First 5 minutes!

Heat Injury or Heat Related Illness (HRI)

Heat injury or heat related illness can occur in our canine veterinary patients due to impaired heat dissipation, overexertion, or unfortunate accidents such as being left in a hot car. This trauma occurs more commonly during seasons with warmer, humid weather, and patients that are brachycephalic, have laryngeal paralysis, or tracheal collapse can be pre-disposed to HRI. In canines, panting and sweating through the paw pads are the only significant cooling mechanisms. When the temperature and humidity of the environment overcome their ability to dissipate heat in this way, HRI can happen.

There are three different levels of heat injury, each having correlating signs:

Heat Stress Signs: Controlled panting, normal or slightly elevated rectal temperature, slight tachycardia, pulses normal to strong, increased thirst, and restlessness.

Heat Exhaustion Signs: Rectal temperature of 103°F-105° F (39.4°C-40.6°C), weakness, ataxia, uncontrolled panting, lethargy, tachycardia and distress, diarrhea, and vomiting.

Heatstroke Signs: Rectal temperature >105°F (40.5°C), obtunded/stuporous mentation, uncontrolled panting/respiratory distress, tachycardia, seizures, neurologic abnormalities, and laterally recumbent.

Pathophysiology

- Increased heat leads to increased vasodilation and cardiac output in an attempt to bring the blood to the skin surface to cool.
- Moderate renal and splenic vessel vasoconstriction.
- Dehydration and electrolyte abnormalities can occur, along with bacterial translocation from the intestines and hypovolemia.
- Thermal injury can cause the breakdown of proteins in tissues and cytotoxicity leading to cellular damage and necrosis.
- Coagulation abnormalities occur leading to petechiae, ecchymosis, and increased bleeding at venipuncture sites.
- Severe organ dysfunction leading to SIRS, DIC, and/or MODS.

This information is formatted as a card-style reference that can be easily printed and placed in an area readily accessible during heat injury triage.

Heat Injury Stages

1st Stage Heat Stress	2nd Stage Heat Exhaustion	3rd Stage Heatstroke
•**Temperature** •Normal to slightly elevated •**Respiration** •Controlled panting •**Heartrate** •Slight tachycardia •**Pulse Quality** •Normal to strong •**Mentation** •QAR/BAR •**Other signs** •Increased thirst •Restlessness	• **Temperature** •103°F-105° F (39.4°C-40.6°C) •**Respiration** •Uncontrolled panting •**Heartrate** •Tachycardia •**Pulse Quality** •Bounding •**Mentation** •QAR •Dull •**Other signs** •Lethargy •Ataxia/muscle weakness •Diarrhea and vomiting •Anxiety	•**Temperature** •>105° f (40.5° C) •**Respirations** •Uncontrolled panting •**Heartrate** •Tachycardia •**Pulse Quality** •Thready •**Mentation** •Stuporous or •Obtunded •**Other signs** •Petechiae •Hematachesia and/or hematemesis •Seizures

Quick Treatment Reference

Heat Stress	Heat Exhuastion	Heatstroke
• Move to a cool place • Fans • Offer room temperature water • Rinse coat or soak in tepid water	• Move to a cool place • Fans • Room temperature IVF • Continuous soaking of coat with running tepid water	• Move to a cool place • Seizure control • Room temperature IVF • Continous soaking of coat with running tepid water • Tepid water enema • Oxygen • Tilt table 45°

Patient Cooling Tips

- Use tepid water to soak coat continuously.
- Be cautious of using soaked towels over patients: can hold heat instead of dissipating heat.
- Alcohol is not suggested due to vasoconstriction and the possibility of being absorbed through the skin.
- Stop cooling efforts at a rectal temperature of 103.5°F-104°F (39.7°C - 40°C) as heat injury patients can experience rebound hypothermia.
- Ice water and ice baths can cause quick vasoconstriction and

Triage Table Set Up Suggestions

- IV catheter set up
- Fluid bag and line
- Fluid pump
- Fluid squeeze/slam bag
- Oxygen
- Box fan
- Wet table or water source
- Towels
- Elevation of head/neck

- Continuous Monitoring
  - Heartrate
  - EKG
  - Blood pressure
  - Temperature
  - Respirations
  - Mentation
  - MM/CRT

https://jts.health.mil/assets/docs/cpgs/K9_Heat_Injury_MWD_CPG_c9_29_Mar_2025_v1.1.pdf?cs=1&hl=en-US&biw=1536&bih=825.6000366210938

Norkus, Christopher L., Liss, David. **Veterinary Technician's Manual Small Animal Emergency and Critical Care**. Chapter 13, Page 292-295. 2012.

Heatstroke in Dogs: https://todaysveterinarypractice.com/emergency-medicine-critical-care/todays-technician-heatstroke-in-dogs/

How to Treat Heatstroke in Dogs By Lexi Hansen, BS, LVT, RVT, VTS (ECC) https://vetgirlontherun.com/how-to-treat-heastroke-in-dogs-vetgirl-veterinary-continuing-education-blog/