Heat Injury And Treatment In Working Dogs

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Heat injury is a fairly common problem in working dogs and severe cases can be fatal. Many recommendations by veterinarians or canine first aid references offer conflicting and complicated recommendations on the best way to treat an overheated dog. The single most important factor to survival is *immediate* treatment and *rapid cooling* to reduce the dog's core body temperature when the first signs occur. For the working dog handler and tactical medical personnel supporting units with canine teams, this means beginning treatment at the point of injury, long before arrival to veterinary care. While heat injury is a complex problem that can have serious complications or outcome, immediate lifesaving treatment is relatively simple, and does not need to be complicated. Basic, rapid measures to cool the dog to a more normal body temperature can greatly increase his chance for survival.

Recognizing Heat Injury

There are many definitions for heat injury, with temperature ranges from 105-107 depending on the source of information. Normal temperature of dogs is

usually between 99-102.5, however their temperature may go up as high as 106 to 107 during hard work and still be normal. Hyperthermia is the term meaning that the body temperature is elevated above the normal range. However, hyperthermia does not mean that there is something wrong with the dog. The time that it takes the temperature to return to normal after a dog stops working may be a better indicator of if there is a problem, vs. the high temperature itself. Different dogs will respond differently and it is important to know what normal recovery time is for your dog. In general, all definitions of heat injury include a significantly high body temperature in combination with clinical signs such as abnormal behavior, exhaustion, or collapse. With mild cases of heat injury a dog may only show vague signs such as appearing tired, or slow or reluctant to follow commands. In more serious cases the dog may collapse, lose consciousness, and may have seizures. Any sudden change in behavior, level of energy, or physical actions of a dog during warm or hot weather should be considered possible heat injury until proven otherwise.

An affected dog's heart rate will likely be elevated, possibly at 150 beats per minute or greater for a typical 60 to 80lb dog and his respiratory rate and effort will likely also be increased. Like his body temperature, this could be elevated from hard work and still be considered normal for him. The heart rate and respiratory effort of a normal dog should begin to return to normal within a few minutes of when he stops working and rests.

Heat injury is usually categorized in different degrees of severity. Mild cases are typically called "heat stress" or "heat exhaustion." These cases may

resolve with adequate rest in a cool environment and rehydration by drinking water or administration of IV or subcutaneous fluids. More severe cases are typically called “heat stroke,” and can often have serious complications. It is not as important for you to know the definitions of the types as it is being able to recognize the conditions in which it’s likely to occur, ways to prevent it, or treat if when it happens.

Working dogs, with their high drive and desire to please their handlers, may not show any signs at all of problems, then suddenly stagger for a few steps and collapse. Any sudden change in behavior, level of energy, or physical actions of a dog during warm or hot weather should be considered possible heat injury.

Thermometers and Method of Taking a Temperature

Every canine first aid kit should contain a thermometer. Rectal measurement of temperature is the most practical, accurate representation of core, or *inner* body temperature in dogs. Since many working dogs don’t like having a thermometer inserted into their rectum, it would be nice to have a less intrusive method of evaluating their temperature. Unfortunately, there is currently no better way to do this. Ear thermometers are generally designed for humans and are not long enough to reach areas of the ear canal that give an accurate temperature reading, and a lot of dogs resent those just as much as rectal thermometers. Flexible digital thermometers, many of which give a reading

within seconds, are probably the best type to use as far as accuracy, safety, and comfort for your dog.

Treatment

According to studies in both veterinary and human medicine, the most important factor in treatment of heat injury is *immediate* treatment. The more quickly cooling occurs, the better chance for survival. Specifically, if aggressive cooling begins within 10 minutes of collapse, the patient has a significantly greater chance for survival that if cooling is delayed longer than this. If you have only one choice at a time between cooling the dog or transporting the dog, cool him first, then transport him to a veterinarian. Ideally, you would start rapid cooling first, then transport to a veterinarian while continuing cooling if needed. Air conditioning inside a vehicle would not be considered “aggressive cooling.” Aggressive cooling would include more rapid measures, such as immersion in cold water or placement several ice packs around the dog’s body and head.

Some recommended methods of immediate cooling include:

- Move into a cooler environment (shade, air conditioning, etc)
- Immersion in cold or cool water
- Wrap in cool or cold wet towels
- Provide a strong breeze with fans or other air movement
- Place ice packs around the body and head
- Administer IV fluids if available

- Place rubbing alcohol on wet fur (avoid the face)
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Contrary to some recommendations, there are really no “wrong” methods of cooling down an overheated dog, barring the extreme or obviously unsafe. For years veterinarians and canine first aid references have warned against immersion in cold or ice water, claiming that those methods will actually slow down or prevent cooling. This is based on the idea that cold or ice water will cause the blood vessels in the skin to constrict, preventing needed heat loss from the blood. While the vessels will constrict to some degree, there is no scientific evidence to show that this slows or prevents cooling overall, and there is also no scientific evidence to show that this method is actually harmful to the overheated patient. In fact, many studies confirm that cold water immersion is the most rapid method for cooling subjects with exercised-induced heat injury, and is the preferred method of cooling down humans with heat stroke.

Similarly, some recommendations state not to place wet towels over a dog to cool them down as the towels will actually “trap” the heat from escaping. Similar to cold water immersion, there is no scientific evidence to back up this recommendation either, and it may come down to common sense on that one: If the water in the towels is colder than the dog, then heat will be transferred from the dog to the towels and the dog *will* cool down. One study showed that cool water immersion cooled down overheated subjects twice as fast as wrapping the patient in wet towels, but both methods were effective in cooling overall.

If you or your teammates have the skills to place IV catheters and administer fluids, this could also be considered. However, do not delay cooling efforts in order to place an IV catheter. And along that same line, once the dog has been cooled, do not delay transport to veterinary care in order to place an IV catheter. Subcutaneous fluids (fluids administered under the skin) may not help much in a severe case of heat injury, but administered in an appropriate dose may help with mild cases, and probably won't hurt in more severe cases. Do not attempt IV or subcutaneous fluid administration unless you have been properly trained to do so, as serious complications could occur if not done properly with the right type of fluid solution.

Many scientific studies have been done on dogs and humans to evaluate which method and speed of cooling is best for survival, and to date the only practical conclusion from these studies is that the more rapid the cooling, the greater chances of survival. The method used should be the one available to you that will cool him most quickly.

Because your goal is to *rapidly* cool the dog, you have to be careful not to overcool him and cause his temperature to drop too low. Overheating can alter the dog's ability to regulate his temperature through damage caused to his hypothalamus; a specific part of the brain that controls temperature regulation. With loss of his normal temperature regulation mechanisms, and your aggressive cooling methods, his temperature can drop way below normal. The general recommendation is to stop aggressive cooling when the dog's rectal temperature reaches 103 degrees F. If his temperature continues to drop below that, you

may need to take measures to keep him warm and prevent even more heat loss. Drying him with a towel and wrapping him in a dry blanket may be all that is needed, but the most important part is to continue monitoring his temperature every five to ten minutes after that until his temperature remains stable and he is in the care of a veterinarian.

Conclusion

Practical treatment of heat injury in working dogs revolves around the idea that the more rapid an overheated dog is cooled down after he reaches a critical temperature, the more likely he is to survive this potentially fatal condition. Don't let yourself be hindered by complicated recommendations of which methods of cooling are the best or are detrimental to care. The bottom line is that all of the practical methods seem to be effective and not harmful if done with common sense and frequent monitoring of the dog's temperature. Cool the dog first, then transport to a veterinarian unless aggressive cooling and transportation can be done at the same time.

Checklist for Treatment: What You Should Do

-Cease working the dog, and move him to a cooler environment if possible (a/c is ideal)

-Remove his muzzle if he is wearing one

-Get him wet all over, with cold water if available. Immerse him in the water if safe to do so, protecting his head from going under

-If the only water available is room temperature or slightly warmer (i.e. warmed by the sun) use it anyway but do not immerse him in it—pour it over him or sponge it on him to wet his fur. Do not use hot water

-Place ice packs around the dog's head if he is unconscious.

-Provide a strong breeze with fans if available

-Provide oxygen by mask if available

-Take his rectal temperature as soon as possible, and repeat every 5minutes to monitor cooling.

-Stop cooling when his temperature reaches 103 degrees F.

-Be prepared to keep him warm if his temperature continues to drop or goes below 99 degrees F.

-Administer IV or subcutaneous fluids if already trained to do so. DO NOT delay other methods of cooling or transportation in order to place an IV or administer fluids.

-Transport to a veterinarian for further care.

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