

Best Friends BULLETIN



Summer 2023

Dear Clients & Friends...

Every couple of years, I revisit topics we've covered before in this newsletter, sometimes many times. There are always new clients coming along who haven't been exposed to some of these topics, and there is always new information to impart, even about topics we've talked about for years. Dental care, nutrition, pain management, wellness screening, preventive care, and behavior are some of the things we talk about the most because they have the most impact on our patients' lives.

In my annual handout for dog owners this year, I took a step back to discuss where you get your pet health information and how our human brains process pet care information and use it to make decisions. These decisions will be based on a lot of factors, such as what you know or past experiences, what you learn along the way, what information you get from us, your relationship with each pet, and your financial situation.

Whenever possible, your veterinarian will usually recommend care based on science and data. This is called evidence-based medicine, or EBM. Human nature, however, often conflicts with rational data. People are more likely to make emotional decisions instead of rational ones, especially when a loved one, human or animal, is involved.

The Evidence-Based Veterinary Medicine Association (EBVMA) is a non-profit professional organization founded to better organize the emerging research, training and practice of evidence-based veterinary medicine. Site includes literature lists and forums about EBVMA. Visit them at www.ebvma.org

In some areas, such as emergency care when a pet is ill or injured, or when choosing food and treats, emotional circuits in our brains are especially engaged. It can be really hard to walk away from emotion and make decisions that are sensible and logical. Another downfall of the human brain is our susceptibility to marketing, peer pressure, and disinformation. Why do we believe the things we do? Many times, our brains don't do us any favors with the way they process information!

Veterinary emergency care is expensive!
Consider insuring your pets!

One of the most common and least helpful ways our brains deceive us is our often mistaken belief that bad things can't or won't happen to us. We all know rationally that at some point in each pet's life, he or she will become ill or injured. We may also know that the chances are good that it will be expensive to diagnose or treat.

Your dog or cat being healthy in the past in no way guarantees it will be healthy in the future! Sadly, only 5% or so of pet owners have health insurance for their pets. The rest pay out of pocket when their pets get sick, to the tune of thousands of dollars in many cases. So many pet owners don't purchase pet insurance and then regret it. We humans aren't very good at long term risk management. We get a lot more emotional reward from giving our pets treats than we do from buying pet insurance or putting them on a weight-loss program.

This edition of the Pet Care Bulletin covers the cost of emergency care, pet food marketing, wellness screening for heart disease in cats, and a little canine behavior. All the tried-and-true categories with scientific, rational information. We hope you enjoy the learning!

*Dr. Nan Boss, DVM and the team at
Best Friends Veterinary Center*

Spring is here! With that comes many creepy crawlies that affect your pets, like ticks, fleas, and biting flies

If you have any questions about how to protect your pets from them please call us at 262-375-0130!

2082 Cheyenne Court, Grafton, WI 53024

Ph: 262-375-0130 • Fax 262-375-4196

Email: info@bestfriendsvet.com

Website: www.bestfriendsvet.com





We Have a New Doctor!!!

Dr. Delany Hinz will be joining our practice on July 1. Since she is newly graduated from veterinary school, she will spend the first couple of months with us tagging along with the other doctors, learning our client education system, and figuring out how to charge for things – veterinary students don't do much estimating or billing. She will be seeing appointments on her own come fall. We hope you will like her and give her a warm welcome! Here is an introduction from her:

To my future patients and their families:

Hello! I am Dr. Hinz, and I am so excited to be joining Best Friends Veterinary Center this summer as their newest veterinarian. While I look forward to getting to know all of you, here is a little about me: I recently graduated veterinary school from UW-Madison, and I was drawn to this clinic because of the high-quality medicine and the care with which they practice it. I was born and raised on a hobby farm in Twin Lakes, WI, with dogs, cats, horses, pigs, goats, chickens, ducks, geese, and rabbits, oh my! Having loved animals all my life, I was inspired to be a veterinarian when my own pets needed veterinary care. I remember wanting what is best for my pets, wishing I had all the information to make the best decision, and depending on my veterinarian to provide me with it. I want to provide that service to my own clients, empowering you with the information to make the best decision for your pet and family. Just as every patient is different, so are their families and their goals. I look forward to meeting everyone "where they are" and being there for you and your pets however I can.

Sincerely,
Dr. Delany Hinz

Imaging4Pets

We have a new service providing ultrasonography for our patients here at Best Friends. Instead of a board-certified internist or cardiologist performing the ultrasounds, we have a certified ultrasonographer, Rebecca. She does both abdominal ultrasounds and echocardiograms, which are transmitted to an internist, radiologist, or cardiologist, who will provide us with a report and treatment recommendations.

This is the first time this type of service has been available in our area. We are thrilled to have her because of the decreased availability of specialists. We currently have only one board-certified veterinary cardiologist in the whole Milwaukee area, which isn't nearly enough. Dr. Horsch had been doing abdominal ultrasounds for us, but she didn't want to continue to do this for us, so we were looking for an alternative. This is perfect.

We are set up for Rebecca to come here on the first Friday morning of every month. She is also available on an emergency basis, at least sometimes; it will be hit or miss, depending on her availability. For critical emergencies or internal medicine consultations, we will continue to refer you, usually to Blue Pearl.

New Prescription Diet Made for Pets with Cancer

One-in-four dogs and one-in-five cats will be diagnosed with cancer in their lifetime. Hill's has developed a new diet made specifically to help these pets. High caloric density and digestibility help maintain weight and muscle mass. Soft kibble and delicious flavor encourage eating. Extra omega-3 fatty acids help manage inflammation. Prebiotics support healthy gut bacteria and maintain a firm stool. Oncology is the study and treatment of cancer. The new diet is called Hill's ONC.



Are You Prepared for a Pet Emergency?

Most Americans Are Not

Many pet owners vastly underestimate what they will spend on care over a pet's life. According to one study, 45% of dog owners and 38% of cat owners thought they were financially ready for pet expenses but were not, and 38% of cat owners thought they were financially ready for pet expenses but were not. One in four pet owners is stressed by a bill of \$250 or less for veterinary care, far below the annual cost of owning a dog or cat.

According to a survey conducted by the American Pet Products Association, nearly 70% of households in the U.S. own a pet. Of those pets, it is estimated that 1-in-3 will need emergency veterinary treatment every year. In 2018, only 39 percent of Americans had enough in savings to cover a \$1,000 emergency. But emergency room visits can cost thousands of dollars, especially if surgery is needed.

Financial advisors recommend adding a line item to your family's monthly budget for your pets and including them in the family emergency fund. Ideally, families should earmark \$5,000 to \$10,000 in the family emergency fund for a pet. It's easy to say that you wouldn't put that much money into a dog or cat, but when it's happening, you don't even think about it. Your pet is a family member, and you want to take care of it.

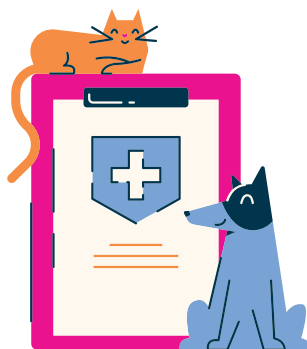
Pet owners can expect to pay \$800 to \$1,500 on average for an emergency vet visit, according to [CareCredit](#), a short-term financing service for medical expenses. Initial costs may go towards stabilizing the pet and diagnosing the problem, often using expensive imaging equipment like X-rays and ultrasounds. Prices obviously vary depending on the severity of the emergency, the veterinary hospital visited, the part of the country you live in, and a few other factors.

Lifetime Cost of Pet Care

Dogs: \$19,893-\$55,132, or \$1270-\$2803 per year

Cats: \$15,055-\$45,790, or \$961-\$2487 per year

Aside from having emergency funds built into your family budget, there are a few other resources to help with medical costs for a pet. One is pet insurance. Today, 2.1 million pets in North America are insured, according to the North American Pet Health Insurance Association. If you do decide to get pet insurance, we recommend getting it when your pet is young and healthy. As with human health insurance, pre-existing conditions factor into most pet insurance plans.



If you have pet insurance, a standard accident and illness policy may reimburse up to 90% of the entire bill. This provides significant relief for pet owners facing a large vet bill. Pet owners still need to pay out-of-pocket and then file for reimbursement, but the majority of care is usually covered.

CareCredit is another option to help with payments. It's a credit card that can be used for medical expenses, and most vets accept it. CareCredit helps make it easier for consumers to say 'yes' to recommended treatment for their pet," said Boo Larsen, general manager of veterinary medicine for CareCredit.



Tidbits...

A study published in *Human-Animal Interactions* found that people with a dog were more likely than others to have trouble sleeping or have a sleep disorder, and people with a cat were more likely to experience leg jerks while sleeping.

Adding different medications together can make cancer drugs more effective. A recent study found that using losartan, a medication for hypertension, combined with toceranib, a cancer drug, resulted in tumor stabilization or regression in half of dogs with advanced relapsed metastatic osteosarcoma to the lungs. Malignant gliomas are aggressive brain tumors that share similarities between dogs and humans. The combination of losartan and propranolol, a beta blocker, along with a cancer vaccine, induced durable tumor responses in eight of 10 dogs with gliomas.

The risk of highly pathogenic avian influenza outbreaks in both wild and domesticated birds is rising with the spring migration season, and people should report dead birds, birds behaving strangely, and dead or oddly behaving mammals to their natural resources department, says Megan Jones, a professor of wildlife and anatomic pathology at Atlantic Veterinary College. People who own birds or poultry should forgo hanging feeders for songbirds, and anyone else who sets out bird feeders should keep them disinfected.

Approximately 88% of pet owners in the US consider their pets family members, and around 86% of cat or dog owners and 62% of people who own a fish, bird, or turtle say their pet is good for their mental health, according to the results of a monthly poll by the American Psychiatric Association. However, pet ownership is not worry-free, as 71% of pet owners expressed concern about their pet's aging or dying; 66% cited health conditions as a concern; making arrangements while traveling was a worry for 56%; and pet health expenses were a worry for 58%.



Pet Food

I rarely watch TV at home. I'm more likely to watch YouTube videos on my phone or tablet. When I'm traveling, though, I'll watch in my hotel room. I recently attended and spoke at a veterinary conference, for the first time since 2019. (COVID-19 sure changed things for continuing education meetings.) It was a bit of a culture shock to watch all the pet food commercials on television. What a passel of marketing tricks, innuendo, and outright lies!

The commercials from Blue are typical examples I watched over and over again in just those few days. One of them implies that the inspiration for Blue pet food was a pet named Blue. Blue was started by, and is still owned by, a bunch of Wall Street financiers and venture capitalists. There was never a pet named Blue or a small family-owned company start-up.

Another of their commercials is for Blue Wilderness, showing a bunch of wolves jumping over a log and then a dog doing the same, claiming that dogs, like wolves, crave meat, so there is 20% more meat in Blue Wilderness. 20% more than what? 20% more than other brands? 20% more than what's in a potato? It's a meaningless statistic.

Dogs are omnivores, not carnivores. They evolved by living side by side with humans and eating our leftovers. At least twelve of the genetic differences between wolves and dogs involve adaptations to digest starch and carbohydrates more efficiently. Dogs don't need that much meat or the fat that goes with it. Eating a diet too high in meat isn't any more healthy for your dog than it is for you. Beef, in particular, has a lot of fat, and it contains a carbohydrate that stores energy for the muscles, which acts as a carcinogen in dogs. Feeding a meat-heavy diet may be "what your dog craves," but that doesn't mean it's healthy for them.

Yet another Blue commercial shows a woman petting her dog and talking about how she switched to Blue because she wanted to feed her dog better ingredients without by-products. Let's unpack that. First of all, the first pet foods manufactured were developed as a way to make money from leftover agricultural products that weren't acceptable for human consumption, and they still are today.

When you see those lovely images of cuts of meat, chunks of vegetables, and piles of fruit, that's not what's in your dog's food. Pet food companies are way more likely to be using carrot peels, apple cores, and offcuts of meat with all the gristle and fat in them than anything in those photos.

Furthermore, you'll often see fruits and vegetables on the ingredient list, but ingredients are listed in order of weight. If the apples and blueberries appear on the label below the vitamins and minerals, the amounts are miniscule. You don't get any nutritional benefit from a single blueberry.

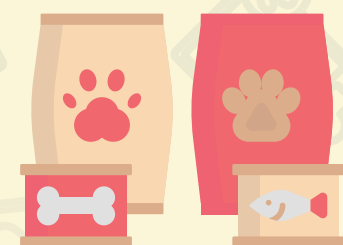
There is no such thing as "human-grade" or "animal-grade" agricultural products. That's not how the USDA categorizes foods. In fact, it's illegal for pet food companies to use the term 'human-grade' in their marketing because it's a misrepresentation. Not that the regulation stops them very often. They know the government has other things to worry about than false advertising claims by pet food manufacturers. Those laws are rarely enforced.

As for by-products, though frequently vilified, there is nothing wrong with them! The pet food company just wants you to think there is, and they want to pretend their food doesn't contain any—even when it does. Blue lost lawsuits because they kept saying their products contained no by-products, but they did. Purina bought bags of Blue pet food from store shelves and analyzed them to find that all of them, in fact, contained by-products. After they lost the lawsuit, Blue claimed to have fixed the problem, and they were sued again when analyses again showed by-products.

Back to the issue of whether by-products are bad in the first place: a by-product is simply what is left over after the primary use of the product has been fulfilled. Skim milk is what's left over after the butterfat has been removed, which technically makes it a by-product.

In the case of pet food, by-product meal usually consist of the internal organs, including the liver, heart, spleen, lungs, and kidneys (but not the intestines). These are some of the most nutritious parts of the body. They are what a wild carnivore eats first. Without the liver, a carnivore would become deficient in vitamins A, D, E, and K, plus iron. Without heart muscle, a cat won't get any taurine in its diet. Cats require taurine in order for their own hearts to function. Without heart muscle going into the food, the company has to add artificial taurine.

Does it make any sense that we send millions of pounds of animal organs to landfills annually but then add artificial vitamins and minerals instead? If you want to feed food that's 'natural' you need to include the parts of the body animals naturally eat in the wild.



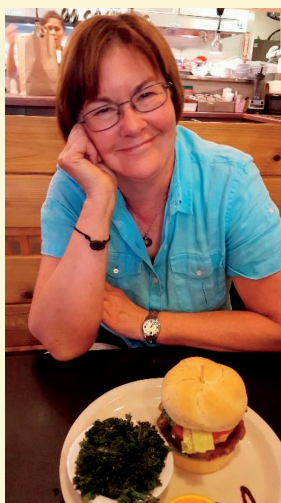
Marketing



Just because we modern humans are squeamish about those things doesn't make them bad for pets. Our ancestors ate every part of the animal, too. It's only because we have the luxury of eating just the choicest cuts of meat and throwing the rest away that we think everything else is not even fit to feed our dogs. Nutritionally, it makes no sense.

Blue is not the only company to use false or misleading advertising and marketing materials. Many pet food companies tell you a bunch of untruths. "No corn, no soy, no fillers!" implies that corn and soy are bad for pets and that the other guy's food is nothing but "fillers."

Often vilified, corn is 87% digestible and provides important nutrients. Soy is almost as high-quality as meat as far as providing the amino acids pets need, while being lower in fat, higher in isoflavones, and less expensive. As a vegetarian myself, I can tell you there are other ways to get protein in your diet than meat. By the way, corn doesn't cause allergies, either. (This is me with a veggie burger!)



As far as fillers go, they don't really exist, at least not legally. A filler is something indigestible or that provides no useful nutrients—think of someone adding sawdust to pet food. Nobody does that. By the way, even an indigestible ingredient is good if it's providing fiber.

Most consumers aren't familiar with the definitions the USDA uses for animal products. Poultry meat meal, for example, is not a by-product. It's the meat protein with the fat removed—almost pure protein. If you want to provide protein while minimizing calories, meat meal works well, so you'll often see it on the labels of diets made for weight management.

Other ingredients can also have names that might throw you off. Many people get very concerned when reading pet food labels because they don't know what some of the names mean. α -tocopherol, for example, is vitamin E, and ferrous sulfate is a form of iron.



Individual ingredients are much less important than how the ingredients work together and how well the nutrients contained in them meet the needs of the pet.

Pet foods that contain the most real meat also contain the most fat and calories. The popularity of this type of diet is part of the reason why obesity is affecting our pets in such large numbers. High-fat diets are expensive, and they have a huge negative effect on the health of the average house pet. Sled dogs need high-fat diets. For most pets, life expectancy will be reduced by these high-calorie diets, and the health consequences can be terrible: arthritis, cancer, diabetes, pancreatitis—there's nothing healthy about the consequences of high-meat diets.

None of these marketing campaigns ever mention that grain-free diets can kill your dog or give your cat bladder stones. 90% of canine cardiomyopathy cases seen by veterinary cardiologists are caused by the pet food the dog is eating. This is a fatal disease! The companies that make them know that. Nevertheless, they continue to make and market these dangerous pet foods to unsuspecting consumers. This is usually one of those brands you see fancy ads for.

The manufacturers don't mention that there is no veterinary nutritionist formulating most of these pet foods, with no feeding trials and no ingredient testing. The companies that make them have no idea whether they are actually providing the best, most optimal formulations, and I would argue that most of them aren't. Billions and billions of dollars are spent by consumers every year on fancy pet food that isn't even good for pets.

Most pet food companies want to make the most money at the least expense, and they will do everything they can to make you think you are getting more than you are. Words like wholesome, natural and premium are thrown around as if they mean something, but they are only marketing terms used to impress the consumer.

Meanwhile, there are a few companies that truly put in the effort to produce diets based on research and science. Individual ingredients are much less important than how the ingredients work together and how well the nutrients contained in them meet the needs of the pet.

This is why it's not good for me to watch television. I can get pretty frustrated by all the misinformation being blasted at all you pet owners night after night. Some of these commercials run multiple times during a single 30- or 60-minute episode of your favorite show. You are bombarded with it every day, while the advice of veterinary professionals is completely drowned by the flood. Don't fall for all the misinformation! Ask us for a diet recommendation, and close your ears to all the rest!

Prioritize Prevention

One of the easiest ways to avoid a pet emergency is to bring your pet to us for annual checkups. We will make sure your pet gets the medical attention he or she needs and that you have the information you need to keep your pet healthy. Yearly vet checkups will help keep your pet out of the emergency room.

Preventive care includes exams, vaccinations, deworming, heartworm and other parasite prevention, and pet dental care. Staying on top of annual checkups (and following our advice on proper courses of action) will help catch conditions early on, and may prevent a trip to the emergency clinic down the road.

It's our job to help prepare you for what you're going to have to deal with as a pet owner. We always wish people would consult us before getting a new pet. Many diseases we see are genetic. There are some dog breeds that will need corrective surgery, such as bulldogs, which have problems with their soft palates that need shortening to fit in their short noses, as well as defective kneecaps that lead to torn ACL ligaments. Toy breeds need a lot of dental care, while giant breeds have a high risk of bloat, orthopedic problems, heart disease, and cancer.



In other words, genetic diseases greatly increase the lifetime cost of care for some breeds. Before you bring that adorable puppy home, ask us what you can expect in the way of health care costs!

There are other simple things you can do to reduce the risk of an emergency visit to the vet. For example, pet-proof your home. Pets, particularly puppies and kittens, are too curious for their own good; that's part of what makes being a pet owner so fun. But it can also lead to some scary situations.

Examples of emergency care costs:

Anaphylactic shock	— \$500–\$1,000
Bloat	— \$1,500–\$7,500
Gastroenteritis	: \$750 – \$3,000+
Intestinal blockage	— \$800–\$7,000
Pancreatitis	: \$2,000 – \$5,000+
Trauma	— \$500–\$8,000
Stomach issues	— \$700–\$3,000
Seizures	— \$500–\$5,000
Heatstroke	— \$1,500–\$6,000
Poisoning	— \$200–\$5,000
Cat bite abscess	: \$300 – \$1,500+
Dog bite wounds	: \$1,000 – \$10,000+
Urinary tract obstruction	: \$1,500 – \$3,000+

Potential hazards such as toxic houseplants, medications, and cleaning supplies are best kept off-limits. Chocolate, chewing gum, grapes, raisins, macadamia nuts, and onions are all harmful to pets. (We recently had a dog come in who had eaten two cups of macadamia nuts!)

Be mindful of your pet and its surroundings. When pets venture outside, there are other precautions to consider. For dogs, basic obedience training and using a secure leash and collar with an ID tag can minimize the chances of a car accident or other injury. Other considerations include walking in the early morning or late afternoon if the weather's too hot and avoiding close encounters with other unknown, unleashed dogs.

With cats, outdoor safety is a bit more complicated. Cats can be more independent than dogs, and they love to explore on their own, which can expose them to dangerous situations. Most owners opt to keep their cat indoors at all times, especially if they live in a high-traffic area, but a few still prefer to let the cat roam freely, especially on rural properties and farms.

To keep an outdoor cat as safe as possible:

- Get a well-fitting collar with an ID tag
- Consider a microchip
- Get them neutered or spayed
- Stay up to date on vaccines
- Prevent parasites
- Bring them in at night

For indoor cats, obesity-related diseases are a cause of illness, specially diabetes, urinary tract disorders, and cancer.

Lastly, feed your pets a diet recommended by your veterinarian and only feed them an amount that will maintain a healthy weight. One of the most common causes of heart failure in dogs is eating a grain-free diet. Cats have a much higher risk of urinary tract disease on certain types of diets. What you put in your pets' food bowls every day and how much are some of the most important decisions you make as a pet owner.



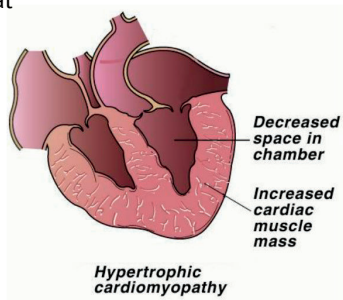
ProBNP Testing in Cats

Some types of heart disease are remarkably difficult to diagnose, especially in cats, yet heart disease is very common. 5–15% of dogs and cats have heart disease. Some breeds of cats are particularly at risk.

In cats, the primary heart problem we encounter is hypertrophic cardiomyopathy, or HCM. In this disease, the heart muscle becomes abnormally thick and stiff. As the heart muscle thickens, the chamber inside the heart that holds the blood shrinks. The heart has to work harder and harder to pump a smaller and smaller amount of blood. This disease affects 1 in 6 cats to at least some degree.

HCM is the most common cause of unexpected death under anesthesia in cats.

A heart that is functioning adequately under normal circumstances may fail under the stress of anesthesia or heavy exercise, which is why some affected pets die under anesthesia even though they had no symptoms beforehand.



This is especially common for the genetic forms of disease we see in younger cats. Anesthesia in cats is actually more dangerous for young cats than old ones, as they are more likely to have more severe disease but no heart murmur to clue us in.

Screening for Heart Disease

ECG screening and chest x-rays may be normal even with severe heart disease in cats, because the heart doesn't always show an abnormal rhythm or become enlarged with HCM. A thicker, stiffer heart can still have a normal size and shape on an x-ray. The ProBNP blood test makes screening for occult (hidden) heart disease easier.

The ProBNP enzyme is released from heart muscle cells in response to wall stress. The cells are stretched or damaged and start leaking muscle enzymes. The more stressed or damaged the muscle, the higher the levels will be.

When the ProBNP test is done at our reference laboratory, we get a number, and we can track increases over time. The worse the disease, the higher the number.

Breeds of cat with higher risk for cardiomyopathy include:

- Abyssinian
- American short hair
- British short hair
- Cornish & Devon Rex
- Domestic short hair
- Domestic long hair
- Maine Coon
- Persian
- Ragdoll**
- Siamese

**A DNA test is available in this breed

When we do the test in-house, the cost is lower and we get an answer right away, but we only get a positive or negative result. A positive in-house test should be confirmed by additional, more accurate testing. It's a red flag that would prompt us to cancel an anesthetic procedure while we investigate further.

It's so much better to find out there is a problem and manage it than to have your pet die under anesthesia from a problem you didn't even know it had!

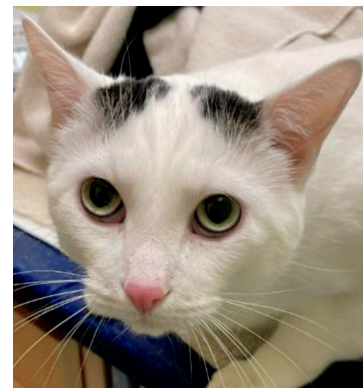
What are the symptoms of HCM?

In the early stages of disease, the cat may not show any symptoms. This is referred to as compensated heart disease. The heart is not normal, but there are no obvious signs of disease. Cats are good at masking illness, so owners often do not notice that their cat is tiring quickly or has a rapid heart rate. Often, cats will alter their activity levels to cope with their disease, which makes it difficult to diagnose cardiomyopathy until it is quite advanced.

HCM can be a deadly disease, but it is treatable if we can find it. Heart failure progresses and begins with mild signs. Not all diseases will progress to failure, but most will worsen with time.

Symptoms to watch for include panting or open-mouth breathing, tiring quickly, and inactivity. Severe signs include sudden death, respiratory distress (gasping for air), and painful blood clots that may be fatal.

Many cats with HCM have heart murmurs that would indicate there is a problem, but these murmurs are often soft and difficult to hear. One-third of affected cats don't have a murmur at all. Hearing a heart murmur will usually prompt us to recommend further heart testing. Cats who have hyperthyroidism or high blood pressure from kidney disease are at higher risk for heart disease and can develop heart murmurs, with or without cardiomyopathy. Regular ProBNP testing is recommended for these cats.



This is Benson, who is 8 years old. He came in for us to extract a tooth but his preanesthetic ProBNP test was positive. His dental work was canceled! A precise ProBNP done at our laboratory was too high to read. Yikes! An echocardiogram showed advanced heart disease. Benson was started on heart medication and is expected to reschedule his dental work. Without medication, there is a good chance he would not have survived his procedure.

Anxious Dogs' Brains Are Wired Differently

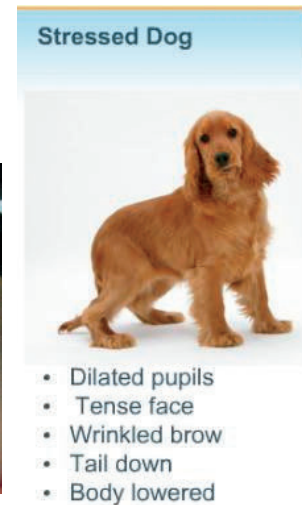
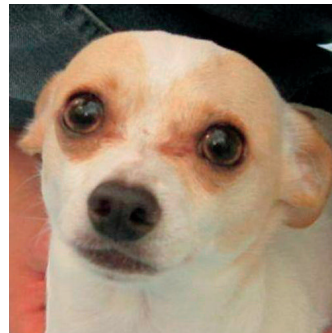
Anxiety disorders are the most common behavioral problems seen in dogs. Anxiety compromises the relationship with the owner and can lead to abandonment, rehoming, or even euthanasia. When fear is accompanied by aggression, it results in safety hazards as well.

According to a new study published in the journal PLOS One, researchers found that dogs with anxiety have differently wired brains compared to dogs who do not have anxiety. The team observed that dogs diagnosed with anxiety have abnormalities in their brain's functional neural networks. Through fMRI scans, they found that the connections between these dogs' amygdala and other parts of the brain's "anxiety circuit"—particularly the hippocampus—were stronger in anxious dogs than in their non-anxious counterparts.

Located in the temporal lobe, the hippocampus plays a crucial role in learning and memory. Previous studies have shown that the hippocampus can be affected by several psychiatric and neurological disorders in both humans and dogs.

The amygdala and hippocampus are associated with becoming aroused, excited, and scared. Dysfunctions of these regions can lead to anxiety symptoms, fear, and reduced trainability, which are in line with previous research in people.

The study group of anxious dogs had less efficient communication between the hippocampus and mesencephalon. The mesencephalon, or midbrain, is responsible for vision, alertness, hearing, motor control, sleep, and wakefulness. Dysfunction in these same areas is related to psychosis in humans.



PRSRT-STD.
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