

HEATSTROKE :

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PREVENTION IS BETTER THAN CURE

Definition:

It is a syndrome of cellular damage caused by an increased body temperature: usually $> 42^{\circ}\text{C}$.

Heatstroke happens (and can be fatal) when the heat production overwhelms the thermoregulation of the body.

The degree of injury on the body depends on 2 factors:

- The magnitude of temperature (how hot)
- The duration of body temperature elevation (for how long)

Which body systems are affected by heatstroke?

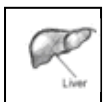
Almost all systems of the body can be affected by heatstroke:



- Kidneys: the kidneys are the earlier affected organs, causing an acute renal failure which can be very quickly fatal.



- The intestines (gastro-intestinal tract) are extremely sensitive to heatstroke, causing vomiting and diarrhea. Direct thermal injury damages the gastro intestinal barrier leading to bacterial translocation also called sepsis or septicemia.



- The liver as well as the intestines is very sensitive to direct thermal injury. Liver dysfunction results in loss of protein making decrease of coagulation factors making, and hypoglycemia (low glucose level).



- Central nervous system injury (cerebral edema) occurs and can cause major complications such as: seizures, coma, respiratory arrest or even cardiac arrest.



- The cardio-vascular system (heart and vessels) is very commonly affected by heatstroke but these symptoms may appear later.



- Heatstroke damages the muscles (heart included) of the body especially if it is the result of excessive exertion (seizures,

excessive exercise). Muscle damage produces lactic acid and aggravates acidosis.

What are the main clinical signs of heatstroke?

- Rapid panting
 - Hyper-salivation
 - Hyperactivity or lethargic/weakness
 - Increased body temperature
 - Vomiting and/or diarrhea ...
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- A shock can develop as heatstroke syndrome progresses
 - Loss of conscious or seizure can occur

Preventing heatstroke?

- Never leave animals unattended in a car on a warm day even if the windows are wound down. The car body acts like an oven and temperatures inside the vehicle rises at a rapid rate!
- If you do not walk the dog(s) yourself inform the one who walks them about the danger of overheating and how to prevent. Remember standing on the side of the street talking already causes overheating in dogs!!
- Dogs should be kept inside during hot and humid times, if you leave on holiday leave the air-conditioning running for your dog(s).
- In summer keep the walk short (5-10 minutes maximum) and try for shade if you have to walk in the heat the of day but only let them out for a quick wee and bring directly back inside
- Early morning is the best time when the humidity is at its lowest
- Dogs that love to run will do so until they drop!
- Carry and offer cool water when out.
- As dogs do not sweat to cool down, wet down the dog to encourage evaporation.
- Use a muzzle that allows the dog to pant properly!
- Remember obese and short nosed dogs such as pugs, pekinese, and bulldogs, are naturally more sensitive to heat.
- Shaving your dog does not prevent heatstroke.

What is the treatment for heatstroke?

Heatstroke is a **medical emergency** and the treatment has to be **early, aggressive and pro-active**.

EARLY INTERVENTION

The pet owner should initiate **cooling measures** before and during

transportation to the vet. Effective cooling measures include:

- REMOVING the patient from the hot environment
- Wetting the patient with cool water
- Provision of cold drinking water if available with electrolytes.
- Enhancing evaporation by providing air movement around the patient (air conditioning or a running fan)
- AVOID ice water and cold water as both are uncomfortable for the patient, results in the blood vessels constricting and therefore reducing the ability of the body core to cool down.

AGGRESSIVE and PRO-ACTIVE (intensive care)

Upon arrival at the hospital:

- Cooling procedures should be continued if the rectal temperature is $> 40^{\circ}\text{C}$ or discontinued if the body temperature is $< 40^{\circ}\text{C}$ to protect from hypothermia.
- The patient should be given supplemental oxygen
- Intravenous (IV) fluid therapy if usually required and depending on the aggressiveness of the fluid therapy one or more IV catheters can be inserted.
- Blood is collected for hematology, biochemistry and electrolytes, and if needed urine can be collected for urine analysis.
- Hypoglycemia (low blood glucose) should be corrected whenever present.
- Injectable steroids are administered to reduce (or prevent) cerebral edema.
- Antibiotics are administered to prevent bacterial translocation and other medicines given to protect the stomach and intestines (e.g. gastro-protectants, anti-acids).
- Heart is closely monitored and supported as appropriate.
- Intravascular disorders (e.g. disseminated intravascular coagulation) are prevented by heparin injections.
- Neurologic system is closely monitored by the medical team and seizures treated if present.

Prognosis?

Patients can recover quickly if caught & treated early enough but severe cases may take days to get them stable. Even when out of danger, some can have long-term damage to their internal organs. Non survivors usually die the initial 36 hours of treatment.