The cannabidiol (CBD) craze is in full swing all over North America. Recently, it was announced that even gas stations will be selling it, not to mention supermarkets, coffee shops and health food stores. Big money is being invested in cannabis worldwide, and as with any trade bubble, there are plenty of players trying to get in, get rich, and get out before the bubble bursts — unfortunately, this “get rich quick” scheme has produced a plethora of unreliable products. Even companies specializing in human CBD products are jumping on the bandwagon and offering pet lines as an “extra” — despite lacking knowledge of veterinary applications, dosing or protocols.

But let’s not throw out the baby with the bathwater! This mania would not exist if utilizing CBD didn’t result in remarkable benefits. While most people are familiar with the marijuana plant’s “high” effects, mediated by tetrahydrocannabinol (THC), Cannabis sativa contains hundreds of compounds, most of which, like CBD, are not psychoactive, and have untapped therapeutic potential. The native cannabis plant has abundant CBD and a small amount of THC; however, high THC strains have been bred for recreational use.

Continued on page 32.
There is even evidence that some of our early ancestors might have recognized the medicinal benefits of the cannabis plant. The BBC (British Broadcasting Corporation) recently reported that archeologists discovered a brazier with traces of high THC cannabis in a 5,000-year-old excavation site in China. Evidence of high-THC cannabis strain residues from ancient times supports the idea that humans have been utilizing this medicinal plant, and cultivating it to increase its desired properties, for many thousands of years.

Cannabis was first declared a Schedule One controlled substance in the 1970s, meaning that the FDA and DEA considered it to have no therapeutic value with great potential for abuse. Since that time, it has been illegal to study cannabis or use it medicinally in the US. However, we now know there are many therapeutic applications for cannabinoids, with little potential for abuse and minimal to no toxicity. Delisting cannabis is likely to happen this year or next, especially after the Farm Bill of 2018 made industrial hemp (cannabis with less than 0.3% THC content) legal in the US as an agricultural product. This will allow for a much greater range of federal research into the medical benefits of cannabis (see Box 1).

**Is CBD legal, and what about my DEA license?**

Unfortunately, this is highly variable state by state. To make things even more confusing, while federal law has declared industrial hemp (less than 0.3% CBD) to be lawful, cannabis has not yet been removed from the list of Schedule One drugs, leaving a lot of room for interpretation.

In some states, like California, even though both medical and recreational marijuana products are legal, veterinarians are not allowed to discuss the medical use of cannabinoids with clients. However, all these laws are rapidly changing and adapting to the hemp industry's exponential growth over the past 18 months. If you don't like the regulations in your state, wait ten minutes!

Unfortunately, the legal gray area is preventing vets from giving their clients the expertise they need, which leads animal owners to rely on Dr. Google.

**How do phytocannabinoids work?**

The endocannabinoid system (ECS) helps the nervous system and immune system communicate. The ECS is suspected to be involved in neuroprotection, immunomodulation, the fighting of cancer, pain reduction, metabolic balance and gastrointestinal motility, with effects in and around the synaptic space.

Phytocannabinoids (cannabinoids derived from hemp and other cannabis species) can act as partial agonists of the ECS, providing pain relief through coactivation with endogenous opioid receptors. They can also reduce excessive inflammatory responses involved in chronic diseases and aging. THC primarily interacts with the CB1 receptors on nerve endings, which function to regulate neurotransmitter turnover. CBD, on the other hand, has indirect effects throughout the body via CB2 receptors, which have widespread distribution in immune cells, muscles, joints, and organs (see Box 2).

**Can my dog or cat get high from CBD?**

CBD is not a psychoactive drug. However, in a quirk of physiology, dogs have an unusually high number of CB1 receptors in their cerebellum, making them highly susceptible to THC effects — a big health risk for dogs that accidentally ingest their human’s medical or recreational marijuana “edibles” or bud. While THC is not toxic to dogs, subsequent severe ataxia and dissociation make them susceptible to secondary dangers, such as falling or aspiration pneumonia.

**Pharmacokinetics of cannabinoids**

Preliminary data in dogs indicates that optimal therapeutic levels are most rapidly reached through trans-mucosal dosing, which avoids interaction with the liver CYP450 detoxification system. However, cannabinoids may compete for CYP450 binding sites, possibly altering or affecting drug clearance time for other medications. This list of affected drugs includes, but is not limited to, certain anti-seizure medications and several classes of antibiotics and cytotoxic chemotherapy drugs, so it is critically important for people to seek the advice of their human or pet health professional before using these substances on themselves or their animals. Anecdotally, dosing with cannabinoids has not been found to alter phenobarbital serum levels (G. Richter, DVM, personal communication).

Purified cannabinoids have a bell-shaped dose-efficacy curve; clinical effects increase then fall off with doses exceeding the peak efficacy for that individual. For this reason, some trial and adaptation is advisable when adding CBD to a treatment plan, because dosage may increase or decrease. Occasionally, pets receiving micro-doses of CBD for anxiety may become disinhibited — forgetting about their house-training or failing to control their aggressive instincts. This usually resolves with a further reduction of the dose. Best results are achieved when checking the dosage after three to five days for effects. Desired CBD effects, whether for pain mitigation or soothing the nervous system, should be visible within a day or two, unlike many therapeutic regimens which take weeks to load (see Box 3).

**Indications for use of exogenous cannabinoids in animals**

There are many useful applications for CBD, the non-psychoactive cannabinoid. (THC is mainly used, where legal, for cancer and end-of-life care (see Box 3). CBD is used for
reducing anxiety and phobias, treating arthritis pain and inflammation\(^4\) as well as neurogenic pain, mitigating idiopathic and non-drug-responsive seizure activity,\(^5\) and regulating diabetes.\(^6\) While cannabinoid research is in its infancy in the US, researchers worldwide have speculated that some neurodegenerative conditions, such as Parkinson's disease in humans and degenerative myelopathy\(^7\) in dogs, may have their etiology in dysregulated function of the endocannabinoid system (ECS). For clinicians who have incorporated CBD into their treatment plans, it is proving to be a useful adjunct in managing many common pet ailments, especially in geriatric pets (see CBD case studies at IVCJournal.com/CBD-case-studies).

Though each individual animal’s response may vary, four levels of CBD dosing are generally used in pets:

**Dose (per kg body weight) indications**

*Micro (0.1 mg/kg)* — anxiety, fear, stress, behavioral issues, mild pain, muscle tension

*Medium (0.2-0.5 mg/kg)* — osteoarthritis, moderate pain, muscle spasms

*High (0.5-1.0 mg/kg)* — moderate to severe pain, neurogenic pain, degenerative myelopathy, tremors, idiopathic epilepsy, diabetes regulation, IBD

*Ultra (1.0-5.0 mg/kg)* — refractory epilepsy, anti-neoplastic, refractory pain, hospice care

In a recent study at Colorado State University College of Veterinary Medicine,\(^8\) high dose CBD treatment was associated with mild transitory diarrhea upon

---

**Not impressed with CBD results?**

Take a closer look at the product quality, administration method and dose amount. Like any therapeutic intervention, details matter!

1. **Is the product you are using reliable?** Look for third party lab testing, easy administration, high potency, and companies that stand by their products with a full guarantee. Many new players in the industry are ignorant of cultivars and are putting out inferior products that are poorly extracted with unreliable concentrations. Don’t get fooled by pretty labels and great marketing! Full spectrum CBD oil should have a light herbal bouquet and should not taste like licking a lawnmower, full of grass and solvents.

2. **Is the method of administration correct?**

   It has long been known that oral ingestion of cannabinoids is non-optimal, with estimates that 80% to 90% of CBD/THC is broken down in first pass liver metabolism by the cytochrome P450 system. So avoid any products that have an oral delivery: e.g. treats, biscuits, "chews" or oils that are advertised to go on top of food. In order to be effective, those products must contain five to eight times the dose of CBD that has been shown effective with direct transmucosal dosing.

3. **Is the dose correct?**

   High quality CBD, appropriately dosed, should take effect in five to 15 minutes, not weeks to months. Compare the amount of actual CBD in the dose to the chart above, for the indication you are treating. If you know your product is reliable, try a different dose if no results are seen in two to three days. Many pet products have vanishingly small amounts of CBD, like 5 mg/ml, which is great for a Yorkie, but not for a Rottweiler. Know your dosages and use the product that can deliver the right dose in the least amount of oil, so that the pet does not balk at a mouth full of oil.

---

**Why Plena Curae?**

- Vet formulated & supported
- 100% THC-free
- Easy to dose
- More palatable
- Sold only to vets

Made by cannabinoid expert
Karen Gellman DVM, PhD

PlenaCuraeVets.com
initiation of treatment. After long-term high-dose usage, one third of dogs showed elevated alkaline phosphatase. However, this study lacked a control group to compare environmental and stress effects with the CBD-associated effects. It is also essential to note that these results were found at doses of 10 mg/kg to 20 mg/kg, compared with the dose range of 0.1 mg/kg to 1 mg/kg, administered trans-mucosally, recommended by veterinarians with extensive experience in CBD’s clinical applications in pets. (R. Silver, Cornell NYSVMS seminar, 2018; G. Richter, CIVT webinar, 2019).

A study conducted at Cornell University⁴ showed similar elevations of alkaline phosphatase, but also involved dosing at 2 mg/kg to 8 mg/kg orally, rather than the lower doses using trans-mucosal delivery. Neither study showed evidence of hepatocellular damage, so it is difficult to interpret the meaning of the changes mentioned above. It is likely that lower dosing though an appropriate delivery method would prevent them. Preliminary research trials in horses suggest that pain and anxiety reduction can be achieved with as little as 20 mg to 25 mg CBD oil administered trans-mucosally, once or twice a day⁵ (see Box 4).

**Box 4**

**Full spectrum or isolate?**

There is a place for both in your pharmacopeia. Full spectrum advocates like the “entourage effect” of having multiple cannabinoids and terpenes. However, very little is known about the actual benefits of many of the lesser cannabinoids, which occur in much lower amounts. A CBD isolate product can be compounded with other oils, like MCT coconut oil or olive oil, for better palatability, and can be dosed more precisely. Many clients want to use the same products as their pets, for convenience, and some humans need to avoid full spectrum due to the possibility of drug testing at work, which could trigger trace amounts of THC.

**HOW SHOULD YOU CHOOSE A CBD PRODUCT?**

When choosing a CBD product to dispense or recommend, it is advisable to consider how “user-friendly” the product is, with doses listed on the label, as well as its reliability. *Do not even consider a product that is not made using good manufacturing practices (cGMPs) or does not have third party lab certiﬁcates of analysis available for every batch of oil.* Better companies will have money-back guarantees on their products, and will be able to answer your questions about the source of their biomass and the overall extraction process. The extraction process can include either ethanol or CO₂ extraction. However, beware of poor quality incomplete extraction. In regards to aroma and flavor, full spectrum CBD oil should have a light herbal fragrance without any hint of chemical residues. This is especially important for feline patients — many cats do not appreciate the taste of full spectrum oils, and may do better on an isolate product.

**PRACTICAL DOSING ADVICE**

Low potency products (300 mg/oz or less) can be useful for micro-dosing behavioral issues, and for pets under 15 pounds. For anything larger than a toy dog, higher potency products should be utilized, to avoid giving a large mouthful of oil. Additionally, CBD is expensive, and tends to come in small total volume bottles, usually 1 oz (30 ml) in size. It is much easier to achieve
excellent compliance from your clients when the total number of CBD mg in the bottle is divisible by 30! It is also useful to remember that oils behave differently than aqueous solutions because of oil's reduced surface tension compared to water — thus, while eye drops contain about 20 drops per ml, CBD oil has 30 drops per ml, because the drops are smaller. Consider a product that contains 900 mg/oz (30 ml). Each ml will contain 30 mg of CBD, and each drop will contain 1 mg. So for a 55-pound Husky, a dose for anxiety (0.1 mg/kg) will be two to three drops BID; however, for moderate geriatric arthritis (a dose of 0.4 mg/kg), you should start at 10 mg (ten drops or 1/3 ml) and adjust up or down as needed, based on the dog's response in three to five days.

Cannabidiol can be a useful addition to your clinical pharmacopoeia: it is effective at relieving pain and anxiety with little or no side effects, and if administered appropriately, can be a cost-effective way to improve quality of life for aging pets.

From the AVH
The Academy of Veterinary Homeopathy is comprised of veterinarians who share a common desire to restore true health to their patients through the use of homeopathic treatment. Members of the Academy are dedicated to understanding and preserving the principles of Classical Homeopathy.

HEALING THE HEALER: SELF-CARE FOR VETERINARIANS

It's simple: if we do not take care of ourselves, we are less able to care for others. The suicide rate among veterinarians is over three times the national average, according to a CDC study released on January 1, 2019. AVMA Immediate Past President Dr. John de Jong, DVM, says we need to adopt a “holistic all-hands-on-deck approach to make real progress” with this problem. I agree, but what does self-care really mean? Eat right, exercise and get enough sleep?

In my life before homeopathy, self-care meant self-medicating, and that path nearly cost me my livelihood and my life. Homeopathy saved me, leading to a better way of dealing with my health issues and a more profound understanding of health and disease. Under the guidance of homeopaths, I stopped all allopathic medicines and learned to rely on better nutrition and homeopathy. Rhus tox beats ibuprofen any day. Ignatia helped dissolve the grief and despair after my dad's death. Cat or dog bites on the hand respond well to Arnica and Lachesis, rather than ibuprofen and antibiotics.

Homeopathy also provided my remedy for compassion fatigue and burnout after 20+ years of allopathic practice. I now feel great peace of mind, knowing I'm caring for myself and others, and above all, doing no harm.

Submitted by Todd Cooney DVM, CVH