



Heat-Related Illness

Epidemiology:

Heat-related illnesses such as heat cramps, heat exhaustion and heat stroke occur when the environmental temperature and humidity exceed the body's natural ability to disperse heat. Heat-related deaths are usually preventable, but occur annually. The Centers for Disease Control and Prevention (CDC) estimated heat-related deaths for the years 1999-2003 using death certificates and including deaths where exposure to excessive natural heat was listed as the underlying cause and/or hyperthermia was listed as a contributing factor. The estimated annual mean number of deaths nationwide was 688. In Mississippi, excessive heat was listed as an underlying or contributing factor in 11 deaths in 2007 and 12 in both 2006 and 2005. Heat as a contributing or underlying cause of death is expected to be underreported, as overheating can exacerbate many existing medical conditions and may be difficult to identify without witnessing the onset of symptoms and/or the death, therefore these numbers are likely an underestimate. In Mississippi, as is true nationally, males outnumbered females, accounting for about 70% of deaths each year. Fifty-four percent were aged 65 years or older, and 15% were aged 3 years or younger.

Background:

The human body dissipates heat through two main mechanisms: 1) convection of heat from the body's core to the skin's surface through circulation, and 2) the cooling effect of evaporation of sweat into the ambient air. Sweating and resulting evaporation is the most effective means of getting rid of excess body heat. When ambient Fahrenheit temperatures reach 90° or higher, and relative humidity exceeds 90%, sweat can no longer evaporate efficiently to cool the body, so the most effective means of controlling body temperature becomes severely compromised.

Persons who are less able to dissipate heat are at especially high risk for heat-related illness. The very old and the very young are at increased risk, as are the obese, those with limited or no access to air-conditioning (and therefore the poor and the homeless) and those with heart disease and other chronic illnesses. Such people may be at particular risk if they rely on fans for cooling in closed, cramped rooms during hot weather, especially if they are unable to maintain replenishment of water lost in sweat. Fans lose cooling efficiency as ambient Fahrenheit temperatures rise into the high 90's and above. Certain medications including antihistamines, anticholinergics, α -adrenergics, pseudophedrine, β -blockers, calcium channel blockers, amphetamines, benzodiazepines, neuroleptics, tricyclic antidepressants, anticonvulsants, thyroid hormones and diuretics increase patients' risk of heat-related illness. Of particular concern this summer are the dramatic increases in fuel and energy costs which may translate to less access to cooler shelter for some people such as elderly citizens on a fixed income. Even among young, healthy, well-conditioned athletes, excessive heat can be a killer if proper precautions are ignored in scorching conditions. Individuals are less likely to have difficulties with strenuous activity under high heat and humidity conditions if given days to weeks to acclimatize.

Classically, progressive stages of heat-related disorders have been recognized: 1) **heat cramps** usually affect the calf or abdominal wall muscles, and occur among persons who sweat profusely and then consume fluids in the presence of inadequate dietary salt intake; 2) **heat exhaustion**, usually due to both water and salt depletion, is a more systemic condition which follows sustained heat stress. Persons with heat exhaustion, which may indicate imminent heatstroke, may have the following signs and symptoms:

- Headache
- Paleness
- Tiredness
- Weakness
- Nausea/vomiting
- Abdominal cramps
- Other muscle cramps, particularly leg cramps
- Dizziness/fainting
- Profuse sweating

3) **heatstroke** is characterized by hyperthermia and central nervous system dysfunction. There are two types of heatstroke, “classic” and “exertional.” Classic heatstroke occurs more often among the elderly, the chronically ill, debilitated patients and infants. It is typically seen during heat waves, longer periods of high temperature and humidity. This type of heatstroke is characterized by a core temperature of 40° C (104° F), or more and central nervous system dysfunction (usually delirium, seizures or coma), and is often accompanied by cessation of sweating. Exertional heatstroke is more common among athletes, farmers/laborers, and the military. It resembles classic heatstroke with one important difference: profuse sweating may be present in the majority of such persons and their skin may feel deceptively cool even in the presence of a high core body temperature. For practical purposes, one can think of heat-associated illnesses in terms of varying degrees of heat exhaustion (includes heat cramps) culminating in heatstroke, which can also vary in its manifestations depending on host factors such as degree of acclimatization, age, and presence of underlying illness.

Prevention:

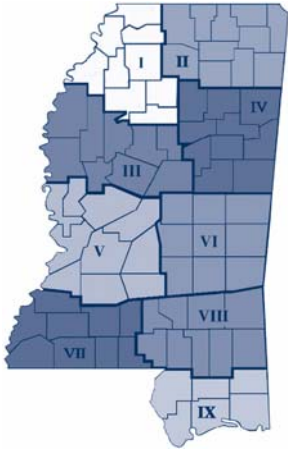
In advising patients and their communities on prevention of heatstroke and death among various groups, health care professionals may wish to stress the following:

- Stay indoors, in an air-conditioned place if possible. If the home is not air-conditioned, spend time in the public library, shopping mall, or community designated heat shelter,
- Monitor those at high risk: Persons in the community should check on elderly and physically or mentally-impaired relatives, friends, and neighbors to ensure adequate water replenishment and access to cooler shelter during hot weather. Elderly persons, physically and mentally impaired people, and others without home air-conditioning should seek or be taken to air-conditioned shelters during periods of extreme heat and humidity,
- Young children, elderly or impaired persons, or pets should never be left unattended in closed automobiles. Even with windows cracked 1.5 inches, the temperature inside a car will increase, on average, 3.1°F per 5 minutes, with 80% of the total temperature rise occurring in the first 30 minutes,
- Use common sense regarding outside exercise – plan those activities during morning and evening hours, preferably in the shade,
- Generally, increase fluid intake during hot weather. Water is the preferred liquid if the person’s dietary salt intake is adequate. Liquids that contain alcohol or large amounts of sugar cause diuresis and should not be used as a way to decrease the risk of heat-related illness,
- If exercising without air-conditioning, a sports beverage may be necessary to replace salt and minerals removed by sweat. Two to 4 glasses (16-32 ounces) per hour of cool liquid should be adequate. Salt tablets should not be used as a way to replenish salts and minerals,
- Wear light, loosely-woven garments during hot weather,
- If working or exercising with others, monitor them and ask them to monitor your condition,
- If exposure to large amounts of direct sunlight cannot be avoided, adequate sun-block products (SPF of at least 15) should be used as directed on the label. **(Continued on back)**

Mississippi

Provisional Reportable Disease Statistics

July 2008



		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	July 2008	July 2007	YTD 2008	YTD 2007
Sexually Transmitted Diseases	Primary & Secondary Syphilis	0	0	2	1	1	1	0	6	7	18	9	89	65
	Total Early Syphilis	3	1	2	1	8	2	3	7	13	40	36	212	251
	Gonorrhea	50	34	110	47	176	80	47	83	60	687	851	4,176	4,873
	Chlamydia	187	120	253	125	508	173	116	203	198	1,883	2,071	11,316	13,010
	HIV Disease	5	2	8	2	14	3	2	2	2	40	47	344	345
Mycobacterial Diseases	Pulmonary Tuberculosis (TB)	1	0	0	0	4	0	1	0	1	7	12	49	57
	Extrapulmonary TB	0	0	1	0	0	0	0	0	0	1	2	12	6
	Mycobacteria Other Than TB	1	2	1	2	11	2	2	3	6	30	26	163	139
Vaccine Preventable Diseases	Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	2	1	0	1	3	0	0	0	7	42	62	88
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	1	0	1
Viral Hepatitis	Hepatitis A (acute)	1	0	0	0	0	0	0	1	0	2	0	4	6
	Hepatitis B (acute)	1	1	1	0	0	0	0	1	0	4	3	18	22
Enteric Diseases	Salmonellosis	5	15	9	16	48	18	12	5	24	152	159	494	436
	Shigellosis	3	3	0	3	4	1	0	1	2	17	65	248	266
	Campylobacter Disease	3	3	4	1	5	6	0	1	2	25	27	74	91
	E. coli O157:H7/HUS	0	0	0	0	1	0	0	0	0	1	1	4	4
Other Conditions of Public Health Significance	Invasive Meningococcal Disease	0	0	0	0	0	0	0	0	0	0	2	9	10
	Invasive <i>H. influenzae b</i> Disease	0	0	0	0	0	0	0	0	0	0	0	2	0
	RMSF	0	0	0	0	0	0	0	0	0	0	3	5	10
	West Nile Virus	0	0	1	1	6	5	1	8	0	22	19	34	27
	Lyme Disease	0	0	0	0	0	0	0	0	0	0	1	1	1
	Animal Rabies (bats)	0	0	0	0	0	0	0	0	0	0	0	2	0

*Totals include reports from Department of Corrections and those not reported from a specific District.

Heat-Related Illness (continued)

Treatment

Heat-related illnesses should be attended to immediately. People with heat exhaustion or heatstroke should be cooled and re-hydrated as fast as possible:

- Take the person to the coolest place immediately available,
- Remove/loosen the person's clothing and sprinkle or wipe down the person with cool water while fanning, apply ice packs to the neck, axillae and groin,
- Among conscious, over-heated persons, oral re-hydration must be attempted at the same time (have the person drink as much water or isotonic electrolyte solution as possible).

In cases of heatstroke – a true medical emergency – transportation to the closest emergency facility/hospital emergency room must be done without delay after application of immediately available first aid cooling and re-hydration measures as listed above.

Reportable Disease Phone Numbers:

1-800-556-0003 (outside the Jackson calling area, 8-5 weekdays)
601-576-7725 (inside the Jackson calling area, 8-5 weekdays)
601-576-7700 (TB reporting)
601-576-7833 (STD/HIV reporting)
601-576-7400 (nights, weekends and holidays)