

# A Randomized Controlled Trial Comparing Topical Cannabidiol to Topical Diclofenac for the Treatment of Osteoarthritis of the Thumb

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**INTRODUCTION:** Carpometacarpal (CMC) arthritis affects up to 1 in 3 women and 1 in 8 men, typically beginning in the fifth or sixth decade. Non-surgical treatments include oral NSAIDs, splinting, and topical diclofenac. In a recent survey, 80% of patients with thumb basal joint arthritis expressed interest in cannabidiol (CBD), a non-psychoactive compound of *Cannabis sativa* with analgesic and anti-inflammatory properties. This study compares the efficacy of topical CBD versus diclofenac gel in treating CMC arthritis.

**METHODS:** A prospective, double-blinded, block-randomized crossover trial was conducted at a single institution. Adults with 1st CMC osteoarthritis were enrolled. Exclusion criteria included opiate or cannabis use, skin disease, substance abuse, or brace/splint use. Participants were randomized to either topical CBD lotion (8.0 mg/mL) or diclofenac gel for 14 days, applied 0.5 mL three times daily. After a 7-day washout, patients crossed over to the alternate treatment. Medications were dispensed in identical prefilled syringes labeled “A” or “B” to maintain blinding. QuickDASH, VAS, PROMIS, grip strength, and range of motion were recorded at baseline, week 2, and week 5. A repeated-measures general linear model (GLM) assessed changes in QuickDASH scores over time, with treatment sequence (CBD→NSAID vs. NSAID→CBD) as a between-subjects factor. Pairwise comparisons used the Least Significant Difference (LSD) method ( $p < 0.05$ ).

**RESULTS SECTION:** Seventeen patients have completed the trial (mean age 66 years); most reported left-sided pain ( $n = 11$ ). Initial treatment allocation was balanced. Repeated-measures GLM revealed a significant effect of time on QuickDASH scores ( $p = 0.018$ ), indicating overall improvement. No significant time-by-sequence interaction was observed ( $p = 0.445$ ), suggesting both sequences were similarly effective (**Figure 1**). In pairwise comparisons, the CBD-first group improved significantly from baseline to week 2 (mean difference = 10.5,  $p = 0.024$ ). The NSAID-first group showed a non-significant improvement over the same interval (mean difference = 5.3,  $p = 0.199$ ), but improved significantly after crossover to CBD (mean difference = 9.1,  $p = 0.034$ ).

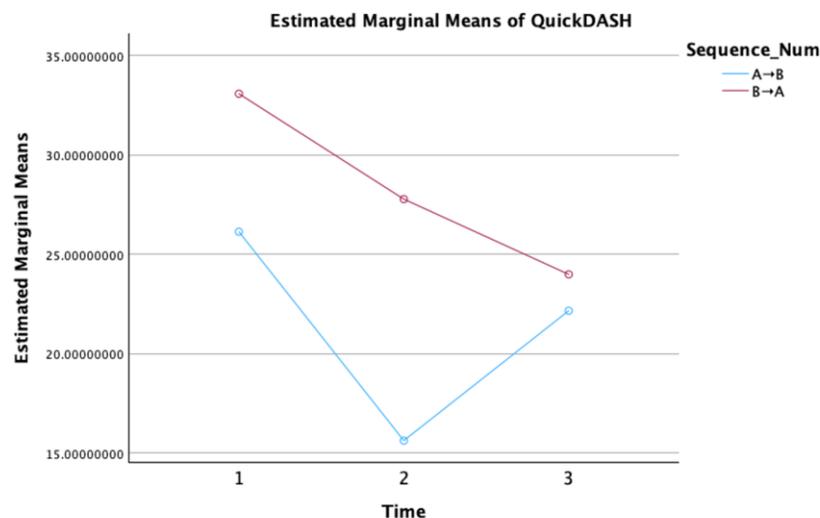
**DISCUSSION:** Preliminary results show significant improvement in QuickDASH scores over time, regardless of treatment order. However, CBD led to greater functional gains both compared to baseline and following NSAID use. Limitations include small sample size, loss to follow-up, and inadequate patient adherence to medication regimen. Ongoing enrollment and further study are needed to confirm these findings, which may have broader applications in hand and wrist arthritis.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Topical cannabidiol produced meaningful short-term functional improvement in thumb CMC osteoarthritis and was at least comparable—often superior—to diclofenac in this crossover trial, suggesting a viable non-opioid option in the hand clinic. If confirmed in larger studies, CBD may be especially useful for patients who cannot tolerate NSAIDs or seek to minimize systemic medications.

## REFERENCES:

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**Figure 1: Estimated Marginal Means of QuickDASH showing similar improvements in both groups over time**



\*A= CBD, B=NSAID