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LABRADOR RETRIEVER Update

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OUTDOOR PRECAUTIONS

Keeping Labrador Retrievers Safe from Heat Stress, Heartworms & Lyme Disease



PURINA

Your Pet, Our Passion.

HEAT STRESS, HEARTWORMS & LYME DISEASE

ARE OUTDOOR DANGERS TO LABRADOR RETRIEVERS

An outgoing, friendly breed, the Labrador Retriever is often described as an ideal companion. Natural sporting dogs, Labradors glow with enthusiasm whether training for retrieving water blinds or a bumper thrown from a dock. Their love of the outdoors requires owners and trainers to be aware of potential dangers. Heat stress, heartworms and Lyme disease are among the culprits to take preventive steps to avoid.

Practicing healthy hydration and understanding the signs of heat stress and how to deal with it can help reduce the dangers of overheating in active dogs. Labrador Retrievers that are overweight or obese, have dark coats and/or medical problems such as laryngeal paralysis are at a higher risk for heat-related illness.

HEAT STRESS WATCHOUTS

Heat and humidity can be a dangerous combination for dogs, potentially putting them at risk for heat stress, or worse, heatstroke.

A beautiful, sunny day in the low to mid-80s seems ideal for being outdoors with a dog, but instead it may generate conditions that are risky for heat illness.

Veterinary emergency and critical care specialist Justine Lee, DVM, DACVECC, DABT, who practices at the Animal Emergency and Referral Center in St. Paul, Minnesota, says, "While owners are aware of the danger of very high temperatures to their dog, they forget that a nice day with mild temperatures could be too hot."

Dr. Lee uses a simple formula to help owners understand when it's too hot to work, play or train outdoors with their dog. "If you add the outdoor temperature to the humidity level and it equals 160 or more, then it's too hot to exercise a dog," she says. "In other words, if it is 85 degrees outside and the humidity is 80 percent, this could put a dog at risk for heat stress. Senior dogs, obese dogs, and dogs with underlying health problems may not be able to tolerate even the 160 combination."

According to a retrospective study of 54 cases of heatstroke in dogs between 1999 and 2004 [published in 2006 in the Journal of Veterinary Internal Medicine](#), several large breeds, including Labrador Retrievers and Golden Retrievers, were significantly overrepresented. Among the predisposing risk factors for heatstroke in the retrievers in the study, the article cited obesity and an active, playful character. Obesity was considered a significant risk



Heat Stress

- Shade-seeking behavior
- Lethargy
- Heavy panting, possibly with tongue curled up
- Lack of coordination
- Loss of focus & motivation for training
- Squinting of the eyes

Heatstroke

- Distressed & anxious behavior
- Profuse, thick drooling
- Extreme panting
- Vomiting
- Diarrhea
- Gums & tongue may turn dark pink or bright red

IF YOU SUSPECT YOUR DOG HAS OVERHEATED, immediately cool the body using water from a pond, creek, hose, or any other source to help bring down the body temperature. If your dog shows signs of heatstroke, you should take your dog immediately to the veterinarian. A dog with advanced heatstroke may have seizures or slip into a coma. The effects of heatstroke can continue for 48 to 72 hours even if a dog appears normal, so it is important for a veterinarian to evaluate a dog for damage to the liver and kidneys and any other health problems.

factor, as excess body fat increases thermal insulation and impairs normal heat dissipation. The authors advised owners of obese large-breed dogs to limit their activity to cooler weather and to minimize their exposure to heatstroke conditions.

“Labrador Retrievers love to fetch and retrieve,” Dr. Lee says. “When they carry things like bumpers and tennis balls in their mouths in hot weather, it impedes their ability to open their mouths wide enough to pant, making them less able to thermoregulate and cool down by panting.”

An article [published in 2017 in the journal *Temperature*](#) describes the severe systemic effects that can occur from classic heatstroke in dogs exposed to hot, humid environments and from exertional heatstroke in dogs exercised strenuously under heat stress conditions. Dogs compensate for overheating by panting; however, under heat stress conditions panting becomes less effective at dissipating body heat. A dog’s cardiac output decreases, causing body heat to accumulate and blood pooling in internal organs such as the liver and spleen, eventually contributing to heatstroke.

Exercise-induced collapse, a heritable condition in Labrador

Retrievers in which fit, muscular dogs with excitable temperaments develop weakness and collapse after short bouts of strenuous exercise, may account for some heatstroke cases in the breed, according to references cited in the article. Other serious complications from heatstroke include rhabdomyolysis, or damage to the muscles after exercise; cardiac arrhythmias, or irregular heartbeats; organ failure such as acute kidney damage or acute respiratory distress; clotting abnormalities; and sepsis, a life-threatening reaction to infection.

Whereas a dog’s normal body temperature is between 100 to 102.5 degrees, heatstroke is a highly fatal condition in which the core body temperature reaches more than 106 degrees. Most dogs are good at controlling their core body temperature — until their temperature goes past a critical level. When this happens, even after the dog’s temperature is lowered back into the normal range, the dog may experience permanent inability to regulate its body temperature as well as before overheating.

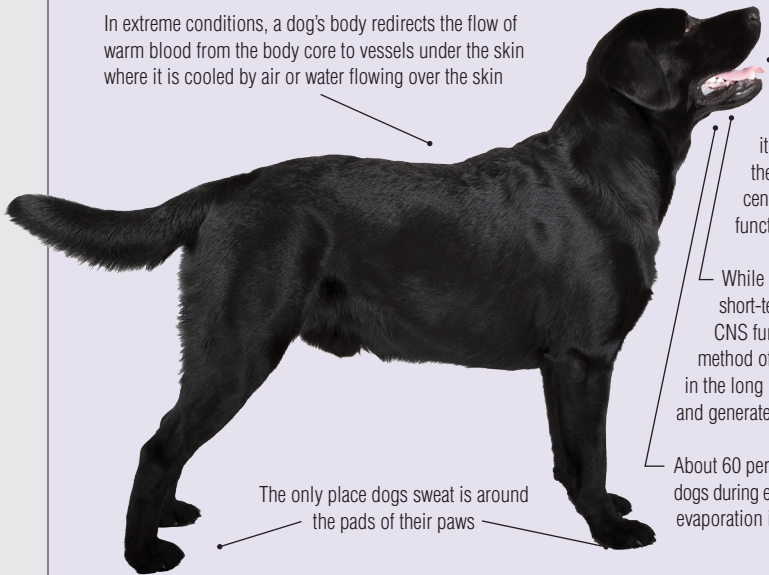
“If your dog is predisposed or at risk for heatstroke — or has had a history of heatstroke — consider carrying a rectal thermometer

“When in doubt, heatstroke is better avoided than treated. Making sure dogs are physically fit and acclimated to the heat can be life-saving.”

Justine Lee, DVM, DACVECC, DABT,
Animal Emergency and Referral Center,
St. Paul, Minnesota

DOGS' COMPLEX CIRCULATION

In extreme conditions, a dog's body redirects the flow of warm blood from the body core to vessels under the skin where it is cooled by air or water flowing over the skin



A dog compensates for overheating by panting, which causes salivation. As saliva evaporates, it cools the blood going to the brain, helping to maintain central nervous system (CNS) functioning

While panting is an effective short-term solution to help maintain CNS function, it is an inefficient method of lowering body temperature in the long run because it uses energy and generates additional heat

About 60 percent of heat dissipated by dogs during exercise is through water evaporation in the respiratory tract

The only place dogs sweat is around the pads of their paws

when you exercise your dog,” Dr. Lee advises. “Anytime a dog has a temperature over 105 degrees, you want to immediately start cooling measures and seek veterinary care to be safe. If the temperature doesn’t read on a digital thermometer, it means the temperature is greater than 108 degrees and immediate cooling and veterinary attention is required.”

In the retrospective heatstroke study cited earlier, the overall mortality rate for affected dogs was 50 percent, with 27 of 54 dogs dying. Sixty-three percent, or 17 dogs, died within 24 hours of admission, four of which were euthanized. The mortality rate for dogs that received veterinary care within 90 minutes was 27 percent versus 62 percent for dogs in which the time lag was greater than 90 minutes. Twenty-six dogs were cooled by their owners before receiving veterinary care.

A quick response in cooling an overheated dog and seeking prompt veterinary care provides the best outcome. If a dog has overheated and is in heat stress, owners can help by taking these steps:

- Be aware of early signs of heat stress — excessive panting, drooling, slowing down, a racing heart rate, and collapsing. If any of these signs is noticed, the dog should be assessed and cooled down.
- Focus on cooling down the dog, and then restoring hydration. Start by getting the dog into the shade out of direct sunlight.
- If there is a nearby safe source of water, such as a pond or stream, consider letting the dog lie in the water. Otherwise, apply cool water to the foot pads and squirt cool water under the dog’s front legs and in the groin area where there is a higher concentration of large blood vessels to aid in cooling.
- Avoid covering a dog with a wet towel or blanket, as you want to encourage evaporative loss to help cooling.
- Do not put a wet dog in an enclosed kennel, as this reduces air flow that would benefit the cooling process. Sitting with a wet dog in a vehicle with the air conditioner or a fan blowing aids cooling.
- Try to keep the dog moving by encouraging standing or walking slowly. The circulating blood tends to pool in certain areas if a dog is lying down, thus preventing the cooled blood from circulating back to the body core.
- Once a dog has cooled down, allow the dog to drink small amounts of water. Do not let the dog gulp water, as drinking too much water too rapidly could cause vomiting. Never force a dog to drink.

“When in doubt, heatstroke is better avoided than treated,” Dr. Lee says. “Being aware of signs of heat stress is helpful. Making sure dogs are physically fit and acclimated to the heat can be life-saving.”

TESTING FOR HEARTWORMS

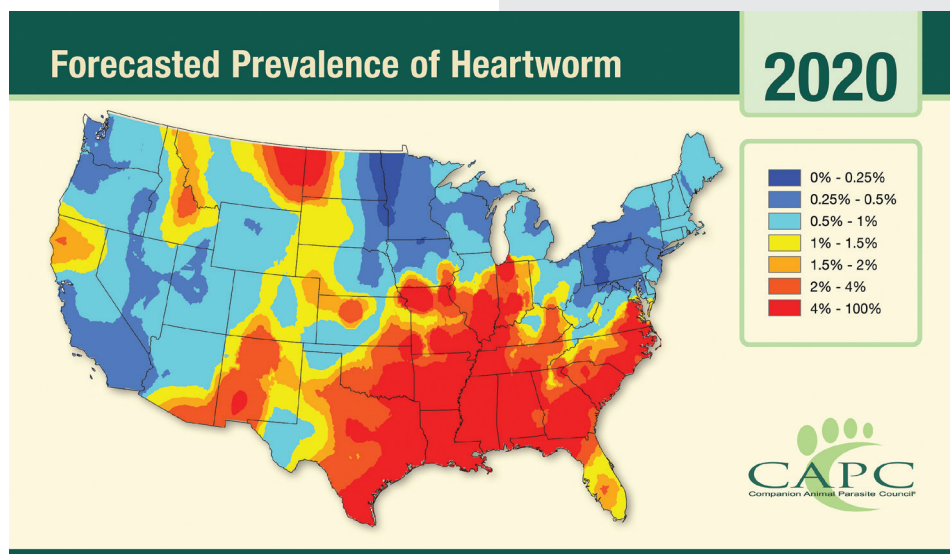
Known by the scientific name *Dirofilaria immitis*, heartworms can be fatal in dogs. The bite of a mosquito carrying a larval form of the heartworm sets in motion the process that causes lung disease, heart failure and sometimes death. Heartworms can live five to seven years in dogs, and infected dogs can have 30 or more heartworms.

Monthly preventives, such as Heartgard®, are the best way to prevent a dog from getting the disease. Fran Smith, DVM, PhD, DACT, chair of the Labrador Retriever Club Health Committee and a theriogenologist who owns Smith Veterinary Hospital in Burnsville, Minnesota, is a breeder of Labrador Retrievers under the Danikk prefix. She routinely screens her dogs for heartworms and uses heartworm preventive.

When her 6 ½-year-old black female “Wendy” (Rebel Ridge Da Little Witch SH) tested positive for heartworms, Dr. Smith knew the dog well enough to figure that she had spit out the chewable heartworm preventive rather than swallowing it. The missed dose would have killed the larvae that had developed in the dog’s bloodstream over the 30 days since the previous month’s preventive. Instead, the larvae kept growing into adult heartworms. Luckily, Dr. Smith caught Wendy’s heartworms early before she suffered damage to the heart, lungs, blood vessels, kidneys, or liver.

Having spent the summer training for field trials in Mississippi, Wendy returned home in the fall seeming a bit off. Dr. Smith ran a blood panel that included a heartworm antigen test. The test detects proteins released by adult female heartworms into a dog’s bloodstream. When it came back positive, she retested Wendy. Again, the test was positive.

Meanwhile, Dr. Smith tested Wendy for heartworm microfilariae, the



immature heartworms produced by adults. It, too, was positive, indicating Wendy had at least one adult female heartworm and she had been infected for at least six months, the time it takes for an adult to produce microfilariae. Left unchecked, Wendy could have developed a severe case that potentially would have killed her.

Reflecting on the 120-day treatment regimen for Wendy’s heartworms, Dr. Smith says, “Treating my own dog made me realize how challenging this can be. Not only is it difficult to keep a dog calm with crate rest and leash walking for several weeks during treatment, the cost is expensive, running around \$1,300, depending on where you live. The stress of worrying whether your dog has suffered long-term heart damage also takes a toll.”

Although the steps of heartworm treatment for an individual dog may vary based on the severity of disease, treatment in general involves:

- Restricting exercise right away to help stabilize the dog, as physical exertion increases the rate at which heartworms damage the heart and lungs. If the dog is not already on a heartworm preventive, treatment should begin.
- Dogs that test positive for microfilariae are prescribed an antihis-

The Companion Animal Parasite Council predicts a widespread increase in heartworm activity in 2020, particularly in areas along the Mississippi River, throughout the southern portion of the Midwest and along the Atlantic Coast north into Virginia.

LYME DISEASE & LABRADOR RETRIEVERS

The most common vector-borne disease in the U.S., Lyme disease is challenging to detect because dogs rarely show signs and the poppy-seed size of the

PHOTO: UNIVERSITY OF FLORIDA



Blacklegged tick or deer tick

nymph form of the blacklegged tick or deer tick (*Ixodes scapularis*) and the Western black-legged tick (*Ixodes pacificus*) is virtually impossible to recognize. A tick infected with the bacteria *Borrelia burgdorferi* can transmit Lyme disease in 24 to 48 hours.

When both her field trial Labrador Retrievers tested positive for Lyme disease based on routine bloodwork, Susan Exo, an owner-handler who travels between Verona, Wisconsin, and Thomasville, Georgia, was caught off guard since she uses tick preventive. Both dogs were treated with the antibiotic doxycycline. One retriever ended up suffering permanent lameness, and the other, a black male named "Levi" (FC Maple Creek's Spirit Warrior), developed a nagging cough.

"Since Levi had been treated for Lyme disease, the veterinarian originally suspected cancer, but an endoscopic exam revealed tiny holes throughout his lungs," Exo says. "This made it hard for Levi to run all out because he became easily winded."

The tiny holes turned out to be lung damage caused by Lyme disease. Exo carefully managed the condition, and Levi went on to have a successful field trial career. At the 2014 National Open Retriever Championship in Vicksburg, Mississippi, Levi, handled by pro Wayne Curtis, was a Finalist, finishing all 10 series of the highly competitive retriever stake.

Levi is among thousands of dogs diagnosed annually with Lyme disease. According to the Companion Animal Parasite Council, thus far **in 2020, there have been 240,663 dogs diagnosed with Lyme disease of 5.39 million dogs tested.** That equals one in 23 dogs in 2020 compared with one in 20 dogs in 2019 and one in 17 dogs in 2015.

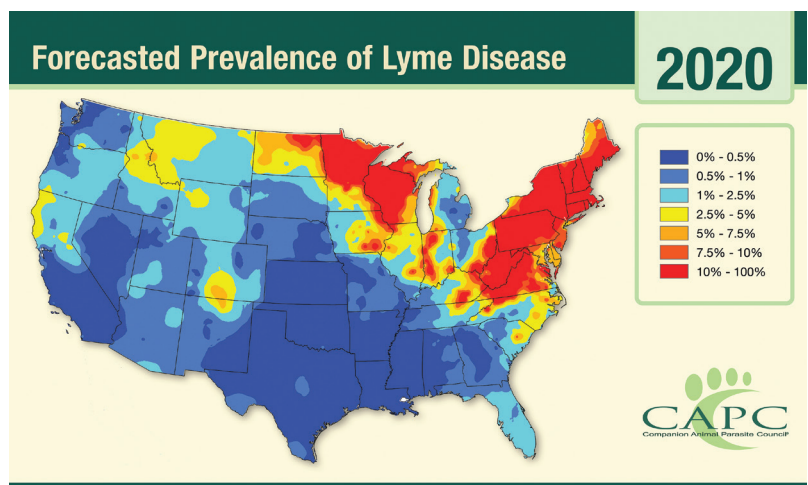
Five to 10 percent of dogs that test positive for *B. burgdorferi* develop clinical signs of Lyme disease, according to references cited in an [article published in 2007 in the Journal of Veterinary Diagnostic Investigation](#). Joint pain, fever, swollen

lymph nodes, lethargy, loss of appetite, and lameness are signs of Lyme disease.

The most severe illness is Lyme nephritis, a form of protein-losing nephropathy that often causes fatal kidney disease. Although it is generally considered rare, Labrador Retrievers and Golden Retrievers are at greatest risk for the disorder. The average age of onset is 5 1/2 years old, with dogs typically having a history of joint disease and previously testing positive for *B. burgdorferi*.

Named for a small coastal town in Connecticut, where it was first recognized in 1975 in children diagnosed with juvenile rheumatoid arthritis, Lyme disease is expanding from the Northeast and Mid-Atlantic states to the upper Midwestern states and throughout Canada. The Companion Animal Parasite Council [predicts high rates for Lyme disease in 2020](#), which isn't surprising given the wet spring and summer across many part of the country, prime conditions for ticks to thrive.

The best prevention for Lyme disease in dogs is year-round protection. Consult your veterinarian to know which products are best for your geographical area. The choices may include: spot-on preventives, oral preventives and/or flea & tick collars. Along with taking time to check your dog for ticks after being outdoors and avoiding heavy woods and grassy areas, you are doing your part to keep your dog safe from ticks and Lyme disease.



The 2020 forecast by the Companion Animal Parasite Council for dogs testing positive for *Borrelia burgdorferi*, the bacterial pathogen carried by ticks that causes Lyme disease, indicates higher-than-average rates from Maine to North Carolina and Tennessee. Particularly large increases are indicated for an area encompassing eastern Pennsylvania, northern West Virginia and eastern Ohio and through the Midwest, with a hot spot expected in northwest Minnesota.

tamine and prednisone to help reduce the risk of anaphylaxis, a severe, potentially life-threatening allergic reaction from dying microfilariae.

- Four weeks of twice-daily doses of the antibiotic doxycycline help to combat a potential infection from *Wolbachia* bacteria. Dying heartworms release *Wolbachia* proteins into the bloodstream, causing inflammation within the blood vessels that can block blood flow.
- Once a dog is stable, injections of melarsomine, or Immiticide®, are given to kill heartworms in the heart and blood vessels. The first vaccine is followed one month later by two injections given within 24 hours. Administered deep into a dog's muscle, these injections are painful to dogs and sometimes require sedation.
- During the month between vaccinations and one month afterward, dogs are not allowed to exercise due to the risk of lung embolism. Adult heartworms die a few days after vaccination. As they decompose, they break up and travel to the lungs where they become lodged in small blood vessels until they are reabsorbed by the body. Fatal embolism can occur if clumps of dead heartworms break off and a blood clot becomes lodged in the lungs.

"A dog's boredom and owner compliance can wane during the two months of strict crate rest," Dr. Smith says. "Excitement, overheating and exercise can cause a fatal embolism. This is why calm leash walks for bathroom breaks are the extent of exercise allowed during this time."

Retesting for heartworms occurs six months after treatment is completed. After the last vaccination treatments and month of crate rest, a dog can resume an active lifestyle and should continue with



monthly heartworm preventive on a year-round basis.

"Owners always ask me why they should check their dog for heartworms when they use a preventive year-round," Dr. Smith says. "What happened to Wendy is why. Dogs may not swallow the preventive or may throw up the medication without owners knowing. An owner may inadvertently give the dosage past the due date. Not knowing your dog's heartworm health status is a risk not worth taking."

Being smart about heat stress, heartworms and tick-borne diseases, such as Lyme disease, are a crucial part of being a responsible dog owner. Simple preventive steps can help keep your Labrador Retriever safe in the outdoors, enjoying life with you. ■

Purina appreciates the support of the Labrador Retriever Club Inc., particularly Fran Smith, DVM, PhD, DACT, LRC vice president and health chair, in helping to identify this topic for the *Labrador Retriever Update*.

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