

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

THIS JUST IN

Coronavirus and Dogs

CDC says spread unlikely

Despite the photos you may have seen with Chinese dog owners buying face masks for their dogs, it appears that while dogs can be infected by coronaviruses, so far they are resistant to this new version making its way around the world.

“Coronaviruses are a large family of viruses that are common in many different species of animals, including camels, cattle, cats, and bats. Rarely, animal coronaviruses can infect people,” reports the Centers for Disease Control and Prevention (CDC).

In dogs, coronavirus infections tend to appear as short-lived but highly infectious intestinal infections. While many adult dogs show no clinical signs, puppies and young dogs may have acute

onset diarrhea. The diarrhea may be orange in color, contain blood, and have a very bad odor. Symptomatic care generally resolves this infection, but it's wise to consult with your veterinarian to rule out any other problems. ■



Photo: iStock Photo

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Use Caution with CBD

Think before you rush into using CBD

Cannabidiol, more commonly called CBD, does not meet current Food and Drug Administration (FDA) requirements to be considered “generally regarded as safe,” or GRAS. This doesn't mean it is or isn't safe; it means we don't know for sure.

“In order to be GRAS, you have to substantiate not only safety or risk, but your product has to be beneficial for a specific purpose. The hemp plant or extracts of the hemp plant certainly have been shown to potentially have nutritional benefits. Hemp seed oil may be a good source of essential fatty acids. Hemp cake or hemp meal might be a good protein source or fiber source,” explains Bill Bookout, President of the National Animal Supplement Council. So far, researchers have not shown a nutritional benefit from feeding CBD. There have been some medical claims, but for GRAS status, a product must have nutritional pluses. In addition, the FDA lacks sufficient empirical evidence to support the safety of CBD for animal consumption, which is required for the FDA to give it a stamp of approval.

A study done at Cornell did show medical benefits for dogs with osteoarthritis and no ill effects, but the study only covered 16 dogs. More trials with more dogs need to be conducted to verify the medical benefit for osteoarthritis. ■

<https://www.frontiersin.org/articles/10.3389/fvets.2018.00165/full>



Photo: iStock Photo

Rabies Increase in the United States

Most rabid animals were wildlife

A report from the Centers for Disease Control and Prevention showed an 11% increase in rabies in the United States in 2018 over 2017. The states with the most cases, in decreasing order, were Texas, Virginia, Pennsylvania, North Carolina, Colorado, and New York.

Over 90% of the rabid animals were wildlife. Bats, raccoons, skunk, and foxes were the leaders in decreasing order. Among domestic animals, rabid cats, followed by rabid dogs, accounted for over 80% of the cases. Three people died of rabies in 2018, up from two in 2017.

Canine rabies is the greatest risk for human health and the cause of 99% of human deaths from rabies. This is undoubtedly due to the close relationship between people and dogs, with even feral dogs often living in human communities.

This study emphasizes the importance of having wildlife that bites someone evaluated for rabies infection, especially if they have been acting strangely. In addition, our pets are a safety barrier between wildlife and people. That means it is vital to have your pets current on their rabies vaccinations.

Most of the rabid cats and dogs were associated with the raccoon variant of the rabies virus. That means contact between pets and raccoons in which the pet was bitten or got infected saliva into a wound or licked it off. Pets also can be exposed to ill or dying bats that get into your house or are found outside. ■



This fox is wearing a collar and appears healthy, but allowing a dog to interact with wildlife is generally unwise.

Photo: iStock Photo

Isolating Dog-Allergy Culprit

Hope for those who love dogs but have allergies

A recent CNN report stated that: "Up to 30% of people who are allergic to dogs are actually allergic to one specific protein that's made in the prostate of a dog," according to Dr. Lakiea Wright, an allergist at Brigham and Women's Hospital in Boston. The protein culprit is Can f 5 and is made in the prostate of male dogs. It is very "lightweight" so when a dog urinates it gets in the air, possibly on his hair coat, etc.

A blood test for this allergen was recently FDA-approved, although some allergists may still recommend the skin prick test for verification. Dog-allergy victims may react to multiple proteins but even removing one protein might lower the threshold for clinical symptoms. For those people who have this protein as their allergy "trigger," lowering levels of exposure would be wonderful.

Female dogs should not produce this protein and neutered males should have low, if any, levels of the Can f 5. For dog lovers, this might mean that having only female dogs or neutered males could make your life allergy-symptom free.

For those who don't get big relief from choosing certain dogs, standard allergy minimizing tactics remain in place such as using HEPA filters in your vacuum and in your house. Keep your bedroom canine free. Get rid of carpets. Mop or vacuum frequently and have your dog groomed on a regular basis. ■



The Season Is Starting: Bee Stings

Preparation is key to helping your dog

If you're traveling and your dog is allergic to bee stings, talk with your veterinarian about making you an epinephrine syringe specifically designed for your dog to have in your first-aid kit. Remember, too, that epinephrine should be stored at temperatures 59° to 86°F and protected from light. Even if you're not aware he's allergic, some diphenhydramine (Benadryl) can help with itching and swelling if he gets stung. The dosage is 1 mg per 1 lb of bodyweight (tablets are 25 mg and 50 mg and can be difficult to break). Be careful calculating the dose, as an overdose can be very problematic. ■



Dogs with Large Cell Lymphoma

Consider being part of a clinical trial at Cornell

Cornell has a clinical trial for dogs with a confirmed diagnosis of large cell lymphoma. The dogs must not have started any treatment yet and be 2 two years of age or older. They should be in substage A, which means they still feel well. In addition, the dogs must be able to tolerate twice-daily oral medications and you must be able to give those medications.

This study will look at treating dogs with an antibiotic that has a known track record of safety in dogs as well as the ability to harm lymphoma cells growing in a laboratory setting. This is to see if the antibiotic will be just as effective when given to a dog with this cancer. Patients will be randomized to either receive prednisone alone or prednisone and this antibiotic.

This study requires up to nine visits. All costs incurred at the Cornell University Hospital for Animals (CUHA) that are study related will be covered. Blood tests will be monitored throughout the 12-week study period to assess for possible side effects and toxicities and are covered by the study as well. If you're interested, talk with your own veterinarian about this trial. He or she will be able to help you participate. ■



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Does a Dog Need All Those Shots?

Weigh the risks vs. the benefits of each vaccine choice

Vaccines can be miracle workers, but they also can be problems, especially if overused. No one argues that. To help make choices, some vaccines are considered “core,” or recommended for all dogs, and some are “non-core.” Non-core vaccines are given by need.

The American Animal Hospital Association (AAHA) canine vaccination guidelines and the World Small Animal Veterinary Association (WSAVA) recommendations are similar. Core vaccines cover those that are efficacious, safe, and provide immunity against diseases that are widespread and often fatal. Rabies is a core vaccine.

Current recommendations suggest vaccinations for distemper, parvovirus, adenovirus, and parainfluenza for almost all dogs. Exceptions are made for dogs who have serious allergic reactions such as anaphylaxis, are suffering from immune-mediated diseases, or have chronic disease conditions that could interfere with proper immune responses.

So far, this is pretty simple. Your veterinarian will recommend these vaccines for most dogs. Most vaccines for viral problems have a three-year schedule for boosters. In some cases, you may choose to do titers, which are blood tests to determine the amount of immunity remaining in your dog's blood before giving a booster shot (see “Titer Use Lands in a Gray Area,” May 2019).

Individualizing

Where the real customization comes in is with the non-core vaccines and evaluating your dog's need for them. Non-core vaccines include protection from various respiratory problems such as kennel cough and canine influenza as well as diseases like Lyme disease and leptospirosis and even Western Diamondback rattlesnake venom.

Kennel cough and canine flu vaccines are most appropriate for dogs who are around lots of other dogs frequently, such as when boarding, going to day-care, or attending shows. Traditionally, the leptospirosis vaccine was recommended for dogs who have a lot of outdoor activity, but more and more cases are being seen in urban areas. Lyme and the rattlesnake vaccines are usually reserved for dogs living in high-risk areas.



Most clinics are consistent with injection-site choices, such as the right-hind hip for rabies, so if there's a reaction there's no question where the vaccine was given.

So how do you plan your dog's vaccine schedule? Discuss with your veterinarian to weigh the risk of your dog contracting a disease, the odds of him having an adverse reaction to the vaccine, and the benefit of being protected from that particular disease.

For puppies, you need to follow the recommendations designed to give your pup immunity against the serious core diseases. Ideally, you should try to spread out your vaccine schedule so your pup's immune system is not overwhelmed.

Many clinics do a monthly examination with your veterinarian to track your puppy's health and give a single vaccine but schedule other vaccines in between at an appointment with a veterinary technician.

Multiple doses are generally required to cover the window of when maternal

immunity wears off. Once your pup's original series is concluded, look at your pup's lifestyle and determine which, if any, non-core vaccines may be relevant.

Generally, puppy vaccine schedules end at about 16 weeks of age. Usually a booster is recommended one year later and then most dogs go on a three-year schedule. A bacterin, which is a vaccine for a bacterial disease, may have more frequent booster schedules recommended.

Choices

Money is often an issue, but it is always more expensive to treat a disease (if it can be treated) than it is to give a vaccine. For a dog who never leaves home and only has access to his own yard, you might get away with the minimum core vaccines. Or, you might choose to do titers instead (although titers are more costly than vaccinations).

However, if you take your dog on walks or train or compete in dog sports or he or she will be boarded or at doggy day-care, you probably want to look at these non-core choices. Be aware that boarding kennels and day-care facilities may have required vaccination protocols.

Some owners choose to purchase and give their own vaccines, although giving your own rabies vaccine will not qualify for mandated state laws. In addition, manufacturer guarantees may not apply unless a veterinarian gives the vaccine. Be aware that some companies sell vaccine brands that are not USDA-approved. If that's not enough to deter you, remember that shipping can affect vaccine quality as well—many vaccines are not as effective if they get warm.

The bottom line is that, used properly, vaccines are lifesavers and the most cost-effective and healthiest choice. ■

Types of Vaccines: Infectious or Noninfectious

Infectious vaccines—or “modified-live” vaccines—have organisms that were attenuated to decrease their virulence. Basically, your dog will have a mild case of the disease without clinical symptoms. These vaccines tend to produce a stronger immune reaction. Intranasal vaccines tend to be infectious vaccines.

Noninfectious vaccines contain “killed” virus and, usually, an adjuvant to help stimulate a stronger immune response. Rabies vaccines are killed. Note: Some experts question if the type of adjuvant used might trigger vaccine reactions, however, this theory has not been proven one way or another.

The third type is the recombinant vaccines. These vaccines have a live vector organism that has been modified to contain antigen from the disease. The actual vector organism will not affect your dog. It's just a carrier for the target antigen.

A Devastating Parasite

Heartworm damage can be avoided if it's caught early

Hearthworm, which is infection with the parasite *Dirofilaria immitis*, is a widespread, devastating, and potentially fatal parasitic disease, and dogs in every state have been identified with heartworm infections.

A heartworm is an adult worm that lives in the pulmonary arteries of infected dogs. The life cycle involves four larval stages before immature worms (called microfilaria) travel through the bloodstream to the pulmonary blood vessels. The cycle starts when a female mosquito ingests microfilaria while feeding on an infected host, such as another dog. The next two stages occur in the mosquito itself, with larval stage 3 appearing in the mosquito's mouth, ready to be injected into a new host when the mosquito feeds again.

These stage 3 larvae migrate into the skin of their new host and molt to larval stage 4, which may migrate around the subcutaneous tissues for weeks until becoming immature heartworms. These immature forms migrate through the heart and lungs where they mature, mate, and produce microfilaria while living in the pulmonary blood vessels of the heart.

The microfilaria can be seen in the blood six to seven months post actual



It is not difficult to see how heartworms damage the dog's heart.

infection. If the adult worms are sterile or all of one sex no microfilaria will be produced. The adult worms—who can grow to 6 inches or so—may live for up to five to seven years in your dog's heart if there is no treatment and if your dog doesn't die earlier from side effects from the infection.

Symptoms

The adult worms living in your dog's heart cause the symptoms of the disease:

Heart failure. Primarily on the right side, heart failure is a cardinal sign. Your veterinarian may pick up arrhythmias while auscultating. Symptoms include:

- Cough
- Trouble breathing

Caval Syndrome

Caval syndrome is an acute, life-threatening emergency resulting from large numbers of adult heartworms in the pulmonary arteries, post vena cava, and right atrium. The worms interfere with the function of the tricuspid valve of the heart.

Dogs with this problem have a weak pulse but a rapid heart rate and sudden collapse. Immediate medical attention is required, and many dogs will die despite intensive, rapid action. Surgery is usually needed to remove the adult heartworms.

- Exercise intolerance
- Lethargy

Weight loss. Your dog may have a bloated appearance, as fluid builds in the abdomen. Oddly, he might appear normal or even overweight while he is actually thin.

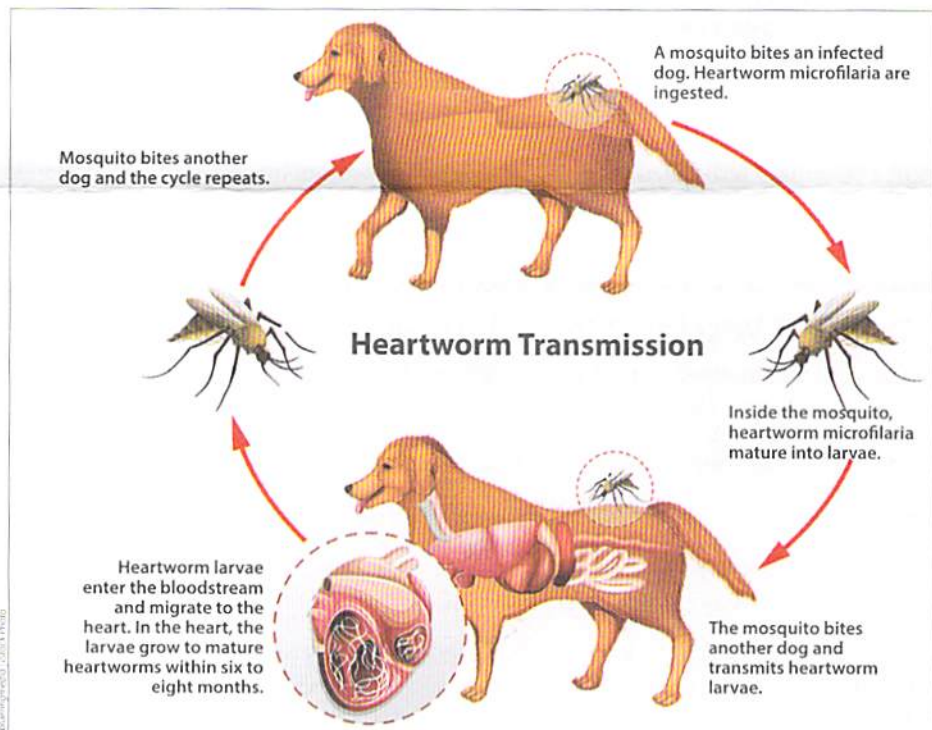
Due to your dog's immune response to these foreign invaders, your dog might also show signs of kidney problems secondary to antigen-antibody complexes being deposited in the kidneys.

Diagnosis

Diagnosing heartworm infections can involve multiple steps. Annual screening is recommended to catch any potential infections early.

Veterinary offices commonly use rapid screening tests that look for an antigen associated with a glycoprotein found in the reproductive tract of adult female heartworms. False positives and false negatives can occur, so additional testing is recommended if a dog tests positive or if a dog tests negative but has clinical signs consistent with heartworm. Your veterinarian can examine blood with a microscope to look for microfilaria or send a sample for additional testing.

Nonspecific blood chemistry changes can occur in a dog infected with heartworms, such as increases in levels of liver enzymes, azotemia, and hyperbilirubinemia. Eosinophilia, an increase in one type of white blood cell, may occur, but these cells also increase with any parasitic infection as well as in many cases of allergies. Anemia and low platelet counts may be noted but are not specific to heartworm infections. Evaluating a urine sample may show proteinuria and albuminuria, but



Did You Know?

April is National Heartworm Awareness Month

these findings are also not specific for heartworm disease.

Your veterinarian may recommend radiographs, not just for diagnosis but also to evaluate the damage already done to your dog's heart. The pulmonary arteries may be enlarged and tortuous. The right side of your dog's heart may be enlarged. A classic description is a reversed "D shape" to the heart due to the enlarged right atrium. Secondary changes to the lungs may be noted.

An electrocardiogram (EKG) and echocardiogram (sonogram) will show evidence of cardiac changes and damage but not specific to heartworm infection. Cornell's Dwight Bowman, PhD, is working on a grant looking at using computerized axial tomography (CAT) and magnetic resonance imaging (MRI) to assess heartworm numbers in infected dogs. While these diagnostics would not be used in every dog, they may help veterinarians decide on treatment regimens for individual dogs.

Treatment

Treatment of dogs with heartworm infections can be complicated. Each infected dog should be evaluated as an individual with customized therapy.

Standard treatment for heartworm infections is melarsomine dihydrochloride, the only FDA-approved drug for this use in dogs. It is extremely important to realize that the dead adult worms are still present in your dog's heart until they are broken down, which means strict restrictions on activity to minimize potentially fatal pulmonary

Resistance Is Lurking

Some heartworm populations have become resistant to the macrocyclic lactones in preventative medications, but it's not common. According to the American Heartworm Society, "Lack of efficacy in heartworm preventives can be related to many factors, including resistance, but the most important of these is compliance." The most resistant populations are from the southern United States where mosquitoes can flourish all year round.

thromboembolism. Steroids may be given as adjunct medications to reduce the risk of side effects.

For a mild infection, especially if the dog can be kept in a mostly mosquito-free situation so he is not a threat to other dogs, the decision may be made to use heartworm preventive medications and wait out the death or sterilization of the adult worms. This is especially true with older dogs and dogs with other health problems who may not survive a full out attack on the heartworms. There are concerns, however, that this "slow kill" method of treatment may contribute to the development of resistant strains of heartworm that will not die when exposed to preventive treatment.

Recent studies have shown that *Wolbachia*, a member of the *Rickettsiaceae* family of organisms that exists symbiotically with microfilaria and adult heartworms, is susceptible to tetracycline antibiotics such as doxycycline. Treatment with doxycycline reduces *Wolbachia* numbers in all stages of heartworms. Dogs who are treated or pretreated with doxycycline have a better prognosis and decreased numbers of microfilaria, which makes them less infective while being treated. Pretreating with ivermectin may also decrease the risk of pulmonary side effects. After treatment, follow up with testing a year from start of treatment.

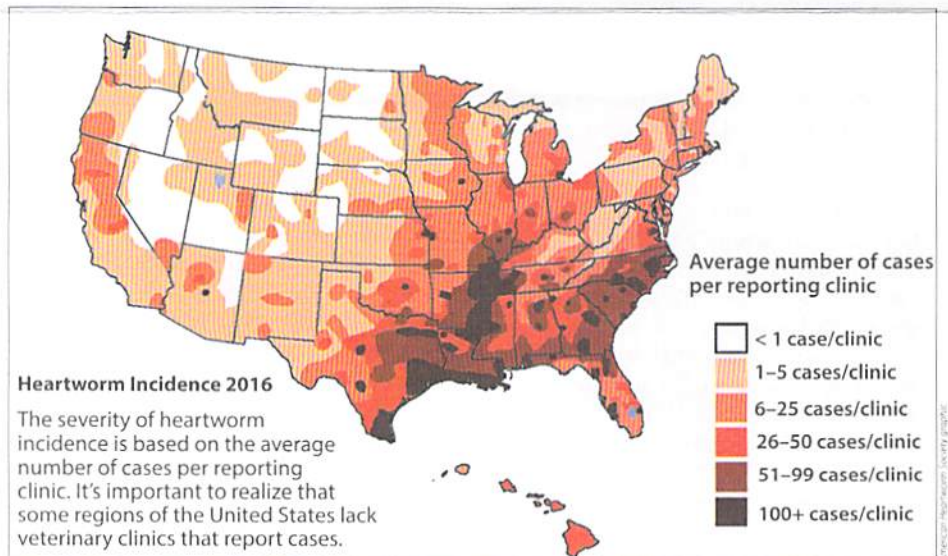
Minimizing exposure to infected mosquitoes is part of prevention. "Although mosquitoes are the only known vectors of *Dirofilaria immitis*, the causative agent of dog heartworm, mosquito species, and geographic strains vary in their vector efficiency and contact

What You Can Do

- ▶ Use a heartworm preventative.
- ▶ Implement mosquito-elimination practices around your home by removing or covering standing water, releasing dragonflies (they eat mosquitoes; purchase dragonfly nymphs to release), putting up houses for birds and bats. Plant natural mosquito-repelling plants like citrus, lemon thyme, and rosemary.
- ▶ Avoid letting your dog out at the peak mosquito feeding times of dusk and dawn.
- ▶ Consider using dog-safe mosquito sprays or K9 Advantix II, which kills and repels mosquitoes.

with suitable hosts of the nematode. Because of these differences, pinpointing the key vector species of heartworm in an area can help determine the best means by which to reduce incidence of heartworm in a population of domestic dogs or other hosts," explains Cornell graduate Nicholas Ledesma, PhD, DVM, who studied mosquitoes involved in heartworm transmission extensively.

Since all dogs can be exposed to mosquitoes, all should be on heartworm preventive medication. Macrocyclic lactones are best: oral ivermectin, oral milbemycin oxime, topical or injectable moxidectin, and topical selamectin. Don't skip treatments or stretch them out, as the time frame for redosing is based on the life of the drug in your dog. ■



Help, My Dog Stinks!

Reasons for body odor, and how to resolve it

We all know that wet-dog smell, but sometimes you notice that your dog smells a bit ripe all the time. You can do the initial detective work to find the cause at home, and seek help from your vet if things aren't adding up.

The Usual Suspects

"Unless the dog is bathed often, all dogs have some body odor and the amount can vary from dog to dog," says William Miller, VMD, DACVD, Professor Emeritus of Medicine, Section of Behavior and Section of Dermatology at Cornell. "Abnormal body odor may not be that—could be malodor from the mouth (bad teeth), ears, or anal sacs that the dog spreads on its skin by licking or rubbing. Always check those areas first."

Bad breath is easy to evaluate—just start sweet-talking your dog while petting his face and you are sure to get some happy pants. Check his teeth while you're at it, and if there is buildup of brown calculus on the teeth, it's time for a dental cleaning. Ears can be smelly for a variety of reasons, including bacterial and yeast infections. You may see debris and/or discharge in the ears as well. Overfilled or infected anal glands are both stinky and uncomfortable, so watch for scooting



Ever just walk along with your dog only to have him drop and roll? There was probably an enticing smell right there.

and licking at the rear end. If any of these areas shows signs of an issue, schedule an appointment with your veterinarian to address it.

"If those sites are OK then examine the dog's outdoor life," says Dr. Miller. "Dogs love to roll in sweet-smelling (at least to them) stuff." If your dog spends lots of time outside playing in the yard or hiking, he may have found something gross to roll in. Wiping or washing off the offending substance will resolve the odor.

If the mouth, ears, and rear end pass the smell test, and your dog doesn't have any streaks of dead something smeared on his face, it is time to consider a skin issue. Many skin disorders can be accompanied by an unpleasant smell due to the disruption of the normal oils and glands in the skin. Depending on the condition and cause, the dog may also be itchy, have a rash, or experience hair loss. Any of these symptoms warrants a veterinary exam and possibly consultation with a veterinary dermatologist.

True Body Odor

But what if your dog seems fine but is just stinky? "If all that is negative and the dog does not have skin disease then 'significant' body odor usually means an overgrowth of bacteria or yeast on the skin's surface," says Dr. Miller. "Lots of reasons for that, but a persistent wetness of the skin, especially under a dense coat, is a very common cause. Dogs who are in and out of non-chlorinated water, e.g. swimmers, are at risk."

Some breeds or individual dogs may be smellier than others. Dr. Miller

says, "Some individuals within some breeds, e.g. Bulldogs, seem to produce more greasy secretions (sebum) on their skin. Sebum has its own odor and can become unpleasant if there are excessive amounts. Excessive sebum also predisposes to bacterial or yeast overgrowth." Sebum is a naturally occurring oily secretion that helps to maintain skin health (but, as we know, you can have too much of a good thing!).

Some conditions, such as diabetic ketoacidosis, can cause your dog to smell. Because of this, your veterinarian may want to do bloodwork to evaluate your dog's organ function.

Resolving Stink

"Any dog with an obnoxious body odor needs to go to the veterinarian to determine why it stinks," advises Dr. Miller. Take note of when you first noticed the odor, how often it occurs, any factors that seem to affect intensity or frequency (such as occurring more often in the summer with a dog that swims a lot, or on rainy days for a dog that has been sprayed by a skunk in the recent past), and any other things you have noticed about your dog's skin and coat. Also consider your regular grooming routine: Do you brush your dog regularly, and how often? When was his last bath? What shampoo do you use?

"I'm a firm believer in brushing for grooming rather than bathing," says Dr. Miller. "The brushing removes dirt and loose hair which is all that most dogs need. If the dog is really dirty or needs a 'holiday' sprucing up, a bath with a grooming shampoo is fine."

For most dogs, regular brushing with an occasional bath when needed is sufficient to keep the dog smelling nice and the owners happy. "If the dog starts to stink again shortly after the bath, a trip to the veterinarian is indicated."

Severe, lasting odor or odor that comes along with other symptoms may require specific treatment relevant to the underlying condition with or without medicated baths.

"Unless prescribed by a veterinarian, an antidandruff or medicated shampoo should not be used," says Dr. Miller. Your veterinarian will be able to evaluate whether or not your dog's case warrants a medicated shampoo, and he or she can point you in the right direction for a medicated shampoo that is appropriate for use on dogs and is likely to help your individual dog. ■

How Often to Bathe

"There are very different opinions on how often to bathe a normal dog that isn't a show dog," says Dr. Miller. "Clearly a normal dog can be over bathed especially when the humidity is low. Some sebum is necessary for the skin's health and it can be removed by over bathing, especially with medicated shampoos.

"Dogs that get dirty may need to be bathed more often. Then there are dogs that do have a noticeable, but not obnoxious, body odor. These dogs get bathed regularly. The shampoo used should be selected carefully so that it isn't too harsh. Since body odor and/or greasiness can be impacted by environmental temperature and humidity, the dog should be bathed when it needs it rather than on a set schedule."

Glyphosate and Dogs

Concerns about this herbicide's safety

The potential dangers associated with glyphosate, aka Roundup, and its toxicity or lack thereof, is in the news a lot lately. While the Environmental Protection Agency (EPA) maintains it is not a problem for human health, you may be concerned about your dog.

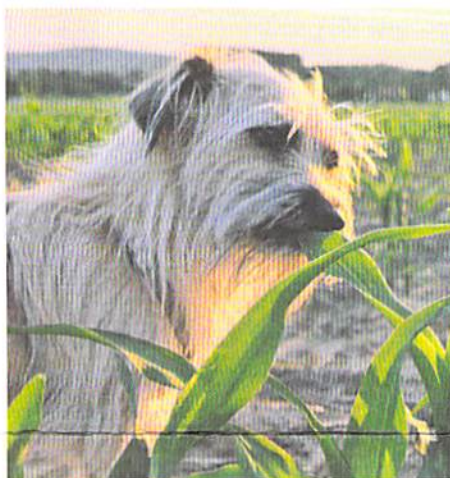
Glyphosate is a broad-spectrum herbicide. It acts on growing plants and blocks a growth enzyme, leading to the death of the plant. The development of a number of resistant food crops such as corn and soybean means increased use of this herbicide since it will kill weeds but not the food crop. Still, concerns have arisen not just about glyphosate itself but also some of the inert ingredients in the herbicide such as surfactants.

The EPA says glyphosate is not a carcinogen (despite some people's concerns about non-Hodgkins lymphoma). They state it is not disruptive of the endocrine system nor is it toxic to humans. It can get into groundwater, however, and while toxicity from occasional exposures to mammals may not be serious, it can affect other species. It is not truly known what can happen with long-term chronic exposures.

European studies show toxicity in companion animals, again believed to be related to the surfactants used in the spray, not just the glyphosate. These are cases of acute toxicity, such as where a dog ingests a fair amount of glyphosate all at once. In Italy, glyphosate leads the list for animal poisonings related to herbicides.

In London, the Veterinary Poisons Information Services have chalked up 992 cases of canine toxicity with vomiting, diarrhea, and lethargy being the most common clinical symptoms. Nine dogs died and two were euthanized. These were all acute cases, with dogs inadvertently exposed to recently sprayed areas. Whether these cases are due to glyphosate itself or to inert ingredients has not been differentiated.

How would your dog get long-term chronic exposure to glyphosate? One way might be through diet. It is also possible that exposure to spray residues could cause chronic exposure, including through contamination of groundwater. Glyphosate does not accumulate in your dog's tissues, so he would only have the



The ways dogs could be exposed to glyphosate are endless.

chemical if he is getting a renewed dose. This appears to be happening through food ingredients that may have been sprayed at some point.

A Cornell research team, including Anthony G. Hay, Cornell Associate Professor of Microbiology, looked at 18 brands of dog and cat food (purchased off the shelf). These samples were from eight different manufacturers, so they gave a widespread look at pet foods. Every sample tested positive for glyphosate. The test results correlated with fiber content in the diets, which makes it likely the glyphosate is connected to plant material in the diets. Once glyphosate has been sprayed, it integrates into the plant and can't be washed off or destroyed by processing. Glyphosate has been shown to accumulate in fish but not in meat animals.

"We know that glyphosate is only certified for spraying on crops, and it does not bio-accumulate in animals, so we would not expect it to come from feed animals that are the main protein sources in some of the products," Hay said. "Our evidence suggests that it's coming from plant material." Most pet foods have some plant material in them as ingredients.

A study done by the New York State

Department of Health found glyphosate present in the urine of the 30 dogs tested (30 cats as well). Glyphosate exposure could come from lawn chemicals, be present in drinking water through groundwater contamination, and/or from pet food. While the testing suggested low levels of exposure, it has not been determined if a chronic low level exposure might be toxic.

"Glyphosate is out there in our pets' food, and while there doesn't appear to be any immediate risk, there is still uncertainty about the chronic impact of low doses like these," Hay said. "It's hard to find a product that doesn't have glyphosate in it, so we included the exposure assessment to provide some context. The old adage 'dose determines the poison' is good to keep in mind: While it's possible that these animals might respond differently than humans, the numbers are still within a range that would be deemed safe for humans."

Canned food has glyphosate residues as does kibble. Raw feeding, since it has very little plant material such as grains, has a lower level. According to a report by Hemopet, dogs on a grain-free kibble have the highest levels of glyphosate residue. Oats, lentils, and legumes such as peas deliver the highest glyphosate levels when tested for human consumption, so it makes sense that those ingredients in dog food would also have a higher level.

Health Research Institute Laboratories is collecting urine samples of pets and farm animals to look at glyphosate residues. Initially, their testing looked at sources of exposures and levels seen in animals. The eventual goal is to have samples from 60 dogs of the same breed (30 dogs with lymphoma and 30 dogs without lymphoma) to compare glyphosate amounts.

Bottom Line? With the uncertainty of toxicity, if you choose to use an herbicide, follow instructions exactly and minimize exposure to your dog. ■

Cancer in Scotties

Transitional cell carcinoma in Scottish Terriers and lymphoma in other breeds has been associated with exposure to the herbicide 2,4-dichlorophenoxyacetic acid (2,4-D), which has been in use since the 1940s. More studies are needed to clarify causation versus correlation.



Handling Canine Grief

Cavalier is lost without her brother

Q Two weeks ago, after three days in ICU at Cornell, I had to euthanize my 9-year-old Cavalier who was in congestive heart failure. It was one of the most difficult decisions I ever had to make.

I have a 10-year-old Cavalier at home who lost her hearing at the age of 8 and depended on her younger brother to lead the way. They followed each other everywhere. My poor girl is going through the grieving process, she misses him terribly. She sits by the glass door waiting, smells his bed but just lies down in front of it. She looks lost most of the time and follows me from room to room.

I can see the sadness when I put my coat on to leave the house. I am not sure what to do for her; I am afraid the loss of her younger brother will make her sick. Can you please give me some advice on what I can do to make it better for her?

A I am so sorry for your loss. You're grieving, as well, and I want you to consider addressing your own feelings, too. Cornell has a Pet Loss Support Hotline at 607-253-3932. It's available 6 p.m. to 9 p.m. Eastern time, Monday through Saturday. Other veterinary schools and the ASPCA have similar support for those who have lost their pets.

I am particularly fond of Cavaliers

because they have very nice temperaments. They are one of the few breeds that were bred to be pets, so an owner doesn't have to train them not to bite strangers or not to run after rabbits. Unfortunately, the breed is at risk of several serious medical problems, including cardiac disease.

To address your concern about your remaining Cavalier, you mentioned that she has many health issues including deafness. For that reason, you should be sure that the stress of losing her companion has not exacerbated those issues. Mourning and illness can look awfully similar, so if you're not sure, a veterinary visit is certainly in order.

Provide her with a daily routine that includes social interaction and physical exercise consistent with her health. She is not too old to learn or re-learn "tricks" like sit, look, and—best of all—stay. I'm including suggestions on how to do this.

Because she is deaf, you will have to use hand signals. There are lots of YouTube videos on how to train a deaf dog. For example, if you want her to focus on you, hold a piece of food up to the corner of your eye and, if she looks at the food, she will be looking in your eyes. When she does, quickly give her the treat. After a dozen repetitions, you should be able to touch the corner of your eye without the food and she will look at you. She will know that if she sees your finger at your eye, she will get a treat if she looks at you. What could be easier?

To teach stay, put the palm of your hand in front of her face and then step back a pace or two. If she doesn't move, give her a treat. You can gradually increase the amount of time you ask her to stay and how far away you move.

You can teach her to come by first teaching her to touch your hand. If you hold out your extended fingers, most dogs will automatically touch them. She should get a treat for doing so. Practice that for several days and then try holding your fingers out when she is a few feet away. She should come to touch your hand. The problem with this come command is that she must be facing you to see the hand signal. Even though she



The older Cavalier, left, was highly dependent upon her brother. When he passed away, her world became unstable.

doesn't hear well, you may be able to get her attention by stomping on the floor.

Another type of enrichment is puzzle toys. While there are lots on the market, I like the plastic batts that contain notes from which the kibble drops as she rolls it. Of course, your environment will also be enriched when you try to find which piece of furniture the ball is under. When you have to leave her, be sure she has a safe long-lasting treat that she gets at no other time. Pick up the treat when you come home if she has not eaten it.

Just a few minutes a day will give her an enriched environment. In addition to amusing her, it will give her what she needs most and that is predictability. She once had a companion who she could predict would be at her side. Suddenly he was gone and now she is confused and does not know what to expect.

I am sure you realize that another dog is not a good idea. Dogs, like people, are not interchangeable and a new dog may not form a close bond with your Cavalier and might exacerbate her stress. ■

© HAPPENING NOW...

Destroyed Semen—In Oregon, a jury awarded two dog breeders \$400,000 because a semen bank for dogs mistakenly destroyed frozen specimens from highly-esteemed Labrador Retrievers, according to *The Register-Guard*.

Beer Cans—WFLA in Bradenton, FL, reports that the Motorworks Brewing company is featuring photos of rescue dogs who need to be adopted. Proceeds of the Cruiser Kölsch 4-Pack are donated to the shelter. The brewery also does a monthly "Yappy Hour" to raise funds for animal charities. Two of the dogs featured on the cans have already been adopted. ■

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 Recognize a Bad Toy Choice
- ▶ Canine Heart Failure
- ▶ Who Needs to Worry About Kennel Cough?
- ▶ Off! Stop Jumping on People!