

THIS JUST IN

Study on Health Issues in French Bulldogs

Data may help breeders improve health of the breed

French Bulldogs, pictured below with the carrot, have long been believed to have a higher incidence of health issues compared to other dogs. And now a study recently published in *Canine Genetics and Epidemiology* validates that belief. Data from 2,781 French Bulldogs and 21,850 dogs of other breeds was analyzed to determine the frequency of disorders in French Bulldogs compared to other dogs. The problems with a greater relative risk in French Bulldogs included narrowed nostrils, brachycephalic obstructive airway syndrome, ear discharge, skinfold dermatitis, and difficulty giving birth.

The study found that the health of French Bulldogs is very different, and largely much poorer, than the health of other dogs overall. Many of these differences are closely associated with the extreme body shape that defines the French Bulldog breed. Shifting the body shape of French Bulldogs to become more moderate is proposed as a logical opportunity to reduce the serious and common health issues in the French Bulldog breed. ■

O'Neill, D.G., Packer, R.M., Francis, P. et al. French Bulldogs differ to other dogs in the UK in propensity for many common disorders: a VetCompass study. *Canine Genetics Epidemiology* 8, 13 (2021).

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Should Your Dog Go Vegan?

Surprisingly, it's not a simple "yes or no" answer

Some people choose to eat a vegan diet for health reasons, including to promote weight loss, reduce the risk of heart disease by lowering cholesterol, or lowering the risk of certain cancers. Others decide to go vegan for moral/ethical reasons, including to protest the exploitation and inhumane treatment of animals, the negative impact of factory farming on the environment, and the repercussions of industrial animal agriculture on global warming. It's understandable that a dog owner who eats vegan for moral/ethical reasons would feel compelled to feed their dog vegan for the same reasons.

There may be health reasons for dogs to go vegan, too. "For some dogs, such as those with food allergies, liver issues, and even some urinary stones, vegan diets can be considered therapeutic. There are some well-balanced commercial diet options available that have been helping the management of these issues for a long time," says veterinary nutritionist Renee Streeter DVM, DACVIM, who did her nutrition residency training at Cornell.

But this dietary plan raises some questions. Is it healthy for dogs to follow this dietary pattern? Aren't dogs carnivorous? Don't they need protein from animal sources? Can you provide the complete nutrition they need without meat? Let's look at the challenges associated with feeding your dog a vegan diet.

Vegan diet perks:

- ▶ Can be therapeutic for some illnesses
- ▶ Dogs do have the ability to digest nutrients from plants
- ▶ Balanced commercial foods with AAFCO statement are available

Vegan diet concerns:

- ▶ Diets may be too low in protein for some dogs
- ▶ Home recipes are difficult to design without a nutritionist
- ▶ Many canine required nutrients are more easily obtained from meat, poultry, dairy, and fish



The vegan choice doesn't depend on if your dog will eat the food but on whether you can adequately cover all the nutritional requirements your dog needs to be healthy.

Nutrition Matters

Dogs are mammals, classified as carnivores, but they are not "obligate carnivores." An obligate carnivore cannot digest plant-based foods. A dog can digest nutrients from both animal and plant sources. It is thought that once the dog became domesticated (often fed table scraps and leftovers) tens of thousands of years ago, their digestive tracts began to evolve to handle more plant-based diets. But just because dogs are able to digest plant-based foods doesn't mean it's proper to feed your dog a vegan diet.

Creating a nutritionally well-balanced vegan diet for dogs is a challenge. Dogs have dietary requirements for calcium, phosphorus, iron, and B vitamins, all of which are much easier to get from animal sources.

(continues on page 2)

Common Household Noises May Stress Your Dog

Researchers find owners sometimes are amused, not concerned

Researchers at the University of California, Davis, found that people may not recognize that their dog is stressed due to noise. While loud, sudden noises are recognized causes, common noises such as a vacuum also can be triggers. The researchers found that high-frequency, intermittent noises like a smoke detector battery are more likely to cause a dog anxiety than low-frequency, continuous noise.

Signs of an anxious dog include cringing, trembling, or retreating, but owners may be less able to identify signs of fear when behaviors are more subtle. For example, stressed dogs also pant, lick their lips, turn their head away, or stiffen their body. Sometimes their ears will turn back, and their head will lower below their shoulders.

Researchers surveyed 386 dog owners about their dogs' responses to household sounds and examined recorded dog behaviors and human reactions from 62 videos. They found that owners not only underestimated their dogs' fearfulness, but most people in the videos responded with amusement rather than concern.

"There is a mismatch between owners' perceptions of the fearfulness and the amount of fearful behavior actually present," says lead author Emma Grigg. "We hope this study gets people to think about the sources of sound, so they can minimize it."

Grigg, E.K., et al. "Stress-Related Behaviors in Companion Dogs Exposed to Common Household Noises, and Owners' Interpretations of Their Dogs' Behaviors," *Frontiers in Veterinary Science*, 2021; 8 DOI: 10.3389/fvets.2021.760845. *Science Daily*.



An owner should be concerned and offer help if a dog appears anxious.

(Vegan, continued from page 1)

They need l-carnitine and taurine in their diet, and both are found in meat, poultry, dairy, and fish. Dogs do, however, have plenty of the enzymes necessary for starch digestion and can utilize vitamins A and D from plant sources, just as humans do.

"A couple of studies have shown that dogs' amino acid concentrations have not been altered when balanced vegan diets are fed," says Dr. Streeter. Essential amino acids are nutrients that must be included in the dog's diet. She adds, "These diets tend to be lower in protein and essential amino acid concentrations than meat-based diets and so may not be ideal for every dog." The most common vegan protein sources are tofu and legumes.

For many vegan dog owners, a dietary compromise may be better than going full-on vegan. You can look for companies that produce meat products in humane, sustainable ways. Or consider using eggs, dairy, or fish that is humanely, sustainably produced.

Ensuring a Balanced Diet

With help, you can formulate a balanced vegan diet for your dog. "These diets should

always be formulated by a board-certified veterinary nutritionist to ensure adequate concentrations of amino acids," says Dr. Streeter. "Your veterinary nutritionist may also recommend supplementation with some non-essential amino acids since these may be lower in vegan diets. While they aren't considered essential, they may be beneficial to overall health. "If you choose to feed a vegan commercial diet," says Dr. Streeter, "look for an AAFCO statement on the bag, which indicates the diet has been formulated to meet requirements for a certain life stage and/or has undergone AAFCO feeding trials to show it is complete and balanced."

Commercial Foods

These vegan foods have an AAFCO statement supporting the formula:

- ▶ Addiction
- ▶ Evolution
- ▶ Halo Pets
- ▶ Natural Balance Vegetarian
- ▶ Nature's Recipe Vegetarian
- ▶ Purina Pro Plan Veterinary Diets HA Hydrolyzed Canine Formula
- ▶ V-Dog
- ▶ Wild Earth Vegan Dog Food

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DogWatch is an independent newsletter produced in collaboration with Cornell University College of Veterinary Medicine



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Subscriptions: \$39 per year (U.S.) - \$49 per year (Canada). For subscription and customer service information, visit www.dogwatchnewsletter.com/cs or write to: DogWatch, P.O. Box 8535, Big Sandy, TX 75755-8535. 800-829-5574



DogWatch (ISSN: 1098-2639) is published monthly for \$39 per year by Belvoir Media Group, LLC, 535 Connecticut Ave., Norwalk, CT 06854-1713. Robert Englander, Chairman and CEO; Timothy H. Cole, Chief Content Officer; Philip L. Penny, Chief Operating Officer; Greg King, Chief Marketing Officer; Ron Goldberg, Chief Financial Officer; Tom Canfield, Chief Circulation Officer. ©2021 Belvoir Media Group, LLC.

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When Can Puppy Leave Mom?

The ideal window is between 8 and 12 weeks old

You did your research and found the puppy that's right for you. The puppies are healthy and so adorable. You just want to bring home your perfect baby NOW!

Patience, my friend. The time your puppy spends with her mother and siblings is critical for her development. Leaving the litter too early can have long-lasting negative consequences. It's just not worth the rush.

The First Month

For the first four weeks or so of life, puppies depend on their mothers for everything. The dam's first milk, called colostrum, is rich in nutrients and antibodies that help to protect the puppies from illness while their immune systems are still developing. Her milk will provide all the nutrition they need for the first few weeks of life.

Weaning to Solid Food

Puppies start to experiment with solid food as early as 3 weeks old. They still nurse, and dams continue to produce milk for up to 10 weeks. Some nursing is for nutrition, but it is also a comforting, bonding activity for the puppies. Most puppies are fully weaned to solid food between 7 and 10 weeks of age, although the transition can occur earlier.

Learning to Speak Dog

Just as important for puppy development is learning proper canine etiquette and communication as part of a litter. As early as 3 weeks of age, puppies start learning from their mother and siblings to eliminate away from where they sleep, which helps with housebreaking later.

If you've ever watched a litter of puppies playing, they have lots of neat moves! But these play behaviors aren't just for fun. The pups are practicing hunting and communication behaviors that they need to perfect.

One of the most important skills that puppies learn through play is bite inhibition, aka not chomping down too hard. As puppies play, they frequently grab their siblings' and mother's legs, tails, and even faces. If a puppy bites too hard, the victim will cry out, signaling that the bite was too rough. Moms will do the same thing or may gently correct

the puppies for getting too rough. This is a critical lesson to learn before heading out into the world, as other dogs will be far less tolerant of inappropriate puppy play than Mom! Biting is also a common problem behavior that can land a dog in a shelter (or worse) later in life.

Puppies will also practice a variety of vocalizations and body language, learning to communicate with their siblings and mother. Puppies who miss out on these early learning opportunities frequently have issues with other dogs later in life, as they do not interpret the other dogs' signals correctly or behave inappropriately themselves.

Socialization

Puppies have an early critical socialization period from approximately 5 to 14 weeks of age. During this time, puppies are open to learning and experiencing new things, and the things they learn about then will impact how they go through the rest of their lives.

The breeder or caretakers should be exposing the puppies to novel sights and sounds on a regular basis. Puppies destined to be working or sport dogs may be exposed to things they will encounter in their jobs later in life, such as sheep wool for herding dogs, a variety of materials and obstacles to climb over for agility dogs, and training scents for future drug and bomb detection dogs.

These safe exposures should continue after you bring your puppy home, but early socialization with littermates and the dam as "backup" are important for building confidence. The puppies will observe how their mother responds to new people and things and mimic her

behavior. If Mom is relaxed and friendly around new people, the puppies will likely be comfortable with strangers.

Research has found that puppies who are separated from the litter too early are more likely to show fear, aggression, anxiety, resource guarding, reactivity, and inappropriate play biting than puppies who stay with the litter for at least eight weeks.

The Ideal Time

The exact time that is best for a puppy to go to its new home can vary by situation, but most breeders and veterinarians agree that 8 weeks of age is a good minimum. By 8 weeks old, the puppy is eating solid food on its own, has benefited from socializing with littermates and observing mom, and is well within the ideal timeframe to bond with new owners. Some states have laws in place preventing puppies from being sold before 8 weeks of age.

Breeders may also opt to keep the puppies until 10 or 12 weeks of age. Toy breeds in particular are often kept with the litter until 12 weeks old because they are so small and fragile.

This gives the pups extra time with the litter, but still has them going to their homes in plenty of time to form a strong bond with their new people. And, as anyone who has welcomed an adult dog into their home can attest, dogs of any age will still bond with their new owners as long as they have had socialization with people!

Keeping the puppies longer does mean more work for the breeder, as he or she will need to take charge of socialization for all the puppies during those extra weeks. But, if the breeder is putting in that time and effort to give the puppies a great foundation, the extra time with siblings can be very beneficial to your new puppy. ■



Puppies like these Golden Retrievers learn confidence by following Mom's lead.

Sharon Givner / iStock

Elbow Lameness

In a young dog, a deformed elbow may be the problem

While hip dysplasia tends to get the headlines for canine orthopedic health, elbow dysplasia can be equally debilitating. Elbow dysplasia (“dysplasia” refers to a developmental defect) is the second-most common cause of elbow lameness in dogs. The first is osteoarthritis, which can be associated with elbow dysplasia.

Rottweilers, Labrador Retrievers, German Shepherd Dogs, Golden Retrievers, and Chow Chows head the list of breeds with a high prevalence of this orthopedic problem, but any dog can suffer from elbow dysplasia. Large dogs are most likely, but Pugs are second on the Orthopedic Foundation for Animals (OFA) elbow-statistics list. Elbow dysplasia is a genetic ailment, so breeders are urged not to use affected dogs in their breeding programs. Of course, that doesn’t mean they do so.

While elbow dysplasia cannot be cured, it can be well-managed. With surgery and the appropriate medical management, many dogs have a good long-term prognosis.

Symptoms

Generally, dogs with elbow dysplasia will be lame after exercise and won’t recover fully with just rest. Some dogs will start refusing to exercise, with a noticeable decrease in their overall activity level. Dogs with this defect often move by turning their paw inward, noticeably holding their elbow out from the body in an attempt to shift weight off the sore part of the joint.

If your dog has elbow dysplasia only



Surprisingly, Pugs rank second on the Orthopedic Foundation for Animals list for elbow problems.

on one side of his body, his lameness may get noticed earlier. Favoring the defective limb will often be evident by a “head bob,” which means your dog’s head goes higher on the bad footfall to take weight off that leg and comes down when the “good leg” lands.

That is the clinical picture if both elbows are affected but one side hurts more than the other. If both elbows are equally affected, it can be more difficult to pick up on lameness. Most dogs will try to compensate with a shortened stride. Manipulating the leg by extending and flexing the elbow joint is often associated with pain. Some dogs are quite stoic, however. Range of motion of

the joint is generally reduced. Owners of dogs may notice some swelling of affected elbow joints along with abnormal warmth in the area.

“In my experience, almost all dogs with elbow dysplasia show both pain and lameness. Pain on palpation or on full extension/flexion is often noticed with careful examination,” says Kei Hayashi, DVM, PhD DACVS, professor, section of small animal surgery at Cornell University’s College of Veterinary Medicine.

What Is It

Dysplasia is a ballpark term that refers to a developmental abnormality in the body’s tissues. In your dog, the elbow joint involves three bones: the humerus, ulna, and radius. These bones must all work together perfectly to give your dog’s elbow joint pain-free movement.

Diagnosis

True elbow dysplasia will not be diagnosed before 4 to 6 months of age when the most commonly involved joint growth plates are likely to close. Most dogs are a couple of months older before a clear-cut diagnosis is made.

Most dogs are diagnosed with elbow dysplasia by physical examination and during a thorough lameness evaluation at 4 to 12 months of age. In mild cases, however, affected dogs may not show lameness until 7 or 8 years of age when arthritis kicks in.

Diagnosing an elbow problem requires a thorough lameness exam with radiographs. Flexed views of both elbows can show defective areas and identify early arthritic changes. A CT scan (computed tomography, computer-guided radiographic imagery) and arthroscopic surgery to look into the joint are used to guide diagnosis and therapy.

Treatment

As with so many health problems, early intervention is best. Surgery may reduce your dog’s pain dramatically. “I personally recommend CT scan and arthroscopic surgery to all symptomatic dogs as soon as they show pain or lameness,” says Dr. Hayashi.

For mild cases of elbow dysplasia, the goal of surgery is to remove any damaged tissues, which will often help to relieve pain at least temporarily. Dogs with moderate-to-severe elbow deformities may need extensive surgery to realign the malformed elbow joint.

Fragmented Medial Coronoid Process

Fragmented medial coronoid process (FCP), osteochondrosis of the humeral condyle, and ununited anconeal process all describe bony defects in the elbow that fall under the elbow dysplasia umbrella. All lead to secondary arthritis. Some dogs will be affected on just one side, but many dogs will have problems with both elbows. Fragmented coronoid process is the most common.

“For mild FCP cases, I offer but don’t necessarily push surgery. The reason for this is we don’t know for sure that we will make these dogs better with surgery. There is the potential to make them worse, and surgery is expensive. At the same time, if owners want to pursue surgery, it’s better to do it when their dog is first diagnosed rather than waiting,” says Selena Tinga, DVM, PhD, DACVS-SA, assistant professor in small animal surgery at Cornell. “For moderate to severe FCP cases, I will push surgery more strongly but never guarantee a cure. Surgery is only part of these dogs’ lifelong treatment.”

According to the American College of Veterinary Surgeons, on average, about 85% of cases will show some degree of improvement in lameness and comfort despite progression of arthritis on x-rays after surgical treatment. The goal of treatment is to slow the progression of arthritis and prolong the patients' use of the elbow.

A new option for dogs is surgical elbow replacement, a very difficult, expensive option. Dr. Hayashi has performed elbow replacements but advises that "our technology and experience are not there yet as compared to say, hip replacements in dogs. There are several elbow replacement systems available, but they all come with very serious complications. We are still diligently working on improving surgical approach and implant designs to reduce complications."

If you're considering elbow replacement for your dog, you need to be sure his weight is ideal and that his other joints are in great shape. Follow-up rehabilitation will be critical.

Prevention

For any puppy, but especially those puppies with a greater risk for any orthopedic defect, keeping the puppy trim as he grows is important. You don't want to scrimp on essential nutrients, but you don't want a chubby puppy. Your veterinarian may recommend some joint supplements right from puppyhood on, even for normal pups. Encourage moderate exercise.

"Jump down" injuries can lead to a variety of front leg problems for dogs. This is when your dog repetitively jumps down off the bed, off the couch, out of your SUV, etc. Going down long flights of stairs frequently can also add trauma. Many breeders recommend puppies avoiding more than 2 or 3 stairs until 6 months of age or older. The potential for damage is worse in puppies than adult dogs.

Rigorous use of screenings for breeding animals with full public information is currently the best bet for decreasing cases of elbow dysplasia. Yes, normal parents may produce elbow problems, but the incidence is much lower than if one or both parents have bad elbows themselves.

"A registry system to reduce the number of dysplastic puppies produced would be the most important strategy to effectively decrease the number of

cases of elbow dysplasia. There are many treatment options proposed (often commercially) but nothing has been scientifically proven to be effective," says Dr. Hayashi.

"I personally recommend early detection of pain/lameness and arthroscopic coronoidectomy ASAP, followed by intensive non-surgical supportive care. We are currently developing more effective surgical options for elbow arthritis, but I have studied the canine elbow for almost 30 years, and now I know we know next to nothing. It has been a humbling experience. Canine elbow disease is a developmental problem with significant dynamic components contributing to pain and disability. I believe it is arrogant to think we can fix it once the problem develops," says Dr. Hayashi. ■

Grading Elbow Dysplasia

Elbow grades are based on radiographic findings, but don't always correlate with the clinical signs. Some dogs are very sore with a Grade 1 and others with Grade 3 are minimally lame.

Grade 1: Minimal bone change along anconeal process of ulna (at less than 2 mm).

Grade 2: Additional bone proliferation along anconeal process (2-5 mm) and subchondral bone changes (trochlear notch sclerosis).

Grade 3: Well-developed degenerative joint disease with bone proliferation along anconeal process being greater than 5 mm.

Non-Surgical Options

Unfortunately, there's no way around it: Surgery is your best choice for helping a dog with elbow dysplasia. The elbow cannot correct itself. That said, if surgery is impossible, medical-management strategies designed to help with severe arthritis are your next-best choice. Just remember, they can't fix the problem, but they may make your dog more comfortable. Therapies include:

- ▶ **Weight management.** Simply getting your dog to his normal weight may decrease his pain dramatically.
- ▶ **Exercise.** Moderate exercise moves the joint and builds cushion. Be sure to use proper warm-up and cool-down periods. For example, if your dog loves to play ball, a 10-minute walk will help loosen his joints so he can move more freely.
- ▶ **Physical therapy.** Hydrotherapy, like underwater treadmills and swimming, and massage are typically done after elbow dysplasia surgery but can be used to help the joint in cases where surgery isn't possible. Laser treatments, TENs, ice therapy, and acupuncture are worth trying.
- ▶ **Pain medications.** Your veterinarian may recommend a non-steroidal anti-inflammatory drug (NSAID) such as carprofen to help keep your dog comfortable.
- ▶ **Joint supplements.** Ingredients like glucosamine, hyaluronic acid, and chondroitin encourage healthy cartilage and increased joint fluid, which help act as cushions. The choices on the market are plentiful, but they aren't all effective. Work with your veterinarian to choose the best supplement for your dog.
- ▶ **Injectables.** Adequan is another injectable drug and could help with the accompanying osteoarthritis and alleviate some pain, but it won't help the elbow dysplasia. The injection of platelet-rich plasma (PRP) into the joint has also been used with some success in canine elbow dysplasia. Synovetin OA is a new injectable medication that uses electron therapy to target macrophages and synoviocytes in the painful elbow. It must be injected directly into the affected joint.
- ▶ **Braces.** Although you'll find braces for elbow dysplasia on the market, they're more suited for luxations (dislocations), hygromas (fluid buildup around joints), and ligament tears, not loose pieces of cartilage or bone. If you're going to try a brace, proper fit is critical to it being effective, so be sure to incorporate your veterinarian or a veterinary rehab specialist in your decision.

An Effective Solution for Chronic Diarrhea

Fecal transplantation for dogs is new, but might help

Chronic diarrhea can be a nightmare for both dog and owner. Most cases can be treated with medications, diet change, or supplements, but sometimes the diarrhea just won't stop.

For these stubborn cases, a fecal microbiota transplantation (also known as fecal transplant or FMT) might be an option. This treatment has been used in humans for a while but is new in veterinary medicine.

"Fecal transplantation is most commonly used for dogs with chronic diarrhea that have not responded to any other treatment including diet trials, medications, or supplements," says Leni K. Kaplan, MS, DVM, of Cornell University's Small Animal Community Practice. "This is considered a last resort treatment after all other treatments have been attempted and thorough diagnostic panels have been performed."

Resetting the Gut

Your dog's gastrointestinal (GI) tract is home to a thriving community of microbes that are important for normal digestion and supporting your dog's immune system. This microscopic community is called the microbiome.

When your dog eats something he shouldn't or simply becomes ill, the normal microbes can get disrupted, allowing abnormal and even pathogenic microbes to move in. This imbalance between "good" and "bad" microbes



Chronic diarrhea drains your dog's energy due to dehydration and often a decreased appetite.

can play a role in why the dog's diarrhea doesn't resolve.

A fecal microbiota transplantation takes stool from a healthy dog with a normal gut microbiome and transplants that into a dog with an abnormal gut. While it sounds disagreeable, this can help to reset the GI tract and reestablish the normal microbes.

The Transplant

To do a fecal transplant, you need a healthy donor dog that is fully vaccinated, free of parasites, and does not have a history of any immune or gastrointestinal disorders. The donor dog should not have had antibiotic treatment within the last three months, as that can impact their microbiome. Ideally, both dogs should be eating the same food to prevent any issues with food sensitivities.

Studies Are Scarce But Show Promise

1. A study in Brazil published in the *Journal of Veterinary Internal Medicine* in 2018 looked at puppies hospitalized to treat parvovirus. Half of the puppies received standard treatment methods, and the other half received standard treatment as well as a fecal transplant. There was no significant difference in survival between the two groups, but the puppies who received fecal transplant had shorter hospital stays and their diarrhea resolved faster.
2. A case report in *BMC Veterinary Research* from 2019 reviewed a French Bulldog with a nasty *C. difficile* infection. This pup received an oral fecal transplant and had normal stool within two to three days.
3. A 2021 study in *PLOS One* evaluated the use of fecal transplant in dogs with acute hemorrhagic diarrhea syndrome. The researchers stated, "We conclude in this small pilot study fecal transplantation did not have any clinical benefit." But they did find that the treated dogs had an increase in some "good" microbes after treatment.

Once a healthy donor has been found, collecting the sample is simple: Just grab some poop! The fresher the sample, the better. The veterinarian will then mix the stool with sterile saline or lactated ringers solution and filter out debris.

"The patient receiving the transplant will need enemas prior to the transplant and may need heavy sedation/light anesthesia during the procedure," says Dr. Kaplan. The most common method used is to sedate or anesthetize the patient and give an enema to clear out the GI tract, then give the fecal transplant as another enema. The transplanted feces can be left in place in the colon for up to 45 minutes.

Another option is to get freeze-dried stool samples that have been packed into capsules and give them orally to the ill dog. The capsules are made to not break down until they reach the intestines.

Improvement is usually seen within the first few days after the transplant but can occur within hours. In some cases, a single transplant is sufficient, but other dogs will start having diarrhea again and may need a second FMT.

Cost of FMT

According to Healthy Paws Pet Insurance, the cost for a fecal microbiota transplantation is \$500 to \$1,500. This includes the necessary workup beforehand to be sure both dogs are healthy as well as the cost of processing the donor stool sample.

The Takeaway

If your dog develops diarrhea, standard treatments such as medications, probiotics, and feeding a bland diet are still the way to go. These treatments are proven to work for most dogs. Where a fecal microbiota transplantation might come in is in a chronic case that doesn't respond to treatment.

"As this is a last-resort treatment, it is crucial that owners strictly adhere to their veterinarian's recommendations including special prescription diets, medications, and supplements before declaring those treatments unsuccessful," says Dr. Kaplan.

"There are still many unknowns about fecal transplantation, but research is definitely underway. As soon as we know this modality is truly helpful and doesn't harm the patients, veterinarians will be more comfortable and aggressive about recommending and performing this procedure," she says. ■

Don't Rule Out Leptospirosis

"Lepto" is on the rise, making prevention critical

Bacteria shed in the urine of wildlife can infect your dog with a potentially fatal disease caused by leptospirosis. It's a zoonotic disease, which means it can infect people, too. Deer, skunks, raccoons, and rodents carry the bacteria. Infection can occur through direct contact with urine or reproductive fluids from infected animals, or through infected water sources or soils. The bacteria enter the dog through mucous membranes, such as when swimming, or drinking from mud puddles, and through breaks in the skin via cuts or open sores.

While many people consider leptospirosis a "rural" disease, research shows that city dogs licking the sidewalk where a rat or mouse has urinated can become infected. It's no wonder cases are on the rise. For these reasons, you need to be aware of how it spreads, its symptoms, the difficulties with diagnosis, and ways to prevent your dog from becoming infected, no matter where you live.

If your dog gets a swift, accurate diagnosis, and immediately starts treatment, you can usually expect a good outcome. About 80% of dogs will make a full recovery.

Symptoms

If your dog becomes infected with leptospirosis, signs almost always include lethargy and loss of appetite. Fever, vomiting, diarrhea, and excessive thirst and urination are common. Yellow mucous membranes frequently occur when there is liver involvement. Less common signs include muscle pain,

abdominal pain, and inflammatory eye conditions. If the lungs are damaged, trouble breathing and coughing up blood can occur. Lung involvement carries a much worse prognosis.

The Bacteria

The leptospire is a bacteria called a spirochete that multiplies in the kidneys of the reservoir host (deer, skunks, raccoons, rodents). Reservoir hosts have adapted to this organism, so it doesn't make them ill. They merely carry and shed the organism.

Once inside a host, like a dog or human, the organisms multiply rapidly in the bloodstream and start damaging the lining of blood vessels. This blood-vessel injury then leads to organ damage. The kidneys and liver are commonly affected, but leptospirosis also can injure the lungs, eyes, and central nervous system.

Diagnosis

Diagnosing leptospirosis in dogs is challenging and involves a combination of history, risk assessment, physical exam, blood tests, and urinalysis. Your veterinarian may also do a blood test called a microscopic agglutination test (MAT). MAT looks for antibodies against leptospirosis and is usually done in paired samples, two weeks apart. If paired samples show a fourfold or greater increase in antibodies, it is considered a diagnosis of leptospirosis. The problem is that waiting two weeks to start treatment for leptospirosis could be deadly. Therefore, if your veterinarian suspects leptospirosis, treatment should start

immediately based on index of suspicion while MAT results are pending.

As if the MAT conundrum isn't enough, early antibiotic therapy, while imperative, may dampen the rise in antibodies detected by the titer test, potentially confusing a diagnosis. So, while it may well be leptospirosis, it might not look like it, based on lack of a rising titer in the paired

Should You Vaccinate?

Base your vaccine decision on your dog's lifestyle. Ask yourself:

- ▶ Is my dog's yard open or fenced?
- ▶ Is there wildlife population nearby?
- ▶ Does my dog go hiking or camping?
- ▶ Do you walk in parks or other open areas shared by wildlife?

If you answered yes to any of these questions, consider vaccinating against leptospirosis. The vaccine has limitations, which we will discuss below, but it is vastly improved from the "old days" when adverse reactions were more common.

Currently available canine leptospirosis vaccines protect against four serovars (strains) of the bacteria. While over 200 different leptospirosis serovars have been identified, the four in the vaccine are the most common. Furthermore, it is believed that the vaccine provides some cross-protection from the other serovars. Plus, studies show that a vaccinated dog who becomes infected may experience less severe disease.

Historically, the leptospirosis vaccine was considered more highly reactive than other vaccines, based on clinical experience. Smaller breeds, especially Pugs and Dachshunds, were over-represented when it came to adverse reactions to the vaccine, raising concerns. With the current markedly improved vaccines in use today, this is no longer the case. Recent studies show the leptospirosis vaccine to be no more reactive than any of the other routine canine vaccines.

Vaccination, however, is not without risk. Vaccine reactions range from mild (not feeling well for 24 hours) to moderate (hives, vomiting, diarrhea) to severe (life-threatening anaphylactic shock). Vaccination also can have delayed reactions that show up weeks later as auto-immune disease. Therefore, if your dog has minimal risk, it may not make sense to vaccinate. The American Animal Hospital Association Vaccination Guidelines support this idea by listing leptospirosis as a non-core vaccine, which means it may not be appropriate for all dogs.



Most dogs enjoy hiking as much or more than their people. Be sure he's safe.

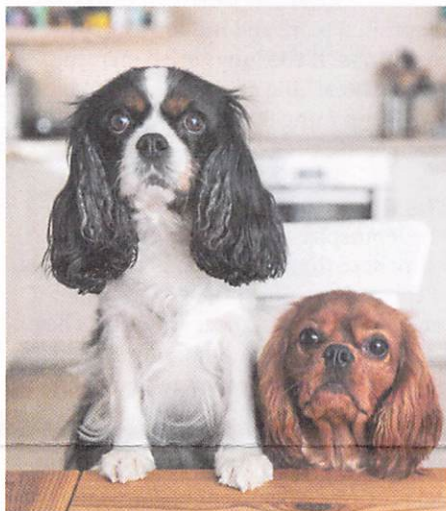
(continues on page 8)

Dog Demands People Food

Saying “no” is not the best way to handle this problem

Q We have a 10-month-old wirehaired female Dachshund. Recently, she has started yelping, crying, and running around whenever someone takes food out of the refrigerator or pantry. Nothing seems to calm her down. She has plenty of food in her bowl, so I know she isn't hungry.

We have removed her from the kitchen when she starts this behavior followed by a strong, “No!” Nothing seems to work. She just continues to yelp and cry from the next room. It seems that she doesn't even hear us reprimanding her because she is so fixated on the food. Can you offer any suggestions to remedy this? Thank you.



Begging can quickly escalate from cute looks to vocal, demanding actions.

A Well, I just finished my healthy breakfast of a slice of unbuttered toast with a light smear of marmalade. If someone walked by with scrambled eggs, bacon, and fresh-baked sticky buns I would probably be crying too, even though I am not really hungry. Accordingly, I think that your little girl is

comparing the sight and smell of human food with what is in her bowl and her bowl contents do not measure up.

Sometime in the seven to eight months that you have had her she has learned that barking works. It certainly

gets your attention because you speak to her (No! No!) and probably approach her. In fact, you punish her for letting you pick her up by telling her “No! No!” when you pick her up.

In general, I try to banish “No” from an owner's vocabulary. I am sure you have seen the cartoon in which the dog says, “My name is ‘No! No! Bad Dog,’”

Another veterinary behaviorist has a great solution. She had the owner teach the dog to go to his bed and lie down when she said “No!” You should try that with a food reward for going to her bed.

Meanwhile, what should be done about the main problem? If there is food in her bowl, that probably means that you are feeding her free choice. It might be a good time to switch to meal feeding. Give those meals just before you plan to cook so she will be busy eating while you are preparing your own meals. You should give her at least half her daily ration in food-dispensing toys so she gets mental stimulation along with the calories.

She is old enough for adult dog food now, and I always recommend pet food from the big companies because they test their diets on real dogs at the various life stages and have a staff of nutritionists (and behaviorists). ■

(Lepto, continued from page 7)

samples. This means there will be times when the diagnosis is “probably lepto.”

Yet another complication is that vaccinated dogs, who can still succumb to active infection, have vaccine-induced antibodies that show up on the tests, and it's impossible to differentiate antibodies due to active infection from vaccine-induced antibodies.

Treatment

Treatment usually involves hospital admission for several days. Kidney and liver involvement requires aggressive intravenous fluid therapy and close monitoring. Penicillin, or its derivative ampicillin, is usually instituted early, as these drugs eliminate the bacteria from the bloodstream. Doxycycline is typically given for at least two weeks to help clear the organism from the kidneys. Anti-vomiting and pain medications are administered as needed. Patients with severe kidney failure who fail to

respond to intravenous fluid therapy should be referred to a specialty center for dialysis.

Once discharged from the hospital, your dog will require close monitoring for several months. Your veterinarian will advise you on how to safely handle your dog's urine at home, which includes avoiding contact with it and wearing gloves when cleaning it up. Routine household disinfectants with bleach are effective against the bacteria.

If you have other dogs at home, consider proactively treating them with doxycycline, just in case. If one is infected, there's a good chance the others have been exposed.

Prevention

Obviously, since keeping your dog in a bubble is not practical or wise, a vaccination should be considered (see sidebar on p. 7). Leptospirosis is a real threat. As such, knowing the early signs of lepto is critical so your dog receives appropriate treatment faster. If infection does occur, prompt veterinary diagnosis and treatment can make a tremendous difference in recovery. ■



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.



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