

Heat Related Emergencies – Humans

By: Lisa Beardsley, RN, BSN of the First Coast Classical Dressage Society and the Northeast Florida Dressage Association

As the mercury continues to climb and higher humidity and temperatures lay ahead, having an understanding of heat related emergencies is beneficial in recognizing possible heat reactions in yourself and your human stable mates (horse signs coming next month). Heat emergencies may present as minor syndromes, such as prickly heat, heat cramps and heat exhaustion or as a serious life threatening disorder known as heat stroke. All of these conditions are preventable.

Heat stroke is the most dangerous of all of the heat related emergencies and therefore recognition of the signs and symptoms are of utmost importance. An elevated core body temperature always exists, however this is a late finding and identification of the subtle early signs is the first line of defense against this potentially deadly condition. Persons developing heat stroke will exhibit signs of heat exhaustion first. The paramount difference between the two is the onset of confusion. A person with heat stroke will be confused, one with heat exhaustion will retain normal mental status. If you are with a person that becomes confused, assure their safety (get them off of the horse, sit or lay them down so they do not fall) and call 911. (Please note: there are other emergency medical conditions that could cause rapid onset of confusion - each one will need medical intervention so even if heat related conditions are not suspected - your actions will still be the same; assure safety and call 911.) If you are active outdoors and any of the signs of heat exhaustion or heat stroke are noted, discontinue any current activities, begin evaporative cooling measures and replenish fluid volume by drinking sports drinks.

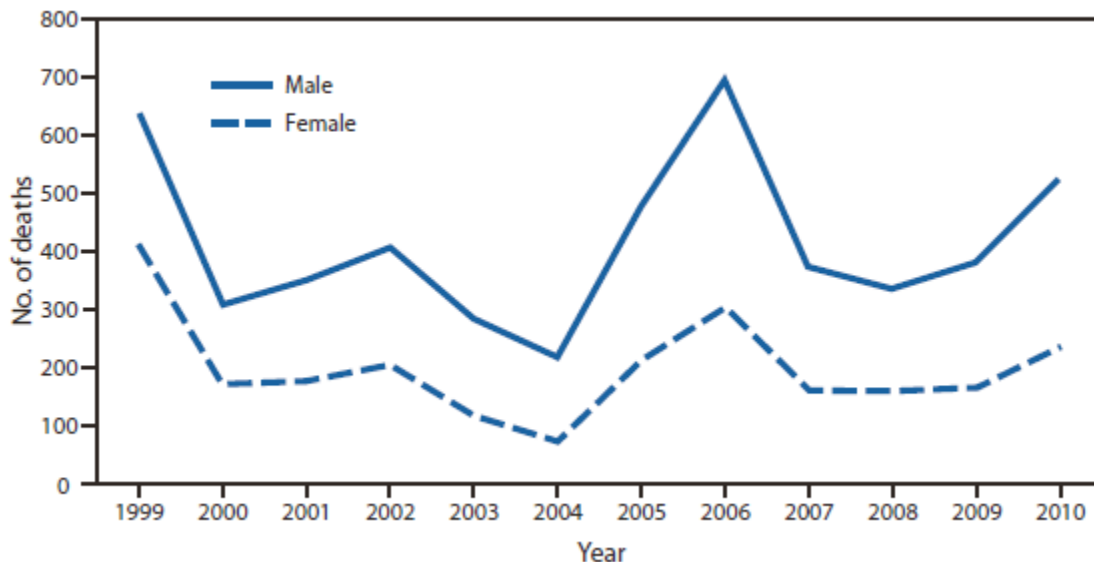
<u>Heat Stroke - signs/symptoms</u>	<u>Heat Exhaustion - signs/symptoms</u>
<ul style="list-style-type: none">• Elevated Core Body Temperature (104+)• Uncoordinated movement• Confusion• Bizarre Behavior• Agitation• Seizures• Coma• Death • * note that the absence of sweating is not necessary. The person may still be sweating.	<ul style="list-style-type: none">• Headache• Weakness• Dizziness• Nausea• Vomiting• Visual Changes• Muscle aches• Possible elevated body temperature (98.6 - 104)• Sweating• Rapid Heart Rate• Rapid Breathing• Increase dizziness and possible fainting with changing position from sitting to standing or from laying to sitting.

Evaporative cooling measures are the most efficient and practical treatment of heat stroke. Initiating these measures should not be delayed. Disrobe the person with respect to their dignity, down to their underwear, wet their entire body with *room* temperature water and place blowing fans on high speed upon them. Avoid the use of cold water and ice packs in order to prevent shivering and possible exacerbation of the problem. Repeat

wetting the entire person with room temperature water and maintain the fans on high until emergency medical personal arrive and the person is prepared for transportation to an Emergency Room. Do not stop treatment while the person is being evaluated by emergency medical personnel, unless their temperature is determined to be 104 or less. An individual with heat stroke will need to be monitored in an inpatient setting for observation of complications. A person with heat exhaustion should cease activity, removed any possible clothing, wet exposed areas of the skin and sit or lay before a blowing fan on high speed until their symptoms improve. Once they feel better they should drink sports drinks to replace fluid volume and electrolytes. They will usually begin to improve as they cool and are rehydrated. They may or may not need to be evaluated by an Emergency Medical Physician based on their underlying medical history.

Treatment for Heat Stroke	Treatment for Heat Exhaustion
<ul style="list-style-type: none"> • Initiate Evaporative Cooling • disrobe the person with respect to dignity - down to their underwear • lay the person in a safe shady place • wet their entire body with room temperature water • place blowing fans on high speed upon them • if able, assess body temperature. • if elevated body temperature of 104 or greater call 911 • If confusion exists - do not delay - call 911 	<ul style="list-style-type: none"> • cease activity • removed any possible clothing • wet exposed areas of the skin with room temperature water • sit or lay before a blowing fan on high speed until symptoms improve • begin fluid and electrolyte replacement by drinking sports drinks • if elevated body temperature of 104 or greater call 911 • *Note Heat Exhaustion progresses to Heat Stroke

CDC - Statistics of Heat Related Deaths from 1999-2010 for entire US



* Deaths attributed to exposure to natural heat, as the underlying and contributing causes of death, are coded as X30 and T67, according to the *International Classification of Diseases, 10th Revision*.

† U.S. residents only.

§ Data for 2010 are preliminary.

From 1999 to 2010, a total of 7,415 deaths in the United States, an average of 618 per year, were associated with exposure to excessive natural heat. The highest yearly total of heat-related deaths (1,050) was in 1999 and the lowest (295) in 2004. Approximately 68% of heat-related deaths were among males.

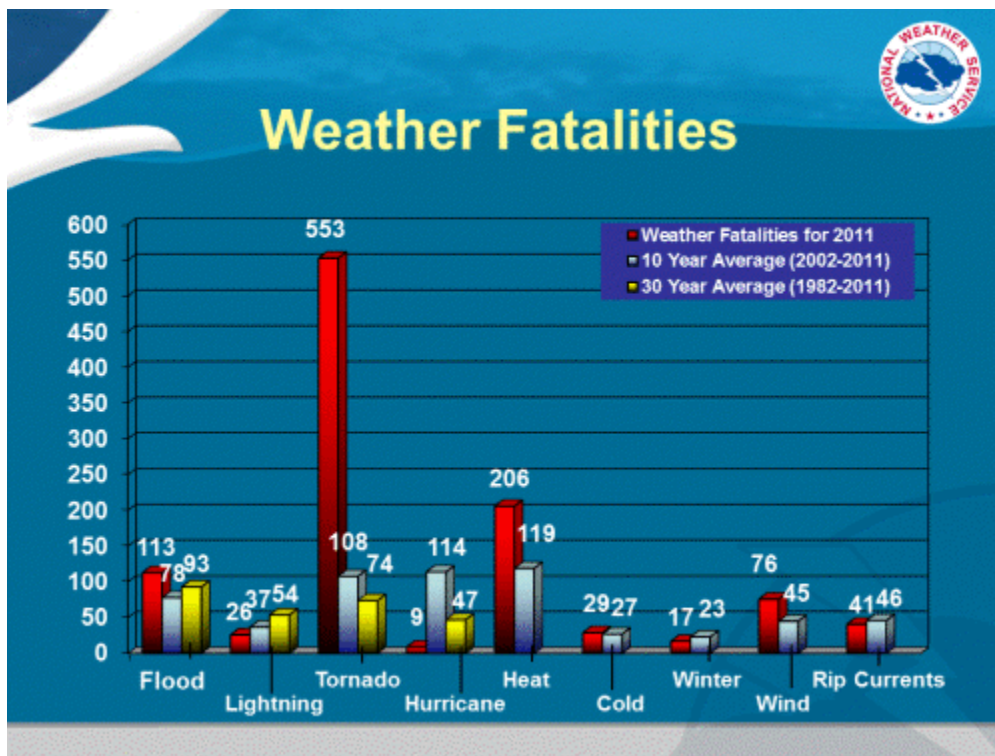
Source: National Vital Statistics System. Mortality public use data files, 1999–2009. Available at http://www.cdc.gov/nchs/data_access/vitalstatsonline.htm.

Reported by: Jiaquan Xu, MD, jax4@cdc.gov, 301-458-4086.

Alternate Text: The figure above shows the number of heat-related deaths, by sex in the United States, during 1999-2010, according to the National Vital Statistics System. From 1999 to 2010, a total of 7,415 deaths in the United States, an average of 618 per year, were associated with exposure to excessive natural heat. The highest yearly total of heat-related deaths (1,050) was in 1999 and the lowest (295) in 2004. Approximately 68% of heat-related deaths were among males.

NOAA - Statistics of Weather Related Fatalities for 2011

* note: Heat Related Fatalities were number one for the 10 year overall. They were number two in 2011 following tornados. The 30 year average is missing for some elements as documentation was not kept during those years.



Do not belittle the threat that Florida heat and humidity poses to you as you train this summer. Heat exchange is dependent on gradients of temperature and moisture; as the ambient temperature and humidity increase, thermal transfer becomes less efficient. Thus hot, humid weather confers the highest risk of heat injury. Schedule rides early in the morning as it is the coolest time of day. Rehydrate with a combination of water and sports drinks and when sweating profusely rehydrate with sports drinks alone. If you have any symptoms discussed here in, stop and rest in an air conditioned place or moisten your skin with room temperature water and sit or lay before a fan on high speed until you feel better. Once you feel better it is still best not to ride again for the day. Take the day and the evening off to rehydrate and cool.

If due to show schedules you are forced to ride at the hottest time of the day, take measures to reduce your heat exposure. Request stabling with stalls facing north or south to reduce exposure to direct sunlight as the summer sun rises, crosses the sky and sets. Limit your warm up time. Ditch the show jacket during warm up and during your classes if possible. Consider wearing a well ventilated helmet during warm up (and during training). Drink sports drinks before and after your warm up and show rides. Look for a shady spot to wait to enter the arena. After the class, ditch the jacket, helmet and tall boots, and replace them with cooler options. Keep a fan back at the barn just for you. Sit before it and cool down. Enhance cooling by wiping your face and arms with washcloths soaked in cool water. While enjoying the show from the ground, stay in the shade as much as possible, wear sun protective clothing and a wide brim hat.

Other minor heat related conditions are briefly summarized below. They are heat fainting, heat cramps, heat rash and heat swelling.

<u>Heat Fainting</u>	<u>Heat Cramps</u>
<ul style="list-style-type: none"> • fainting resulting from fluid depletion • common in individuals poorly acclimated to Florida heat • thoroughly evaluate the person for injuries resulting from the fall • Treatment consists of rest and fluid rehydration • Cardiac, neurologic or other potential serious causes of fainting should be considered and the person should seek further medical evaluation 	<ul style="list-style-type: none"> • Painful muscle cramps especially in the calves, thighs and shoulders • caused by drinking water to replace perfuse sweating • common during athletic exertion • results from salt loss through sweat and fluid replacement with only water • results in a low sodium level in the body • Avoid this by drinking sports drinks and replacing lost electrolytes.

<u>Heat Rash</u>	<u>Heat Swelling</u>
<ul style="list-style-type: none"> • results from blockage of sweat ducts • presents as a red rash mostly found over clothed areas of the body • treated with antihistamines (Benadryl) and an antibacterial cream or lotion • Continued blockage of sweat ducts results in a raised white rash that is treated with oral antibiotics combined with a medicated topical lotion applied to affected areas. Evaluation by a MD is required for the proper prescriptions and treatment. 	<ul style="list-style-type: none"> • Swelling of hand and feet caused by body functions associated with cooling • Usually is self limited and rarely last more than a few weeks • Treatment is elevation of the extremities above the level of the heart • Severe cases may need compression stockings • Medical attention may need to be sought depending on personal medical history

* D. Cline, M.D., J. Ma, M.D., J Tintinalli, M.D., et. al. Emergency Medicine, 5th Edition, McGraw-Hill, pp. 604 - 607