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** Part III -- Heat-related illnesses -- don't blame them all on the sun.

HEAT-RELATED ILLNESSES

DALLAS--After a cold winter, most of us can't wait to shed the sweaters and head out into the sun. But for many the summer heat poses a life-threatening danger. Those living in hot and humid climates are particularly susceptible to heat-related problems.

Not only climate, but lifestyle, can contribute to heat illness. Nationwide, heatstroke is second only to head and spinal injuries as the leading cause of death in athletes, said Dr. Ron Anderson, associate professor of Internal Medicine at The University of Texas Health Science Center at Dallas and chief executive officer at Parkland Memorial Hospital.

Evaporation of sweat, the body's "radiator system" that cools the body, accounts for about 20 percent of the body's heat loss, said Anderson. Temperature and movement of air also influence the cooling process. The more moisture in the air (humidity), the more difficult it is for the body to cool itself because the sweat evaporates more slowly. Some breeze, natural or induced, hastens cooling.

Nearly every organ of the body is affected by severe heat illness, said Anderson. In particular, cardiac problems, renal failure and neuromuscular difficulties can begin within minutes of a heatstroke.

Heatstroke

Heatstroke is much more dangerous than other heat illnesses. It falls into two categories--exertional and classical, explains Anderson.

Exertional heatstroke occurs primarily in persons previously normal but who are participating in strenuous muscle activity in a hot environment. Athletes, pushing themselves to perform beyond previous limits, are especially vulnerable.

Classical heatstroke more often appears as an epidemic affecting the elderly, the very young, the frail and the poor during sustained heat waves.

Victims suffering exertional heatstroke have moist skin when first seen, whereas with classical, the skin is hot and dry. Anderson said both types of heatstroke can lead to hyperventilation, disorientation, confusion, coma and seizures. Other signs are weakness, dizziness and fatigue.

"Whether classical or exertional, almost every organ system is in jeopardy of functional and/or structural damage," Anderson explained. Many factors may predispose a person to heatstroke. Failure to acclimate (slowly build up tolerance to the heat) is the most common reason healthy, normal humans suffer heatstroke. Other contributors to heat illness may be salt and water depletion, heat intolerance, acute infection or fever and mild to moderate obesity. In addition, some diseases may precipitate heatstroke. Cardiovascular diseases are the most common predisposing illnesses that contribute to heatstroke in the elderly. Endocrine disturbances such as diabetes, alcoholism, malnutrition, impaired sweat production (resulting from a thermal burn, barbiturate

(over)

poisoning or previous heatstroke), potassium deficiency or the use of a variety of drugs may also impair heat dissipation and precipitate heatstroke.

Heat Exhaustion

A slightly less serious disorder, heat exhaustion, is caused by sodium deficiency, water deficiency or both.

Several days of exposure to heat usually precede heat exhaustion, which commonly occurs in epidemics brought on by weather conditions. If returned to their hot environment, those suffering from heat exhaustion face great risk of suffering a heatstroke.

Symptoms vary with the type of deficiency. Water deficiency, characterized by intense thirst, fatigue, weakness, anxiety and confusion, among others, is more likely to progress to heatstroke. Sodium depletion is evidenced by a clammy, pale appearance, giddiness and various systemic problems such as nausea, vomiting and headache. These patients do not experience intense thirst per se, said Anderson.

Heat Cramps

Cramps can occur when persons, even though acclimated and sweating normally, are working intensely in a hot environment and replace salt and water loss with water only. Often excruciatingly painful, heat cramps, caused by sodium depletion, may not appear for sometime after the person leaves the hot environment. Typically, replacement of sodium, either orally as salted fluids or intravenously as saline, promptly relieves the pain and cramping.

First Aid

Efforts to cool the patient must begin immediately!

Rapid removal of the patient from the hot environment to a cool place is imperative to survival, stressed Anderson. The time spent in heat is in direct proportion to the amount of potential damage sustained.

Remove restrictive clothing and wet the patient with cool water and use some type of fan to create movement of air. Ice can be used but care must be taken to ensure that the patient doesn't shiver,—the body's way to generate heat. Use ice indirectly, on top of a protective covering on the patient and massage extremities to continue maximum circulation.

Massage can also be used for heat cramps.

Salt tablets are not recommended as they can cause severe gastrointestinal irritation. However, insist the patient drink large amounts of fluid to which a very small amount of salt (one teaspoon per glass) has been added. Do not give the victim any drugs, stimulants (such as caffeine) or alcoholic beverages.

The victim should be taken to an emergency room as soon as possible, most appropriately by paramedics who have training in heat stroke management in route to the hospital. The hospital chosen is critical and should be one with a major emergency room capability.

Prevention

--Aside from staying in cool shelter during hottest hours, acclimation is probably the most important prevention of heat illnesses. This physiologic process can take several weeks. Activity levels should be carefully monitored -- gradually adding new exercises and avoiding concentrating on one set of muscles. Coaches must insist that athletes work up

slowly to their peak performance.

--Drink plenty of water, at least eight glasses per day.

--Never wear rubber sweatsuits to lose weight.

--Never jog during the hottest part of the day. Jog or exercise outside only in the early mornings or late evenings.

--Be particularly cautious if an individual has suffered a previous heatstroke. Such individuals, said Anderson, may be predisposed to having further heat problems.

--Frequent (at least once a day) visitations to the elderly and the frail and to those living in high-density, low-income areas may prevent many problems. Victims suffering heatstrokes were often reported as being "ill less than one day" before hospitalization or being found dead, said Anderson. These areas, because of the low percentage of air-conditioned residencies, he explained, accounted for more than 90 percent of the heatstroke cases seen in the 1978-80 Dallas heat epidemics.

--"Recently we are seeing more frequent cases involving Mexican nationals -- workers who are performing strenuous work in a hot environment," said Anderson. Educational campaigns, providing temporary housing and energy grants and donating fans and water coolers may help reduce the risk among the poor and the elderly. Past experience, said Anderson, has shown that removal of the elderly to "day care" centers was largely unsuccessful because they were reluctant to leave their homes unattended. Therefore, provision of in-home cooling devices may be preferable.

--Never leave children or pets in a closed car. Tremendous heat stress can result after just a few minutes, emphasized Anderson.

--If you or your children are involved in athletics, insist on knowing the routine, extent of activity and clothing required (i.e. adding football pads gradually) and water availability. Be sure the coach is considering everyone's safety first and foremost.

--Learn to recognize and adhere to your own limitations relating to activity in the heat.

--See a doctor immediately if you suffer any signs or symptoms of heat illness.

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