SISC Risk Management Bulletin

Heat Stress and Athletic Participation

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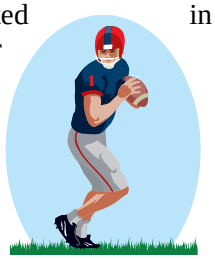
There are no Excuses for Heatstroke Deaths.

Early fall football, cross country, soccer and field hockey practices are often conducted in very hot and humid weather conditions. Due to the equipment and uniforms needed in football, most of the heat problems have been associated with football. From 1995 through the 2007 football season there have been 33 heat stroke football deaths in the United States. High school football accounted for 25 of these heat stroke deaths. This is not acceptable. There are no excuses for heatstroke deaths, if the proper precautions are taken. During hot weather conditions, the athlete is subject to the following:



HEAT CRAMPS — Painful cramps involving abdominal muscles and extremities caused by intense, prolonged exercise in the heat and depletion of electrolytes and water due to profuse sweating.

HEAT EXHAUSTION/HEAT SYNCOPE — Exhaustion, nausea, vomiting, dizziness, weakness, fainting, and elevated body temperature.

HEAT STROKE — An acute medical emergency related to thermoregulatory failure that is associated with nausea, seizures, disorientation, and possibly unconsciousness or coma. It may occur suddenly without being preceded by any other clinical signs. The individual usually has a high body temperature and a hot dry skin (heat stroke victims, contrary to popular belief, may sweat profusely).

It is believed that the above-mentioned heat stress problems can be controlled provided certain precautions are taken. According to the American Academy of Pediatrics Committee on Sports Medicine, heat related illnesses are all preventable ("Sports Medicine: Health Care for Young Athletes," American Academy of Pediatrics, July 2000). The following practices and precautions are recommended:

1. Each athlete should have a physical examination, with a medical history, when first entering a program and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included. State High School Association recommendations should be followed.

2. It is clear that top physical performance can only be achieved by an athlete who is in top physical condition. Lack of physical fitness impairs the performance of an athlete who participates in high temperatures. Coaches should know the PHYSICAL CONDITION of their athletes and set practice schedules accordingly.

3. Along with physical conditioning, the factor of acclimatization to heat is important. Acclimatization is the process of becoming adjusted to heat and it is essential to provide for GRADUAL ACCLIMATIZATION TO HOT WEATHER. It is necessary for an athlete to exercise in the heat if he/she is to become acclimatized to it. It is suggested that a graduated physical conditioning program be used and that 80 percent acclimatization can be expected to occur after the first seven to ten days. Final stages

of acclimatization to heat are marked by increased sweating and reduced salt concentration in the sweat.

4. The old idea that water should be withheld from athletes during workouts has NO SCIENTIFIC FOUNDATION. The most important safeguard to the health of the athlete is the replacement of water. Cold water must be on the field and readily available to the athletes at all times. It is recommended that a minimum ten-minute water break be schedules for every twenty minutes of heavy exercise in the heat. Athletes should rest in a shaded area during the break. Fluid replacement should take place before, during, and after activity. COLD WATER OR OTHER LIQUIDS SHOULD BE AVAILABLE IN UNLIMITED QUANTITIES.

5. Check and be sure athletes are drinking the water. Replacement by thirst alone is inadequate. Test the air prior to practice or game using a wet bulb, globe, temperature index (WBGT index) which is based on the combined effects of air temperature, relative humidity, radiant heat, and air movement. The following precautions are recommended when using the WBGT index:

   Below 65º — Low risk
   65º-73º — Moderate risk
   73º-82º — High risk
   82º plus — Very high risk

6. An alternative method for assessing heat and humidity is the weather guide or heat index. Refer to the NFHS Sports Medicine Handbook section on heat related illness published by the NFHS. Figure 1 is an example of a heat-humidity index table that defines low, moderate, high, and very high risk zones.

7. Cooling by evaporation is proportional to the area of the skin exposed. In extremely hot and humid weather, reduce the amount of clothing covering the body as much as possible. NEVER USE RUBBERIZED CLOTHING.

8. Athletes should weight each day before and after practice and WEIGHT CHARTS CHECKED. Generally, a three to five percent weight loss is in the danger zone. Over a three percent weight loss, the athlete should not be allowed to practice in hot and humid conditions. Observe the athletes closely under all conditions. Do not allow athletes to practice until they have adequately replaced their weight.

9. Observe athletes carefully for signs of trouble, particularly athletes who lose significant weight and the eager athlete who constantly competes at his/her capacity. Some trouble signs are nausea, incoherence, fatigue, weakness, vomiting, cramps, weak rapid pulse, visual disturbance, and unsteadiness.

10. Teams that encounter hot weather during the season through travel or following an unseasonably cool period may be physically fit but will not be environmentally fit. Coaches in this situation should follow the above recommendations and substitute more frequently during games.

11. Know what to do in case of an emergency and have your emergency plans written, with copies to all your staff. Be familiar with immediate first aid practices and pre-arranged procedures for obtaining medical care, including ambulance service.

HEAT STROKE — THIS IS A MEDICAL EMERGENCY — DELAY COULD BE FATAL. Immediately cool body while waiting for transfer to a hospital. Remove clothing and immerse torso in ice-cold water. Immersion therapy has the best cooling rates. If not available, rapidly rotate ice water towels combined with ice packs. Continue cooling efforts until EMS arrives.

HEAT EXHAUSTION — OBTAIN MEDICAL CARE AT ONCE. Cool body as you would for heat stroke while waiting for transfer to hospital. Give fluids if athlete is able to swallow and is conscious.

SUMMARY — The main problem associated with exercising in the hot weather is water loss through sweating. Water loss is best replaced by allowing the athlete unrestricted access to water. Water breaks two or three times every hour are better than one break an hour. The best method is to have water available at all times and to allow the athlete to drink water whenever he/she needs it. Never restrict the amount of water an athlete drinks, and be sure the athletes are drinking the water. The small amount of salt lost in sweat is adequately replaced by salting food at meals. Talk to your medical personnel concerning emergency treatment plans.

NATIONAL ATHLETIC TRAINERS ASSOCIATION HEAT GUIDELINES

Due to the heat stroke deaths of 39 football players (29 high school, 7 college, 2 professional, and 1 sandlot) from 1995 through 2008, the National Athletic Trainers Association (NATA) released a statement on pre-season heat acclimatization guidelines for secondary school athletes. The release appeared in the June 2009 issue of the *Journal of Athletic Training*. The statement recommendations are as follows:

- During the first five days of the heat acclimatization period, athletes may not participate in more than one practice a day.
- Total practice time should not exceed three hours per day.
- A one-hour maximum walk-through is permitted during the first five days of the acclimatization period, but there must be a three-hour recovery period between the practice and walk-through (or vice versa).
- During the first two days of practice, only helmets are allowed. During days three to five, only helmets and shoulder pads worn.
- On day six all protective equipment may be worn and full contact allowed.
- On day six through day 14 of practice, double practice sessions must be followed by a single practice day.
- On double practice days neither practice should exceed three hours, and both practices combined should not be more than five hours in duration. The two practices should be separated by at least three hours in a cool environment.
- Due to the risk of heat illness in pre-season practice, the consensus statement recommends that an athletic trainer be on-site before, during, and after all practices.

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FOR MORE INFORMATION — The information above appeared in the newsletter From the Gym to the Jury. The publication is a bi-monthly on-line newsletter designed to help protect sports programs from costly injuries, liability, and lawsuits. The newsletter is a nationally acclaimed source for legal trends and risk management strategies for sports programs.

Check out their website at **www.gym2jury.com** for subscription information.