

Summer Sun: Heat Safety

Summer looks and feels like it is finally here: b-b-ques, swimming pools, vacations and the hot summer sun. While it's important to spend time outdoors for your health and emotional well-being, it's equally important to protect your self from the dangers of the sun, heat and ultraviolet light with basic precautions and understanding.

This presentation will cover:

Key Phrases Associated with Heat Injuries

How to Protect Yourself

Understanding the Heat Index

Ultraviolet Radiation

THE HEAT IS ON !



INTRODUCTION

- Since 1936, according to the National Safety Council, 30,000 people have died from heat related illnesses.
- On the average, 384 people die each year from heat stroke.
- Heat-related injuries seem to occur often with the elderly and people who are not in good physical condition or acclimatized to the heat.

GENERATION OF BODY HEAT

- There are two main ways in which our bodies produce heat:



Metabolic Heat - the body generates heat through the digestion of food, work and exercise.



Environmental Heat - body absorbs heat from the surrounding environment, whether it's the hot sun or a hot room.

THE BODY'S COOLING SYSTEM

- **There are three methods in which our bodies can be cooled.**



Convection - is the transfer of heat through the circulation of air.

Evaporation - is when a liquid changes into a vapor. This is what happens when you sweat in a dry environment and is the most important method to cool your body.

Radiation - heat is naturally emitted from the body surface.

CONDITIONS AFFECTING THE COOLING SYSTEM

- **Acclimation** - the biological process through which our bodies adapt to the environment -- basically getting used to the heat.
- **Air Temperature** - heat flows from warmer objects to cooler objects.
- **Air Movement** - moving air speeds the evaporation process.
- **Humidity** - the amount of water vapor in the air affects the rate of evaporation.
- **Clothing** - the type of clothing affects the amount of heat our bodies absorb and retain.

KEY PHRASES of HEAT RELATED HEALTH PROBLEMS

Heat Rash - also known as Prickly Heat, occurs in hot, humid environments where sweat can't easily evaporate from the skin.

- This condition produces a rash which in some cases causes severe pain. The procedures to prevent or minimize this condition is to rest frequently in cool places and bath regularly ensuring to thoroughly dry the skin.

Heat Cramps - painful muscle spasms that result from the loss of salt and electrolytes due to excessive sweating.

- The cramps will usually affect the stomach, the arms and legs.
- This condition can be treated by drinking fluids containing electrolytes such as calcium, sodium and potassium.
- This condition usually precedes heat exhaustion.

KEY PHRASES of HEAT RELATED HEALTH PROBLEMS

- **Heat Exhaustion** - is a state brought on by the loss of fluids lost during excessive sweating.
 - Individuals with heat exhaustion still sweat, but they experience extreme weakness and may even collapse. They may experience nausea and headache. Their skin is clammy and moist, their complexion is usually pale and the body temperature is usually normal or slightly higher.
 - This condition is best treated by taking the patient to a cool place, applying cool compresses, elevating the feet and giving the individual plenty of fluids.
- **Heat Stroke** - is a severe medical emergency which could result in death.
 - Heat stroke results when the body's core temperature gets too high and the body is no longer able to cool itself. An individual suffering from heat stroke will have hot and dry skin, a high pulse rate and their blood pressure will fall.
 - This condition must be treated by immediately cooling the victim's body with water or wrapping them in cool wet sheets. Immediately seek medical attention.

	Cause	Symptom	Treatment	Prevention
Heat Rash	Hot humid environment; plugged sweat glands.	Red bumpy rash with severe itching.	Change into dry clothes and avoid hot environments. Rinse skin with cool water.	Wash regularly to keep skin clean and dry.
Sun Burn	Too much exposure to the sun.	Red, painful, or blistering and peeling skin.	If the skin blisters, seek medical aid. Use skin lotions (avoid topical anaesthetics) and work in the shade.	Work in the shade: cover skin with clothing; wear suntan lotions with a sun protection factor of at least 15. People with fair skin should be especially cautious.
Heat Cramps	Heavy sweating drains a person's body of salt, which cannot be replaced just by drinking water.	Painful cramps in arms, legs or stomach which occur suddenly at work or later at home. Cramps are serious because they can be a warning of other more dangerous heat-induced illnesses.	Move to a cool area; loosen clothing and drink cool salted water (1 tsp. salt per gallon of water) or commercial fluid replacement beverage. If the cramps are severe or don't go away, seek medical aid.	When working in the heat, workers should put salt on their food (if on a low-salt diet, this should be discussed with a doctor). This will give the body all the salt it needs; don't take salt tablets.
Fainting	Not enough blood flowing to the head, causing loss of consciousness.	Sudden fainting after at least two hours of work; cool moist skin; weak pulse.	Fainting may be due to a heart attack or other illness. GET MEDICAL ATTENTION. Assess need for CPR. Move to a cool area; loosen clothing; make person lie down; and if the person is conscious, offer sips of cool water.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms which often precede heat stroke.
Heat Exhaustion	Inadequate salt and water intake causes a person's body's cooling system to start to break down.	Heavy sweating; cool moist skin; body temperature over 38oC; weak pulse; normal or low blood pressure; person is tired, weak, clumsy, upset or confused; is very thirsty; or is panting or breathing rapidly, vision may be blurred.	GET MEDICAL AID. This condition can lead to heat stroke, which can kill. Move the person to a cool shaded areas; loosen or remove excess clothing; provide cool water to drink (salted if possible); fan and spray with cool water.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms which often precede heat stroke
Heat Stroke	If a person's body has used up all its water and salt, it will stop sweating. This can cause body temperature to rise.	High body temperature (over 41oC) and any one of the following: the person is weak, confused, upset or acting strangely; has hot, dry, red skin; a fast pulse; a headache or dizziness. In later stages, a person may pass out and have convulsions.	CALL AMBULANCE. This condition can kill a person quickly. Remove excess clothing; fan and spray the person with cool water; offer sips of cool water if the person is conscious.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms which often precede heat stroke.

PREVENTING HEAT-RELATED HEALTH PROBLEMS

- **Dress Light** – Lightweight, light-colored clothing reflects heat and sunlight and helps your body maintain normal temperatures.
- Wear loose-fitting clothes such as cotton which lets air move over your body.
- Wide brimmed hats should also be worn.



PREVENTING HEAT-RELATED HEALTH PROBLEMS

- **Acclimation** - accustom yourself to the weather prior to long durations of physical activity.
- **Maintain Body Fluids** - Fluid intake must be maintained throughout the course of physical activity. A good rule of thumb is 8-10 oz of water every 15-20 minutes.
 - Do not rely on thirst as an indicator of dehydration because your body loses water faster than you realize. By this time, you are already dehydrated
 - Alcohol should be avoided because it is a diuretic, which increases dehydration and can interfere with heat loss.

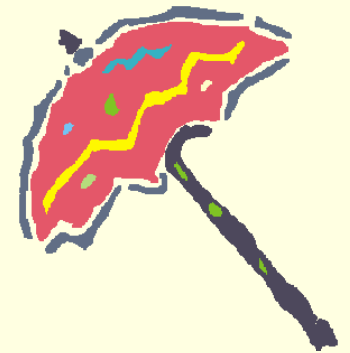


PREVENTING HEAT-RELATED HEALTH PROBLEMS

- **Proper Diet** – Eat light and stay away from heavy foods. They increase metabolic heat production and also increase water loss. Eat smaller, well-balanced meals more often.



Rest Periods - Pace your work activities at a slower rate during high temperatures and take frequent rest periods in a shaded area and drink plenty of fluids. Take a break every 15-20 minutes.



Exercise should be conducted early in the morning or late evening when it is cooler. Be sure to hydrate well and drink electrolytes before and after exercising.



HOW HOT IS IT? HEAT INDEX CHART

Go up the temperature scale and across the humidity scale. Remember, anything over 90 means you need to take precautions!!

HEAT INDEX CHART

		RELATIVE HUMIDITY								
		10 %	20%	30%	40%	50%	60%	70%	80%	90%
TEMPERATURE F°	104°	98	104	110	120	>130	>130	>130	>130	>130
	102°	97	101	108	117	125	>130	>130	>130	>130
	100°	95	99	105	110	120	>130	>130	>130	>130
	98°	93	97	101	106	110	125	>130	>130	>130
	96°	91	95	98	104	108	120	128	>130	>130
	94°	89	93	95	100	105	111	122	128	>130
	92°	87	90	92	96	100	106	115	122	128
	90°	85	88	90	92	96	100	106	114	122
	88°	82	86	87	89	93	95	100	106	115
	86°	80	84	85	87	90	92	96	100	109
	84°	78	81	83	85	86	89	91	95	99
	82°	77	79	80	81	84	86	89	91	95
	80°	75	77	78	79	81	83	85	86	89
	78°	72	75	77	78	79	80	81	83	85
	76°	70	72	75	76	77	77	77	78	79
74°	68	70	73	74	75	75	75	76	77	

Take This Chart Home!!

Directions: Locate the current temperature on the left column and then locate the relative humidity on the top row. Follow the temperature across and the humidity down until they meet; this measurement is the heat index. The heat index will increase 15 degrees in direct sunlight.

SUGGESTED HEAT WORK PROCEDURES for HEAT INDEX READINGS

Temperature	Danger Category	Heat Syndrome	Procedures
> 130	Extreme Danger	Heat Stroke Imminent	When the heat index is in this zone employees in the affected area should be dismissed
105 - 129	Danger	Heat Cramps or heat exhaustion likely. Heat Stroke possible with prolonged exposure and activity	When the heat index is in this zone. Non critical work activities should be suspended. Critical work activities shall be evaluated and schedule changes of affected employees should be made. Management must specifically approve employees working in heat index danger areas
91 - 104	Extreme Caution	Heat cramps or heat exhaustion possible with prolonged exposure and activity	When the heat index is in this zone management shall discuss the situation with supervisors and make schedule/work adjustments to accommodate for the heat. Specific approval must be granted for working under extreme heat conditions
77 - 90	Caution	Fatigue Possible	Normal work day, no alerts posted

Ultra Violet Radiation (UV) Index:

The UV Index is a forecast of the probable intensity of skin damaging ultraviolet radiation reaching the surface during the solar noon hour (11:30-12:30 local standard time or 12:30-13:30 local daylight time).

The greater the UV Index is the greater the amount of skin damaging UV radiation. How much UV radiation is needed to actually damage one's skin is dependant on several factors. But in general the darker one's skin is, (that is the more melanin one has in his/her skin) the longer (or the more UV radiation) it takes to cause erythema (skin reddening). The following chart where by one can cross check his/her propensity to burn versus the UV Index.

For those who always burn and never tan the times to burn are relatively short compared to those who almost always tan.



Ultra Violet Radiation (UV) Index: How to use it!

The EPA has devised general guidelines as far as what to do to protect oneself from overexposure to UV radiation. These are shown in the table below.

<i>Exposure Category</i>	<i>UV Index</i>	<i>Protective Actions</i>
Minimal	0, 1, 2	Apply skin protection factor (SPF) 15 sun screen.
Low	3, 4	SPF 15 & protective clothing (hat)
Moderate	5, 6	SPF 15, protective clothing, and UV-A&B sun glasses.
High	7, 8, 9	SPF 15, protective clothing, sun glasses and make attempts to avoid the sun between 10am to 4pm.
Very High	10+	SPF 15, protective clothing, sun glasses and avoid being in the sun between 10am to 4pm.

