

Health

Science & tech

The science behind giving CBD and cannabis to cats and dogs

Alexa Peters



Kitty beware! This is not the way to administer cannabis medicine to a cat or dog. (It'll probably make them sick.) Specially formulated and dosed meds do show promise for pain, anxiety, and seizures, though. (Julia Sumpter/Leafly)

A growing number of pet owners are using cannabis-derived products containing high doses of cannabidiol (CBD) and low or negligible doses of THC to alleviate pain, seizures, and other conditions. But what's known about the science of cannabinoid medicine and pets?

There isn't a lot of peer-reviewed research, but a recent Cornell University study found extremely promising results.

Unfortunately, not a lot. But there are a few things to be learned from the science of cannabis and dogs and cats, even as the field emerges from decades of neglect.

As with humans, the question of using medical cannabis to improve the health of a dog or cat is a complicated one. There isn't a lot of solid, peer-reviewed research examining its safety or effectiveness. That's slowly changing, though, and the science of cannabis and pets recently took a big leap forward. In July 2018, [the first clinical study](#), examining the effects of hemp-based cannabidiol on arthritic dogs was published in [Frontiers in Veterinary Science](#), a leading international journal. The results were extremely encouraging.

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That study, titled “Pharmacokinetics, Safety, and Clinical Efficacy of Cannabidiol Treatment in Osteoarthritic Dogs,” was led by Dr. Joseph Wakshlag of Cornell University. Wakshlag and colleagues measured the effects of a particular hemp-based cannabidiol product—ElleVet Sciences' proprietary hemp oil blend—on pain and arthritis in a small sample of dogs.

The results were remarkable: More than 80% of the dogs in the study saw significant decrease in pain and improved mobility.

Few other studies

That's only one study, though. As promising as it is, nobody should rely on a single study to decide on the right path for them and their dog or cat. And unfortunately, when it comes to pets and cannabinoid-based medicine, only a small number of studies have ever been published. (A search of the leading medical research databases turned up a grand total of four.)

Understanding the political, ethical, and scientific implications of using medical cannabis and hemp in animals is more urgent than ever, and there's a lot to unpack.

Most vets can't touch CBD

You should know this up front: In most states, a veterinarian is not allowed to prescribe or recommend a cannabis product for your pet, regardless of the vet's personal or professional opinion. Each state has its own veterinary board, and that board adheres to federal law concerning medical cannabis.

Even in California, where state law makes cannabis legal for all adults, the California Veterinary Medical Board clearly states: “There is nothing in California law that would allow a veterinarian to prescribe, recommend, or approve marijuana for treating animals. Veterinarians are in violation of California law if they are incorporating cannabis into their practices.”

Leafly spoke with Dr. Gary Richter, a veterinarian based in Oakland, CA, about this issue in 2017. At the time, Richter had mentioned an online petition he was working on to get a “compassionate care” law for animals in his state. Recently, Dr. Richter confirmed that a bill of this sort has recently passed through the state legislature and was signed into law by Gov. Jerry Brown.



Administering CBD medication for arthritis, specifically formulated for dogs, is one of the most common uses of cannabis for pets. (Julia Sumpter/Leafly)

“I’m happy to report it was signed on Sept. 29,” Richter said. “It goes into effect Jan. 1 next year. The bill was far from perfect but it is a huge step in the right direction and the first of its kind in the nation.”

In most states, a veterinarian is not allowed to prescribe or recommend a cannabis product for your pet.

Richter says he's spent the last year in the political sphere, advocating to allow the use of medical cannabis for pets because he's seen first-hand the benefits of its use. And yet, under current California law, veterinarians risk having their licenses revoked if they actively recommend a medical cannabis product to an animal's owner.

"Almost anything that cannabis would be used for in a human, from a medical standpoint, has the potential to be equally as valuable in dogs or cats," Richter said. "Pain, inflammation, arthritis, gastrointestinal related things, stress, anxiety, seizures, cancer, you name it. We've seen the benefits in all of these areas. But if a vet talked about cannabis for pets, they literally did so at their own peril as far as the Veterinary Medical Board is concerned."

Illegal states are tough

It's even worse in states where cannabis is illegal for any purpose. For instance, contributing her own data to cannabis research has been almost impossible for Dr. Dawn Boothe, an internist and clinical pharmacologist at Auburn University in Alabama, according to an article published earlier this year in [VINNews](#), the web site of the Veterinary Information Network.

"At Auburn University in Alabama, Boothe, the clinical pharmacologist, has had difficulty getting her clinical work off the ground, owing to the legal morass," wrote reporter Edie Lau. "Alabama is one of 20 states where marijuana remains illegal for any purpose, although the state in 2016 created an industrial hemp research program overseen by its agriculture department."

The DEA's position on cannabis is clear: The agency holds that all cannabis-derived products, including CBD, are subject to the same restrictions as marijuana with substantial THC content. That means researchers are forced to jump through the additional hoop of applying for a federal permit to handle a controlled substance. Which makes it all the more difficult to conduct research on cannabis.

A handful of published studies

As difficult as it is to research cannabis, a number of scientists have persevered and published solid peer-reviewed work. Their surprising results have piqued the interest of vets and pet owners alike.

"If my dog ever has chronic arthritis, this would be one of the things I'd definitely use."

Joseph Wakshlag, Cornell University College of Veterinary Medicine

Until very recently, there was little-to-no data on the effects of cannabis in dogs. As recent as April 2017, [American Veterinarian](#) stated, “Concerning to many veterinarians is the lack of peer-reviewed clinical studies proving the efficacy of cannabis products for animals, yet another consequence of marijuana’s status as a controlled substance.”

The angle that has gotten the most vetting is that of marijuana’s *toxicity* to animals—in other words, dogs or cats accidentally eating their owner’s supply. Indeed, as far back as 2004, a study found that marijuana poisoning was possible in dogs, based on a milligram per kilogram, or weight proportionate, dosage.

That 2004 study found that “From January 1998 to January 2002, 213 incidences were recorded of dogs that developed clinical signs following oral exposure to marijuana, with 99% having neurologic signs, and 30% exhibiting gastrointestinal signs.”

The study in particular gauged what “poisoning” looked like in the animals. Researchers cited gastrointestinal signs as primarily vomiting, and neurological signs as depression, tremors, seizures, disorientation, hyperactivity, or stupor. Prior to [this study](#), there were only a few surveys of cannabis-smoking teenagers who’d exposed their pets to secondhand THC.

Most research focused on harm

Through the 2000s, there were only a few studies done on cannabis and dogs, all mostly corroborating the plant’s mild toxicity. The authors of [a 2013 study](#), conducted by a veterinary hospital in Denver, observed that “although the drug has a high margin of safety, deaths have been seen after ingestion of food products containing the more concentrated medical-grade THC butter.”

Even so, this recent Cornell study on cannabidiol and arthritis in dogs has given scientists an even deeper understanding of how cannabis works in the body of animals and by extension, humans, especially when it comes to absorption and dosage. And other studies currently underway, including several more by ElleVet Sciences and Wakshlag as well as by researchers at Colorado State University, are looking like they will take these new discoveries even further.



The right dosage makes all the difference. And it may take some time to find the right amount for your dog. (Julia Sumpter/Leafly)

Dogs absorb CBD differently

Previous to this study on ElleVet Sciences' hemp oil in dogs, the effects of cannabis in dogs had been measured by giving them pills on a fasted stomach. What [that 1988 study](#) found is that the form of CBD administered was poorly absorbed and did little to help the dog.

“ElleVet came to us and were looking for a [scientist] that was open to doing a pile of studies on oil absorption for their cannabinoid-rich hemp, for the molecule called CBD, and they also wanted to do a clinical trial if we could find that it would be absorbed well,” said Cornell’s Wakshlag. “We did an initial study for absorption in a handful of dogs and it seemed to be absorbed pretty effectively compared to some of the older literature that was out there, which was surprising.”

Wakshlag says it’s the oil base that accounts for the difference in result. As opposed to the previous studies where CBD was administered intravenously or as a powder in a gelatin capsule, the team at Cornell found that cannabidiol was more easily and fully absorbed with a lipid carrier, or oil base.

What about CBD dosage?

Another big challenge when it comes to cannabis and pets is finding the right dose for each animal. For CBD-only products, like the hemp oil from ElleVet Sciences, if they don't offer a sufficient amount of CBD or if the CBD isn't well-absorbed by the animal, you won't see any change in the pet.

Thus, for Wakshlag, dosage was a prime concern, especially because there are several companies distributing nutraceutical derivatives of industrial hemp for pets, despite little scientific evidence regarding how to safely and effectively dose a pet orally.

"The dosing [in our study] was basically modeled off of other doses that seem to have worked in a handful of studies in humans – somewhere between 1-5 mg per kg body weight," said Wakshlag. "So, we chose 2 mg because we wanted to hopefully see a clinical effect and, number two, we couldn't make it so that it was so expensive that it couldn't be used. In the end, we chose 2 because that would be a pharmacologically effective dose, and it wouldn't be so expensive that it would preclude people from actually using it or buying it."

THC is trickier

Wakshlag and his colleagues were able to find a good dose of a specific CBD-only product. The stakes change, though, when you add THC into the mix. In fact, many vets and researchers, including experts quoted in this [previous Leafly article](#), suggest that people refrain from giving pets any amount of THC at all.

"THC is actually toxic for dogs. So, of course we wouldn't want to give dogs THC at all," said ElleVet's founder Amanda Howland. For that reason, ElleVet's products, including the oil used in the Cornell study, are all hemp-based. (Hemp is defined as cannabis containing less than 0.3% THC content.)

The THC issue isn't a settled question.

The THC issue isn't a settled question, though. Oakland veterinarian Gary Richter believes in the efficacy of THC as medicine in animals. Richter says he's seen its benefits in his own dog, Leo, to whom he gives [cannabis preparations](#) like tinctures and hashish. Richter also works to educate vets and pet owners about cannabinoid medicine through webinars, lectures, and online continuing education courses.

"The research is very, very clear from the human literature standpoint that there's medical benefits to THC," Richter told Leafly during a phone interview from his office in California. "And while certainly the relative sensitivities are different for people versus animals, we all have a very similar endocannabinoid system. There is no reason to think that THC is beneficial in people when it's somehow poison to dogs and cats."

"The thing that troubles me," Richter added, "is that you've got animals out there that could be benefiting from products with THC in them, and not only are pet owners shying away because of this information

but you've got veterinarians that are believing this and saying that you should never give an animal something with THC in it. Honestly, that's a real shame. The truth is that I have a whole cabinet full of pharmaceuticals that if used improperly could cause harm, and nobody seems to have a problem with that."

The right cannabinoid combo

Instead of abstaining from THC altogether, Dr. Richter advises doing research into whether THC might help your pet's particular ailment—and if so, starting with very small doses. Always look to the absolute amount of THC as the limiting factor in your dosing, he said.

"The two big players are THC and CBD, but there are so many other compounds within cannabis," said Richter. "There are other cannabinoids and terpenes and there are things in the product that are going to vastly change its behavior as a medicine. Depending on what's being treated, the first question is: What is the most ideal combination of these various compounds that will benefit an animal?"

Overall, Richter says the best way to keep your pets from getting sick from cannabis is to consult with a veterinarian as they dose—and with the new California law he helped pass, starting Jan. 1 vets throughout the state will be able to weigh in to help their patients.



"The crazy thing about it is that the vets have been restricted from getting involved—like, from telling someone if the CBD product they bought is good or bad," Richter added. "We hadn't been allowed to talk about it. It was crazy that the 16-year-old kid at PetSmart could give you that advice, but I couldn't."

Amazing turnarounds

With type of treatment and dose in mind, the results of medical cannabis in dogs and cats with a variety of ailments has been very promising.

"He went from having multiple seizures per week to having one or two per month."

Gary Richter, Oakland veterinarian

The recent ElleVet and Cornell study showed that once the right dosage is determined for your pet, cannabidiol can improve pain due to arthritis. The study involved a small sample size—only 16 dogs, all with a lot of pain from chronic arthritis in the Cornell study, and each dog saw significant improvement.

“We had one that the owner was really ready to euthanize the dog and this trial was a last-ditch effort,” said ElleVet founder Howland. “Once she was in the test group, the dog did so well and completely turned around. It’s almost two years later and she’s still alive and doing well.”

“I believe we really scratched the surface in regard to how this could be used from an overall pain perspective,” said Joseph Wakshlag, leader of the Cornell study. “If my dog ever has chronic arthritis, this would be one of the things I’d definitely use.”

Calming seizures

Gary Richter’s own dog, Leo, suffers from seizures that are the result of brain damage that occurred during a dog attack. After trying multiple pharmaceutical medications, the Oakland veterinarian put Leo on a cannabis preparation. Richter observed a marked change. “Almost immediately his seizure frequency decreased,” he said in a [blog post](#) on his website. “He went from having multiple seizures per week to having one or two per month.”

Research at Colorado State University, one of the nation’s leading veterinary research institutions, is beginning to back this up. [One study underway](#) at CSU is testing the use of CBD on dogs with epilepsy. In July, Stephanie McGrath, a neurologist at CSU’s James L. Voss Veterinary Teaching Hospital, came out with “promising” preliminary data from a CBD clinical trial. McGrath plans to share further results of this trial and another one CSU is performing for osteoarthritis later this year.

Off-label uses are spreading

In addition to the research at CSU and other institutions, there are more and more anecdotal accounts of cannabis-based medicine helping dogs with behavioral and gastrointestinal issues as well.

“ElleVet is science-oriented so we don’t advertise the product for anxiety,” said company founder Howland. “But it really does have a great anti-anxiety affect. We’ve had a number of vets in Florida try it with some of their patients who really freak out during thunderstorms. We had amazing reports about dogs who’d [previously] hurt themselves or throw themselves through windows during thunderstorms; it’s really calmed them. We’ve also seen results with irritable bowel, it’s pretty well-documented for humans of the anti-inflammatory affects and how well it works for autoimmune disorders like Crohn’s disease. That’s an area we’d like to study more. It’s a great secondary effect.”

Wakshlag and ElleVet have plans to do more studies on different types of pain. Three studies at the University of Florida are set to begin this fall, specifically looking at cannabis in oncology and post-operative canine patients.

What about cats?

So far, cannabis looks to be helpful to some sick dogs. But what about cats?

Unfortunately, there isn't much data when it comes to cannabinoids and cats.

ElleVet is the only company that has done a long-term clinical and pharmacological study on cats, using their own products. Otherwise, the available data primarily focuses on the toxicity of accidental cannabis doses in cats.

Though research for cats still lags behind dogs, leading cannabis researchers have plans to begin studying cats in earnest.

ElleVet did find their propriety hemp blend to be helpful to cats, but Howland stressed that cats respond much differently to cannabis than dogs.

"Cats are absolutely not small dogs," she said, "and they metabolize things very differently. Cats can't take any of the drugs that dogs take for pain. Their livers just don't tolerate it." If a human tries to help an ailing cat by giving it a canine pain reliever, "they can get very sick. There are very few pain options for cats that are safe. So we did a long-term safety study to determine that [our products] are safe for cats."

What they found is that for the treatment of anxiety, cats responded better to cannabinoid medicine than dogs. Cats also saw decreases in pain from arthritis and other problems, like dogs. But the half-life of their hemp oil is only two hours in cats, meaning they need a much higher dose more frequently than a dog of the same size.

Though research for cats still lags behind dogs, leading cannabis researchers have plans to begin studying cats in earnest. ElleVet, for instance, has one cat study underway for pain, and another testing whether cats with chronic UTIs are helped by lowering their anxiety levels with cannabinoid medicine.

Curious? Do your research

Many pet owners are curious about cannabis-based treatments for their ailing companions. The market for CBD products for dogs and cats is booming. But Richter acknowledges that changing the attitude of medical professionals toward the use of medical cannabis with pets is slow, hard work, and will continue to be for the foreseeable future.

"We've seen the benefits in all of these products," said Richter. "The science is here, but as is typical with the medical community, you're going to have a pretty sizeable group in the medical community that will refuse to accept any of it until it's documented in research."

Still, he trusts that the research will continue to show cannabis as a positive medical option for the treatment of dogs and cats. Because of that, Richter and many others who've seen the firsthand effects of cannabis medicine in animals, don't see a point in waiting to start helping pets.

“While I am certainly a person who’s a proponent of the research,” he said, “just because the research isn’t there doesn’t mean you can or should ignore something that’s completely obvious and right in front of your face.”

For more information about the studies cited in this report, explore the links below:

- The Wakshlag/Cornell University study: [Pharmacokinetics, Safety, and Clinical Efficacy of Cannabidiol Treatment in Osteoarthritic Dogs](#)
- A 2013 study on cannabis poisoning in dogs: [Marijuana Poisoning](#)
- Samara E, Bialer M, Mechoulam R. [Pharmacokinetics of cannabidiol in dogs](#). *Drug Metab Dispos.* (1988) 16:469–72. <https://www.ncbi.nlm.nih.gov/pubmed/2900742>
- Harvey DJ, Samara E, Mechoulam R. [Comparative metabolism of cannabidiol in dog, rat and man](#). *Pharmacol Biochem Behav.* (1991) 40:523–32.



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