

Performing Arts Safety Bulletin #4

GUIDELINES FOR WORKING IN EXTREME HOT TEMPERATURE CONDITIONS



This bulletin addresses special safety considerations when working outdoors and exposed to extreme hot temperature conditions. Safeguards should be taken to prevent serious injury or illness to cast or crewmembers.

1. INTRODUCTION:

When the body is in a hot environment, or when too much body heat is produced by vigorous physical activity, the body will attempt to rid itself of the excess heat. The body's most efficient mechanisms are sweating, the evaporation of the sweat and dilation of the blood vessels. Dilation of the blood vessels brings blood to skin surface. This increases the rate of radiation of heat from the body.

Ordinarily, the heat-regulating mechanisms of the body work very well. However, one will become ill when the body is exposed to more heat energy than one can handle. When the body gains or retains more heat than it loses, the result is called hyperthermia or high core temperature, which can cause damage to the brain and other vital organs and could decrease the chances of survival.

2. FACTORS THAT INCREASE HEAT ILLNESS:

Elevated air temperatures and humidity, work around hot machinery, vigorous work activity, absence of a breeze or wind, exposure to direct sunlight increase heat illness. Heat illnesses include heat rash, heat fatigue, heat cramps, heat exhaustion and heat stroke.

3. HEAT RASH:

Heat rash is a relatively minor disorder, which results from a buildup of heat in the skin caused by:

- Clogged pores or sweat ducts
 - Prolonged sweating
- a. Symptoms
 - i. Reddened skin in affected area
 - ii. Pain and itching
 - iii. Skin eruptions
 - b. Treatment Includes
 - i. Good personal hygiene; keep the skin clean and pores unclogged.
 - ii. allow the skin to dry
 - iii. Seek medical attention (i.e. set medic, studio hospital or medical provider)

4. HEAT CRAMPS:

Heat cramps are a more serious disorder, caused by the loss of electrolytes in the blood and muscle tissue. Electrolytes (salts) are lost through sweating

The Primary Symptoms of Heat Cramps

- a. Painful muscle spasms
- b. Cramping of skeletal muscles such as the arms and leg, or
- c. Cramping of involuntary muscles such as abdominal muscles or both.

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HEAT CRAMPS MAY DEBILITATE A PERSON FOR SEVERAL DAYS. FULL RECOVERY IS NECESSARY BEFORE RETURNING TO A HEAT STRESS ENVIRONMENT.

5. HEAT EXHAUSTION:

Heat exhaustion, also called heat prostration or heat collapse, is the most common serious illness caused by heat. It occurs as a result of water and salt depletion along with pooling of the blood in the peripheral circulatory system such as the arms and especially the legs. Heat exhaustion tends to occur, similar to heat cramp victims, in persons who are exerting themselves in hot environments. However, heat exhaustion is also common in persons that are dehydrated. Someone who develops heat exhaustion is said to be in hypovolemic shock.

- a. Symptoms May Include
 - i. Nausea
 - ii. Dizziness
 - iii. Headache
 - iv. Blurred vision
 - v. Cold/wet (clammy) grayish skin or disorientation

NOTE: Heat exhaustion may come on suddenly as syncope (fainting) and collapse. This is especially true if the crew or cast member has been sitting or standing for long periods of time with little movement. The pooling of blood causes a decrease in blood supplied to the brain causing a syncopal (fainting) episode. The vital signs may be normal, although the pulse is often rapid. The body temperature is usually normal or slightly elevated, but on rare occasions it may be as high as 40°C.

- b. Treatment Includes
 - i. Removal from the heat
 - ii. Seek medical attention and/or call 911
 - iii. Replenish fluids; use water and Gatorade type drinks (isotonic fluids); rest.

Recovery from heat exhaustion may take from days to weeks. Longer periods may be required before a person can return to a heat stress environment. If the symptoms are recognized early and action taken, the condition can be alleviated. If not treated, heat exhaustion can develop into heatstroke.

6. HEATSTROKE:

Heatstroke is the least common but most serious heat illness caused by heat exposure. It is caused by a severe disturbance in the heat regulating mechanism of the body and is a true medical emergency. Left untreated, heatstroke may result in death.

Heatstroke normally occurs in very hot and humid weather conditions. Because the body cannot dissipate heat as well or at all, the core temperature can soar. High humid conditions reduce the effectiveness of sweating, the evaporation of sweat, and radiation of heat from the body. If one continues to exert themselves under these conditions the heat will build up inside the body and cause the core temperature to soar.

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- a. Symptoms May Include
 - i. Chills
 - ii. Irritability
 - iii. Convulsions
 - iv. Rapid shallow breathing
 - v. Disorientation
 - vi. Red face and skin
 - vii. Dry skin
 - viii. Restlessness
 - ix. Euphoria
 - x. Syncopal (Fainting) episode

NOTE: Heatstroke left unattended will likely result in DEATH. Early in the course of heatstroke, the patient may still be sweating and the skin may be moist or wet. As the body core temperature (the temperature of the heart, lungs, and other vital organs) rises, the patient's level of consciousness falls. As the patient becomes unresponsive, the pulse becomes weaker and the blood pressure falls.

- b. Treatment includes
 - i. Seek medical attention (set medic, studio hospital or medical provider) and/or call 911 immediately.
 - ii. Remove from heat.
 - iii. Lie on back with feet elevated.
 - iv. Start aggressive cooling with wet cloths, alcohol wipes or immersion into tepid water.
 - v. Transport to a medical facility

7. ULTRAVIOLET RADIATION:

Another hazard is ultraviolet radiation, caused by exposure to the sun's rays. Exposure can cause sunburn; long term exposure can cause skin cancer.

Precautions to minimize exposure should be taken, including the use of sunscreen. Sunscreen should be applied 15 to 20 minutes prior to exposure. Re-apply throughout the workday.

Chronic exposure to intense ultraviolet radiation damages the lens of your eye and can eventually lead to cataracts. The proper pair of UV sunglasses should be used.

8. ACCLIMATIZATION

During the first few days of working in heat, the body needs time to adjust. This period of adjustment (acclimatization) varies by individual and can take up to a few weeks. During this acclimatization period you should:

- a. Start work slowly and increase the pace gradually. During a heat wave there is still a risk for heat illness even if previously acclimatized.
- b. Report to a supervisor if returning to work after an absence or illness, or when changing from a cool to a hot and/or humid climate.
- c. Supervisors and employees should be aware that acclimatization to heat can take several days and work/rest cycles should be scheduled accordingly.

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9. GENERAL PRECAUTIONS FOR HOT ENVIRONMENTS:

Fluid replacement is the most important thing a person can do to prevent heat related illnesses. The body can lose 1 to 2 litres of fluid per hour during vigorous activity in a hot environment. General precautions include the following:

- a. Eight ounces of fluid replacement every 15 minutes is recommended.
- b. Alternate between water and Gatorade type drinks.
- c. Avoid alcohol and caffeine.
- d. If possible, get acclimated, this can take several days.
- e. Use sunscreen or sun block.
- f. Wear long loose sleeved shirts and pants.
- g. Wear a wide brim hat. Baseball caps do not provide protection to the ears and neck area of the body.
- h. Over head sun protection, water and/or fluid supply should be available.

