



**DEPARTMENT OF DEFENSE
DEPENDENTS SCHOOLS
OFFICE OF THE DIRECTOR, EUROPE
UNIT 29649 BOX 7000
APO AE 09096**

August 12, 2003

MEMORANDUM FOR SCHOOL PRINCIPALS, DoDDS-EUROPE

SUBJECT: Excessive Heat And School Operations -- Guidance For Principals

The recent heat wave in Europe has elevated concerns about the health and safety of students and employees as we approach a new school year. It is critical that school administrators and staff be well informed about heat related issues and plan appropriately.

The following guidance will provide direction to principals regarding heat related issues and school operations. Hopefully, heat conditions will improve dramatically before teachers and students return; however, we need to be prepared. It is important to remember that no single policy or practice is applicable to all schools across the European area. Temperatures vary across Europe. Facility designs, ventilation, and configurations vary as well. Some schools may need to modify a schedule. Others may need to curtail the school day, outdoor activities, and/or athletic practices. Many may not need any adjustments. In each case, the decisions about modifications are local ones tailored to the situation and community.

The safety and health of students and employees are always the most important considerations. It is suggested that principals coordinate with the complex and school liaison officers/installation commanders to bring to their attention that the release of students because of heat impacting on the health and well-being of the students is a community commander decision. The release of school employees would be tied to the commander's release of all non-essential civilian employees in his/her AOR. All of this would be similar to a snow day or no water/electrical service release. Principals should discuss plans or proposals with District Superintendents as always.

What is Excessive Heat?

While most heat waves hit when school is not in session, temperatures can occasionally soar into the 90s in May, June, and September. Like wind to cold, humidity adds to the effects of heat. The National Weather Service (NWS) uses a "heat index" (see attached) to combine these effects, see <http://www.wrh.noaa.gov/sacramento/html/heatindex.html>. In the States, the NWS will issue a heat advisory when the "heat index" is expected to reach 105 F and an excessive heat warning when it is expected to reach or exceed 120 F. This may be a helpful tool for principals to use in working heat related issues with community commanders and local health/safety officials. **Source:** NWS

Principals need to monitor temperatures in classrooms and workplaces. Thermometers can be locally purchased and mounted in a couple of locations in each school. If extreme temperatures adversely affect a community, school officials should consult with local LURs/FRSs, community commanders and other resources on the best ways to deal with these situations. It is important to remember that any changes to school schedules affect a variety of community agencies. Coordination must always occur with the School Liaison Officer, DoDDS School Bus Office, Child Development Services, AAFES Lunch Program, security or military police personnel who provide protection for school buses or monitor the arrival and departure of students, and local military Public Affairs Offices to communicate changes.

Health and Safety of Employees and Students

The Center for Disease Control (CDC) says that each year more people in the United States die from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined. You can help by learning the warning signs of heat stroke and heat exhaustion and then checking on your employees and students frequently.

Supervisors should be sensitive to the effects of heat in the workplace on students, staff and general school operations and should take any precautions necessary to ensure the health and welfare of all. Principals should discuss concerns and coordinate decisions with local commanders and faculty/union representatives.

When an employee or student exhibits signs of heat related illnesses, they should be provided with medical attention immediately. Those who are physically ill or have chronic medical conditions (asthma, heart disease or high blood pressure) are more at risk. School nurses should identify a cool location that can be used as a temporary refuge/heat-relief shelter for anyone who feels ill from the heat. Parents should be contacted whenever a student has signs of heat related injuries. Employees should be offered sick leave if there is any doubt about their well being in an extreme temperature situation. School principals and nurses should communicate and coordinate with medical treatment facilities regarding local procedures and concerns. **Source:** CDC

Maintenance of Technology

Technology has become an indispensable part of our school environment. However, the abundance of computers and other related technology works to increase the temperature of classrooms and offices. Please follow the following guidelines:

- All Dell Computer equipment is rated for operation between 50 and 95 degrees (F) - if you find that the spaces where you have computers located, offices, classrooms etc., have exceeded 95, turn the computers off.
- Servers are rated at the following temperatures, if your spaces exceed this temperature, please send out a general message to other districts and this office, and turn the servers off.

All Models of Dell Systems Servers: 50 - 95 F

All Models of Compaq Systems Servers: 32-102 F

Enterasys LAN Switches/Hubs: Matrix E6 41 - 104 F

Verical Horizon LAN Switches: 32 - 102 F

Cisco Systems Routers: 32 - 104 F

HP printers projected to be approx. 95 - 100 F.

- All equipment should be powered off when not absolutely necessary. This will extend the life of the equipment and generate less heat in the working environment. Areas such as the network closets are essential to support our data requirements but will do us no good if they fail due to excessive heat. DTLs should contact Lenny Dobson at DoDDS Europe (DSN 338-7208) ASAP regarding any server or LAN system components that are not environmentally controlled.

Maintenance of Equipments Lights and Appliances

Temperatures are increased when equipments, appliances, and lights are operated continuously. Classroom and offices are cooler when these devices are turned off except when needed. Equipment should be turned off instead of left in a standby mode. Principals should work with staff and students to monitor the equipment/devices listed below:

- Computers
- Printers
- Monitors
- Televisions, VCRs, and DVD Players
- Lights and Lamps
- Transformers
- Other Electronic Equipment
- Fans (except when in use)

Classroom Pets and Animals

In some cases, animals are allowed in classrooms. High temperatures, direct sunlight, and a lack of ventilation can be dangerous for pets as well. Every precaution should be taken to keep animals in a cool and well ventilated area.

Water, Clothing and Sunscreen

It is critical that a supply of cool water is available for students and staff. Common sense dictates that employees and students drink plenty of fluid, replace salts and minerals, and wear appropriate clothing and sunscreen. During hot weather everyone will need to drink more liquid than one's thirst indicates. Increase your fluid intake, regardless of your activity level. **Source:** CDC

Principals should ensure:

- Water fountains are inspected and repaired prior to the return of school.
- Staff and students are encouraged to bring supplies of water to school for use.
- Policies that restrict the consumption of bottled water in classroom are modified for the duration of any heat emergency.

- Bottled water is readily available for students and staff for purchase in the lunchroom or school store.
- Supplies of cool water and ice are readily available for health officials in schools to assist any students or employees exhibiting signs of heat related illness,

Recess, outdoor physical/regular education, and sports activities pose health threats for students as well. Sunburn should be avoided because it damages the skin. Although the discomfort is usually minor and healing often occurs in about a week, more severe sunburn may require medical attention. Symptoms of sunburn are well known: skin becomes red, painful, and abnormally warm after sun exposure.

Employees and students should protect themselves from the sun by wearing a wide-brimmed hat (also keeps you cooler) and sunglasses and by putting on sunscreen. The CDC recommends that people wear lightweight, light-colored, or loose-fitting clothing. Some dress codes may need to be modified to allow the wearing of appropriate school attire for the duration of the excessive heat.

Principals may have to modify the times that students are exposed to the sun in extreme temperatures. Outdoor activities such as recess and physical education may be unadvisable. Sports practices and competitions may have to be scheduled in the early morning hours or well after the sun goes down depending on the situation.

Athletics

Principals, athletic directors, and coaches must use extreme caution and judgment when scheduling or conducting athletic practices or clinics. Seek advice from local medical authorities, observe posted installation/command safety advisories regarding exercise and outdoor activities, and consider alternative times for practice and/or conditioning.

Coaches/athletic directors who attended recent certification training received a copy of a CD ROM titled, Tackling the Heat. It was produced by the Gatorade Sports Science Institute and contains great information for coaches and athletes. Use of this resource does not in any way endorse the Gatorade Corporation or its products. It is the principals responsibility to set expectations with athletic directors and coaches regarding any athletic activities conducted during periods of hot weather or extreme heat. The safety of students comes first. Principals should check with their athletic directors or with Karen Seadore (DSN 338-7801) to access the resources on this CD ROM or visit the Gatorade Sports Science Institute Website at <http://www.gssiweb.com>.

Resources for Principals

Internal:

School Nurses
District Safety and Security Officers
DoDDS-E IT Division
District Administrative Technologists (AT)
School ATs

External:

Occupational Safety and Health (OSHA) www.osha.gov


Center for Disease Control (CDC) www.cdc.gov

National Weather Service (NWS) <http://www.wrh.noaa.gov>

Gatorade Sports Science Institute <http://www.gssiweb.com>

Additional information published by the CDC, Gatorade Sports Science Institute, and the NWS are attached for reference. Please share with supervisors, coaches, nurses, and any other DoDDS personnel who are involved with student activities or who are aware of athletic camps and practices - even if these activities are not officially sanctioned by DoDDS.

Questions regarding excessive heat and appropriate responses can be addressed to Mr. Harvey Gerry, DoDDS-E Chief of Staff at DSN 338-7812.


CANDACE M. RANSING
Deputy Director, DoDDS-Europe

Attachments:

Heat Index Chart (NWS)

The Heat Equation (OSHA)

Extreme Heat (CDC)

Football Coaches' Guide (Gatorade Sports Science Institute)

Preventing Heat Illness (Gatorade Sports Science Institute)

cc:

Division Chiefs, DoDDS-E

DoDDS-E Safety and Security

Dr. Gretchen Ridgeway, DoDDS-E Education Division

Ms. Karen Seadore, DoDDS-E Education Division

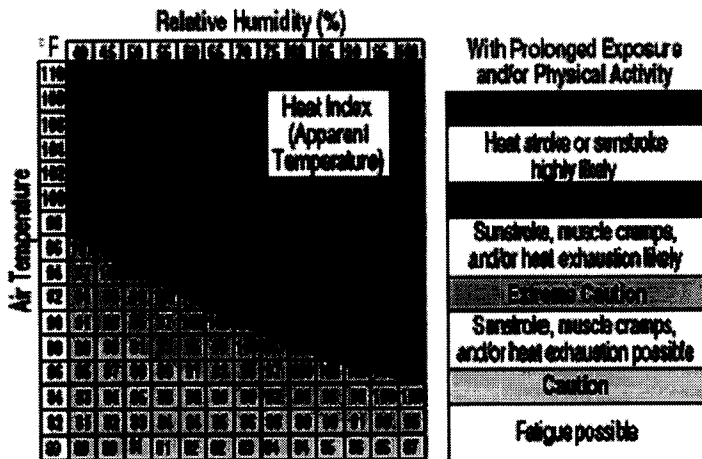
Dr. Ed Tyner, DoDDS-E Education Division

Superintendents, DoDDS-E

Service School Liaisons

Heat Index Chart
 National Weather Service <http://www.wrh.noaa.gov>
Using Apparent Temperature Chart

The chart below lists the apparent temperatures in degrees Fahrenheit (F). The chart is read by finding the ambient temperature on the left vertical column and the Relative Humidity (RH) across the top horizontal row and reading where these values intersect. If the ambient temperature is 90 degrees and the RH is 60 percent, then the apparent temperature is 100 degrees.



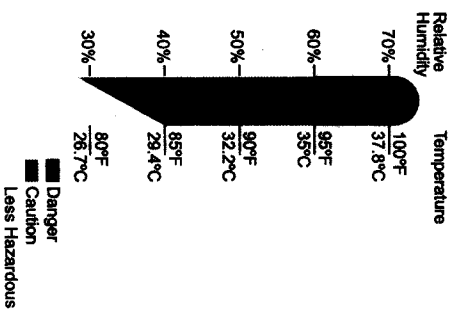
Effects of Heat	
Heat Index	Possible Heat Disorder
80-90 F	Fatigue possible
90-105 F	Sunstroke, heat cramps, heat exhaustion possible
105-130 F	Sunstroke, heat cramps, heat exhaustion likely - Heat stroke possible
130 F or greater	Heat stroke/Sun stroke highly likely



The Heat Equation

**HIGH TEMPERATURE + HIGH HUMIDITY
+ PHYSICAL WORK = HEAT ILLNESS**

When the body is unable to cool itself through sweating, serious heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, heat exhaustion could progress to heat stroke and possible death.



U.S. Department of Labor
Occupational Safety and Health Administration

OSHA 3154
2002

Heat Exhaustion

What are the symptoms?

HEADACHES; DIZZINESS OR LIGHTHEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN

What should you do?

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Heat Stroke—A Medical Emergency

What are the symptoms?

DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE

What should you do?

- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

How can you protect yourself and your coworkers?

- Learn the signs and symptoms of heat-induced illnesses and how to respond.
- Train your workforce about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Build up tolerance to the heat and the work activity slowly. This usually takes about 2 weeks.
- Use the buddy system, with people working in pairs.
- Drink plenty of cool water, about a cup every 15 to 20 minutes.
- Wear light, loose-fitting, breathable clothing, such as cotton.
- Take frequent, short breaks in cool, shaded areas to allow the body to cool down.
- Avoid eating large meals before working in hot environments.
- Avoid alcohol or beverages with caffeine. These make the body lose water and increase the risk for heat illnesses.

What factors put you at increased risk?

- Taking certain medications. Check with your health-care provider or pharmacist to see if any medicines you are taking affect you when working in hot environments.
- Having a previous heat-induced illness.
- Wearing personal protective equipment such as a respirator or protective suit.



Fear of High Utility Bills Could Worsen Heat-Related Illness This Summer

Each year more people in the United States die from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined. During 1979-1998, a total of 7,421 deaths in the United States were attributed to excessive heat exposure. On average approximately 300 people die each year from exposure to heat. This year extreme heat is of particular concern because of the energy problems facing many areas of the country. Air conditioning is the number-one protective factor against heat-related illness and death. Brownouts that last a few hours will likely have little effect on people's health. However, some people may be fearful of high utility bills and limit their use of air conditioning. Such action can place people who are already at risk for heat illness at increased risk. You can help by learning the warning signs of heat stroke and heat exhaustion and then checking on your neighbors frequently.

Temperature Overload

People suffer heat-related illness when their bodies are unable to compensate and properly cool themselves. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs.

Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate temperature include old age, youth (age 0-4), obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug use and alcohol use.

Summertime activity, whether on the playing field or the construction site, must be balanced with measures that aid the body's cooling mechanisms and prevent heat-related illness.

Beat the Heat this Summer

Tips on Preventing and Managing Heat

The best defense is prevention. Here are some *prevention tips*:

- Drink more fluids (nonalcoholic), regardless of your activity level. Don't wait until you're thirsty to drink. Warning: If your doctor generally limits the amount of fluid you drink or has you on water pills, ask him how much you should drink while the weather is hot.
- Don't drink liquids that contain caffeine, alcohol, or large amounts of sugar—these actually cause you to lose more body fluid. Also, avoid very cold drinks, because they can cause stomach cramps.
- Stay indoors and, if at all possible, stay in an air-conditioned place. If your home does not have air conditioning, go to the shopping mall or public library—even a few hours spent in air conditioning can help your body stay cooler when you go back into the heat. Call your local health department to see if there are any heat-relief shelters in your area.

- Electric fans may provide comfort, but when the temperature is in the high 90s, fans will not prevent heat-related illness. Taking a cool shower or bath, or moving to an air-conditioned place is a much better way to cool off.

If you must be out in the heat:

- Limit your outdoor activity to morning and evening hours.
- Cut down on exercise. If you must exercise, drink two to four glasses of cool, nonalcoholic fluids each hour. A sports beverage can replace the salt and minerals you lose in sweat. **Warning: If you are on a low-salt diet, talk with your doctor before drinking a sports beverage. Remember the warning in the first “tip” (above), too.**
- Try to rest often in shady areas.
- Protect yourself from the sun by wearing a wide-brimmed hat (also keeps you cooler) and sunglasses and by putting on sunscreen of SPF 15 or higher (the most effective products say “broad spectrum” or “UVA/UVB protection” on their labels).
- Wear lightweight, light-colored, loose-fitting clothing.
- **NEVER** leave anyone in a closed, parked vehicle.
- **Although any one at any time can suffer from heat-related illness, some people are at greater risk than others. Check regularly on:**

Infants and young children

People aged 65 or older

People who have a mental illness

Those who are physically ill, especially with heart disease or high blood pressure

Visit adults at risk at least twice a day and closely watch them for signs of heat exhaustion or heat stroke. Infants and young children, of course, need much more frequent watching.

Disclaimer

These self-help measures are not a substitute for medical care but may help you recognize and respond promptly to warning signs of trouble. Your best defense against heat-related illness is prevention. Staying cool and making simple changes in your fluid intake, activities, and clothing during hot weather can help you remain safe and healthy.

Hot Weather Health Emergencies

Even short periods of high temperatures can cause serious health problems. Two common problems are heat stroke and heat exhaustion.

Heat Stroke

Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Recognizing Heat Stroke

Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F, orally)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

What to Do

If you see any of these signs, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the victim. Do the following:

- Get the victim to a shady area.
- **Cool the victim rapidly using whatever methods you can.** For example, immerse the victim in a tub of cool water; place the person in a cool shower; spray the victim with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the victim in a cool, wet sheet and fan him or her vigorously.
 - Monitor body temperature, and continue cooling efforts until the body temperature drops to 101-102°F.
 - If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
 - Do not give the victim alcohol to drink.
 - Get medical assistance as soon as possible.

Sometimes a victim's muscles will begin to twitch uncontrollably as a result of heat stroke. If this happens, keep the victim from injuring himself, but do not place any object in the mouth and do not give fluids. If there is vomiting, make sure the airway remains open by turning the victim on his or her side.

Heat Exhaustion

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.

Recognizing Heat Exhaustion

Warning signs of heat exhaustion include the following:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness

- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

The skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention immediately if any of the following occurs:

- Symptoms are severe.
- The victim has heart problems or high blood pressure.

Otherwise, help the victim to cool off, and seek medical attention if symptoms worsen or last longer than 1 hour.

What to Do

Cooling measures that may be effective include the following:

- Cool, nonalcoholic beverages, as directed by your physician
- Rest
- Cool shower, bath, or sponge bath
- An air-conditioned environment
- Lightweight clothing

Heat Cramps

Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.

Recognizing Heat Cramps

Heat cramps are muscle pains or spasms . usually in the abdomen, arms, or legs . that may occur in association with strenuous activity. If you have heart problems or are on a low-sodium diet, get medical attention for heat cramps.

What to Do

If medical attention is not necessary, take these steps:

- Stop all activity, and sit quietly in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous activity for a few hours after the cramps subside, because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention for heat cramps if they do not subside in 1 hour.

Sunburn

Sunburn should be avoided because it damages the skin. Although the discomfort is usually minor and healing often occurs in about a week, a more severe sunburn may require medical attention.

Recognizing Sunburn

Symptoms of sunburn are well known: skin becomes red, painful, and abnormally warm after sun exposure.

What to Do

Consult a doctor if the sunburn affects an infant younger than 1 year of age or if these symptoms are present:

- Fever
- Fluid-filled blisters
- Severe pain

Also, remember these tips when treating sunburn:

- Avoid repeated sun exposure.
- Apply cold compresses or immerse the sunburned area in cool water.
- Apply moisturizing lotion to affected areas. Do not use salve, butter, or ointment.
- Do not break blisters.

Heat Rash

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can occur at any age but is most common in young children.

Recognizing Heat Rash

Heat rash 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 breasts, and in elbow creases.

What to Do

The best treatment for heat rash 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 or creams . they keep the skin warm and moist and may make the condition worse.

Treating heat rash is simple and usually does not require medical assistance. Other heat-related problems can be much more severe.

Frequently Asked Questions for Extreme Heat

1. ***What happens to the body as a result of exposure to extreme heat?*** People suffer heat-related illness when the body's temperature control system is overloaded. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs. Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate temperature include old age, youth (age 0-4), obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug use and alcohol use.

2. ***Who is at greatest risk for heat-related illness?*** Those at greatest risk for heat-related illness include infants and children up to four years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications.

3. ***What is heat stroke?*** Heat stroke is the most serious heat-related illness. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

4. ***What are the warning signs of a heat stroke?*** Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

5. ***What should I do if I see someone with any of the warning signs of heat stroke?***

If you see any of these signs, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the victim. Do the following:

- Get the victim to a shady area.
- Cool the victim rapidly, using whatever methods you can. For example, immerse the victim in a tub of cool water; place the person in a cool shower; spray the victim with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the victim in a cool, wet sheet and fan him or her vigorously.
- Monitor body temperature and continue cooling efforts until the body temperature drops to 101-102°F.
- If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
- Do not give the victim alcohol to drink.
- Get medical assistance as soon as possible.

6. ***What is heat exhaustion?*** Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Those most prone to heat exhaustion are elderly people, those with high blood pressure, and those working or exercising in a hot environment.

7. ***What are the warning signs of heat exhaustion?***

The warning signs of heat exhaustion include the following:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

The skin may be cool and moist. The pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. See medical attention if symptoms worsen or last longer than one hour.

8. ***What steps can be taken to cool the body during heat exhaustion?***

Drink cool, nonalcoholic beverages.

- Rest.
- Take a cool shower, bath, or sponge bath.
- Seek an air-conditioned environment.
- Wear lightweight clothing.

9. ***What are heat cramps and who is affected?*** Heat cramps are muscle pains or spasms – usually in the abdomen, arms, or legs – that may occur in association with strenuous activity. People who sweat a lot during strenuous activity are prone to heat cramps. This sweating depletes the body's salt and moisture. The low salt level in the muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion. If you have heart problems or are on a low-sodium diet, seek medical attention for heat cramps.

10. ***What should I do if I have heat cramps?***

If medical attention is not necessary, take the following steps:

- Stop all activity and sit quietly in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous activity for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention for heat cramps if they do not subside in 1 hour.

11. ***What is heat rash?*** Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can occur at any age but is most common in young children. Heat rash 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 breasts, and in elbow creases.

12. ***What is the best treatment for heat rash?*** The best treatment for heat rash 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 or creams . they keep the skin warm and moist and may make the condition worse.

13. ***Can medications increase the risk of heat-related illness?***

The risk for heat-related illness and death may increase among people using the following drugs: (1) psychotropics, which affect psychic function, behavior, or experience (e.g. haloperidol or chlorpromazine); (2) medications for Parkinson's disease, because they can inhibit perspiration; and (3) tranquilizers such as phenothiazines, butyrophenones, and thiozanthenes.

14. ***How effective are electric fans in preventing heat-related illness?*** Electric fans may provide comfort, but when the temperature is in the high 90s, fans will not prevent heat-related illness. Taking a cool shower or bath or moving to an air-conditioned place is a much better way to cool off. Air conditioning is the strongest protective factor against heat-related illness. Exposure to air conditioning for even a few hours a day will reduce the risk for heat-related illness. Consider visiting a shopping mall or public library for a few hours.

15. ***How can people protect their health when temperatures are extremely high?*** Remember to keep cool and use common sense. Drink plenty of fluid, replace salts and minerals, wear appropriate clothing and sunscreen, pace yourself, stay cool indoors, schedule outdoor activities carefully, use a buddy system, monitor those at risk, and adjust to the environment.

16. ***How much should I drink during hot weather?*** During hot weather you will need to drink more liquid than your thirst indicates. Increase your fluid intake, regardless of your activity level. During heavy exercise in a hot environment, drink two to four glasses (16-32 ounces) of cool fluids each hour. Avoid drinks containing alcohol because they will actually cause you to lose more fluid.

17. ***Should I take salt tablets during hot weather?***

Do not take salt tablets unless directed by your doctor. Heavy sweating removes salt and minerals from the body. These are necessary for your body and must be replaced. The easiest and safest way to do this is through your diet. Drink fruit juice or a sports beverage when you exercise or work in the heat.

18. ***What is the best clothing for hot weather or a heat wave?*** Wear as little clothing as possible when you are at home. Choose lightweight, light-colored, loose-fitting clothing. In the hot sun, a wide-brimmed hat will provide shade and keep the head cool. If you must go outdoors, be sure to apply sunscreen 30 minutes prior to going out and continue to reapply according to the package directions. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. It also causes pain and damages the skin.

19. ***What should I do if I work in a hot environment?*** Pace yourself. If you are not accustomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity. Get into a cool area or at least in the shade, and rest, especially if you become lightheaded, confused, weak, or faint.

Football Coaches' Guide to Heat Illness and Hydration

By JACQUELINE R. BERNING, PH.D., R.D., assistant professor at the University of Colorado (Colo. Springs, CO) and sports nutrition consultant for the Denver Broncos football team

Fluid replacement is an important nutritional concern for football players. Approximately 60% of body weight is water. As a football player trains and competes, fluid is lost through the skin as sweat, through the lungs as he breathes and as urine. If fluid is not replaced at regular intervals during a game or training it can quickly lead to dehydration.

Football Gear Is For Protection, Not Cooling

Football players are at increased risk of dehydration in part because of their equipment needs. Football gear is designed for protection, but the necessary padding does not allow for quick evaporation or cooling. It's not uncommon for players to lose anywhere between 5-15 pounds during a game or workout, especially during two-a-day practices.

In addition, a player's helmet substantially reduces the body's ability to release heat, thus increasing body temperature and the risk of heat illness. Players that are dehydrated will fatigue earlier, lose coordination skills and have a higher risk of heat exhaustion, heat illness or even heat stroke. If a football player wants to maximize his athletic potential he should make sure that he is well-hydrated throughout the game or practice.

What Fluids Should Players Consume?

Research shows that a sports drink containing 6% carbohydrate (14g/8 oz serving) can be absorbed in the body as rapidly as water. But unlike water, a sports drink can provide energy to the working muscles, delay fatigue and improve performance. Players that consume a sports drink can maintain higher energy levels at a time when energy stores are becoming depleted. Players who dilute sports drinks don't get enough carbohydrate to maintain energy levels. Also, drinking beverages that have a high carbohydrate level, like soft drinks and some fruit juices, can slow fluid absorption.

Don't Wait Until You're Thirsty

- ✓ Thirst mechanisms don't kick in until a player has lost about 2% of his body weight as sweat. In other words, a defensive player who weighs 250 pounds may lose 5 pounds before he even becomes thirsty. Unfortunately, this small amount of fluid loss can hurt performance skills and the player may be fatigued before he starts to drink!
- ✓ Players often drink to quench their mouth thirst. If a player only drinks to quench his thirst he may be replacing only 1/2 to 2/3 of the fluids lost. As a result, he will start the next practice or workout in a state of dehydration. Football players need to drink throughout the day whether they are thirsty or not.

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Fluid Intake Recommendations

- ✓ Players should have unlimited access to fluids (sports drinks and water) throughout the game or workout.
- ✓ Weigh players before and after practice. For each pound lost during the workout, an athlete should consume at least 20 oz of fluid. If this recommended amount of fluid isn't consumed, the player must replace 80% of lost weight by next practice to avoid dehydration.
- ✓ Check the color of the urine. If it is a dark, gold color (like apple juice) the player is already slightly dehydrated. If it is very pale yellow (like lemonade) then he is on the way to being hydrated.
- ✓ Players should consume 17-20 oz of fluid two hours prior to the start of the game or workout.
- ✓ Players should drink during exercise to minimize losses in body weight but should not over drink.
- ✓ Avoid carbonated drinks. They can cause bloating and may decrease the amount of fluid consumed.
- ✓ Avoid caffeinated beverages and alcohol as they cause the body to lose body fluids.



For more information on sports performance and nutrition, visit the Gatorade Sports Science Institute at www.gssiweb.com.

Preventing Heat Illness: Keeping Athletes from Falling into Danger Zones

Robert Murray, Ph.D., FACSM, Director, Gatorade Sports Science Institute
Randy Eichner, M.D., Team Physician, University of Oklahoma

- **Formula for Disaster:** Heat illness is an ever-present risk when athletes are engaged in high-intensity exercise. In football, the risk of heatstroke is increasingly more likely during high-intensity drills on a hot, humid day, particularly in an overweight, out-of-shape, unacclimatized and dehydrated player wearing a dark-colored uniform and helmet. There are, however, a variety of steps that coaches and athletic trainers can take to increase the safety of play in hot temperatures and diminish the risk of dehydration and associated heat related injuries.
- **Keep Them Cool:** The cooler they stay, the harder they can play. Frequent breaks to allow players to drink and cool down should be part of any successful football program. Fluid should always be available at arm's reach. Provide shaded areas and cooling units during rest breaks. Take advantage of cool breezes or fans to increase cooling. Practice duration and intensity should be reduced while increasing the frequency and duration of rest breaks. Have players sit in cold water tubs right after practice. Also, spreading out two-a-days by holding team meetings and meals between the two practices allows players to be cooler during both practices and provides another opportunity for rest and recovery.
- **Hydration is Key:** An important preventative step is to stay properly hydrated. That means both the right amount and the right kind of fluid needs to be available to players at all times. Give opportunities and encourage players to drink often. Water is simply not enough. Research consistently shows that drinking an optimally formulated sports drink, like Gatorade, before, during and after practice and games, helps athletes stay better hydrated than water alone. Athletes who drink only water have been shown to have poor voluntary intake and increased urine production. Water does not contain everything football players need to replace what they're losing in their sweat. Water has no electrolytes to promote fluid retention and no carbohydrates to fuel the brain and muscles.
- **Gear Up for the Heat:** High temperatures and humidity can quickly overwhelm even well hydrated and acclimated athletes. A few days of moderate physical activity, lasting from 60 to 90 minutes will provide some initial acclimatization to the heat (greater blood volume, better sweat response, improved drinking), a critical step in reducing the risk of heat illness. Ideally, this should be accomplished just prior to the start of summer camp.
- **Focus on High-Risk Athletes:** Larger athletes, especially those who are unfit, overweight and not acclimatized to the heat, are high-risk candidates for heatstroke. Even when they are properly hydrated, physically fit and acclimatized, some athletes can heat up faster than they cool down. An important safety measure is to make sure that athletes' temperatures and body weights are at their normal levels before practice, especially if they experienced symptoms of heat illness the previous day.



- **Limit Use of Full Pads When Heat and Humidity Rise:** Wearing full pads and helmets is obviously part of most football practices. But, when possible, coaches should move full-pad practices to early mornings or evenings the temperature is the lowest. Working out in full pads during warm, humid weather can literally turn an athlete into a "heat bomb."
- **Keep an Eye on Over-Motivated Athletes:** Pride can play a huge factor in heat-related injuries. Many athletes are determined to succeed no matter the cost and fail to alert coaches and athletic trainers when they develop heatstroke symptoms. While they should definitely be aware of the signs and symptoms, a player can not be relied upon to correctly diagnose heat illness. Symptoms include belligerence, confusion and irrational behavior. These players simply won't recognize the need to stop and will get angry when told to do so.
- **Train Them, Don't Strain Them:** Athletes can not be expected to perform high-intensity exercise until they are sufficiently acclimated to the heat. Most football players begin to show improved heat acclimation within four to five days, with ten to 14 days needed for most physiological adaptations to occur. Until that time, workout intensity and duration should be increased gradually.
- **Monitor Medications:** Some prescription, over-the-counter and recreational drugs can adversely influence heat production (by increasing metabolism) and heat loss (by decreasing sweating and/or skin blood flow). The risk of heat illness is much greater with individuals who consume these drugs. Instruct players to advise an athletic trainer or doctor about all the medications they are taking, both prescription and over-the-counter drugs.
- **Behavioral Risk Factors:** Athletes who have not been sleeping well, have recently been ill (with the common cold or flu, especially when accompanied by vomiting or diarrhea), are big consumers of alcohol and those who are prone to dehydration (chronic under-drinkers on the field) are at increased risk of heat illness.
- **Cooling Cues:** Players who are at high risk of heat illness may respond well to pre-cooling before practice and games in hot weather. Research shows that 15 to 30 minutes in a cold bath will slightly reduce resting core temperature, increasing the safety buffer for heat problems. Another benefit: improved performance in hot weather. Using cold towels or splashing cold water on the face, head and neck are no substitutes for adequate hydration and minimal clothing during exercise in the heat. The psychological relief associated with a splash of cold water has no effect on core temperature. In emergency situations, cool first and transport second. Immersing a heat-stricken player in a tub of ice water is the best way to cool fast. Cellular damage from overheating occurs quickly, so every effort must be made for immediate cooling.

**For more information on hydration and heat illness,
check out the GSSI website at www.gssiweb.com.**