

## Understanding Heat Injury in the Operational K9-

### The difference between life and death for your partner!!

We have all seen, read, or heard of stories where children have died as a result of being left in a vehicle during warm weather. Unfortunately, our canines in the Operational K9 community are also susceptible to this horrific situation. In fact, despite tremendous advances in the prevention, recognition, and treatment of heat injury, it still remains a major threat to operational K9s. While accurate statistics are virtually impossible to obtain, most experts agree that death by heat injury remains one of the leading causes of non-hostile death for the OpK9. In many, if not most, cases this tragedy can be avoided by basic situational awareness, training, and old-fashioned common sense. Following is a brief synopsis of heat injury, its causes and signs, and some preventative and treatment measures that can be employed if Heat injury is suspected in the operational K9.

#### Basics of Heat Injury

Heat injury occurs when the OpK9s internal or core temperature exceeds its capacity to manage and dissipate excess heat. As a result, vital internal organs literally start to cook and die. Unfortunately, some of the most vital organs for survival are also some of the most sensitive to heat (brain, gastrointestinal tract, kidneys, etc). There are two forms of heat injury in the OpK9: Exertional and Confinement. Exertional occurs when the metabolic activity of the animal exceeds its own ability to dissipate heat. A classic example of this is a high drive canine on a long track in hot and humid conditions. The most common and unfortunate form of heat injury occurs when the environmental conditions that the OpK9 are exposed to exceed its ability to mitigate them. Here the offending cause is external, not internal. The classic example for this is the dog who is left to bake and die in a patrol vehicle.

There are some predisposing factors that can predispose OpK9s to heat injury. Lack of time acclimating to higher temperatures is one of the most common causes for heat injury- especially exertional. It also makes sense that high ambient temperatures are more risky. Overweight/out of condition dogs are at increased risk since fat acts like an insulator and excess weight also makes the animal work harder and increases its exertional output. Finally, dogs with upper airway obstruction are at increased risk due to their inability to pant away extra heat. This is seen in breeds genetically predisposed to laryngeal paralysis (Labrador retriever, Bouvier de Flanders) or in dogs with a history of harsh neck corrections.

#### Signs of Heat Injury

While the signs of heat stroke are varied and can differ from dog to dog, if you think your partner is overheated, treat him/her as such. You are probably the person best able to determine how your partner is feeling and if there is doubt, err on the side of caution. Commonly seen signs of an impending problem include uncontrollable panting, an atypical disregard to basic commands, shade seeking and laying down. More serious signs include staggering, bloody diarrhea, a non-responsive state and seizures. If an animal is exhibiting these signs, especially the latter ones, immediate, aggressive measures must be initiated. It is important to note that, contrary to prior training, core body temperature alone is NOT a good indicator for heat injury. Many active, acclimated dogs have body temperatures in the 104-108F range and are

medically okay. Conversely it is possible for a dog with a body temperature on the lower end of that range to be in fulminant heat injury if they have not been acclimated to higher temperatures. However, it is still critical to obtain a baseline body temperature as soon as possible and monitor body temperature throughout the pre hospital period. Because of this, an absolutely necessary medical device in every first aid kit should be a functioning rectal thermometer. It is important to note that ear thermometers or temporal scan thermometers are not accurate for canines.

### Prevention of Heat Injury

The phrase “ an ounce of prevention is worth a pound of cure” is tailor made for heat injury. Given the potential catastrophic, irreversible and/or fatal consequences of heat injury EVERY effort should be made to prevent heat injury from occurring. Perhaps foremost of the preventive measures is acclimating the OpK9 to the environmental conditions that they will experience. This is sometimes a lengthy but necessary process. Dogs travelling from the Northeast United States for work, training, or competitions in the southern United States during the winter months are at extreme risk for heat injury as their bodies have acclimated to colder temperatures and simply can not adjust in one or two days. Almost as important is the development of policies and procedures to protect against confinement or exertional heat injury. These would include standards for monitoring OpK9s on warm or hot days, a requirement for first aid training, and operating procedures stating how/when/where the handler has the final discretion on utilizing an OpK9 when the potential for heat injury is unreasonably high. Having a properly maintained, functioning heat detection and mitigation system in every Police K9 vehicle should be part of the minimal equipment requirements. These units have undoubtedly saved countless K9 lives and in this day and age, failure to have such equipment may be considered negligence in regards to the safety and care of the OpK9.

### Treatment of heat stroke:

Above all else, the goal of treatment of suspected or confirmed cases of heat injury is to reduce the core body temperature of the patient AS QUICKLY AS POSSIBLE!!! Remove the patient from the dangerous environment and start applying cool or cold water to the entire body with cold packs to the neck, armpit, and groin areas facilitate cooling the entire patient. Old standbys of walking a dog in running water or applying alcohol to the pads of the animal have fallen out of favor. Likewise, many experts in this area are now suggesting that ice baths or covering large sections of the animal with ice is safe and, in fact, the best way to rapidly cool an overheated patient. Fears of vasoconstriction and so-called cold shock are outweighed by the dangers of a patient remaining at an elevated temperature for extended periods. In this crisis, seconds to minutes can actually make the difference between life and death. In fact, studies looking at this condition have shown that initiating aggressive measures PRIOR TO transporting the canine have a significant positive effect on survival. Someone should be tasked with monitoring the patient's core body temperature (via rectal thermometer most likely) every two to three minutes. Active cooling should be stopped at a temperature of approximately 101-102 F to prevent the possibility of overdraw and creating a hypothermic patient. Although very counterintuitive, a handler may have to turn on the heat while transporting a hyperthermic patient as their body temperature falls to low as the animal has lost its ability to regulate its own temperature. While evaporation is the most effective means of cooling, additional treatments such as increased (ideally cold) airflow over the OpK9 can facilitate cooling as well.

The handler should also initiate their emergency K9 protocol at the earliest opportunity so that the veterinary clinic that will receive the patient is prepared PRIOR to the animals arrival.

Heat injury presents a real threat to the operational canine. This condition is often fatal and carries the additional stigma of being a preventable condition in the vast majority of cases. Handlers should be constantly aware of the signs of heat injury and the steps necessary to prevent or, if needed treat, this condition.

\*\*For a more thorough analysis of this condition, readers are directed to Dr. Janice Baker's webinar presented by the Veterinary Tactical Group for an excellent, thorough, and state-of-the art discussion of this condition.