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"Ask the Vet"

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Heat Stroke and Heat Stroke in Brachycephalics

Here in the midwest we are are just getting into the warmer weather and in Michigan we experience significant fluctuations in temperatures, even within one day. This makes it difficult for dogs to adjust to even mild warm weather, such as the 70s F. Elsewhere you deal with hot weather regularly and heat stroke is a more constant concern. A dog can experience heat stroke at 70 F as easily as at 90 F, depending on activity level, exertion, acclimation to climate and ability to cope with higher temperatures.

Heat stroke is defined as extreme hyperthermia of temperatures of 106-109 F causing thermal damage to the tissues of the body. It is caused when heat generation exceeds the ability of the body to dissipate or rid itself of the excess heat. The most common causes of heat stroke in dogs are overheating in a hot car or overexertion in warm weather. Any dog can develop heat stroke, but certain breeds and conformations of dogs are more susceptible. Even certain medical conditions make heat stroke more likely (laryngeal paralysis, primarily occurring in Labrador Retrievers).

Brachycephalic breeds, like our short faced French Bulldogs, anatomically have several design features that make them much more susceptible to development of heat stroke. They have a lower jaw that is normal size in proportion to their body while their upper jaw is compressed, often severely. As a review, first are the stenotic nares or narrowed nostril openings. These are the very small respiratory passages or slit like openings for breathing that lead to many brachycephalics open mouth breathing. Enlarged tongues (macroglossa) are the thick and large tongues of brachycephalics. Elongated soft palates present in some degree in almost all brachycephalic breeds and dogs. It is difficult to fit the soft tissues needed into their short mouth and throat. The soft palate separates the nasal passages from the oral cavity and hangs or flaps down loosely. When the dog is panting or breathing heavily it creates the snorting sounds. Acute respiratory distress is rare related to an elongated soft palate except in English bulldogs. Tracheal stenosis or hypo plastic trachea is a narrowed trachea (windpipe) that can be dangerously narrowed making anesthesia a risk or entubating (placing a tube for anesthesia) difficult or impossible. This occurs most often in English bulldogs vs our French bulldogs. Everted laryngeal saccules are in the throat and turn inside out causing a throat obstruction following prolonged increased breathing effort. This can be reversed with correction of the increased breathing effort, ie opening up stenotic nares. These occur most often in Pugs.

Brachycephalic dogs pant inefficiently. Normally saliva from the tongue evaporates as air is passed over it and the blood circulating through the tongue cools efficiently and is circulated back to the rest of the body. Much more work is required of our brachycephalic dogs for this

process to occur. Conformationally the upper airways in brachycephalics compromise their ability to take in air. In their normal day to day life this is not a problem. If you have dogs that are overweight, under stress, in heat, or over exerted then the airways become inflamed and swollen and as this continues you get more obstruction, more distress and more overheating.

Clinical signs (what people often call symptoms) of heat exhaustion and then heat stroke: excessive panting, inside of ear pinnae (ear flaps) bright pink or red, weakness, collapse or staggering, syncope or fainting (loss of consciousness). It is best to address the problem at this first signs of panting and mild weakness before further progression occurs.

Treatment of heat stroke: If you feel your pet is experiencing any level of heat exhaustion or heat stroke, before you can get veterinary care or go to a clinic for advanced treatment do the following: Cool (not cold) water baths work best, not with towels that can actually hold heat in unless changed very frequently (every minute). Dogs can be initially cooled in a cool water bath, but you must stop cooling them at a temperature of 103 F to prevent rebound problems of over cooling and cooling too fast. Cooling too fast causes a rebound shock. Fans work well and rubbing alcohol can be placed on the paw pads, but the alcohol does not provide much help as a therapy on its own. Treatment at the veterinarian or advanced treatment: Intravenous fluid therapy is the primary treatment to provide systemic cooling to a normal body temperature and provide blood pressure stabilization. Oxygen therapy is provided in cases where there is concern of laryngeal swelling or cerebral edema (swelling of the brain), ice cubes are placed in an oxygen mask to cool the oxygen provided and humidify the air. If heat stroke is severe enough a dog can have collapse of the larynx and require a tracheostomy, this can often be a permanent tracheostomy (an opening to the trachea bypassing the oral cavity and vocal folds/larynx).

The best is prevention for our dogs, especially the brachycephalic breeds: water spray bottles to cool the ground or standing on cool towels with ice/shammy towels in cool water for them to stand on, cooling coats, kiddie pools with cool water available, plenty of shade or access to air conditioning. Prevent long walks or playing too long even if a temperature feels okay to you, using the air conditioning if there is high humidity and with any temperature over 72-75 F as a guideline. Walk your dogs in the early morning or in the evening after the sun is down, these are both times when it is cooler and more tolerable for your dogs. Do not leave your dogs outside for long periods of time in warmer temperatures (over 5-10 minutes). These could protect your pet from over exertion and heat exhaustion or heat stroke. If you are ever in doubt of your pet's condition provide a cool environment and take their temperature (rectal, keep a thermometer just for use for your pets) and contact your veterinarian.