

Heat stroke / Hyperthermia

Extended version

Classic case: Summer months, dog left in car with core body temperature over 105.8°F

Presentation:

History and Signalment

- Pediatric, geriatric
- **Genetic & breed dispositions**
 - Dark-colored, long-haired
 - Upper airway obstruction (brachycephalic breeds, laryngeal paralysis)
- Obesity, cardiovascular dz, previous Hx heat stroke
- Excessive external heat / inadequate heat dissipation
 - **Heat stroke**
 - Left in car, clothes dryer, strenuous activity
- Excessive muscle fasciculations
 - Seizures, garbage intoxication (mycotoxin), hypocalcemic tetany
- Endogenous pyrogens
 - Sepsis, febrile neoplastic syndrome
- Medications
 - Phenothiazines, opioids (cat), cardiac drugs
- Seasonality
 - Late Spring (before heat acclimation), Summer



Image courtesy, Alex Guerrero, Wikimedia Commons (cropped)

Clinical signs

- Acute increase **core body temp >105.8°F (41°C)**
- Brick red mucous membranes
- Tachycardia
- Excessive panting
- Collapse (heat prostration)
- Respiratory distress, hypersalivation
- Diarrhea (bloody), vomiting
- Shock, petechiae
- Ataxia, muscle tremors
- Seizures, loss of consciousness, DEATH

LIFE THREATENING, medical emergency
ALL MAJOR ORGAN SYSTEMS VULNERABLE

DDX:

Fever, malignant hyperthermia, seizures, shock



Informational poster, My Dog is Cool website devoted to preventing heatstroke

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Test(s) of choice: Usually history and presentation are clear

- **Rectal Temperature - 105-110°F (41-43°C), anything higher = DEATH**
- ECG – tachycardia, cardiac dysrhythmias
- CBC – increased PCV, TP due to dehydration, thrombocytopenia
- Biochemistry – increased BUN, Creatinine (prerenal or renal azotemia) increased CK due to muscle damage, hypoglycemia
- Blood gas – respiratory alkalosis from excessive panting or metabolic (lactic) acidosis due to decreased tissue perfusion
- Urinalysis – Oliguria, hemoglobinuria
- Coagulation panel – prolonged ACT, PT, PTT (poor prognostic indicator), FDP
- Blood pressure – hypotension due to shock and dehydration

Rx of choice: Stabilize

- O₂ supplementation
- IV fluids (lukewarm)
 - Isotonic crystalloids +/- colloids, Shock dose if required
 - Restore blood volume and dehydration
- Aggressive active cooling
 - Use **tepid** water, **NEVER COLD WATER** or **ICE**- Apply soaked towels, shallow bath, fans
 - Lower core body temperature to 103°F (39.4°C)
 - **Monitor temp Q 5-10 min to avoid hypothermia**
- Supportive care based on above findings
- Prophylactic broad-spectrum antibiotics – GI sloughing/bacterial translocation (common)

Prognosis:

Good to Guarded Early Rx; usually no long term effects; risk reoccurrence

Guarded to Good Obtunded patients, coagulopathy, renal failure, 2° organ damage

Grave Severe heat stroke; death may occur w/in 24 hrs, If survive >24 hrs better Px

Prevention:

Client education for warm/hot weather

- Never leave an animal in a car
- Always provide access to shade and water
- Avoid prolonged exercise, esp. for dogs with upper airway obstruction



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Pearls:

Contraindications:

- Cold water & ice bath cooling-
 - Causes extreme peripheral vasoconstriction
 - Inability to dissipate heat
- NSAIDs
 - Because of decreased renal perfusion
 - GI sloughing
- Jugular venipuncture - unknown or abnormal coagulation status

Refs: Ford, Kirk and Bistner's Handbk Vet Proc & Emerg Tx 8th ed. pp.147-8, Cote, Clin Vet Advisor, Dog and C. 2nd ed. pp. 477-9

My Notes: