CORNELL COLLEGE OF VETERINARY MEDICINE

DOGWatch

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Expert information on medicine, behavior, and health in collaboration with a world leader in veterinary medicine

THIS JUST IN

California Ticks

Some were carrying Lyme

A recent study from Colorado State University found that tick-borne diseases in California include Lyme disease (caused by *Borrelia burgdorferi*), infections with *Borrelia miyamotoi,* and human granulocytic anaplasmosis (caused by *Anaplasma phagocytophilum*).

The researchers surveyed multiple sites and habitats (woodland, grassland, coastal chaparral) in California to describe spatial patterns of tick-borne pathogen prevalence in western black-legged ticks (*Ixodes pacificus*). They found that several species of *Borrelia* were observed in habitats such as coastal chaparral that does not harbor obvious reservoir host candidates.

Understanding the local host ecology and prevalence of zoonotic diseases is vital for public health. Using tick-borne diseases in California, the study shows that there is often a bias to our understanding and that studies tend to focus on particular habitats e.g., Lyme disease in oak woodlands. Other habitats may harbor a surprising diversity of tick-borne pathogens but have been neglected, e.g., coastal chaparral.■

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Salkeld, D., et a., Examining prevalence and diversity of tick-borne pathogens in questing Ixodes pacificus ticks in California. Journal of Clinical Microbiology. DOI: 10.1128/AEM.00319-21

INSIDE THIS ISSUE

Worries About a Fractured Tooth

That neglected broken tooth can "bite" back

Broken teeth are common in dogs. While some fractured teeth don't cause problems, others can be extremely painful. A broken tooth may cause the dog to avoid eating and may result in an infection. If you routinely brush your dog's teeth—as you should—you may notice a chipped or broken tooth. If you do, make a veterinary appointment. If it needs treatment, the sooner, the easier.

"Very often there is no specific history of the tooth fracture, it is something we find incidentally on oral examination," says Nadine Fiani BVSc AVDC Associate Clinical Professor, Section of Dentistry and Oral Surgery at Cornell University's School of Veterinary Medicine.

A tooth fracture that exposes the sensitive pulp—the tissue that contains nerves and blood supply—will be painful. Your dog might react to hot and cold, including not drinking fresh, cool water. You might notice him avoiding his chew toys and refusing treats that he has to bite into, such as a hard biscuit. Some dogs will approach their food bowl but then walk away without eating to avoid the pain. A chronic broken tooth may lead to an abscess with swelling and pain.

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The tip of this canine tooth is broken off. If it's not loose or painful, it should be monitored.

Causes

"Fractured teeth are commonly caused by chewing very hard objects. However, we do see them secondary to trauma such as being hit by a car," says Dr. Fiani. Even chew toys can be a cause.

Most veterinary dentists go by the "thumbnail test" for chewing items. They suggest that you should be able to make a dent in the item with your fingernail. The Veterinary Oral Health Council (vohc.org) lists chews for dogs that have been approved by them as being safe for dogs. Be sure to always select the chew size that is appropriate for your dog. Larger chews are harder and may not be the right choice for a little dog.

Good options include toys from Kong and Goughnuts. While some rawhides are safe for dogs, they always require supervision. Avoid antlers, hooves, and bones, which may break a tooth or splinter and cause stomach problems. Do not let your dog chomp on ice cubes (licking, chasing, playing is OK).

Treatment

Once a broken tooth is identified, your veterinarian will do dental x-rays to evaluate the full extent of the damage, down into the root. Your dog will be sedated for the x-rays, which also allows your veterinarian to do a thorough exploration of your dog's oral cavity. A treatment plan will follow, partially dependent on the tooth involved and your dog's lifestyle.

A chipped tooth may be left alone and monitored, especially if no dentin (the layer under the outer enamel, which can be sensitive to hot/cold) is exposed. But if the tooth is wiggly, that is not an option, because it could allow a pathway for bacteria to make its way to the roots and spread throughout the dog's body.

Most broken incisors are extracted. Working police and military dogs who get broken teeth may sport a flashy titanium cap if they get a fracture. You can choose a cap, if you wish, but most owners don't. For most pets, an extraction may be the least expensive and best option. The key to your decision should be your dog's health.■

IFT122 Gene Mutation

It causes destruction of the photoreceptor, retinal dystrophy

A study from the University of Helsinki has uncovered a mutation in the IFT122 gene in blind dogs. The gene defect now discovered results in the progressive destruction of photoreceptor cells and retinal dystrophy. IFT122 is a new candidate also for retinal dystrophy in humans. A gene test in support of breeding and diagnostics has been developed based on the finding.

Data encompassing more than a thousand Lapponian Herders and Finnish Lapphunds from a canine DNA bank were utilized in the study. Previously, several retinal dystrophy genes have been described in both breeds.

"Among other finds, two eye disease genes have previously been identified in Lapponian Herders, but they have not accounted for all cases. In some dogs, the disease is caused by the IFT122 gene. The finding is significant since gene tests can now distinguish between retinal dystrophies associated with different genes in breeds, which makes a difference in monitoring disease progression, making prognoses, and developing novel treatments. Diagnostics are getting better and making the job of veterinarians easier," says veterinarian Maria Kaukonen.

The gene discovery also facilitates the understanding of retinal biology. IFT122 is part of a protein complex linked with ciliary function in the retina.

The findings are also significant for further plans to remove the disease from different breeds. In the Lapponian Herders and Finnish Lapphunds, the share of individuals carrying the gene variant was 28% and 12%, respectively. ■

Kaukonen, M. et al. A missense variant in IFT122 associated with a canine model of retinitis pigmentosa. Human Genetics, 2021; DOI: 10.1007/s00439-021-02266-3

Stem Cells Generated from Canine Blood

These iPSCs can be programmed from a developing cell

Scientists have developed a novel method to induce stem-cell generation from the blood samples of dogs. Through this technique, the scientists hope to advance regenerative stem-cell therapies in veterinary and human medicine.

By transplanting stem cells and guiding their differentiation into desired cell types, researchers are effectively able to regenerate damaged tissues, thereby reversing the course of various complex diseases. Although this technology is widely studied in humans, the research in stem-cell therapy in dogs is lacking.

To this end, a research team from Osaka Prefecture University in Japan has been working on isolating induced pluripotent stem cells (iPSCs) from canine blood samples. iPSCs are a type of stem cell that can be programmed from a developed cell by introducing a specific set of genes into them. These genes code for proteins called transcription factors, which induce the change from a differentiated to a pluripotent stem cell, which then can mature into various cell types. iPSCs can proliferate rapidly, providing a supply of stem cells for regenerative therapies.

The previous attempts by these scientists to generate iPSCs from canine blood cells, using viral vectors to deliver the pluripotency-inducing transcription factors, were not as effective. In this study, they tested a different combination of inducing factors, which they believe were key to harvesting the full potential of these cells. Most importantly, the researchers needed to control how the reprogrammed cells replicated in the host body. The authors believe that additional research into regenerative therapies for canines might have some ripple effects into therapies in human medicine as well. ■

Kimura, K., et al. "Efficient Reprogramming of Canine Peripheral Blood Mononuclear Cells into Induced Pluripotent Stem Cells." Stem Cells and Development, 2021; 30 (2): 79 DOI: 10.1089/scd.2020.0084

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CONTRIBUTING WRITERS
Eileen Fatcheric, DVM
Katherine Basedow, LVT

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Cornell University
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Veterinary Medicine

For information on pet health, visit the Cornell University College of Veterinary Medicine, website at vet.cornell.edu

Send questions and letters to the editor:
DogWatch
535 Connecticut Ave.
Norwalk, CT 06854-1713
dogwatcheditor@cornell.edu

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Vestibular Syndrome Symptoms

Your dog may seem out of kilter, with wiggling eyes

You wake up and your senior dog can't or won't get up. When you help him up, you notice a head tilt and weird-looking eyes. If he gets up, he's wobbly. Some dogs will circle once you get them moving. Many vomit or refuse to eat. This sounds like a common ailment called "senior dog vestibular disease."

The vestibular system is responsible for balance and equilibrium. It coordinates movements of the eyes and the head as well as the legs. Receptors are found in the inner ear, near the hearing receptors. Incoming information is passed on to the brain stem and cerebellum. Problems anywhere along these paths can lead to an unsteady dog, tilted head, nystagmus (unusual eye movements), and often nausea (similar to you feeling ill if you get dizzy or seasick).

Of course, these symptoms could also indicate a middle ear infection, a reaction to medications, or trauma, but the onset of vestibular syndrome in older dogs is usually abrupt and without an identifiable cause. If the vestibular signs are due to a cancer in the brainstem or inner ear, affected dogs do not usually return to normal.

Older dogs dealing with vestibular tend to show the most extreme signs the first day or two. Improvement tends to come slowly but surely. The head tilt and some stumbling may take a bit longer, but most dogs are back to almost 100% in a week or 10 days. The biggest improvement tends to happen within the first 72 hours. A small percentage of dogs will retain a head tilt for the rest of their lives, but overall, they adapt.

Chris Bosonski | Creative Commons

A dog with vestibular syndrome will need a great deal of supportive care.

At the Veterinary Office

Your veterinarian will do a neurologic exam, looking for proprioception, weakness on one side versus the other, and any problems with balance. A full workup to exclude things like stroke or cancer might include a referral for a magnetic resonance imaging (MRI) or computed tomography (CT) scan. In most cases, your veterinarian will elect to treat for idiopathic (unknown cause) vestibular syndrome, at least initially.

The rapid eye movements contribute to the nausea. Many dogs benefit from anti-nausea medications such as maropitant citrate (Cerenia). You may still have to hand feed your dog his favorite treats for a day or two until the worst of the dizziness clears.

While a dog can go for a couple of days without eating, he needs to drink every day. If your dog has trouble drinking, your veterinarian may give him subcutaneous fluids and show you how to administer them at home.

Some dogs benefit from rehabilitation care once they get past the most acute stages. That might include exercises for you to do at home as well as underwater treadmill work. Acupuncture can help some of these dogs to make a faster and more complete recovery, advises Allan Schoen, DVM (Cornell 1978).

Supportive Care

Supportive care starts with balance assistance. Often a harness, special sling, or even just a towel under your dog's abdomen right in front of the rear legs will help him to go outside and eliminate. It is especially important to provide support of some kind if your dog must negotiate steps or uneven terrain. Most dogs remain continent during a bout of vestibular disease but not all. If not, you may need doggy diapers for a short time. Be sure to keep your dog clean and dry under them.

Make sure your dog has good footing in your home, including adding extra non-slip throw rugs or yoga mats over slippery surfaces like ceramic tiles or linoleum. Use a baby gate to block off stairs or rooms where your dog might end up falling or getting stuck in a corner. Keep him in an ex-pen or crate when you can't be right with him, and provide a comfortable, soft bed. You want to encourage him to rest, so he needs to have a bed or blankets that keep him comfortable and make him want to lie down. Luckily, most senior dogs totally recover from vestibular disease. ■

Could It Be a Stroke?

An ischemic stroke comes on quickly, just like vestibular syndrome, and causes similar symptoms. About 50% of dogs that suffer from strokes have an underlying cause, although it may not be easily identifiable.

Causes of ischemic strokes in dogs are similar to human stroke causes: hypertension, which might be associated with chronic kidney disease; endocrine disorders like hypothyroidism or Cushing's disease; some coagulation (blood clotting) disorders; and some cancers.

Obviously, if a stroke is suspected, your dog will require advanced diagnostics to rule out or treat specific causes. Dogs who have had a stroke are susceptible to more strokes, often within a short period of time. With typical idiopathic senior vestibular disease, however, you get an abrupt set of symptoms that gradually improve with no recurrences or setbacks.

What You Can Do

- Take your dog to the veterinarian for a neurologic exam.
- Ask about anti-nausea medication.
- Place non-slip mats like yoga mats over slippery surfaces.
- Construct a sling so you can help him move outside to eliminate.
- Keep him in a well-padded crate or ex-pen for his safety.

Braces Not Ideal for CCL Injuries

Surgery is the best treatment option for eligible dogs

A torn cranial cruciate ligament (CCL) is a diagnosis that dog owners fear. Your dog holds up his hind leg and doesn't seem to want to use it, and now your veterinarian is telling you that he needs surgery to fix the lameness. And there's a lot of zeros in that estimate. Is there another way?

The good news is that there are alternatives to surgical repair. The bad news is that the outcome is less certain.

Christopher Frye, DVM, DACVSMR, CVA, Assistant Clinical Professor and Chief of Sports Medicine and Rehabilitation at Cornell University's College of Veterinary Medicine says, "Most of the time we recommend surgical correction for cranial cruciate ligament disease followed by catered rehabilitation for optimal outcomes. Some dogs may be candidates for non-surgical management for a variety of reasons such as age, other disease that precludes surgery or anesthesia, and resources or time to undergo the surgery or recover from it."

Why the CCL Is So Important

Your dog's cranial cruciate ligament in the stifle joint functions similarly to the anterior cruciate ligament in your knee. This ligament connects the femur and the tibia and works to stabilize the joint as your dog moves around. When this ligament is damaged or torn, the joint becomes unstable, and the femur can slide around on the top of the tibia (or the tibia can slide forward where it isn't meant to be). This is unsettling and can be painful. Your dog will limp and may even refuse to use the affected leg.

All that excess motion contributes to the development of osteoarthritis in the stifle, and decreased use of the limb will cause the muscles to atrophy and weaken. Arthritis and muscle atrophy will both continue to worsen over time.

Unfortunately, ligaments aren't good at healing themselves. They have a poor blood supply. Even partial tears can result in long-term or permanent weakness to the ligament.

Surgical Options

Surgical options for treating a ruptured CCL vary, and the exact procedures for your dog may depend on which ones the surgeons in your area perform. The two most common repairs are extracapsular stabilization and tibial osteotomies.

Extracapsular stabilizations put in an artificial "ligament" of sorts that mimics the function of the CCL. Tibial osteotomies alter the biomechanics of the joint by altering the surface of the tibia to provide stability. The most commonly used technique in this category is the tibial plateau leveling osteotomy (TPLO).

"Our surgery of choice at Cornell is the TPLO by a board-certified surgeon," says Dr. Frye. "However, under certain circumstances and in certain breeds or dogs, other options may be recommended."

Regardless of the type of surgery done, your dog will need a long recovery period to allow his leg to heal and regain strength before he returns to normal activities. Most surgeons and rehabilitation practitioners follow a 12-week recovery plan, gradually increasing the dog's activity over time. Adjustments are made as needed based on your dog's progress and unique needs. For more information on the surgical options for torn cranial cruciate ligaments and the recovery process, see our May 2018 issue.

Braces

Orthotics—commonly referred to as braces—are frequently used in humans recovering from a torn ACL, so it was natural for there to be interest in this option for dogs. In theory, a well-fitted brace can provide support and stability for the joint either permanently or until scar tissue is able to build up in and around the joint.

What You Can Do

- Encourage your dog to engage in low-impact exercise such as walks, free running, and mental training games instead of high-impact activities such as chasing a ball that are more likely to cause an injury.
- Consider your goals for your dog after a CCL injury. Do you want him to be able to run without limping again, or do you just want to manage his pain? This may impact your treatment choices.
- Discuss all treatment options with your veterinarian to determine the best fit for you and your dog.

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Braces are popular in human medicine for a torn ACL, but research looking at them for CCL ruptures in dogs is inconclusive. Additional damage can occur.

Two studies in 2016 looked at different aspects of using a brace to treat CCL ruptures. The first, published in Veterinary Evidence, looked at lameness in 10 dogs who were treated with a stifle orthotic. The researchers did find an increase in weight bearing after using the brace for at least 90 days. Although promising, the increase in weight bearing was small and not as significant when the dogs were not wearing their orthotics. This was also a retrospective study with a small sample size. More research is needed to determine if bracing can provide adequate stability for healing.

The second study was published in the *Journal of the American Veterinary Medical Association*. This was a survey-based study comparing owner satisfaction after treating with a brace vs a TPLO. This study had a much better sample size, with 279 owners completing the survey. The researchers wrote, "The proportion of owners who reported that their dogs had mild or no lameness and rated the intervention as excellent, very good, or good was significantly greater for the TPLO group than for the orthosis group." Among dogs treated with an orthosis, 46% experienced skin lesions due to the brace, 11% later received surgery anyway, and 7% completely refused to tolerate the orthotic.

This second study reveals some of the issues with using a brace to treat a cranial cruciate ligament rupture. Dr. Frye says he typically avoids using braces of the knee, when possible, because:

- The mechanical joint of the brace never truly mimics/reflects the movement of an anatomical one well (in other words real joints allow rotation, flexion, extension, and gliding).
- Because the dog's thigh is shaped like an upside-down cone, it is difficult to anchor these braces. Typically, they are suspended above the calf muscle where nerves and blood flow are prominent or have a harness system that run over the back and secures around the circumference of the other limb. In addition, some braces are more compressive over the limb musculature than others to provide stability which affects the muscles and prevents proper strengthening and normal use.
- Sometimes with cruciate injury and instability, the new unwanted mechanical forces damage tissue called the meniscus (supportive and cushion) inside the joint. If braces are inappropriately fitted or of poor design, further unwanted forces may be delivered to an already injured joint. (The same challenges apply to using a brace for support before or after surgery.)

Making Your Decision

The recommended treatment for a torn cranial cruciate ligament is surgery to stabilize the joint followed by physical rehabilitation to rebuild the muscle and preserve range of motion. Surgery also allows the surgeon to address a torn meniscus (cartilage pad inside the joint) if that is present. The exact procedure selected will depend on what is available in your area and your budget.

Photo Courtesy of Cornell College of Veterinary Medicine

In the TPLO surgical procedure, a plate holds the rotated bone in place while it heals.

A custom brace may be a suitable treatment option for dogs who are unable to undergo surgery, but further research is needed to evaluate the true effectiveness of this method. "I prefer to incorporate pain management and targeted physiotherapy to promote strengthening of the muscles that support the joint as well as re-educating the neuromuscular feedback functions that have been disrupted during injury," says Dr. Frye. Pain management and rehabilitation therapy are the cornerstones of CCL injury recovery, regardless of the treatment method selected for your dog. ■

Research at Cornell

The College of Veterinary Medicine at Cornell University is working on a study about radiofrequency therapy for pain management. Dogs with stifle pain that is difficult to control with other treatments are eligible for the study. There is no cost to the owner, but you will need to bring your dog to Cornell at four specified intervals. Radiofrequency ablation and pulse-dosed radiofrequency therapies are used in people to treat chronic pain, including osteoarthritis. Neither has been researched in dogs for chronic pain management but could be highly effective, long-lasting means of relieving OA pain when other treatments fail. For more information, visit https://www.vet.cornell.edu/hospitals/clinical-trials/radiofrequency-therapy-pain-management-dogs.

Let's Talk Money

According to CareCredit, the average cost of an extracapsular repair surgery is $1,200 to $1,500 and the average cost of a TPLO is $3,500 to $5,000. This may also include rehabilitation services during the recovery period.

Because dogs vary so much in size and shape, a custom brace is necessary for optimal fit and performance. A custom brace generally runs $700 to $1,000, along with fees for shipping and fitting appointments. At the end of the day, the cost often ends up comparable to doing surgery. And don't forget that 11% of dogs that ended up undergoing surgery even after investing the time and money in a custom brace.

Standard-size, fabric braces are more economical, but provide minimal support and are challenging to fit properly. A CCL injury does not have a do-it-yourself fix.

Warm-Ups for Weekend Warriors

Set your dog up for fun, pain-free activity

For many of us, time spent with our dogs is lopsided: during the work week we go for short walks once a day and do a little training and then on the weekend we want to have two days of fun. This weekend-warrior routine can be harmful because we aren't in shape for the activities we want to do on the weekend. But we can assess the situation and put a plan into place.

Evaluate Physical Condition

Consider how active your dog really is during the week. Time spent outside in the yard does not necessarily count as active time and walks need to be brisk to count as real activity.

You can evaluate your dog's muscle condition score (MCS). Just like us, a dog who is in tip-top physical shape will have thick, firm muscles, while a dog who prefers watching movies from the couch will have a softer feel. A well-muscled dog will have well-developed shoulder and gluteal muscles, while a dog that is not in shape will be flatter.

Plan Realistic Activities

Dogs who are not in shape are more likely to get injured when they engage in intense or prolonged physical activity. This could range from muscle soreness the next day to muscle tears and strains and even a torn ligament.

Make weekend plans with your dog based on what he can realistically handle. If his normal routine during the week is a 15-minute walk twice a day and you don't have any stairs in your house, going on a long hike in the state park is probably not the best choice on Saturday. Leave your dog home, or start working on shorter, easier hikes now so you can gradually build up your dog's stamina and fitness over time.

Warm Up!

Getting your dog warmed up before activity, whether it's taking a long hike or going for a run, can help to loosen his muscles and get him ready for the day. "Warm up depends on the desired activity and dog's fitness level. Walking is my favorite for most cases," says Alicia M. Brown, DVM, CVA, CCRP, Cornell Class of 2013, who practices small animal medicine at Village Veterinary Hospital in Canastota, N.Y., and competes in agility trials with her Australian Shepherd.

Your warm-up should mimic what you are going to be doing with your dog, but at a decreased intensity level. Dr. Brown explains, "For hiking or running, walking on mostly flat ground works well. If planning to do a lot of quick movements, then walk followed by half speed tug/fetch or a similar game." A five- to 10-minute warmup can help to loosen your dog's muscle fibers and heat up his body a little, making movements easier.

Watch for Signs of Fatigue

It is our job as owners to make sure that our dogs don't overexert themselves. "Some dogs will keep playing a game until they drop!" says Dr. Brown. "Watch tongue color. If it's getting deep red or purple, take a break, get out of the sun, get some water (dogs will drink more right after stopping exercise than they will if there is a delay in access to water). Other things to look out for may be excessive scuffing of their feet (listen to them walking) or having a harder time keeping their footing, slipping/ tripping a little more on irregular ground." All these are signs that your dog is starting to fatigue, and continuing to run or play at this point dramatically increases the risk of injury.

Be your dog's advocate. Throwing a ball for the dog is a popular activity at family barbecues, and your dog probably loves it, but he shouldn't be running all day. If he is starting to slow down and pant heavily, tell your friends and family to stop throwing the ball (or confiscate the toy if needed). Give him several hours to recover before allowing the game to resume. If he starts to limp, the game needs to stop immediately before additional damage is done.

If your dog is getting tired, listen to him. "Dogs don't necessarily understand the 'no pain, no gain' concept that we like to push ourselves for, so if they're really slowing down or trying to take breaks, I wouldn't try to make them push through it," says Dr. Brown. "This may be them having a hard time keeping up with your walk/run pace, try to stop in the shade or stop anywhere possible to get a drink." Call it a day and let your dog have a well-deserved rest. ■

Do These Stretches After You've Walked a Bit

"After warm up, move on to active stretching," says Dr. Brown. She has two favorite warm-up stretches—both of which allow you to coax your dog using a treat—that help to stretch out the hip flexors, lower back, and iliopsoas muscles:

Treat stretches. Use a treat to lead your dog's nose back to different points on his body to gently stretch him out. Have the dog try to touch his hock, stifle, and hip on the hind leg as well as turning to touch his shoulder. Repeat several times for both sides.

mspoltax | Shutterstock photo

Step stretch. Ask your dog to place his front feet on an elevated surface, such as a box, step, or chair, and then reach forward and upward to get a treat. This should make him extend his spine. You can also teach your dog to place his front feet on your leg as you kneel or on your outstretched arm.

If your dog is recovering from an injury or has chronic mobility challenges, talk to your veterinarian or rehabilitation practitioner about specific exercises to get him ready for action.

Let's Stay Safe This Summer!

Some rare but deadly hazards may be lurking

Summer is a great time to be a dog, and, as an owner, it's your job to keep your dog safe.

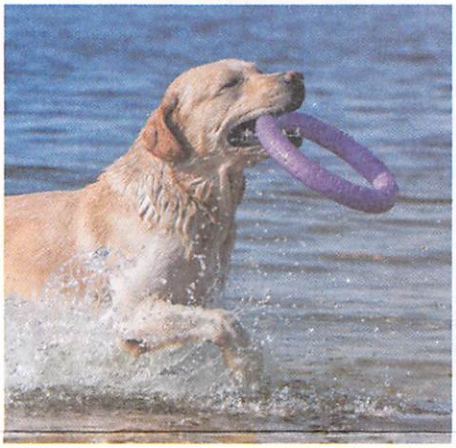
1 Fresh Water Intoxication. If your dog ingests too much water, he can become ill. A dog who is in and out of the pool or a lake all day, especially chasing balls, ingests a lot of water. When he ingests too much, the normal electrolytes in the bloodstream become diluted, causing brain swelling that leads to seizures and other neurological derangements, possibly death. This awful situation is avoidable by making sure your dog takes frequent half-hour breaks from the water all day. A little down time between water sessions allows the body's natural fluid balancing system time to adjust and manage the excess intake.

2 Saltwater Intoxication. When a dog consumes too much saltwater, the opposite phenomenon happens in the brain. Excess salt in the bloodstream pulls water out of brain cells, causing them to shrink. The resultant neurologic signs include muscle tremors, disorientation, and seizures. Again, this is a terrible life-threatening situation that can be avoided with some simple steps.

First and foremost, make sure your dog has had plenty of fresh water and is well hydrated before you head off to the beach or your saltwater pool. This will make him less likely to voluntarily ingest saltwater due to thirst. If your dog is one of those you can "lead to water but can't make him drink," watermelon chunks are a great way to help dogs hydrate. Again, make sure your dog takes lots of rest breaks between water excursions, with lots of fresh water available.

One potential issue caused by saltwater ingestion you may not be able to avoid, especially with ocean swimming, is explosive watery diarrhea. Seawater, in addition to being high in sodium and chloride, contains magnesium, which has a strong laxative effect. To avoid an unpleasant surprise, walk your dog for 20 to 30 minutes or so before getting in the car to drive home.

3 Blue-Green Algae. This algae, called cyanobacteria, is an increasingly common water hazard due to ubiquitously rising water temperatures around the globe. Cyanobacteria love warm, stagnant water and any water will do, so it's not just ponds or lakes we have to worry about. Warm stagnant water in buckets, bird baths, and livestock troughs pose the same risk to your dog.



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Some dogs never want to stop playing! It's up to you to keep him safe.

Note: Cyanobacteria is not that thick green stuff that seems to grow on top of the water. It's more a glowing greenish cast that looks like it's in the water. Not all cyanobacteria are toxic, but they all look the same, so you simply must avoid them all.

Some cyanobacteria produce toxins when ingested that cause rapid, massive liver necrosis. The liver damage can be so immediate and so severe that the liver starts filling up with blood, which can throw your dog into severe hypovolemic shock within hours. Even if these dogs make it to the veterinarian in time to be treated for shock, they usually succumb to the ensuing liver failure.

Other cyanobacteria produce neurotoxins, which are so deadly, the dog doesn't even make it to the veterinarian. Dogs exposed to these neurotoxins typically come out of the water, collapse, have convulsions, and die within minutes.

Your best bet when it comes to cyanobacteria is never allow your dog to drink or swim in anything but clear, cool, moving water.

4 Pool Chemicals. Once diluted, most pool chemicals aren't toxic to your dog. The one exception is pool shock, which is when an extremely high dose of chlorine is put in the pool water. This can irritate your dog's skin and respiratory tissues, and some dogs suffer collapse after swimming in a recently shocked pool. Nobody knows exactly why this happens. Affected dogs typically recover quickly with intravenous fluid support, but it's best to avoid this. Pool chemicals in their concentrated forms (chlorine tabs, crystals, and concentrated liquids) are caustic. If your dog chews on these, he will likely suffer painful burns in the mouth, esophagus, and stomach, requiring immediate veterinary attention.

5 Lawn Care Products. If a product comes as pellets or granules that you spread on the ground and then water in, typically, the water washes the chemical agents into the soil. What's left behind is the usually harmless material the pellets that carried the chemical were made of, typically corncob or clay matter. But, if your dog rips open a bag of lawn treatment and snacks on it, call Poison Control (888-426-4435) while you're on the way to the veterinarian's office.

Fortunately, most residential pesticides are safe. However, a few highly toxic agents are out there, so read warnings on the labels before deciding what to use. For instance, outdoor ant and snail baits can be toxic to dogs, so don't use them. If a product says "bait," it means it is doctored with yummy stuff to draw in the victims. This yummy stuff will attract your dog as well.

With herbicides, usually it's the inactive ingredients, or solvents, that cause some stomach upset if ingested.

Moldy fertilizer may contain mycotoxins that are neurologically poisonous to the dog. Occasionally, pesticides are added to the fertilizer, so it is extremely important to check labels carefully before using any product.

A note about mulch: For the most part, mulches are not toxic, with one exception: cocoa-bean mulch. It looks beautiful and tastes delicious (according to dogs), but it's just as toxic as chocolate to dogs. Avoid this mulch. Other mulches typically cause gastrointestinal upset or blockage, but you don't want that either.

Clearly, awareness is your first step in protecting your dog from summer hazards. Knowing what to avoid and/or how to prevent problems in the first place will help keep you and your dog safe and happy all summer long.

Keep this number handy: Poison Helpline 800-213-6680. ■

More Barking Woes

This Lab does some amazing tricks but not to be quiet

Q My female lab Lilly behaves exceptionally well except she's an obnoxious barker. Joggers, a neighbor's car door, anything gets her going. And worst of all, though she loves to ride along when I'm running errands, she starts barking when she realizes I'm about to park and keeps it up when I run into the post office for stamps or the hardware store for screws. I've trained her to do all sorts of things: go out and fetch the newspaper. If she's coming in wet, she knows to sit right down on a particular rug until I can towel her down. She's so teachable generally. Why can't I get through to her on barking?

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Separation anxiety may be yet another reason not to leave your dog alone in your car.

A You have done an amazing job with Lily. I bet she brings your slippers as well as the paper. The problem is that it is harder to teach an animal to not do something than to do it. Some people claim they can teach Quiet or No Bark, but none of my clients have been able to do so. The next best thing is to get rid of the stimulus to bark.

She must see joggers out the window, so try to block her view. We usually recommend translucent window clings that admit light, but won't allow her to see the joggers.

But you can use background music—if you and she can agree on a genre—Lilly may like Rock and you may like Mozart. You can use a white noise machine to mask outside noises. It will be harder to deal with sounds that stimulate barking.

The barking in the car sounds like separation anxiety because she only does it when you leave the car or she anticipates your leaving (parking the car). If you sometimes take her for a ride to a hiking trail or dog park she may be barking in frustration. The simple solution is to leave her home when you do errands.

An alternative suggestion is leave her with a long lasting treat like a Kong stuffed with something delicious but hard to extract, such as frozen peanut butter or with a rawhide. She will be too busy licking or chewing to bark.

There are lots of gadgets to punish barking, such as shock collars, citronella collars, or ultrasonic devices. I don't think her behavior is serious enough to warrant punishment. The citronella collars actually work better than the shock collars. The ultrasonic collars don't work in the long run because the dogs habituate to the ultrasound very quickly.

Good luck with reducing the noise pollution in your home and car. Let us know how it goes for you.■

Do You Have a Behavior Concern?

Send your behavior questions to Cornell's renowned behavior expert Katherine Houpt, VMD, Ph.D., shown here with Yuki, her West Highland White Terrier. Email to dogwatcheditor@cornell.edu or send by regular mail to DogWatch, 535 Connecticut Ave., Norwalk, CT 06854-1713.

Coming Up ...

- *How to Achieve Perfect Poop*
- *Understanding and Detecting Renal Failure*
- *Some People Rotate Dog Food—Should You?*
- *Deciding on Veterinary Care for a Tick Bite*

Don't Stress Me Out

Listen to your dog's body

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Dogs can tell you they're feeling uncomfortable or stressed through growling, whining, pacing, tucking tail, and fearful eyes. But they can also be more subtle. Many simply lick their lips, scratch, yawn, or shake themselves, as if they were wet. If you see these signs, consider ending the activity for the day or at least remove him from the trigger until you have time to go back and reintroduce it, slowly.■

Rising Parvo—Fox19Now in Ohio reports that there's an increase in parvovirus cases among dogs in the area. Parvo is a contagious gastrointestinal illness that most often affects puppies. The vaccine against parvovirus is one of the recommended core vaccinations every dog should have.

COVID-19 Recruits—The University of Pennsylvania is looking for volunteers to participate in a study to determine if dogs can detect odors associated with COVID-19 (SAR-CoV2) infection. They are looking for new (48 hours) cases of COVID-19. If that's you, the study involves wearing a cotton T-shirt for one night, and they pay shipping expenses. Contact coviddogs542@gmail.com.

Sniff Your Feet, Please—A report from *Smart Brief* says a Labrador Retriever named Buffy greets visitors at Doctors Hospital of Sarasota, Fla., and with permission, sniffs their feet for odors indicating an active COVID-19 infection. The story in the *Tampa Bay (Fla.) Times* says Buffy is one of four COVID-19 scent detection dogs, all of which flunked out of guide-dog training.■