

CBD for canine arthritis and pain management

There is preliminary evidence to support the analgesic properties of CBD in treating chronic canine osteoarthritis and in managing pain.[1]

In 2022, a systematic review was published of the randomised clinical trials using CBD in dogs [2]. Of the three studies which used CBD in the treatment of dogs with osteoarthritis, it was found that CBD significantly reduced pain and increased activity of these dogs.

How can CBD help with pain?

Studies suggest that CBD can have immunomodulatory, pain modulation and anti-inflammatory actions through its interaction with the endocannabinoid system. This makes it an attractive therapeutic option for dogs with arthritis and joint pain.

For further information regarding the mode of action of CBD, the uses of CBD, and scientific evidence in this area, see the following review papers:

- Lima TM, Santiago NR Alves ECR, Chaves DSA & Visacri MB 2022, 'Use of cannabis in the treatment of animals: a systematic review of randomized clinical trials', *Animal Health Research Reviews*, vol. 23, pp. 25–38.
- Yu CHJ, Rupasinghe HPV 2021, 'Cannabidiol-based natural health products for companion animals: Recent advances in the management of anxiety, pain, and inflammation', *Research in Veterinary Science*, vol. 140, pp.38-46
- Silver RJ 2019, 'The Endocannabinoid System of Animals', *Animals (Basel)*, vol. 16, no. 9, pp. 686
- Hill, KP, Palastro, MD, Johnson, B & Ditre, JW 2017, 'Cannabis and pain: a clinical review', *Cannabis Cannabinoid Research*, vol. 2, pp. 96–104.

What dose would I give a dog with arthritis?

- Generally, a 2mg/kg to 2.5mg/kg dose given twice daily orally has been found to be effective.
- There are individual differences in dogs as to effective dose range. In a 2020 study, it was found that a wide range of CBD doses (0.3 to 4.12 mg/kg body weight) were needed to achieve analgesic effects.[5]

Can I use CBD in conjunction with other pain medication?

- It is known in humans that CBD is oxidized by the p450 cytochromes in the liver. It is assumed that this is similar to the metabolic pathways in the dog [3].
- Other pain medication may be given in conjunction with CBD, however the dose of any other medication given may need to be reduced or increased.

Gabapentin

- In a study in 2020, for dogs given gabapentin, the addition of CBD allowed a third of the dogs to wean off the drug, and another one-third of the dogs were able to have their doses reduced [5].

NSAIDs

- In a 10 week study in 2018, dogs with OA receiving NSAIDs and CBD showed decreased pain [3].

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What studies have been conducted?

To date, there are multiple studies on CBD supplementation in managing chronic pain in dogs. In chronological order, the studies are summarised below.

Gamble et al. 2018 [3]

Design: Randomized, placebo-controlled, double-blind, cross-over trial.

Sample:

16 client-owned dogs, diagnosed with OA

Method:

- Treatment group - CBD oil (dose 2mg/kg). vs control group - placebo oil, every 12 h for 4 weeks
- Dogs were allowed to continue NSAIDs, fish oil, and/or glucosamine/chondroitin sulphate.
- Other analgesic medications used, such as gabapentin and tramadol, were discontinued at least 2 weeks prior to enrolment.

Findings:

- Clinically, canine brief pain inventory and Hudson activity scores showed a significant decrease in pain and increase in activity ($p < 0.01$) with CBD oil.
- Veterinary assessment showed decreased pain during CBD treatment ($p < 0.02$).
- No side effects were reported by owners
- Increase in ALP during CBD treatment ($p < 0.01$).

Martello et al. 2019 [4]

Design: Pilot study

Sample:

- 8 client-owned dogs diagnosed with OA.
- Inclusion criteria: confirmed radiographic and clinical signs of OA.
- Exclusion criteria: evidence of other diseases based on clinical history and blood test results, acute pain, recent trauma or surgery on any joint in the previous 6 months, neurological conditions, medications or diet supplements given in the two weeks before the enrolment in the study.

Method:

- Tablets containing a preparation of natural ingredients were administered for 30 days.
- Active ingredients were CBD isolate (99.9%), hempseed oil, Boswellia and powdered melon fruit pulp. CBD dose range given was around 2.56 mg per 15 kg of body weight.

Findings:

- Using Helsinki chronic pain index (HCPI), there was a significant reduction in pain scores after 30 days.

Kogan L, Hellyer P & Downing R 2020 [5]

Design: 90-day pilot clinical trial

Sample: 32 dogs diagnosed with chronic maladaptive pain from OA

Method:

- Use of NSAIDs, tramadol or amantadine was restricted
- Gabapentin and polysulphated glycosaminoglycan was allowed
- All dogs starting dose of full spectrum CBD at 0.25mg/kg QID on food
- CBD dose was adjusted as needed in response to pain assessment. Dose escalations of 0.5 to 0.75mg/kg BID were made.

Findings:

- A wide range of CBD doses (0.3 to 4.12 mg/kg body weight) were needed to achieve analgesic effects.
- Some dogs responded to small doses of CBD while others required larger doses for the same effect, suggesting different pain tolerance in dogs and different dosage requirements.
- For dogs given gabapentin, the addition of CBD supplementation allowed a third of the dogs to wean off the drug, and another one-third of the dogs were able to have their doses reduced.

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Brioschi et al. 2020 [6]

Design: Randomised control trial

Sample: 21 dogs

Method:

- Dogs randomly divided into two groups:
- Treatment (n = 9) group given CBD @ 2mg/kg BID + pharmaceuticals (NSAID, gabapentin, amitriptyline)
- Control group given pharmaceuticals only, no CBD
- Dogs were evaluated by owners using the Canine Brief Pain Inventory scoring system before treatment initiation (T0), and one (T1), two (T2), four (T3) and twelve (T4) weeks thereafter.

Findings:

- Pain Severity Score was significantly lower in CBD vs control group
- Pain Interference Score was significantly lower in CBD vs control group
- Quality of Life Index was significantly higher in CBD group

Verrico et al. 2020 [7]

Design: 4-week randomised, double-blind, placebo-controlled study

Sample:

- 20 large client-owned dogs (> 20 kg)
- Inclusion criteria: dogs that 1) received an affirmative diagnosis of OA by a veterinarian and 2) demonstrated signs of pain according to assessment by their owners, detectable lameness on visual gait assessment, and painful joint(s) upon palpation.
- Exclusion: No cases of OA were related to trauma, and no animals with end-stage disease were enrolled.

Method:

- All other medications were discontinued at least 2 weeks prior to enrolment and during the study
- Groups: (1) placebo, (2) 20 mg/day (0.5 mg/kg) naked CBD (99.9% CBD isolate), (3) 50 mg/day (1.2 mg/kg) naked CBD (99.9% CBD isolate), or (4) 20 mg/day liposomal CBD.

Findings:

- Animals given a high dose of naked CBD or a low dose of liposomally-encapsulated CBD experienced significant improvements in quality of life scores
- No significant effect for animals given placebo or those given a low daily dose of naked CBD.

Mejia et al. [8]

Design: Prospective, double-blinded, crossover, placebo-controlled study

Sample: 23 client-owned dogs with naturally occurring OA of appendicular joints

Method:

- Dogs were randomly allocated to either placebo or CBD treatment for 6 weeks, then 6 weeks with the opposite treatment.
- Outcome measures included objective gait analysis, activity counts (via accelerometry) and clinical metrology instruments.

Findings:

- There were no differences noted between groups at any time point for any of the recorded outcome measures.
- Adverse events associated with CBD administration included elevation in liver enzymes (n = 14) and vomiting (n = 2).

References:

[1] Yu CHJ, Rupasinghe HPV 2021, 'Cannabidiol-based natural health products for companion animals: Recent advances in the management of anxiety, pain, and inflammation', *Research in Veterinary Science*, vol. 140, pp.38-46

[2] Lima TM, Santiago NR Alves ECR, Chaves DSA & Visacri MB 2022, 'Use of cannabis in the treatment of animals: a systematic review of randomized clinical trials', *Animal Health Research Reviews*, vol. 23, pp. 25–38. <https://doi.org/10.1017/S1466252321000189>

[3] Gamble et al. 2018, 'Pharmacokinetics, Safety, and Clinical Efficacy of Cannabidiol Treatment in Osteoarthritic Dogs', *Frontiers in Veterinary Science*, vol. 5, pp 165.

[4] Martello et al. 2019, 'Effects on pain and mobility of a new diet supplement in dogs with osteoarthritis: a pilot study', *Annals of Clinical Laboratory Research*, vol. 7, pp. 1-5.

[5] Kogan L, Hellyer P & Downing R 2020, 'The use of Cannabidiol-rich hemp oil extract to treat canine osteoarthritis-related pain: a pilot study', *Journal of the American Holistic Veterinary Medical Association*, vol. 58, pp. 35-45

[6] Brioschi et al. 2020, 'Oral transmucosal cannabidiol oil formulation as part of a multimodal analgesic regimen: effects on pain relief and quality of life improvement in dogs affected by spontaneous osteoarthritis', *Animals (Basel)*, vol. 10, pp. 1505.

[7] Verrico et al. 2020, 'A randomized, double-blind, placebo-controlled study of daily cannabidiol for the treatment of canine osteoarthritis pain', *Pain*, vol. 161, pp. 2191–2202.

[8] Mejia S, Duerr FM, Griffenhagen G & McGrath S 2021, 'Evaluation of the effect of Cannabidiol on naturally occurring osteoarthritis-associated pain: a pilot study in dogs', *Journal of the American Animal Hospital Association*, vol. 57, pp. 81-90.