29CFR 1926.20(b)-Accident Reduction, 29CFR 1926.21- Safety Training & Education 29CFR 1926.20(a)-Unsafe Working Conditions	Notes
Heat Stress & Related Illness	
Preparation  1. Read Applicable Background information and related Company Policy Chapter.  2. Make Copies of this Lesson Plan for Personnel  3. Make Transparency, procure transparency pens, etc.  4. Coffee, tea, snacks	
Other:	
Material  1. Personal Protective Clothing 2.  Objective	
<ul> <li>By the end of this session, personnel shall be able to:</li> <li>Discuss the causes of heat stress</li> <li>Describe the 3 major forms of Heat Illness</li> <li>Describe the ways to prevent Heat Illness</li> <li>Describe the warning signs of Heat Stroke and what actions to take if it occurs</li> <li>Describe the warning signs of Heat Exhaustion and what actions to take if it occurs</li> <li>Describe the warning signs of Heat Cramps and what actions to take if it occurs</li> <li>Describe Heat Rash</li> </ul>	
Background	
Certain safety problems are common to hot environments. Heat tends to promote accidents due to the slipperiness of sweaty palms, dizziness, or the fogging of safety glasses. Wherever there molten metal, hot surfaces, steam, etc., the possibility of burns from accidental contact also exists.	
The frequency of accidents is higher in hot environments than in more moderate environmental conditions. One reason is that working in a hot environment lowers the mental alertness and physical performance of an individual. Increased body temperature and physical discomfort promote irritability, anger, and other emotional states which sometimes cause workers to overlook safety procedures or to divert attention from hazardous to	asks.

Lesson	Notes
Causes of Heat Stress	
High temperatures and humidity stress the body's ability to cool itself, and heat illness becomes a special concern during hot weather Employees are responsible for wearing and maintaining hearing protective devices as instructed. Employees exposed to excessive levels of noise must also participate in annual training programs and the medical surveillance program which includes audiometric testing.	
Forms of Heat Illness and Preventions There are three major forms of heat illnesses: heat cramps, heat exhaustion, and heat stroke, with heat stroke being a life threatening condition.	
Heat Cramps	
Heat cramps are muscle spasms which usually affect the arms, legs, or stomach. Frequently they don't occur until sometime later after work, at night, or when relaxing. Heat cramps are caused by heavy sweating, especially when water is replaced by drinking, but not salt or potassium. Although heat cramps can be quite painful, they usually don't result in permanent damage. To prevent them, drink electrolyte solutions such as Gatorade during the day and try eating more fruits like bananas.	
<ul> <li>What to do: If you have heart problems or are on a low sodium diet, get medical attention. If medical attention is not necessary, take these steps:</li> <li>Stop all activity, and sit quietly in a cool place</li> <li>Drink clear juice or a sports beverage</li> <li>Do not return to strenuous activity for a few hours after the cramps subside</li> <li>Seek medical attention for heat cramps if they do not subside in 1 hour</li> </ul>	
Heat Exhaustion	
Heat exhaustion is more serious than heat cramps. It occurs when the body's internal air-conditioning system is	

overworked, but hasn't completely shut down. In heat exhaustion, the surface blood vessels and capillaries which originally enlarged to cool the blood collapse from loss of body fluids and necessary minerals. This happens when you don't drink enough fluids to replace what you're sweating away.

## **Heat Exhaustion (continued)**

The symptoms of heat exhaustion include: headache, heavy sweating, intense thirst, dizziness, fatigue, loss of coordination, nausea, impaired judgment, loss of appetite, hyperventilation, tingling in hands or feet, anxiety, cool moist skin, weak and rapid pulse (120-200), and low to normal blood pressure.

Somebody suffering these symptoms should be moved to a cool location such as a shaded area or air-conditioned building. Have them lie down with their feet slightly elevated. Loosen their clothing, apply cool, wet cloths or fan them. Have them drink water or electrolyte drinks. Try to cool them down, and have them checked by medical personnel. Victims of heat exhaustion should avoid strenuous activity for at least a day, and they should continue to drink water to replace lost body fluids.

What to do: If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention if the symptoms are severe or the victim has heart problems or high blood pressure. The following cooling measures may be effective:

- Drink cool, non-alcoholic beverages
- Cool Shower, bath, or sponge bath
- Rest in an Air Conditioned Environment

## **Heat Stroke**

Heat stroke is a life threatening illness with a high death rate. It occurs when the body has depleted its supply of water and salt, and the victim's body temperature rises to deadly levels. A heat stroke victim may first suffer heat cramps and/or the heat exhaustion before progressing into the heat stroke stage, but this is not always the case. It should be noted that, on the job, heat stroke is sometimes mistaken for heart attack. It is therefore very important to be able to recognize the signs and symptoms of heat stroke - and to check for them anytime an employee collapses while working in a hot environment.

The early symptoms of heat stroke include a high body temperature (103° F); a distinct absence of sweating (usually); hot red or flushed dry skin; rapid pulse; difficulty breathing; constricted pupils; any/all the signs or symptoms of heat exhaustion such as dizziness, headache, nausea, vomiting, or confusion, but more severe; bizarre behavior; and high blood pressure.

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Heat Stroke (continued)	Notes
Advance symptoms may be seizure or convulsions, collapse, loss of consciousness, and a body temperature of over 108° F.	
It is vital to lower a heat stroke victim's body temperature. Seconds count. Pour water on them, fan them, or apply cold packs. Call 911 and get an ambulance on the way as soon as possible.	
<ul> <li>What to do: Have someone call for immediate medical assistance while you begin cooling the victim:</li> <li>Get the victim to a shady area</li> <li>Cool the victim rapidly using whatever methods you can. For example, immerse the victim in a tub of cool water, place in a cool shower, spray water from a garden hose: sponge with cool water and fan him or her vigorously.</li> <li>Monitor body temperature, and continue cooling efforts until the body temperature drops to 101°-102°F</li> <li>If emergency medical personnel are delayed, call the hospital emergency room for further instructions</li> <li>Do not give the victim alcohol to drink</li> <li>Get medical attention as soon as possible</li> </ul>	
Sometimes a victim's muscles will begin to twitch uncontrollably. If this happens, keep the victim from injuring himself. Do not place any object in the mouth and do not give fluids. If there is vomiting, turn the victim on their side and make sure their airway remains open.	
Heat Rash	
<b>Heat Rash</b> looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breast, and in elbow creases. The best treatment is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort, but avoid using ointments and creams.	

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## Anyone can suffer a heat illness, but by taking a few simple precautions, they can be prevented:

- Condition yourself for working in hot environments start slowly then build up to more physical work. Allow your body to adjust over a few days.
- Drink lots of liquids. Don't wait until you're thirsty, by then, there's a good chance you're already on your way to being dehydrated. Electrolyte drinks are good for replacing both water and minerals lost through sweating. Never drink alcohol, and avoid caffeinated beverages like coffee and pop.
- Take a break if you notice you're getting a headache or you start feeling overheated. Cool off for a few minutes before going back to work.
- Wear light weight, light colored clothing when working out in the sun.
- Take advantage of fans and air-conditioners.
- Get enough sleep at night.

With a little caution and common sense, you can avoid heat illnesses.

What questions do you have?

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