

Health watch

Heatstroke in the Irish wolfhound

Heatstroke is a life-threatening emergency that is most commonly seen during hot summer months from exposure to or exertion in a hot and humid environment. Examples include the dog left in the car while the owner runs a few quick errands or the dog tethered outside with no shade and an empty water bowl. The brachycephalic breeds (dogs with shortened faces and compromised upper airways), obese and geriatric dogs are more prone to developing this condition. Active large-breed working dogs with thick coats are also prone to it. This is especially so when the seasons change from spring to summer and the dog isn't yet acclimatized to the increasing temperatures when exercising.

The classic clinical presentation is a dog in distress that is panting, hyperthermic (rectal temperature above 40°C) and dehydrated, and is exhibiting central nervous system dysfunction (that is, profound depression, delirium, coma, seizures). The heart rate is most often elevated and the gums are brick-red, dry and tacky. There is often a history of fainting, collapse, or gastrointestinal signs such as vomiting and diarrhea. Animals with heatstroke will quickly develop shock and multiple organ failure if untreated. Heatstroke results in the release of many inflammatory mediators which in turn cause the patient to lose the ability to coagulate blood. Ultimately, these patients bleed into any organ such as the brain, intestinal tract, kidneys, lungs or heart muscle. As the dog progresses into shock, body temperature, heart and breathing rates begin to drop. The mortality rate is approximately 50%!

Animals dissipate their heat through evaporation, conduction, convection and radiation. Panting is the main way dogs achieve evaporative heat loss. Dogs can sweat through their foot pads and other hairless areas, but compared to a human, this doesn't amount to much heat loss. Conductive heat loss occurs when there's direct contact between the skin and a cooler surface (for example, a dog lying frog-legged on a cool tile floor). Convection is the transfer of body heat to an air current such as heat dissipation that occurs with a fan or wind. Dilation of the blood vessels below the skin helps to promote convective and conductive heat loss — particularly on the abdomen where there is minimal hair. On the contrary, a thick fur coat will hamper these processes. Finally, radiation is the natural process of heat being released into the environment.

Dehydration will impair heat dissipation. Dehydrated animals have decreased blood volume, which leads to constriction of the peripheral blood vessels and impaired heat dissipation through all the mechanisms. Animals with underlying cardiovascular disease have poor cardiac output, which also impairs heat loss. Obese animals have a thick layer of insulation and poor exercise tolerance that predisposes them to heatstroke.

When the ambient temperatures start rising in the spring and summer time, physiological processes that allow the body to adapt to environmental or climatic changes occur. This is called acclimatization. Over a period of several weeks, animals develop the metabolic changes that allow them to better cope with the higher temperatures and to dissipate heat more effectively. These adaptive mechanisms work to improve conservation of water and salt, enhance cardiovascular performance, increase plasma volume and enhance the ability of the kidneys to filter blood.

Another way the body helps to protect itself against the ill-effects of heat is through the production of heat shock proteins (HSPs). Heat-stressed cells start producing these proteins that in turn will protect cellular function and structure. Aging, lack of acclimatization and genetic differences are associated with fewer levels of HSPs and increased risk of heatstroke.

If you suspect that your dog may be exhibiting signs of heat exhaustion, move it to a cooler area and ensure access to plenty of water. You can spray the animal with a hose or mist it with cool water and direct fans toward it to assist in lowering the body temperature through convection. Ice packs in front of the fan will help to cool the air directed at the dog.

DO NOT PLACE YOUR DOG IN AN ICE BATH.

This will cause constriction of the superficial blood vessels of the skin and cause the core body temperature to rise. It can also induce shivering, which can increase heat production. Active cooling

Pinky takes the sun wisely.



Photo: courtesy Liz Barringham

What else is new?

should stop between 39.5°C and 40°C (between 103°F and 104°F) to prevent both shivering and rebound hypothermia.

The temperature should be continuously monitored if possible. A rectal temperature can be evaluated by gently placing a lubricated digital thermometer with a flexible end approximately one centimeter into the dog's rectum. Always have a helper hold your pet's head while you're doing this procedure because some animals may try to bite you. Do not try this in dominant dogs or if you're by yourself. The normal temperature is 38°C to 39.3°C. If the temperature is above 40° or if your pet is profoundly depressed, weak or has collapsed, you should seek advice from your veterinarian or load your wet dog into the car and make the trip into the emergency hospital with the windows down and the air conditioner on full blast.

Treatment of heatstroke patients includes cooling techniques and aggressive treatment with intravenous fluids to replenish the fluid losses and to correct electrolyte imbalances. Antibiotics treat and prevent the secondary bacterial infections that occur from translocation of bacteria from the intestines into the circulation. Gastroprotectant medication, dextrose (sugar solution) and colloids (to maintain blood pressure) are often needed. A canine fresh-frozen plasma transfusion can provide a source of clotting factors and anti-inflammatory mediators to quell the inflammatory cascade. Oxygen therapy is provided through a small tube in the nose or via a mask. If the patient is having difficulty breathing, the veterinarian may administer sedatives and anti-inflammatory doses of steroids. In cases with severe breathing difficulties, the patient needs to have an endotracheal tube placed into the windpipe and manual ventilation while under anesthesia.

A complete blood count, biochemical profile, urinalysis and clotting profile are recommended at presentation. These tests usually reveal changes associated with dehydration. They may also reveal elevated liver and kidney values, low blood sugar (hypoglycemia), prolonged clotting times and low platelet levels.

Monitoring of vital signs, blood pressure and urine production is important. Other testing includes an electrocardiogram to monitor for abnormal heart rhythms, and chest X-rays to check for the presence of acute respiratory distress syndrome (ARDS) or a lung bleed. A urinary catheter is often placed to monitor urine output and assess kidney function.

Treatment of heatstroke patients will cost several thousand dollars with no guaranteed outcome. In animals that have died, death usually occurs in the first 24 hours.

Prevent heat-related illness by ensuring that your pets always have access to water. Bring water with you on long walks, avoid exercising during the heat of the day and stick to shady areas. Take it easy during heat waves and periods of high humidity. When summer is coming and the temperatures start rising, acclimatize your pets to changes in the weather by gradually increasing their heat exposure and exercise levels; avoid the "week-end warrior" syndrome. Finally, never leave your animals in poorly ventilated, confined spaces.

Marjorie McIsaac, DVM, has found her niche in the challenges of emergency/ICU medicine with the Alta Vista Animal Hospital in Ottawa. She is an associate professor with the veterinary technician program at Ottawa's Algonquin College and a diagnostician with the Canadian Food Inspection Agency Foreign Animal Disease Surveillance Unit.

In the next issue, due in your mailbox in early August:

The breed standard, part 1 of 4 by Jocelyne Gagné. It's on the back cover of every issue of the *Bulletin*, but how many of us really understand how all those discrete parts and descriptions come together with purpose and perfection? Conformation and lure coursing judge Jocelyne will give us a deeper appreciation for what happens under skin and fur.

Poisons and toxins on your table and in your house. It isn't just under your sink or in the laundry room that dogs can get into fatal mischief. Here's a current listing of foods and plants that can sicken and even kill your pooch.

LGRA results. We're adding new dedicated sections to the *Bulletin* to report performance results. We're also looking for artists who can give us a logo for the pages.

Gotta love it. Something that doesn't cost anything. Your online purchases can fund rescue or pay for the *Bulletin* without costing you one penny extra. Find out how to make Amazon and Dogwise pay you.

A reader survey to help us plan the *Bulletin's* future. You'll be able to reply by mail if that suits you, but you can also get a glimpse of online services that will accept your responses and tabulate them for us in real time as you make your choices.

AGM on the horizon. It's that time of year again. Get the details.

Next up in Canadian events... Be sure to check details on canuckdogs.com.

Western Gazehound Club Group 2 Specialty, Surrey, BC on July 16.

Running at the same time: IWCC Mid Western Specialty, Calgary, on July 16.

Also on July 16 and 17, the Capital Area Sighthound Association. 2 specialties for sighthounds, Kars, Ontario.

Sighthound Club of BC Group 2 Specialty, Surrey, on July 17.

Southern Counties Hound Breeds Association Group 2 specialty on August 7, in Milton Ontario.

Manitoba House Club, Winnipeg, August 13.

Don't forget the IWCC booster in Fredericton on July 30, judged by IW breeder Richard McCoy, from Ireland.