

Do you feel the heat?



The Prevention of Heat Related Illnesses

The purpose of a Heat Related Illness program is to protect the health and safety of our associates. To prevent heat related illnesses we will do the following:

1. Provide an overview of our Heat Related Illness program.
2. Provide training on the **types and symptoms** of heat related illnesses.
3. Provide training on the causes and prevention of heat related illnesses, and provide educational materials and postings.
4. Provide training on the treatment of heat related illnesses.
5. Provide training on the **controls** that will be used to minimize heat related illnesses.
6. Explain **how workplace monitoring** will be performed.

Interviews



“437-002-XXXX Heat Illness Prevention”

(b) The requirements of OAR 437-002-XXXX apply to work environments that are not equipped with a cooling system when employees are exposed to ambient heat at or above an applicable temperature

- listed in Table 1, and
- by various workloads.

Document a Hazard Analysis

Workloads are defined as the following:

Light workload	Sitting, standing, light arm/hand work, occasional walking
Moderate workload	Normal walking, moderate lifting.
Heavy workload	Heavy material handling, walking at a fast pace.
Very Heavy workload	Pick and shovel work.

Table 1

Workload	Limit for Unacclimated Workers (Action Limit)	Limit for Acclimatized Workers (Threshold Limit Value)
	Effective WBGT	
Light	28°C (82.4°F)	30°C (86°F)
Moderate	25°C (77°F)	28°C (82.4°F)
Heavy	23°C (73.4°F)	26°C (78.8°F)
Very heavy	21°C (69.8°F)	25°C (77°F)

Document a Hazard Analysis

Heat Related Illness Prevention Plan

Plan Element	Caution	Extreme Caution	Danger	Very High/Extreme Danger
Adequate water, rest area set up, associate communication plan in place.	X	X	X	X
Emergency planning on what to do if a heat related illness occurs.	X	X	X	X
Worker acclimatization allowing frequent breaks as needed	X	X	X	X
Modified work schedules		X	X	X
Distribution and monitoring of heart rate monitors		X	X	X

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

<https://osha.oregon.gov/Pages/topics/heat-stress.aspx>

Advisory Committees

Outdoor Workplace Exposures to Excessive Heat

Final Rules

Division 2, Subdivision J, General Environmental Controls (includes Lockout/Tagout, Confined Spaces)

3-2015 *Word version*

Division 4, Subdivision J, Work Environment

4-2011 *Word version*

Program Directives

Local Emphasis Program (LEP): Preventing Heat Related Illness

The purpose of this directive is to inform enforcement staff about Oregon OSHA's heat stress prevention

Heat stress

[Topic index](#)

Overview

Heat stress happens when your body is no longer able to control its internal temperature. Heat stress can lead to heat exhaustion and heat stroke. The symptoms of heat exhaustion include dizziness, headache, rapid pulse, nausea, and vomiting. The symptoms of heat stroke include high body temperature, confusion, and convulsions. Heat stroke can be fatal.

You can prevent heat stress when you are working in a hot environment by drinking water frequently (even if you are not thirsty), resting in the shade when you need to cool down, and wearing a hat and light-colored clothing.

Highlights



Federal OSHA outreach to prevent heat related illness



WATER. REST. SHADE.

The work can't get done without them.

Contents

1. Introduction
2. About the Heat Index
3. Using the Heat Index to Protect Workers
4. Protective Measures to Take at Each Risk Level

Additional Guidance/Resources

- Planning Checklists
- Training Workers
- Preparing For and Responding to Heat-Related Emergencies
- About Work/Rest Schedules
- Estimating Work Rates or Loads
- Acclimatizing Workers
- Monitoring Workers at Risk of Heat-Related Illness

Using the Heat Index: A Guide for Employers

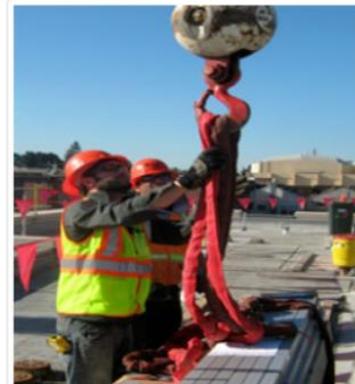
Introduction

Outdoor workers who are exposed to hot and humid conditions are at risk of heat-related illness. The risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather.

For people working outdoors in hot weather, both air temperature and humidity affect how hot they feel. The **"heat index"** is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels, since sweat does not readily evaporate and cool the skin. The heat index is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources.

Heat-related illness can be prevented.

OSHA does not have a specific standard that covers working in hot environments. Nonetheless, under the OSH Act, employers have a duty to protect workers from recognized serious hazards in the workplace, including heat-related hazards. This guide helps employers and worksite supervisors prepare and implement hot weather plans. It explains how to use the heat index to determine when extra precautions are needed at a worksite to protect workers from environmental contributions to heat-related illness.



Two primary sources of heat for workers: Workers become overheated from two primary sources: (1) the environmental conditions in which they work and (2) the internal heat generated by physical labor. Heat-related illnesses occur when the body is not able to lose enough heat to balance the heat generated by physical work and external heat sources. Weather conditions

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning

<https://www.osha.gov/heat-exposure/case-studies>



Outdoor workers

include any workers who spend a substantial portion of the shift outdoors. Examples include construction workers, agricultural workers, baggage handlers, electrical power transmission and control workers, and landscaping and yard maintenance workers.

These workers are at risk of heat-related illness when the heat index is high. **Additional risk factors are listed below.** *These must be taken into consideration even when the heat index is lower.*

- ❖ Work in direct sunlight - adds up to 15 degrees to the heat index.
- ❖ Perform prolonged or strenuous work
- ❖ Wear heavy protective clothing or impermeable suits

NOAA issues extreme heat advisories to indicate when excessive, extended heat will occur. The advisories are based mainly on predicted heat index values:

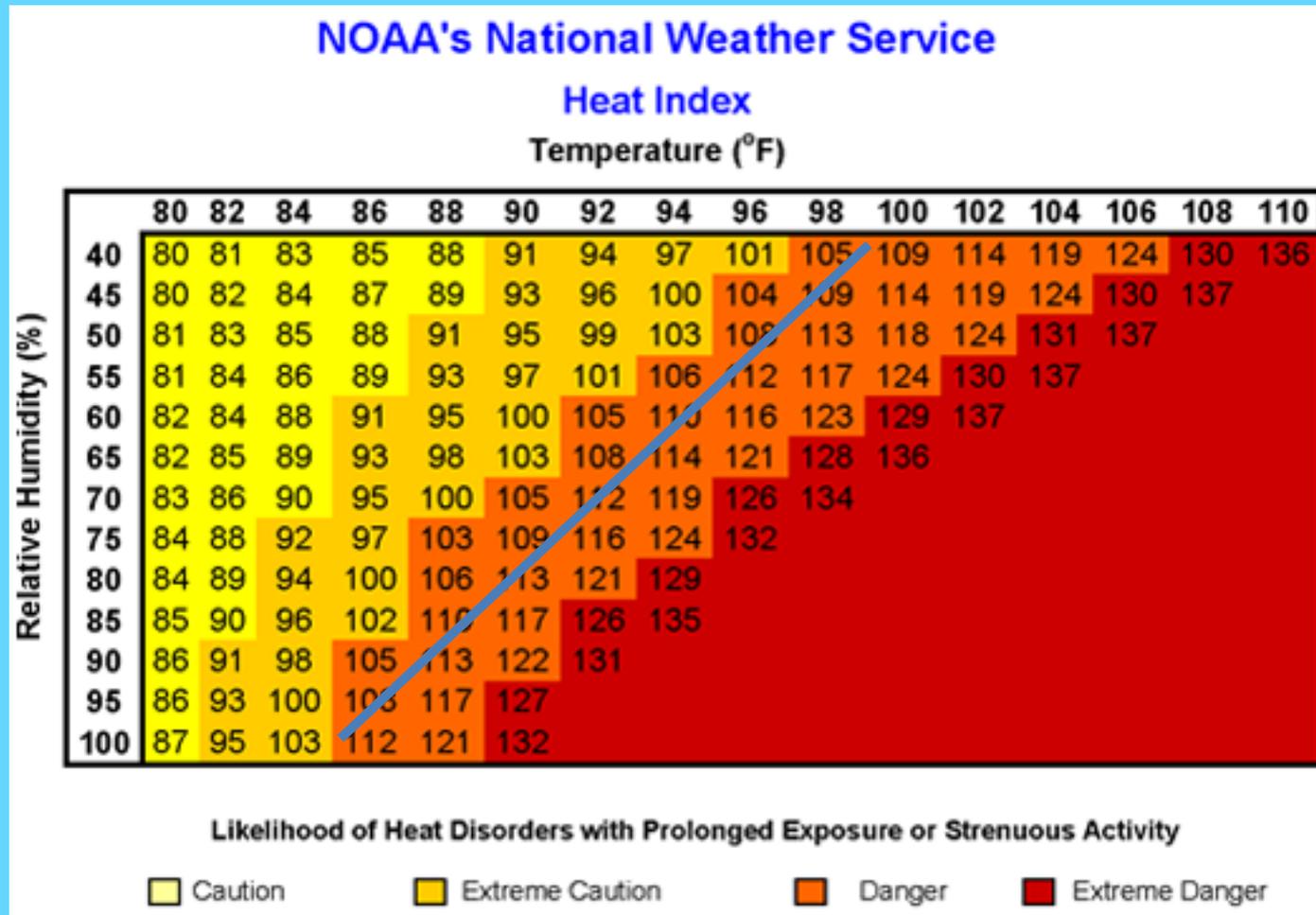
- ***Excessive Heat Outlook***: issued when the potential exists for extended excessive heat (heat index of 105-110°F) **over the next 3-7 days**. This is a good time to check on supplies, such as extra water coolers, and refresh worker training.

- ***Excessive Heat Watch***: issued when excessive heat could occur within the **next 24 to 72 hours**, but the timing is uncertain.

- ***Excessive Heat Warning***: issued when the heat index will be high enough to be **life threatening in the next 24 hours**. This warning indicates that the **excessive heat is imminent or has a very high probability of occurring**.

- ***Excessive Heat Advisory***: similar to an Excessive Heat Warning, but less serious. This is issued when the heat index could be **uncomfortable or inconvenient, but is not life threatening if precautions are taken**.

Medford NOAA Alert is an HI of 105-110 °F for two days



Acclimatization Body Changes

- Gradually build up your ability to handle heat (increase exposure time by an hour/day)
- When your body gets used to the heat (acclimatized) your sweating becomes more “efficient” (more sweat, quicker but with less salt in sweat)
- blood flow to skin is reduced; more blood is available to muscles
- heart rate more stable, heart stroke volume increases and blood volume increases

Acclimatization

- **Temporary adaptation** of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.

Drink Water

Acclimatization **does not** decrease your body's need for water! You must continue to take scheduled water breaks to replace the fluids your body has lost through sweating. Also, **remember that acclimatization is lost after 7 to 10 days away from the job,** in periods of cool weather or by working in air-conditioning.

Drink plenty of water!



Why Workers Must Be Acclimatized

Humans are, to a large extent, capable of adjusting to the heat. Much of this adjustment to heat, under normal circumstances, usually takes **about 5 to 7 days**, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable. However, it may take up to several weeks for the body to fully acclimatize.

On the first day of work in a hot environment, the body temperature, pulse rate, and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimatized to the heat, the worker will find it possible to perform work with less strain and distress.

NIOSH, Working in Hot Environments (NIOSH 86-112) "[Preparing for the Heat](#)" and OSHA's [Heat-related Illness Prevention Training Guide](#)

Monitoring Workers for Acclimatization

1. Heart rate

Count the radial pulse during a 30-second period as early as possible in the rest period.

- If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
- If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

2. Oral temperature

Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

- If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.
- If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.
- Do not permit a worker to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6°F (38.1°C).

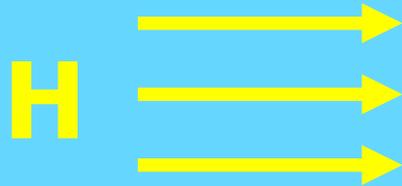
3. Measure Body Water Loss, if possible.

Measure the worker's weight on a scale (ideally accurate to ± 0.25 lb) at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing (changes of clothing or damp clothing can cause an inaccurate reading). The body water loss should not exceed 1.5 percent total body weight loss in a work day. (3# for a 200# employee is 1.5% = 95 ounces, 6 bottles)

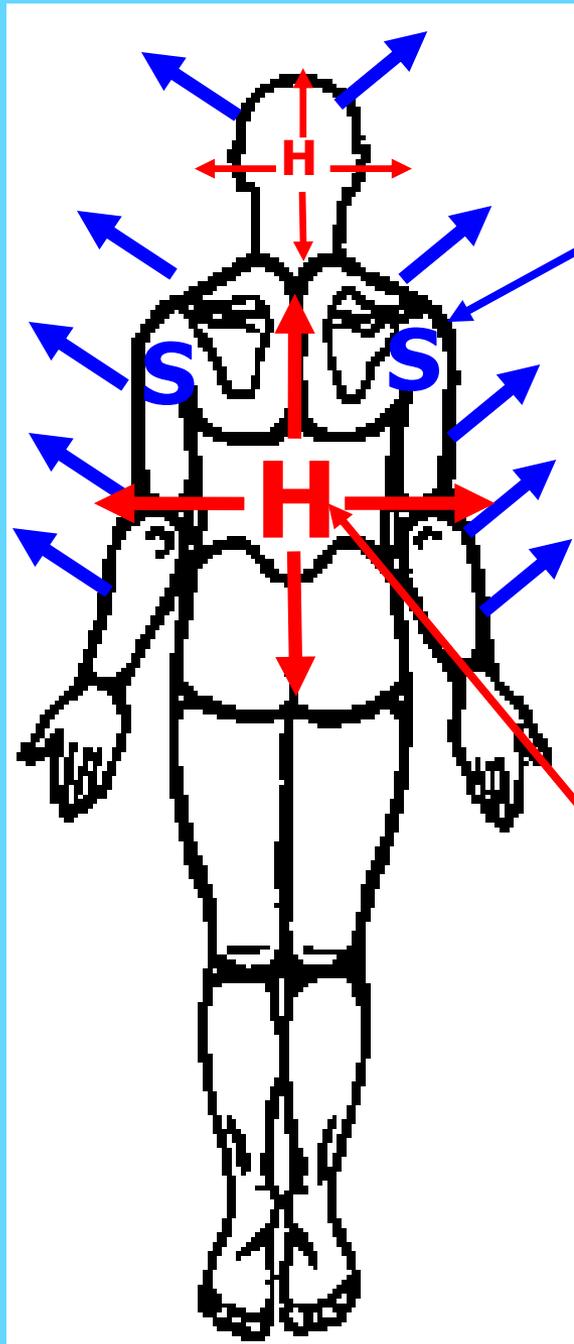
Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar load and the level of physical work (see your table). The length of the work cycle will be governed by the frequency of the required physiological monitoring, and your hazard assessment.

Most outdoor fatalities, 50% to 70%, occur in the first few days of working in warm or hot environments because the body needs to build a tolerance to the heat gradually over time.

The Issue is Heat Balance



External Heat sources
hot weather
radiant heat sources



Cooling
evaporation
of sweat

Internal Heat sources
muscle activity

The Body and Heat

The human body regulates high temperatures in two ways. One, through blood flow and two, by sweating. Blood is circulated to the skin, increasing the skin temperature and allowing the body to give off the excess heat through the skin. Sweating occurs when the body senses that the heat loss due to increased blood circulation is not enough to cool the body. Evaporation of the sweat cools the skin and eliminates large quantities of heat from the body. If the body is unable to release excess heat, it will store it.

When this happens, the body's core temperature rises and the heart rate increases. If the body continues to store heat the person may begin to have difficulty concentrating, may become irritable and lose the desire to drink. The next stage is often fainting which would signal a medical emergency.

Indirect Health Effects

Reduced Work Performance: tired, fatigued workers perform with reduced accuracy, efficiency

Increased Accidents: tired, fatigued workers are more susceptible to accident and injury

Reproductive Problems: heat has been shown to reduce both male and female fertility and can be a problem for the fetus

Heart/Lung Strain: if you already have heart, lung, kidney or circulatory problems, heat stress is an added strain on your body which in severe situation may precipitate serious episodes of acute problems

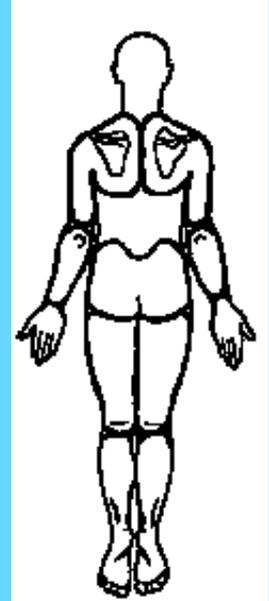
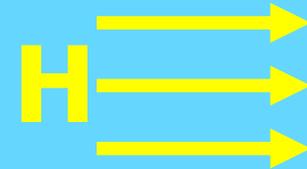
Predisposing Factors

- very small body size
- overweight
- over 40 years old (the older the more sensitive)
- **previous heat illness**
- heart disease
- high blood pressure
- diabetes
- inactivity
- physical activity

➤ **...sooner or later we're all vulnerable ...**

External Heat Source Controls

**External
Heat sources
hot weather
radiant heat sources**



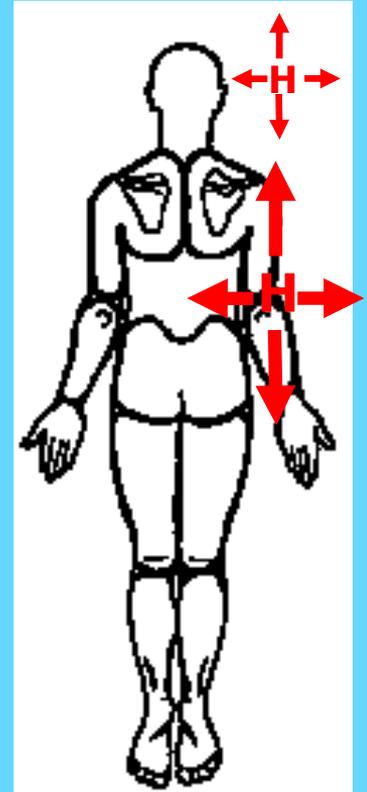
- **At the source**
 - Replace/isolate heat producing processes
 - Block radiant heat with barriers (shade)
- **Along the path**
 - Isolate worker from heat
 - Air condition workplace (booth)
 - Capture hot air with exhaust ventilation

Internal Source Controls

At the source:

- Reduce workload
 - improve ergonomics,
 - provide assistance (buddy, medical)
 - increase relief time (breaks),
 - slow down (pacing)
- Provide adequate water
- Actively cool body
- Gradually acclimatize
- Ensure good nutrition and rest

**Internal
Heat sources
muscle activity**



Promoting Cooling

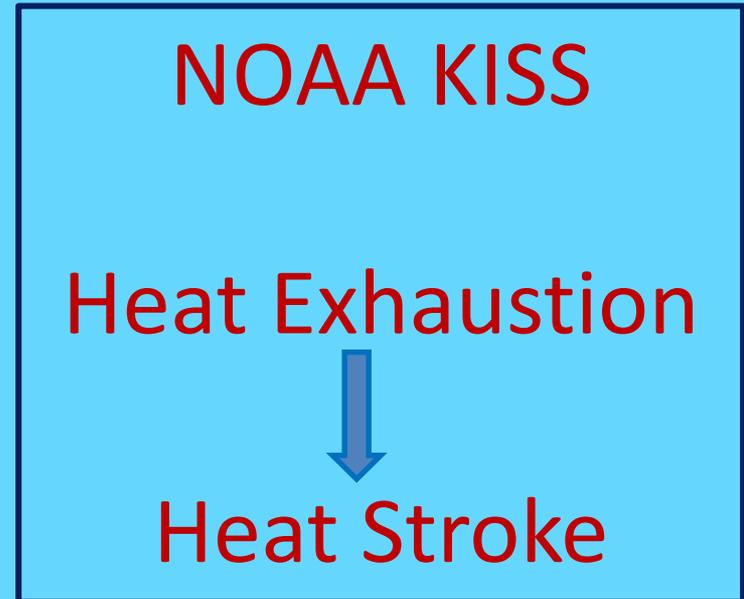
- Wear loose clothes that **allow sweat to evaporate easily** (cotton ?)
- Take internal heat sources into account when using **any personal protective clothing that prevents cooling by keeping sweat from evaporating**
- Wash clothes regularly and **maintain good personal hygiene** (clean, sweat build-up, SPF)

**Cooling:
evaporation
of sweat**



Types of Heat Related Illnesses

- Heat Fatigue
- Heat Rash
- Heat Syncope
- Heat Cramps
- Heat Exhaustion
- Heat Stroke



Forms and Symptoms of Heat Stress



Heat Rash

The mildest form of heat sickness, heat rash results in red bumps and itchy skin



Heat Syncope

Characterized by dizziness, light-headedness, and fainting



Heat Cramps

Symptoms include heavy sweating and spasms of large muscle groups



Heat Exhaustion

Identified by nausea, headaches, dizziness, weakness and irritability



Heat Stroke

Can cause confusion, seizures, loss of consciousness and death

Mild

Severe

Rash, Syncope, Cramps, Fatigue



Transient Heat Fatigue

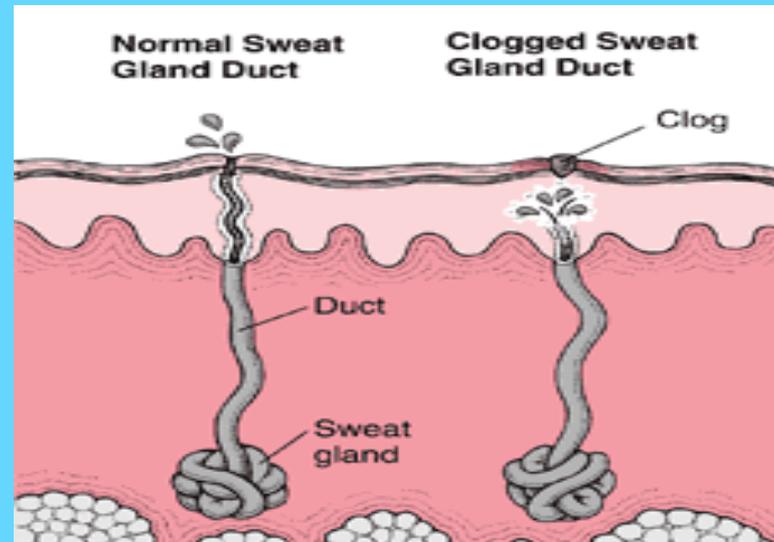
Symptoms: General feeling of tiredness or fatigue.

First Aid: Fluid replacement and rest.



Heat Rash (prickly heat)

Symptoms: Skin becomes reddened and may itch, feel prickly or hurt.



First Aid: Practice good personal hygiene; keep the skin clean and the pores unclogged, allow skin to dry, wear loose clothing, see doctor if rash persists.

Heat Syncope (fainting)



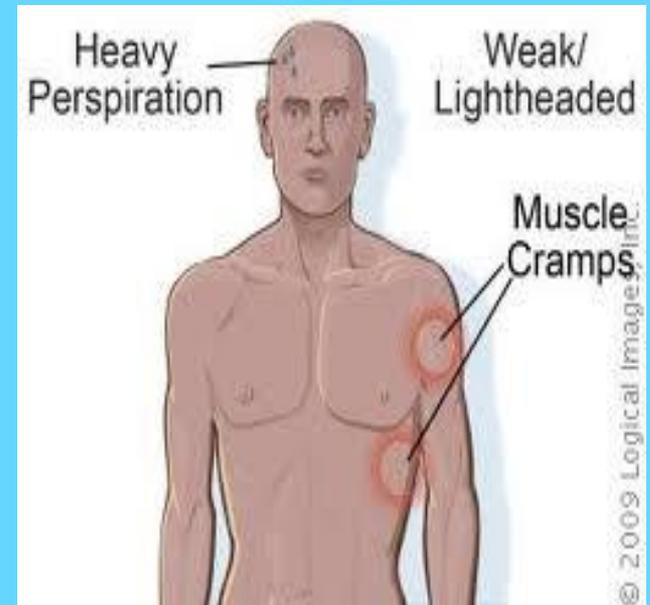
Symptoms: Syncope means “fainting.” First signs are dizziness, feeling light-headed and perhaps nauseous, then the person may faint. Usually occurs in the beginning of heat stress season before the circulation system is adapted.

First Aid: Lay victim in a cool location horizontally with feet elevated. If conscious, give fluids. Treatment is the same as shock.

Heat Cramps

Symptoms: Cramping of either active muscles (arms, legs) or involuntary muscles (usually abdominal), or both.

First Aid: Replenish electrolytes through drinking of fluids such as water, Gator-Ade, Squincher or PowerAde. Rest in a cool environment.

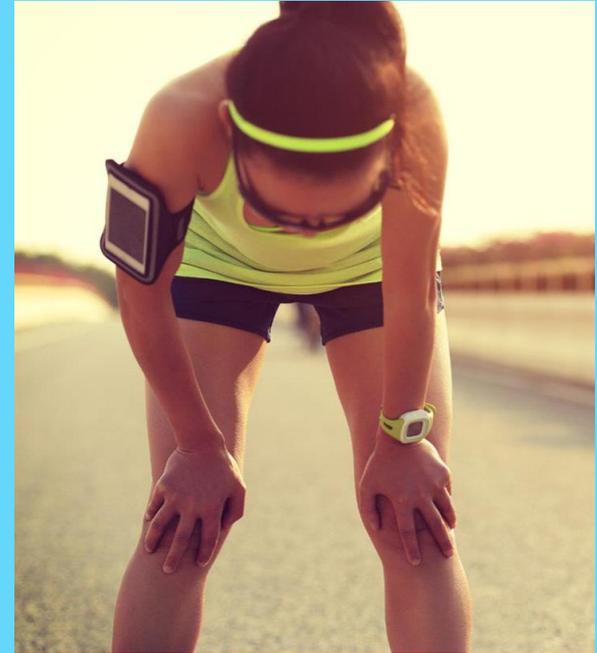


Heat Exhaustion

Symptoms:

Nausea, dizziness, weakness
headache, blurred vision, profuse sweating, cold/wet (clammy) grayish skin, unconsciousness, coma and death.

First Aid: Place victim in a prone position in a cool location, administer fluids if the victim is conscious. **If unconscious, seek medical care or transport to a medical emergency room.**



Heat Stroke !!



Symptoms: Chills, restlessness, irritability, euphoria, red face and skin, disorientation, hot/dry skin (not always), collapse, unconsciousness, convulsions and death.

First Aid: Immediate, aggressive cooling of the victim's body using wet cloths, immersion into cold water or alcohol wipes.

Transport to emergency medical facility ASAP!

Watch out for each other!

- A worker heading into a heat stroke will no longer realize what's happening to him/her
- It is vital that co-workers be able to recognize what's happening and intervene
- Without quick attention, the co-worker may die!



Measurements



Mannix Digital Heat Stress Monitor

Temperature



Heat Index



WBGT

The applicable temperatures are based upon Wet Bulb Global Temperature (WBGT) measurements and are also provided for both acclimatized and unacclimated workers.

WBGT uses temperature, humidity, wind, solar radiation, and other weather parameters. It's a particularly effective indicator of heat stress for active populations such as outdoor workers and athletes.

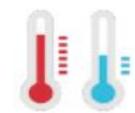
<https://www.weather.gov/media/safety/heat/2020-WBGT-Handout.pdf>

Comparing WBGT and Heat Index

	WBGT	HEAT INDEX
Measured in the sun	●	●
Measured in the shade	●	●
Uses temperature	●	●
Uses relative humidity	●	●
Uses wind	●	●
Uses cloud cover	●	●
Uses sun angle	●	●



solar radiation



temperature



relative humidity



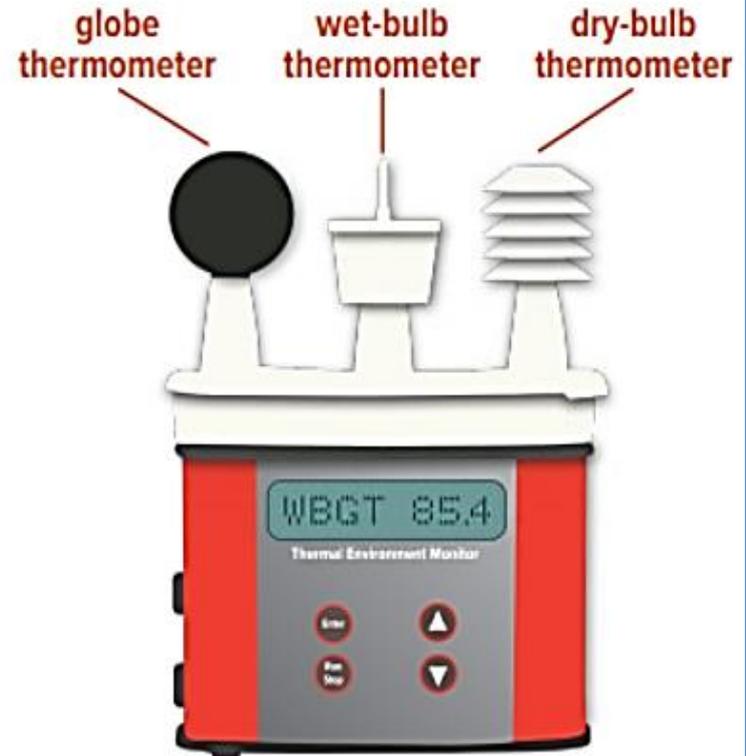
wind speed

Wet Bulb Global Temperature?

Why is it called Wet Bulb Globe Temperature?

The WBGT is derived from a combination of temperatures from three thermometers — wet globe for humidity, black globe for solar factor, and dry bulb for the ambient temperature.

A wet bulb temperature is measured by taking a thermometer that has a bulb covered by a water-soaked cloth. When air passes over the cloth to evaporate the water, the evaporative cooling shows the wet bulb temperature on the thermometer.

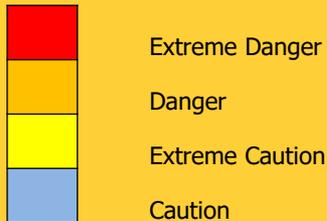


Example of WBGT Equipment

Relative Humidity

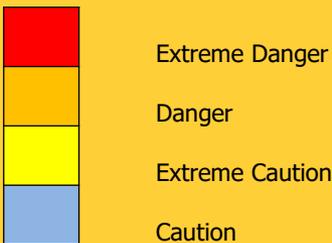
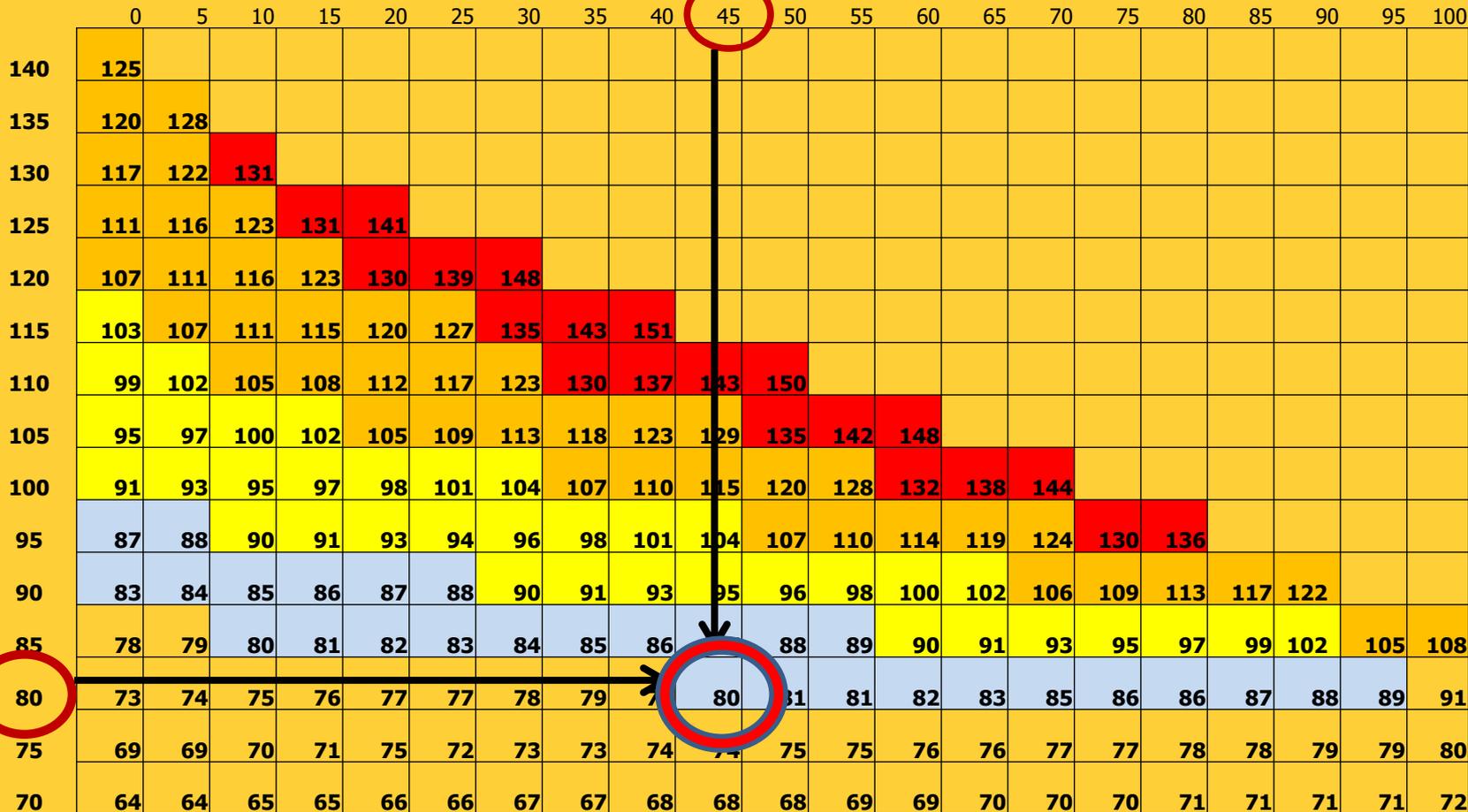
Air Temperature Degrees Fahrenheit

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
140	125																					
135	120	128																				
130	117	122	131																			
125	111	116	123	131	141																	
120	107	111	116	123	130	139	148															
115	103	107	111	115	120	127	135	143	151													
110	99	102	105	108	112	117	123	130	137	143	150											
105	95	97	100	102	105	109	113	118	123	129	135	142	148									
100	91	93	95	97	98	101	104	107	110	115	120	128	132	138	144							
95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136					
90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122			
85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108	
80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91	
75	69	69	70	71	75	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	
70	64	64	65	65	66	66	67	67	68	68	68	69	69	70	70	70	71	71	71	71	71	72



Relative Humidity

Air Temperature Degrees Fahrenheit



Monitoring - Heat Index

It is important to mention that throughout the day during warm weather months, announcements will be made alerting associates as to what the heat index zone is in the work area. Once again those heat index zones are blue, yellow, orange and red.

BLUE

The blue or caution zone represents heat indexes between 80 and 89 degrees (F). The ambient temperatures would start at 80 degrees (F) with a humidity of 45%. The upper end of the blue zone would consist of a temperature of 95 degrees (F) and a humidity of 5%.

Refer to the Heat Prevention Plan for the actions that will be taken when heat indexes are in the blue range.

Yellow

The yellow or extreme caution zone represents temperatures starting at 85 degrees (F) with a humidity of 60%. This combination would result in a heat index of 90 degrees. The upper end of the yellow zone is a temperature of 115 degrees (F) and a humidity of 0%. This combination would produce a heat index of approximately 103 degrees (F).

Refer to the Heat Prevention Plan for the actions that will be taken when heat indexes are in the yellow range.

Temperatures in the yellow zone will warrant additional monitoring using heart rate monitors.

Orange

The orange or danger zone represents temperatures starting at 85 degrees (F) with a humidity of 5%. This combination would result in a heat index of 88 degrees. The upper end of the orange zone is a temperature of 140 degrees (F) and a humidity of 0%. This combination would produce a heat index of approximately 125 degrees (F).

Refer to the Heat Prevention Plan for the actions that will be taken when heat indexes are in the blue range. Temperatures in the orange zone will also warrant the use of heart rate monitors.

Red

The red or extreme danger zone represents temperatures starting at 95 degrees (F) with a humidity of 75%. This combination would result in a heat index of 130 degrees. The upper end of the red zone is a temperature of 130 degrees (F) and a humidity of 10%. This combination would produce a heat index of approximately 131 degrees (F).

Temperatures in the red zone are not expected in Roseburg, Oregon. However,

Refer to the Heat Prevention Plan for the actions that will be taken when heat indexes are in the red zone.

HI is One Method of Control,
but also consider HR, BP, Metabolic
Rate, and Recovery Period

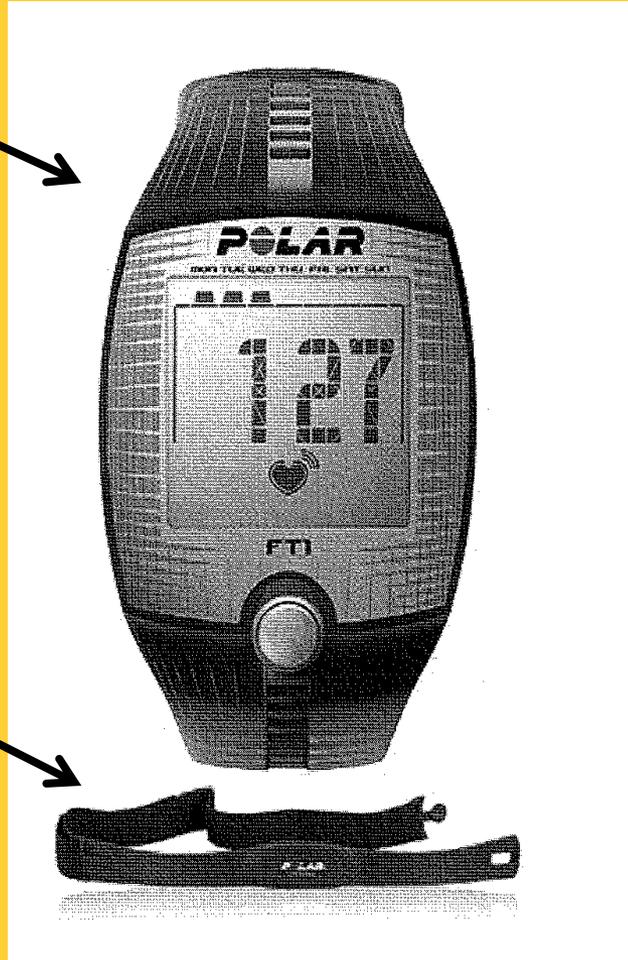


Polar Heart Rate Monitor

Watch monitor



Chest strap transmitter



Polar Heart Rate Monitors (Avg)

The heart rate monitor measures heart beats per minute. Two heart rates are important and will be monitored in Ingram's Heat Stress Program. These two numbers are the maximum and moderate heart rates. For purposes of our program we will be monitoring in the range at or below the moderate heart rate.

The maximum heart rate is calculated by subtracting the associates age from 220. Therefore, a thirty (30) year old associate would have an approximate maximum heart rate of 190 (220-30). The associate's moderate heart rate is 70%-80% of that number or 133-152. Our Heat Stress program will use **set points** of **110** and **140**, well below these numbers.

Heart Rate Monitoring (Active 110-140)

As previously mentioned, Ingram's heat stress monitoring program will use two set points; 110 and 140. Associates will monitor these numeric values by observing the display on their heart rate monitor watch.

A numeric value of 110. The numeric value of 110 will serve as a "caution" to the associate that their heart rate is at 110 beats per minute. As more energy is expended, the heart rate could elevate particularly if the combined ambient temperatures and humidity (heat index) in the work area, elevates. As the associate's heart rate approaches 110 the associate should be pacing themselves.

A numeric value of 140. When the heart rate monitor reaches 140, it is time for the associate to rest. The rest period should be long enough to allow the heart rate monitor to fall below 110.

Heart Rate Monitoring (Rest 110-140)

During this rest period, the associate is encouraged to drink water. Once the heart rate falls below 110, the associate is able to return to work.

It is permissible to work within the range of 110-140; however a reading of 140 requires the associate to take a rest break.

Sampling-Heart Rate Monitors

Individual monitoring can be performed using Polar heart rate monitors. These heart rate monitors will be assigned to work in where “medium to high” metabolic rates can occur due to the associate’s workload. The metabolic rate represents the range of energy used in a period of time, an hour is the reference.

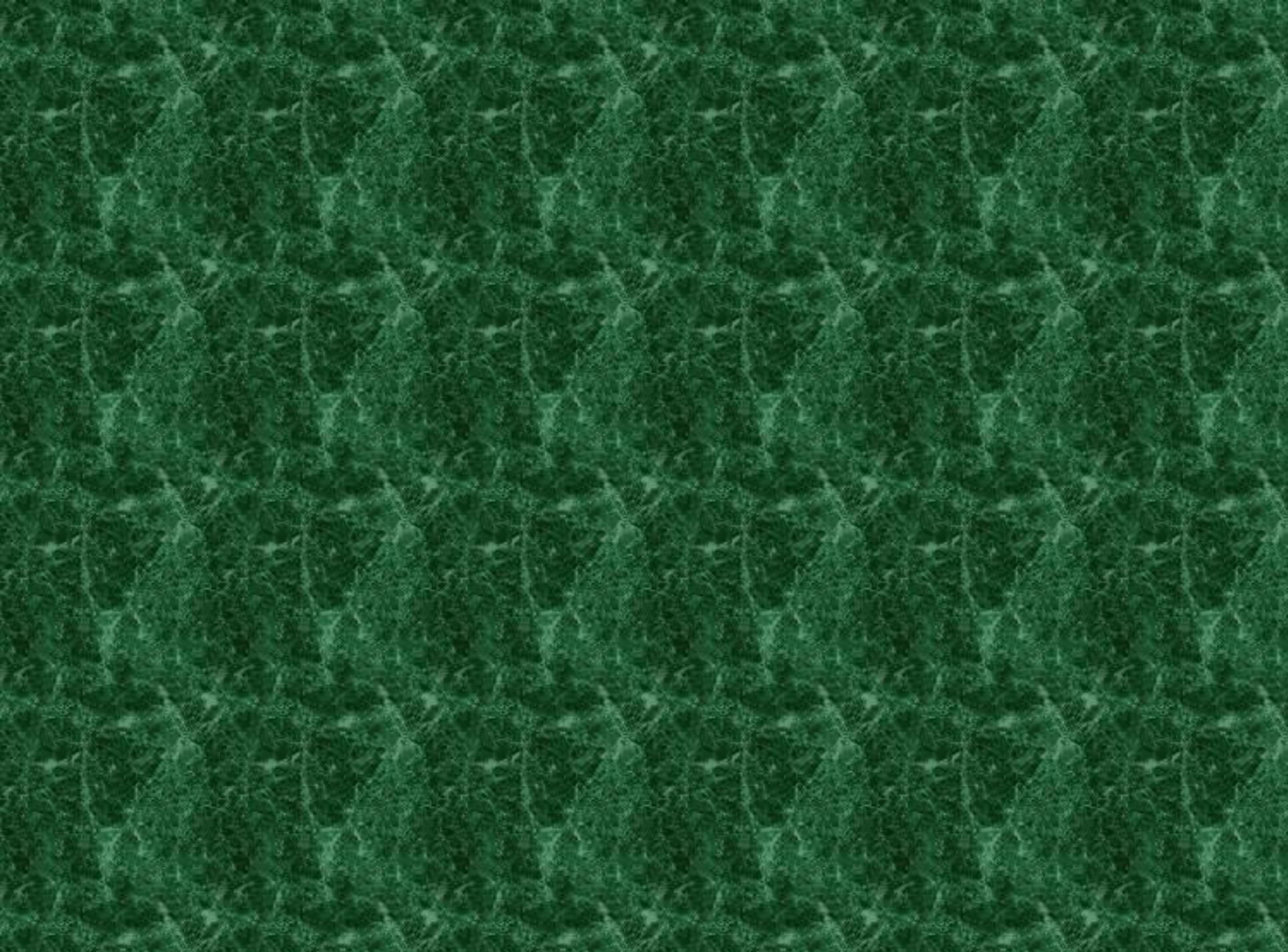
Performing job tasks rated at “medium to high” metabolic rates generally expend approximately 200 - 500 kcalories per hour.

We expect “medium to high” metabolic rates to occur in the following departments:

Shipping
Maintenance
Receiving



Use representative monitoring. Collect the profile data. Avoid the worst case by at least 10%



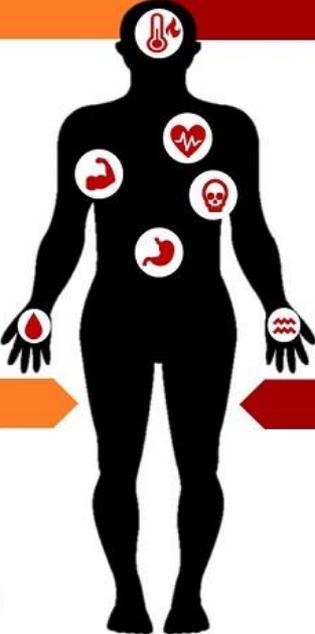
III. Personal Heat Management

Demonstrating Commitment

NWS/NOAA

- <https://www.weather.gov/safety/heat-index>
- Heat Stress (Exhaustion – Stroke)
- Heat Risk (HeatRisk forecast provides a color and numeric value)
- Heat Index (when RH is factored in with the actual air temperature)

HEAT EXHAUSTION	HEAT STROKE
<ul style="list-style-type: none">■ 37°C to 40°C (98.6°F to 104°F)■ Headache, Fatigue, Dizziness■ Muscle Cramps■ Nausea■ Pale, Moist Skin■ Weak Pulse	<ul style="list-style-type: none">■ > 40°C (>104°F) and above■ Confusion, Unconsciousness■ Seizures■ Vomiting■ Warm, Dry Skin■ Fast and Strong Pulse■ Rapid Heart Rate <p>Coma and Death Possible! </p>
First Aid Guide	First Aid Guide
<ul style="list-style-type: none">■ Move to a cool place and rest■ Remove excess clothing■ Fan skin■ Place cool cloths on skin■ Drink cool water if fully conscious	<ul style="list-style-type: none">■ Call local emergency number■ Move to a cool place and rest■ Remove excess clothing■ Drench skin with cool water■ Place ice bags on the armpits



Don'ts

- Party
- Stay up late
- Smoke
- Not Drinking H₂O (1 Qt./HR)
- Coffee and Soda
- Not drinking water (station too far)*
- Skipping B.P. medication
- Siting in car for shade
- Wear heavy, dark cloths
- No hat, SPF
- No work planning (shade)
- No rest breaks
- Not washing/cooling with water
- Not acclimated
- Vapor Barrier Clothing
- Skip your breaks
- **SUGAR**

Contributing Personal Factors

Body Size

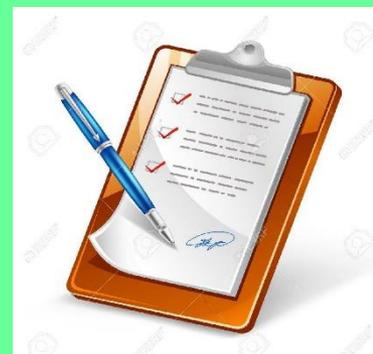
Diet

Acclimatization

Age

Weight

Medications



Do's

- Get up a little earlier
- Plan your route to be cool
- Water, water, water
- Electrolytes (full spectrum)
- Small food quantities
- Cooling scarfs and towels
- Personal mister
- Water pack
- **HAT and SPF**
- Water (1 Qt./HR)
- Cool feet
- Ice chest
- Ice water circulator
- Arteries and Veins (pits\crotch)
- Know your EMT process
- Poster of your programs
- Pace yourself



My Favorite Issues

Preparation:

Pain

SPF

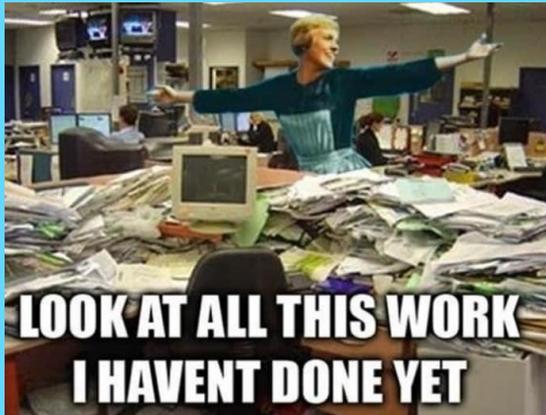
Short Hair

Cool Your Head

Timing

Irrational/Pissy

Baby Food



Avoid Stress

Have a Plan



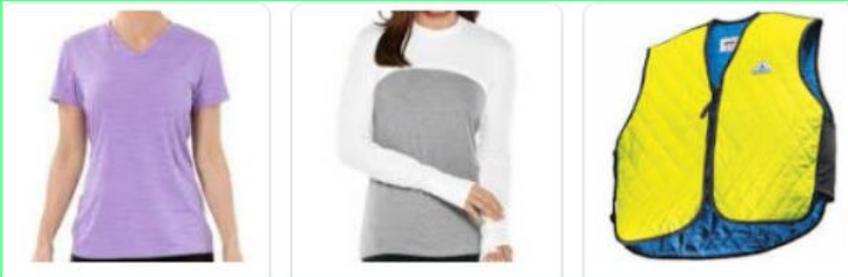
Modify and Adapt

am I working at my regular capacity?
no. but am I prioritizing and taking care of the most important tasks? no.
but am I at least taking care of myself and my mental health? also no.

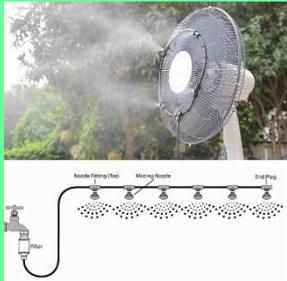
Clothing

- Cooling wraps
- Cooling Shirts
- Cooling pants
- Cooling arm and leg wraps
- Sunscreen SPF
- White and light
- Cotton versus Synthetic

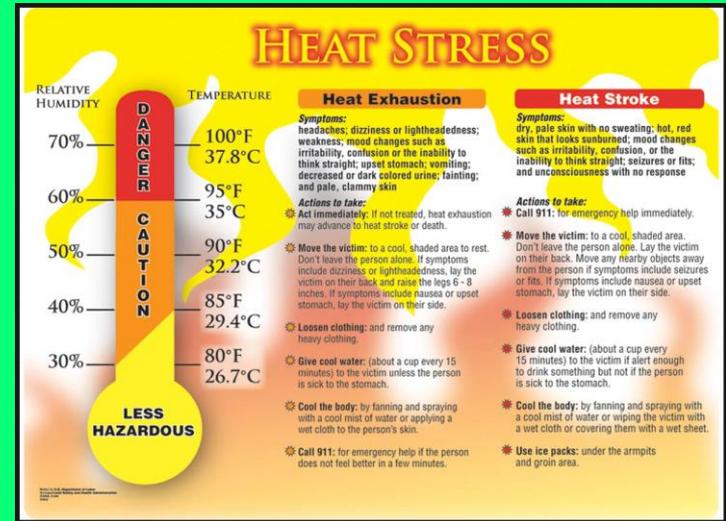
Cooling Clothing



Misting



Postings



Heat Aware™ HEAT STRESS MANAGEMENT SYSTEM

"Your Heat Stress Management Solution"

HEAT EXHAUSTION

HEAT STROKE

EXCESSIVE SWEATING

NO SWEATING

RAPID WEAR PULSE

IRREGULAR PULSE

HAUSEA OR VOMITING

HAUSEA OR VOMITING

COOL, PALE CLAMMY SKIN

RED, HOT DRY SKIN

MUSCLE CRAMPS

CONFUSION OR UNCONSCIOUSNESS

FIRST AID

HEAT EXHAUSTION

HEAT STROKE

HEAT STROKE

HEAT STROKE

The chart is an estimate of the likelihood of suffering a heat-related illness based on ambient temperature and relative humidity. Other factors such as long-sleeved work clothing, direct sunlight and wind speed must be considered when assessing risk.

How to use this chart:

- Along the left side (Ambient Temperature), locate current, high temperature
- On the top, locate current Relative Humidity
- Follow across and down to find the "Heat Index" or "What it feels like"
- Determine Heat Stress Risk from chart



Are You Hydrated? Take the Urine Color Test

HYDRATED	Optimal	Optimo
Well Hydrated	OK	Bueno
Dehydrated	Dehidratado	Dehidratado
Severely Dehydrated	Severely Dehydrated	Severely Dehydrated

% RELATIVE HUMIDITY

TEMP.	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
A 120° F	107	118	130	144						
M 110° F	103	111	120	131	141					
I 110° F	99	105	112	123	137	150				
E 105° F	95	100	105	113	123	135	149			
N 100° F	91	95	99	104	110	120	132	144		
T 95° F	87	90	93	96	101	107	114	124	136	
M 90° F	83	85	87	89	93	96	100	106	113	122
E 85° F	78	80	82	84	86	88	90	93	97	102
T 80° F	73	75	77	78	79	81	82	85	86	88
M 75° F	69	70	72	73	74	75	76	77	78	79
P 70° F	64	65	66	67	68	69	70	71	71	71

WORK TO REST / FLUID INTAKE

TEMP.	WORK/REST*	FLUID INTAKE PER HOUR
<91° F	Not Restricted	As needed
91° to 93° F	Rest about 10 min/hr	About 12-24 ounces
93° to 103° F	Rest about 10 min/hr - light work	About 24-36 ounces
103° to 107° F	Rest about 20 min/hr - heavy work	About 24-36 ounces
>107° F	Use extreme caution. Take fluids, rest and shade breaks as often as needed.	Use extreme caution. Take fluids, rest and shade breaks as often as needed.

Heat Aware Heat Stress Management System™

Heat Aware™

"Your Heat Stress Management Solution"

www.heataware.com

Dos tipos de enfermedades por calor:

¡Manténgase seguro y sano!

Two types of heat illness:

Heat Exhaustion

Heat Stroke

Stay safe and healthy!

Drink water even if you aren't thirsty - every 15 minutes

Ward out for each other

Wear a sun and light-colored clothing

Know when you are working in close you need to call 911

Rest in the shade

Heat kills - get help right away!

(6) Access to shade

- (a) Shade must be present when the temperature exceeds 80 degrees Fahrenheit. When the outdoor temperature in the work area exceeds 80 degrees Fahrenheit, the employer must have and maintain one or more areas with shade at all times while employees are present that are either open to the air or provided with ventilation or cooling. The shade must be located as close as practicable to the areas where employees are working.
- (b) Shade must be available when the temperature does not exceed 80 degrees Fahrenheit. When the outdoor temperature in the work area does not exceed 80 degrees Fahrenheit, either provide shade as per subsection (6)(a) or provide timely access to shade upon an employee's request.



(7) High-heat procedures

- Implement high-heat procedures when the temperature equals or exceeds **95 degrees Fahrenheit**. These procedures must include the following to the extent practicable:
 - Communication
 - Signs and Symptoms
 - Protective PPE and Clothing
 - Method to Reduce Over-Heating
 - Medical Management
 - Mandatory Buddy System

Controls - Ventilation

Fans are used to help cool and circulate air throughout the work area.



**6-12 ACH depending
on LEV**

Workloads are defined as the following:

Light workload	Sitting, standing, light arm/hand work, occasional walking
Moderate workload	Normal walking, moderate lifting.
Heavy workload	Heavy material handling, walking at a fast pace.
Very Heavy	Pick and shovel work.

Table 1

Workload	Limit for Unacclimated Workers (Action Limit)	Limit for Acclimatized Workers (Threshold Limit Value)
	Effective WBGT	
Light	28°C (82.4°F)	30°C (86°F)
Moderate	25°C (77°F)	28°C (82.4°F)
Heavy	23°C (73.4°F)	26°C (78.8°F)
Very heavy	21°C (69.8°F)	25°C (77°F)

Compliance Issues

- Heat Management for Employees (water, breaks, log, clothing...)
- Interview of Employees (work-rest cycle, available water)
- Acclimatization Program
- Training (guest trainers and employee trainers)
- Postings
- Written Plan <https://osha.oregon.gov/OSHAPubs/pubform/heat-sample-program.pdf>
- *See Local Emphasis Program* <https://osha.oregon.gov/OSHARules/pd/pd-299.pdf>

Take Care of Your Loved Ones

