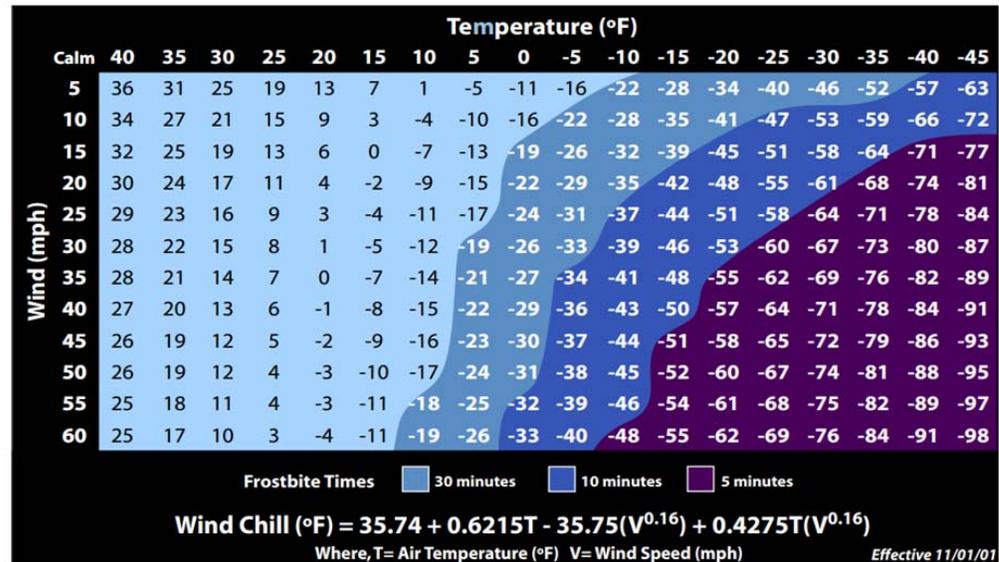
3.2.2 Wind Chill Index

Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and internal body temperature.

Many formulas exist to calculate wind chill. The National Weather Service Wind Chill Temperature Index should be used to help guide decisions for working in the cold, as described in section 3.2.3 below.



Wind Chill Chart



The real-time outdoor heat index value can be obtained from the NOAA National Weather Service's local forecast for Albany, NY:

<http://www.weather.gov/aly/>



3.2.3 Protective Measures for Working in the Cold

The table below summarizes best practices to protect workers at various wind chill risk levels. These measures have been adapted from the ACGIH recommended work/warm-up schedule.

Table 4: Protective Measures for Working in the Cold

WINDCHILL INDEX	RISK LEVEL	PROTECTIVE MEASURES	BEST PRACTICES
32°F or above	Lower	Basic cold safety and planning	<ul style="list-style-type: none"> • Normal breaks • Warm beverages available in staff break areas.
15 to 31°F	Moderate	Implement precautions and heighten awareness	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Supervisors: <ul style="list-style-type: none"> ○ Be aware of wind chill index anticipated for the day and identify precautionary actions as necessary. ○ Review with staff how to recognize cold-related illnesses, how to prevent them, and what to do if someone gets sick (see Table 3 above). ○ Remind staff to layer clothing and cover their hands, head, and face. ○ Remind staff to drink hot beverages, avoiding caffeine and alcohol. ○ Watch workers for signs of cold-related illness.
0°F to 14°F	High	Additional precautions to protect workers	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Adjust work activities: <ul style="list-style-type: none"> ○ 15 minute warm-up break for every 2 hours working outside of a heated area/vehicle. ○ When possible, reschedule activities to a time when it will be warmer. • Supervisors: <ul style="list-style-type: none"> ○ Alert workers of high risk and extended breaks. ○ Watch/check in with workers frequently.
-15°F to 0°F	Very High	Triggers more aggressive protective measures	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Adjust work activities: <ul style="list-style-type: none"> ○ 15 minute warm-up break for every 1 hour working outside of a heated area/vehicle. ○ Reschedule non-essential activity for another time/day when it will be warmer. Move essential work tasks to the warmest part of the work shift.
Less than -15°F	Severe	Triggers even more aggressive protective measures	<p>In addition to the steps listed above:</p> <ul style="list-style-type: none"> • Adjust work activities: <ul style="list-style-type: none"> ○ 15 minute warm-up break for every 30 minutes working outside of a heated area/vehicle.

4 SUN SAFETY

The “New York State Public Employee Sun Safety Law” was enacted on August 18, 2006 as an amendment to Section 218-A of the New York State Labor Law. The law states:

Any state employee who spends more than a total of five hours per week outdoors shall be provided information about (a) the potential dangers of diseases caused by over-exposure of the sun, such as skin cancer, (b) the existence of available protections and their proper uses, and (c) any other information necessary to afford an employee his or her best opportunity to protect themselves from the sun.

EH&S meets the requirements of this law by providing the sun safety information found in the subsections below to affected employees who spend more than a total of 5 hours per week outdoors.

4.1 Potential Dangers of Over-Exposure to the Sun

Sunlight contains ultraviolet (UV) radiation, which causes sunburn, premature aging of the skin, skin cancer, and cataracts. The amount of damage from UV exposure depends on the strength of the light, the length of exposure, and whether or not the skin and eyes are protected.

The most noticeable acute effect of excessive UV radiation exposure is erythema, the familiar inflammation of the skin commonly called sunburn. The symptoms of mild sunburn are reddening of the skin caused by vascular dilatation and some swelling, while in severe cases the skin will blister.

Three different types of skin cancer are linked to sunlight overexposure. Basal cell cancer (the most common) and squamous cell cancer are usually treatable and totally cured if caught in time. Malignant melanoma is rarer, but more likely to be fatal if treatment is delayed. Most of the 10,000 Americans who die from skin cancer each year are victims of malignant melanoma. The risk of developing skin cancer increases in proportion to the unprotected time in the sun and the intensity of the sun's rays during exposure.

Sun exposure is also a major risk factor for cataract development, although cataracts appear to different degrees in most individuals as they age. Cataracts occur when proteins in the eye's lens unravel, tangle, and accumulate pigments that cloud the lens and eventually lead to blindness.

Employees who work in the sun are at risk to UV radiation exposure. Intensity is greatest in the summer from 10 am to 4 pm. Work surfaces, such as concrete or metal, can also reflect up to 50 percent of the sun's radiation, which intensifies exposure.

Be aware that many medications contain ingredients that may cause photosensitivity, a chemically-induced change in the skin that makes an individual unusually sensitive to light. These medications include (but are not limited to): non-steroidal anti-inflammatory drugs (NSAIDs) such as naproxen (Aleve), multiple types of antibiotics, anti-seizure medications, mood stabilizers, diabetes medications, and heart medications. Ask your doctor or pharmacist whether you should take any special precautions to avoid sun exposure while you are taking a medication.

4.2 Protecting Against Sun Exposure

Sun exposure can usually be easily addressed by recognizing the hazards and taking some simple steps to minimize or avoid these hazards.

The easiest way to reduce UV risk is to reduce direct exposure to the sun, especially between the hours of 10 am and 4 pm when the sun's UV rays are strongest. Wear protective clothing, such as a wide-brimmed hat, long pants, and long-sleeved shirt.

Stay in the shade whenever possible. Shade can be found behind trees, hedges, or buildings, or under structures such as the concrete canopy of the Academic Podium.



Protective sunscreens are also encouraged. Use a sunscreen with a sun protection factor (SPF) of 30 or higher and is also water-resistant to withstand humidity and sweat. Reapply every two hours when outdoors or more often if perspiring or swimming. Avoid baby oil, cocoa butter, or skin oils that do not protect against sunburn.

To protect the eyes, wear quality sunglasses that offer UV radiation protection. The clear and dark safety glasses provided by EH&S both offer protection from UV radiation. Safety glass lenses are made of polycarbonate, which naturally blocks 99.9% of UV radiation.



Australia's SunSmart® program provides an easy to remember slogan for sun protection: **“Slip, Slop, Slap, Seek, and Slide.”**

- **Slip** on sun protective clothing that covers as much of your body as possible
- **Slop** on SPF 30 or higher broad-spectrum, water-resistant sunscreen, at least 20 minutes before sun exposure
- **Slap** on a broad-brimmed hat that shades your face, neck, and ears
- **Seek** shade
- **Slide** on sunglasses



For further information visit SunSmart.com.au



<http://www.sunsmart.com.au/downloads/resources/posters/outdoor-sunsmart-facilities-sign.pdf>

Check the **UV Index** to determine the appropriate level of protection. The UV Index is an international standard measurement of the strength of UV radiation at a particular place and time. The UV Index is a linear scale, with higher values representing a greater risk due to UV exposure.



In summer months, the UV Index is usually reported along with the weather forecast on the internet, TV, or radio. The UV Index can be obtained by typing your zip code into the EPA UV index tool:

<https://www.epa.gov/sunsafety/uv-index-1>

UV Index values correspond to the following recommendations for protection. Bright surfaces, such as sand, water, and snow, will increase UV exposure.

UV Index	Recommended Protection
0-2 Low	<ul style="list-style-type: none"> • Wear sunglasses on bright days. • If you burn easily, cover up and use broad spectrum SPF 30+ sunscreen.
3-5 Moderate	<ul style="list-style-type: none"> • Stay in shade near midday when the sun is strongest. • If outdoors, wear protective clothing, a wide-brimmed hat, and UV-blocking sunglasses. • Generously apply broad spectrum SPF 30+ sunscreen every 2 hours, even on cloudy days, and after swimming or sweating.
6-7 High	<ul style="list-style-type: none"> • Reduce time in the sun between 10 a.m. and 4 p.m. • If outdoors, seek shade and wear protective clothing, a wide-brimmed hat, and UV-blocking sunglasses. • Generously apply broad spectrum SPF 30+ sunscreen every 2 hours, even on cloudy days, and after swimming or sweating.
8-10 Very High	<ul style="list-style-type: none"> • Minimize sun exposure between 10 a.m. and 4 p.m. • If outdoors, seek shade and wear protective clothing, a wide-brimmed hat, and UV-blocking sunglasses. • Generously apply broad spectrum SPF 30+ sunscreen every 2 hours, even on cloudy days, and after swimming or sweating.
11+ Extreme	<ul style="list-style-type: none"> • Try to avoid sun exposure between 10 a.m. and 4 p.m. • If outdoors, seek shade and wear protective clothing, a wide-brimmed hat, and UV-blocking sunglasses. • Generously apply broad spectrum SPF 30+ sunscreen every 2 hours, even on cloudy days, and after swimming or sweating.

In addition to reducing exposure, employees who work in the sun should examine themselves regularly. It is important to regularly examine the skin because skin cancers detected early can almost always be cured. Check the skin for danger signs, including any wound, sore, or patch of skin that won't heal or constantly scales, or any growing lump or mole, particularly if it is brown or bluish in color. The most important warning sign is a spot on the skin that is changing in size, shape, or color. If anything looks suspicious or unusual, get a medical opinion right away. Also, advise your employer of any sun-related condition or medical diagnosis.

5 REFERENCES

- OSHA Using the Heat Index: A Guide for Employers
https://www.osha.gov/SLTC/heatillness/heat_index/pdfs/all_in_one.pdf
- OSHA Heat Stress Quick Card
<https://www.osha.gov/Publications/osha3154.pdf>
- OSHA Wind Chill Temperature: A Guide for Employers (including ACGIH TLVs)
https://www.osha.gov/dts/weather/winter_weather/windchill.html
- OSHA Cold Stress Quick Card
<https://www.osha.gov/Publications/OSHA3156.pdf>
- PESH Fact sheet on Outdoor worker safety and the NYS Sun Safety Law
<https://labor.ny.gov/formsdocs/wp/P216.pdf>
- Australia SunSmart skin cancer prevention program
<http://www.sunsmart.com.au/>
- World Health Organization's Global Solar UV Index: A Practical Guide
<http://www.who.int/uv/publications/en/UVIGuide.pdf>

6 RESOURCES

- Download the OSHA Heat Safety Tool application for Android or iPhone:
https://www.osha.gov/SLTC/heatillness/heat_index/heat_app.html
- National Weather Service Heat Index Calculator:
<http://www.wpc.ncep.noaa.gov/html/heatindex.shtml>
- National Weather Service Windchill Calculator:
<http://www.nws.noaa.gov/om/winter/windchill.shtml>