

# VIRGINIA SAFETY AND HEALTH CODES BOARD

Informational Briefing:  
Heat Illness Hazards,  
Guidance and Outreach Materials,  
State Unique Standards, and  
OSHA Enforcement Approach

# VIRGINIA DOLI PROGRAMS



**Registered  
Apprenticeship**



**Labor and  
Employment Law**



**Boiler and  
Pressure Vessel  
Safety**



**Virginia  
Occupational  
Safety and Health  
(VOSH)**

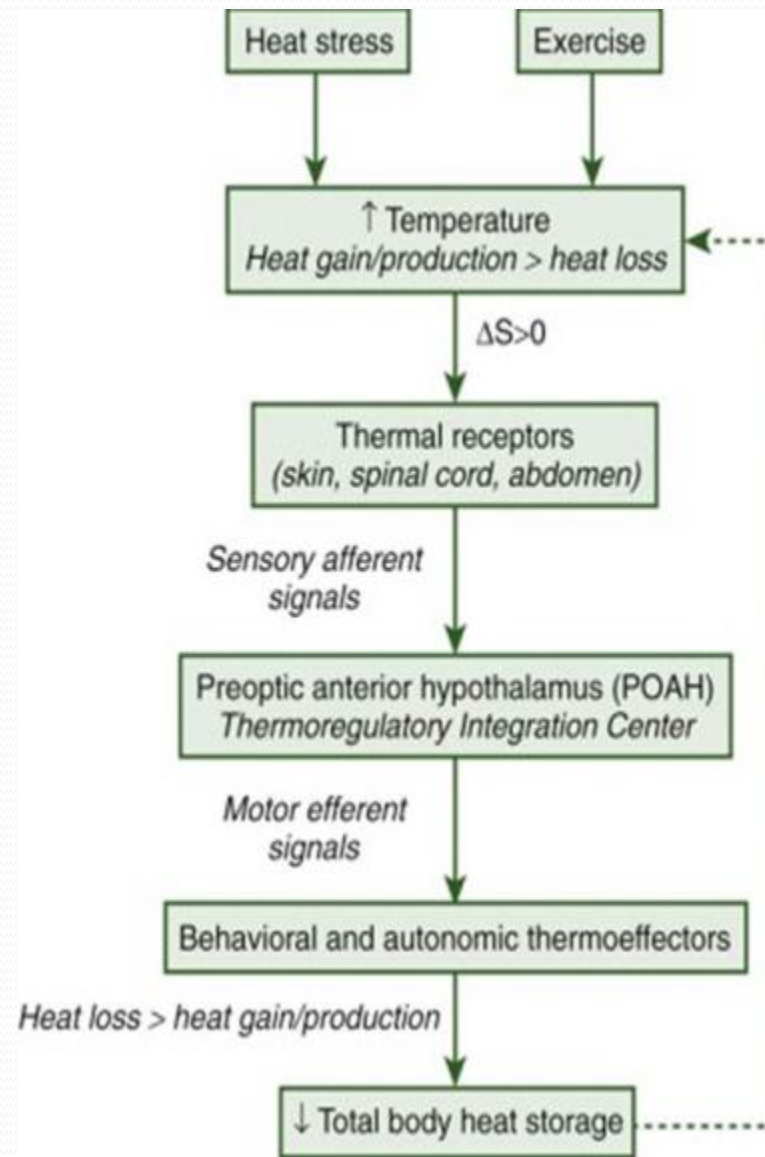


# VIRGINIA SAFETY AND HEALTH CODES BOARD

Informational Briefing:  
Heat Illness Hazards

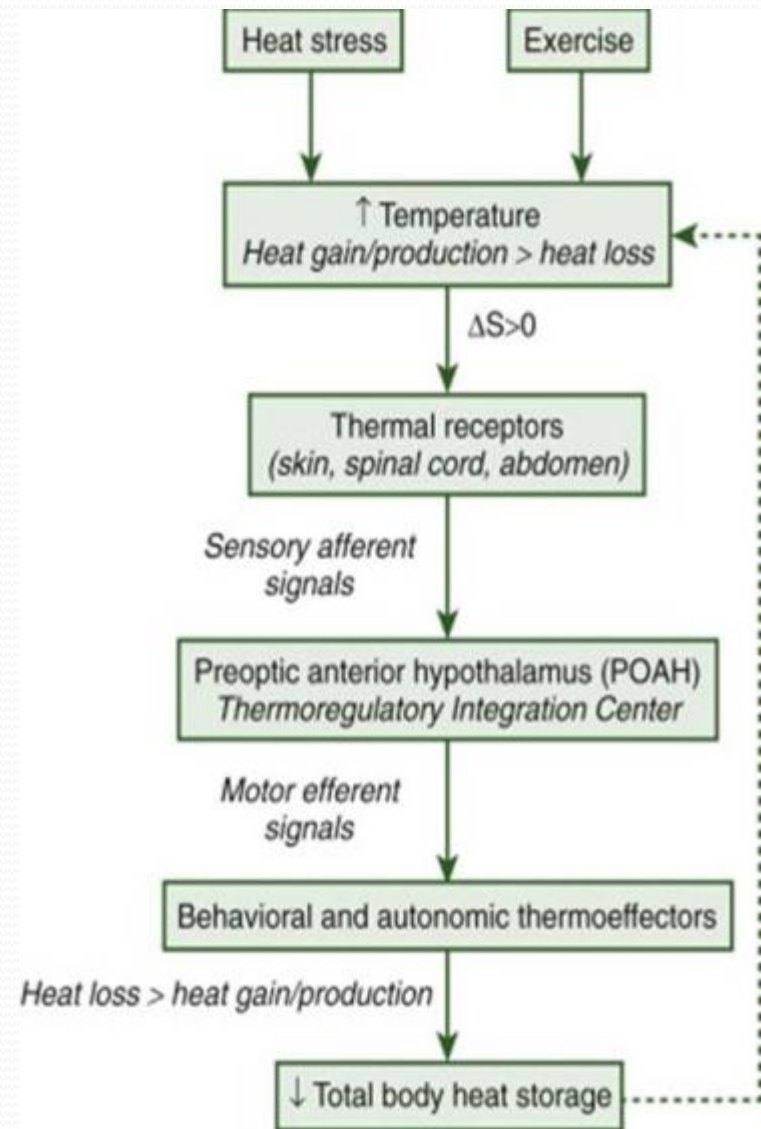
# Heat-Related Illnesses: External Risk Factors

- High temperature and humidity
- Direct sun exposure/no shade
- Radiant heat from the sun
  - Or other objects
- Limited air movement
- Physical exertion
- PPE
  - Bulky protective clothing,
  - Respirators



# Heat-Related Illnesses: Internal Risk Factors

- Personal factors
  - Medical conditions\*
  - Physical fitness
  - Age
  - Sleep
- Physical fitness/acclimation
- Medications (prescription/OTC)
- Level of hydration
  - Caffeine and alcohol



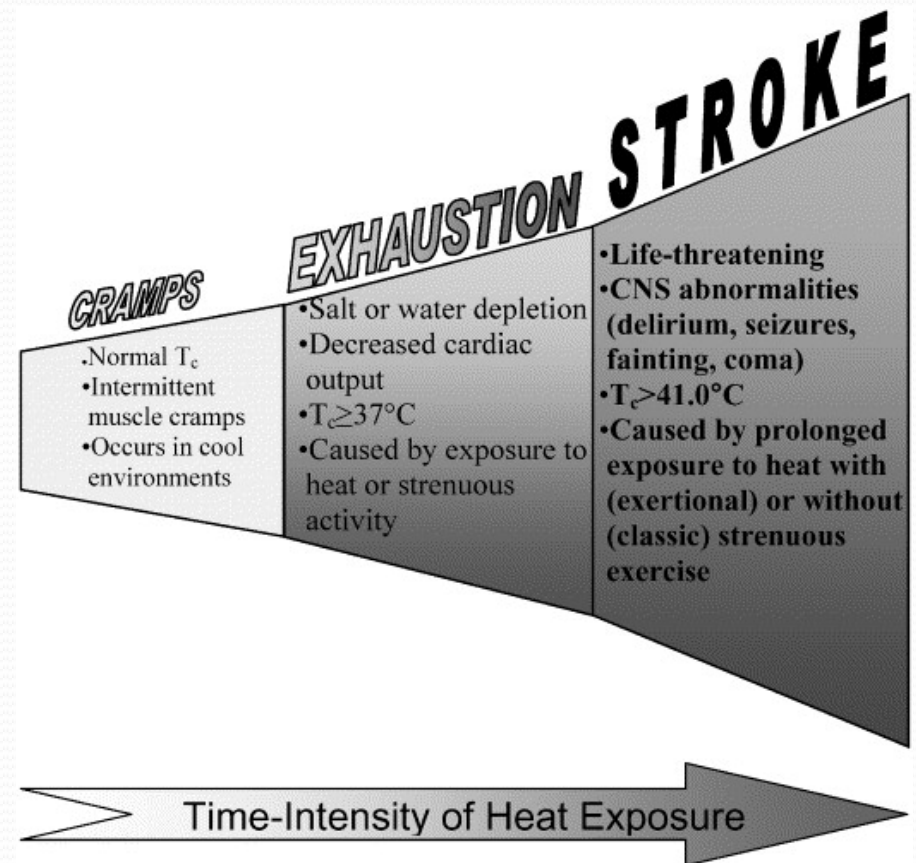
# Medical Conditions

- Diabetes
- Heart disease and high blood pressure
- Obesity
- Thyroid disease
- Infections
- GI disease
- Pregnancy
- Skin problems – sunburns



# Heat Related Illnesses

- Heat Cramps
- Heat Syncope/fainting
- Heat Rash
- Heat Exhaustion
- Heat Stroke



Increased risk for heat related illness when body temperature is greater than 100.4 F

After work, continue to monitor for symptoms, sometimes they can be delayed

# Heat Cramps

- Performing hard physical labor in a hot environment or working 6 to 8 hours in heavy protective equipment
- Attributed to an electrolyte imbalance caused by sweating when sodium is lost in sweat
- Muscle spasms usually affect the arms, legs or stomach
- Blood pressure may be normal or slightly elevated, pulse may be elevated
- Skin may be cool and pale



# Heat Cramps - Treatment

- Move to a cool shaded area
- Loosen clothing
- Drink water every 15 to 20 minutes
- Eat snack (salty)
- Studies have shown that commercially available carbohydrate-electrolyte replacement liquids are effective (low sugar)
- Gentle stretching or massage
- Seek medical care if cramps persist- may indicate muscle injury (destruction)

# Syncope/Fainting

- Brain does not receive adequate oxygen due to blood pooling in extremities
- Onset may be rapid and unpredictable
- Prodromal symptoms may include nausea, yawning, sighing and restlessness
- Skin may appear pale and sweaty but generally moist and cool
- Pulse may be weakened; heart rate rapid

# Heat Syncope/Fainting - Treatment

- Elevate feet
- Move to cool environment
- Encourage fluids
- Recovery is usually immediate
- Loss of consciousness is *brief* and *self-limited*
- Always think about heat stroke and heat exhaustion

# Heat Rash

- Skin irritation caused by excessive sweating during hot weather
- Sweat gland plugged
- Looks like a red cluster of pimples or blisters
- More likely to occur in the neck, upper chest, groin, breasts and in the elbows (areas of restrictive clothing)
- Compromised skin



# Heat Rash - Treatment

- Keep skin cool and dry
- Reduce sweating in affected areas
- Temporary job reassignment for individuals wearing sweat-impermeable protective clothing
- Rash usually disappears when the individual return to a cool environment
- Seek medical care if sign of infection occurs

# Heat Exhaustion

- Milder form of heat related illness
- Can occur after several days of exposure to high temps, inadequate or unbalanced fluids
- Warning signs include heavy sweating, nausea, vomiting, weakness, vertigo, dizziness, fainting, tiredness or headache
- Rapid heart rate, breathing
- Sweating - Skin may be cool and moist
- Body temperature >100.4 degrees F
- Symptoms resolve with treatment within 20-30 minutes
- If untreated and exposure continues, may progress to heat stroke

# Heat Exhaustion - Treatment

## **Similar to Heat Stroke...**

- Move to cool location, shade, air-conditioning
- Rest
- Loosen clothing
- Cool shower, sponge bath, ice packs
- Drink water or electrolyte drinks
- Check by medical personnel recommended
- Avoid strenuous activity for at least a day

# Heat Stroke

## **This Is a Medical Emergency!**

- Abnormally high body temperature (~ 104 F)
- Diagnosis = High body temperature + Central nervous system (CNS) dysfunction
  - Nausea, dizziness, headache, confusion, hallucinations, sudden collapse, seizures, coma and death
- Can be *sweating* (50% of exertional heat stroke victims are still sweating)
- **But if skin is hot and dry, this is always heat stroke**



# Heat Stroke - Treatment

- 911- Seek medical treatment immediately!
- Move the individual to a cooler area
- Remove outer clothing
- Cool individual as rapidly as possible, ex.
  - Immerse in cool water, place in cool shower, fan individual's body, ice sheets and packs to armpits and groin, cold water immersion arms/hands
- Give fluids to drink only if worker is awake and alert
- If medical treatment is delayed, call hospital emergency room for further instructions

# Scope of the Problem

- From 1999-2010 – 7,415 deaths in U.S., average 618/year ([CDC, MMWR 9/14/2012](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6136a6.htm)) – work and non-work related
- From 2008-2012 **97 Heat Related-Fatalities** reported to OSHA <http://www.osha.gov/SLTC/heatillness/map.html>
- From 2013-2017 **29 Heat Related-Fatalities** reported to OSHA <https://www.osha.gov/SLTC/heatstress/>



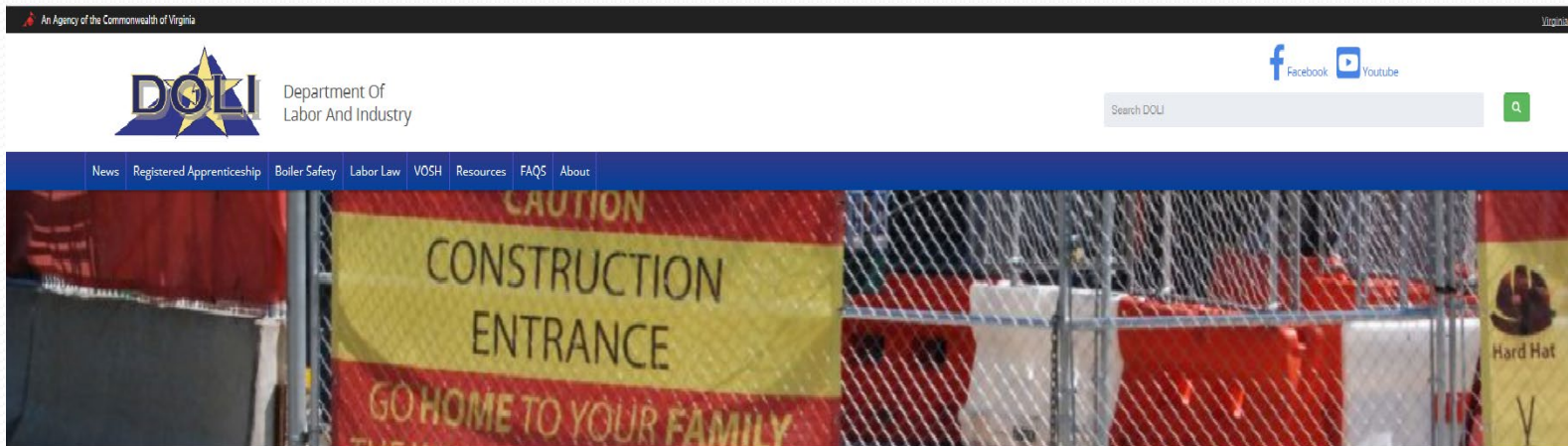
# Virginia Heat Illness Fatalities

- June 2017: Heat stroke on residential construction site
- July 2016, Heat illness during agricultural field work
- July, 2015: Heat stroke on construction site
- July, 2015: Heat stroke on bridge construction site
- June 2010: Heat stroke on construction site (roofing)
- August, 2009: Heat stroke during agricultural field work
- August, 2006: Heat stroke on logging site
- July 2006, Heat stroke in manufacturing plant
- July, 2005: **Non-fatal Catastrophe**, three employees hospitalized during agricultural field work
- August, 2002: Heat stroke on construction site
- July, 2002: Heat illness during agricultural field work
- July 1999: Heat illness at meatpacking plant

# VIRGINIA SAFETY AND HEALTH CODES BOARD

Informational Briefing:  
Heat Illness  
Guidance and Outreach Materials

# <https://www.doli.virginia.gov/vosh-programs/heat-stress-illness-and-prevention/>



## VOSH Programs

### Heat Stress Illness And Prevention

Many workers spend some part of their working day in a hot environment. Workers in foundries, laundries, construction projects, and bakeries — to name a few industries — often face hot conditions which pose special hazards to safety and health. The following references aid in recognizing and evaluating hazards in the workplace.

**WATER, REST, SHADE.** OSHA's Campaign to Keep Workers Safe in the Heat <https://www.osha.gov/heat/index.html>

**Occupational Heat Exposure** <https://www.osha.gov/SLTC/heatstress/index.html>

**Heat-related Illnesses and First Aid** [https://www.osha.gov/SLTC/heatstress/heat\\_illnesses.html](https://www.osha.gov/SLTC/heatstress/heat_illnesses.html)

**Heat Hazards: Working Outdoors in Warm Climates Fact Sheet (2005) (English): HTML PDF**

#### **Heat Illness: Health Effects of Heat Worksite, Training Poster**

If working outdoors, the risk for heat-related illnesses, such as heat stroke, can cause serious medical problems or death. Display this poster at the worksite for workers to see, and use it as an educational training tool.

(OSHA 3431 – 2011) **(English): PDF**

#### **Heat Illness: Health Effects of Heat Worksite, Training Poster (Spanish)**

(OSHA 3432 – 2011) **(Spanish): PDF**

## In This Section

CFR Archive By Year

Heat Stress Illness and Prevention

Safety and Health Consultation Services

Compliance

Consultation and Training

How to File a VOSH Complaint

Office of Whistleblower Protection

Report a Workplace Fatality or Severe Injury

Virginia Unique Standards

Asbestos/Lead Program

Research and Analysis

VOSH Manuals

<http://www.osha.gov/SLTC/heatillness/index.html>

# OSHA Heat Campaign

**WATER. REST. SHADE.**

*The work can't get done without them.*

Drink water often

Rest in the shade

Report heat symptoms early

Know what to do in an emergency

## Awareness, Education and Outreach to Employers and Workers to Prevent Heat Illness

**2012:** Over 4.5 million directly reached by OSHA

**2011:** Over 2.5 million directly reached by OSHA

**WATER. REST. SHADE.**

*The work can't get done without them.*

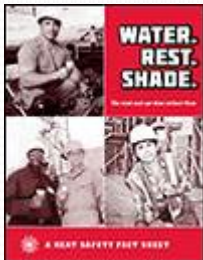
# Prevention of Heat Injuries

- General recommendations
  - Minimize/avoid exertion in heat
  - Rest in cool location
  - Maintain hydration and eat regular meals
  - Acclimatization
  - Get plenty of sleep
  - Cumulative exposure

# OSHA Heat Illness Resources

<https://www.osha.gov/SLTC/heatstress/>

- Website
- Illustrated, Low-Literacy Fact Sheets
- Worksite Poster
- Community Poster
- Training Guide
- Using the Heat Index:
- A Guide for Employers
- Outreach Wallet Card
- OSHA's Heat Smartphone App

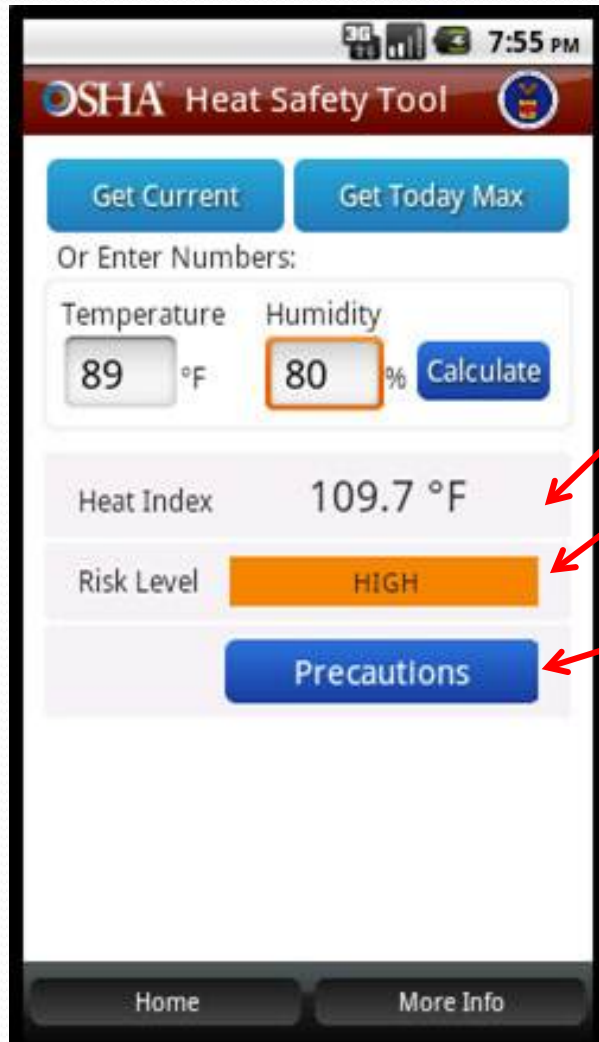


**All are available in Spanish**

**\*\*Download from website or Office of Communications\*\***



# OSHA Smartphone App



- Calculates heat index
- Displays risk level
- Provides protective measures (precautions) based on risk

# CDC/NIOSH: <https://www.cdc.gov/niosh/topics/heatstress/>

Workplace Safety and Health  
Topics

Promoting productive workplaces  
through safety and health research **NIOSH**

## Heat Stress

Heat Related Illness

HHE and FACE reports

Recommendations

Additional Resources

Hazards to Outdoor  
Workers

## Related Topics

[Protective Clothing](#)

[Skin Exposures and Effects](#)

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## HEAT STRESS

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Exposure to extreme heat can result in occupational illnesses and injuries. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers as it may result in sweaty palms, fogged-up safety glasses, and dizziness. Burns may also occur as a result of accidental contact with hot surfaces or steam.

Workers at risk of heat stress include outdoor workers and workers in hot environments such as firefighters, bakery workers, farmers, construction workers, miners, boiler room workers, factory workers, and others. Workers at greater risk of heat stress include those who are 65 years of age or older, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

Prevention of heat stress in workers is important. Employers should provide training to workers so they understand what heat stress is, how it affects their health and safety, and how it can be prevented.



OSHA-NIOSH Heat Safety Tool App  
Featuring real-time heat index and hourly forecasts.

[Heat-Related Illnesses](#)

[HHE and FACE Reports](#)

[Recommendations](#)

[Additional Resources](#)

## Features



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

A useful resource for planning outdoor work activities based on how hot it feels throughout the day.



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

Provides safety professionals and employers an evaluation of the scientific data on heat stress and hot environments, and NIOSH recommendations.



### [NIOSH Prevent Heat Related Illness Poster](#) [PDF- 57 KB]

Basic reminders for workers exposed to heat and hot environments.

# VIRGINIA SAFETY AND HEALTH CODES BOARD

Informational Briefing:  
Heat Illness  
State Unique Standards



# **California Heat Illness Prevention Regulation: §3395**

# §3395. Heat Illness Prevention

## (a) Scope and Application.


- Agriculture
- Construction
- Landscaping
- Oil and Gas Extraction
- Transportation and delivery of agricultural products, construction materials or other heavy materials (e.g. furniture, lumber, freight, cargo, cabinets, industrial or commercial materials), except for employment that consists of operating an air-conditioned vehicle and does not include loading or unloading.

# **§3395. Heat Illness Prevention**

- (b) Definitions.**
- (c) Provision of water.**
- (d) Access to shade.**
- (e) High-heat procedures.**
- (f) Emergency Response Procedures.**
- (g) Acclimatization.**
- (h) Training.**
- (i) Heat Illness Prevention Plan.**

# California Heat Illness Prevention

<https://www.dir.ca.gov/DOSH/HeatIllnessInfo.html>

 State of California  
Department of Industrial Relations

Press room | [Índice en español](#)

[Labor Law](#) | [Cal/OSHA - Safety & Health](#) | [Workers' Comp](#) | [Self Insurance](#) | [Apprenticeship](#) | [Director's Office](#) | [Boards](#)

[Cal/OSHA](#) | Heat Illness Prevention

## Heat Illness Prevention

[► en Español](#)



California employers are required to take these four steps to prevent heat illness:

- 1. Training**  
Train all employees and supervisors about heat illness prevention.
- 2. Water**  
Provide enough fresh water so that each employee can drink at least 1 quart per hour, or four 8 ounce glasses, of water per hour, and *encourage them to do so*.
- 3. Shade**  
Provide access to shade and encourage employees to take a cool-down rest in the shade for at least 5 minutes. *They should not wait until they feel sick to cool down.*
- 4. Planning**  
Develop and implement written procedures for complying with the Cal/OSHA Heat Illness

### Cal/OSHA

#### Quick Links

- [► File a workplace safety complaint](#)
- [► Obtain a free consultation](#)
- [► Important Cal/OSHA updates](#)
- [► Public records requests](#)

#### Cal/OSHA Branches & Units

##### Branches

- [► Enforcement](#)
- [► Consultation Services](#)

##### Units

- [► Amusement Ride and Tramway](#)
- [► Asbestos and Carcinogen](#)

## **Minnesota**

### **Indoor Ventilation and Temperature in Places of Employment Regulation:**

**§5205.0110**

## **Minnesota**

### **Employee Right-to-Know on Harmful Physical Agents (Heat) and Training Regulation:**

**§§5206.0500 and 5206.0700**



# **§5205.0110, Indoor Ventilation and Temperature in Places of Employment**

**Subpart 1. Air flow and circulation.**

**Subpart 2. Heat conditions.**

**Subpart 3. Cold conditions.**

**Subpart 4. Recirculated air.**

**Subpart 5. Definitions.**

# §5206.0500, Heat

- Minnesota's Employee Right-to-Know regulation identifies "Heat" as a "Harmful Physical Agent"
- Where there is a reasonably foreseeable potential for exposure to one or more of these physical agents at a level which may be expected to approximate or exceed the permissible exposure limit or the applicable action level the employer must provide training to employees as required in part **5206.0700**.

# §5206.0700, Training

Subpart 3. Training program for harmful physical agents. The training program for employees who may be routinely exposed to harmful physical agents at a level which may be expected to approximate or exceed the permissible exposure limit or applicable action levels shall be provided in a manner which can be reasonably understood by the employees and shall include the information required by the standard for that physical agent as determined by the commissioner including the following:

- A. the name or names of the physical agent including any commonly used synonym;
- B. the level, if any and if known, at which exposure to the physical agent has been restricted according to standards adopted by the commissioner, or, if no standard has been adopted, according to guidelines established by competent professional groups which have conducted research to determine the hazardous properties of potentially harmful physical agents;
- C. the known acute and chronic effects of exposure at hazardous levels;
- D. the known symptoms of the effects;
- E. appropriate emergency treatment;
- F. the known proper conditions for use of and/or exposure to the physical agent;
- G. the name, phone number, and address, if appropriate, of a manufacturer of the equipment which generates the harmful physical agent; and
- H. a written copy of all of the above information which shall be readily accessible in the area or areas in which the harmful physical agent is present and where the employees may be exposed to the agent through use, handling, or otherwise.



**Washington**  
**Outdoor Heat Exposure**  
**Regulation:**  
**WAC 296-62-095**

# WAC 296-62-095, Outdoor Heat Exposure

## Scope and purpose.

- (1) WAC [296-62-095](#) through [296-62-09560](#) applies to all employers with employees performing work in an outdoor environment.
- (2) The requirements of WAC [296-62-095](#) through [296-62-09560](#) apply to outdoor work environments from May 1 through September 30, annually, only when employees are exposed to outdoor heat at or above an applicable temperature listed in Table 1.
- (3) WAC [296-62-095](#) through [296-62-09560](#) does not apply to incidental exposure which exists when an employee is not required to perform a work activity outdoors for more than fifteen minutes in any sixty-minute period. This exception may be applied every hour during the work shift.

# WAC 296-62-095, Outdoor Heat Exposure

## Table 1

To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

### Outdoor Temperature Action Levels.

All other clothing	89°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
Non-breathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°

# **WAC 296-62-095, Outdoor Heat Exposure**

**WAC 296-62-09520. Definitions.**

**WAC 296-62-09530. Employer and employee responsibility.**

**WAC 296-62-09540. Drinking water.**

**WAC 296-62-09550. Responding to signs and symptoms of heat-related illness.**

**WAC 296-62-09560. Information and training.**

# Washington Outdoor Heat Exposure Guidance

<https://www.lni.wa.gov/safety/topics/atoz/heatstress/>

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Home > Safety & Health > Safety & Health Topics > A-Z Safety & Health Topics > Outdoor Heat Exposure

Safety & Health Topics

A-Z Safety & Health Topics

Industries

## Outdoor Heat Exposure

Related keywords: (OHE, Heat Stress)

Overview | Rules & Requirements | Training & Videos | Publications & Tools

### Be Heat Smart!

Heat-related illness can quickly become a medical emergency. Warmer temperatures, physically demanding work, heavy clothing, and dehydration can put even the healthiest workers at risk for debilitating heat exhaustion and life-threatening heat stroke.

Impairment caused by heat exhaustion can also make workers more susceptible to falls, equipment-related injuries, and other on-the-job safety hazards.

Prevention is the best approach to protect workers. Follow safety requirements in applicable rules and use the resources on this page to plan, prepare, and train for prevention.

Lastly, being heat smart before and after work helps your body recover from (or prepare for) a long, hot workday. To get tips for heat safety outside of work, go to [Hot Weather Safety \(www.doh.wa.gov\)](http://www.doh.wa.gov) and [Staying Safe During A Heat Wave \(toolkit.climate.gov\)](http://toolkit.climate.gov).



Don't let this happen to your workers! Take advantage of the cooler hours of the day and provide shade and water.

Photo courtesy of CDC.

### Related Topics

- Accident Prevention Program
- Summer Safety
- Workplace Fatalities and Hospitalizations

### More help from L&I

- Getting Started with Safety.
- Workplace Safety Complaints.
- Consultation Services.
- Worker Rights to a Safe Workplace.

For general information, call 1-800-423-7233.



# VIRGINIA SAFETY AND HEALTH CODES BOARD

Informational Briefing:  
Heat Illness  
OSHA Enforcement Approach



# OSHA Enforcement Approach

- OSHA does not have a Heat Illness Standard.
- OSHA was petitioned by the Public Citizen's Health Research Group on September 1, 2011 to promulgate an emergency temporary standard (ETS) for a heat stress threshold and a subsequent permanent heat stress standard.
- The petition for an ETS was denied on June 7, 2012, by Assistant Secretary David Michaels. OSHA also indicated they were “not planning on promulgating a [permanent] standard anytime soon”.

# OSHA Enforcement Approach

- OSHA stated that it agreed that “exposure to extreme heat can lead to death; however, the majority of workers with adverse health effects from heat exposure experience dehydration, cramps, exhaustion, and other effects and are able to recover fairly quickly when the appropriate measures are take.”
- On July 17, 2018, Public Citizen and 131 other organizations 89 individuals petitioned OSHA to adopt a permanent standard applicable to outdoor and indoor exposure to excessive heat.

[https://www.citizen.org/sites/default/files/180717\\_petition\\_to\\_osh\\_a\\_on\\_heat\\_stress-signed\\_final\\_o.pdf](https://www.citizen.org/sites/default/files/180717_petition_to_osh_a_on_heat_stress-signed_final_o.pdf)



# OSHA Enforcement Approach

- §5(a)(1) of the OSH Act “General Duty Violation”
- PPE violations (1910.132(d); 1915.152; 1917.95; 1926.28)
- Recordkeeping violations (1904.7(b)(5))
- Inadequate drinking water (1910.141; 1915.88; 1917.127; 1918.95; 1926.51; 1928.110)
- Medical Services and First Aid violations (1910.151; 1915.87; 1917.26; 1918.97; 1926.50)
- Failure to train construction employees (1926.21)



## 5(a)(1) General Duty Clause

The general duty clause requires each employer to “furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.”

29 U.S.C. § 654(a)(1). Va. Code §40.1-51.1.A



# General Duty Clause Elements for Heat Stress

1. A heat stress hazard exists in the workplace;
2. The employer or industry recognizes the heat stress hazard;
3. The heat stress hazard is causing or likely to cause death or serious physical harm; and
4. A feasible means exists to eliminate or materially reduce the heat stress hazard.

# Other OSHA Regulations: Drinking Water

- Construction Sanitation: 16VAC25-160-10
- Agriculture, Field Sanitation: 16VAC25-180-10. 16VAC25-180-10 (c)(1) [potable drink water] shall apply to all agricultural establishments regardless of the number of employees.
- General Industry: 1910.141

# Medical Services and First Aid

General Industry: 1910.151

Construction: 1926.50



# General Industry: 1910.132(d)

1910.132(d) **Hazard assessment** and equipment selection.

1910.132(d)(1) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

1910.132(d)(1)(i) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

1910.132(d)(1)(ii) Communicate selection decisions to each affected employee; and,

1910.132(d)(1)(iii) Select PPE that properly fits each affected employee. **Note:** Non-mandatory appendix B contains an example of procedures that would comply with the requirement for a hazard assessment.

1910.132(d)(2) The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

# Construction Training: 1926.21

1926.21(b) Employer responsibility.

1926.21(b)(1) The employer should avail himself of the safety and health training programs the Secretary provides.

1926.21(b)(2) The employer shall instruct each employee in the recognition and avoidance of **unsafe conditions** and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.

# Questions?

