

Comparing the Efficacy of CBD and NSAIDs in Recovery from Delayed Onset Muscle Soreness Following Eccentric Exercise: A Systematic Review

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INTRODUCTION

- Delayed Onset Muscle Soreness (DOMS) is the soreness experienced 24-72 hrs after exercise^{1,2}
 - Results from microscopic muscle damage^{1,2}
 - Most prevalent following eccentric exercise (lengthening muscle)¹
- Commonly self-prescribed treatments include non-steroidal anti-inflammatory drugs (NSAIDs) and cannabidiol (CBD)^{3,5,7}
 - **NSAIDs:**
 - Ex: Ibuprofen, Etoricoxib
 - 92% of 310 athletes reported their use in-season⁶
 - Chronic use of NSAIDs lead to potential side effects
 - Gastrointestinal disorders, kidney damage, cardiovascular issues⁴
 - **CBD:**
 - Variety of forms (topical, oral, powder)
 - 45% of 301 athletes reported using some form of CBD to treat DOMS related symptoms⁵
 - Proposed to have anti-inflammatory and reduced pain properties⁴
- ★ This systematic review compares the how efficient CBD is compared to NSAIDs in managing DOMS recovery

METHODS

- Primary sources were retrieved from Medline, PubMed, and Scencedirect search engines
 - January 2025-February 2025
- **Inclusion criteria:** Human trials, comparison of CBD and NSAIDs for DOMS
 - Initially yielded 47 articles
- **Exclusion criteria:** Animal studies, systemic reviews
 - Yielded 20 articles after exclusion filters applied
 - ★ Eight randomized controlled trials met inclusion criteria and selected for study

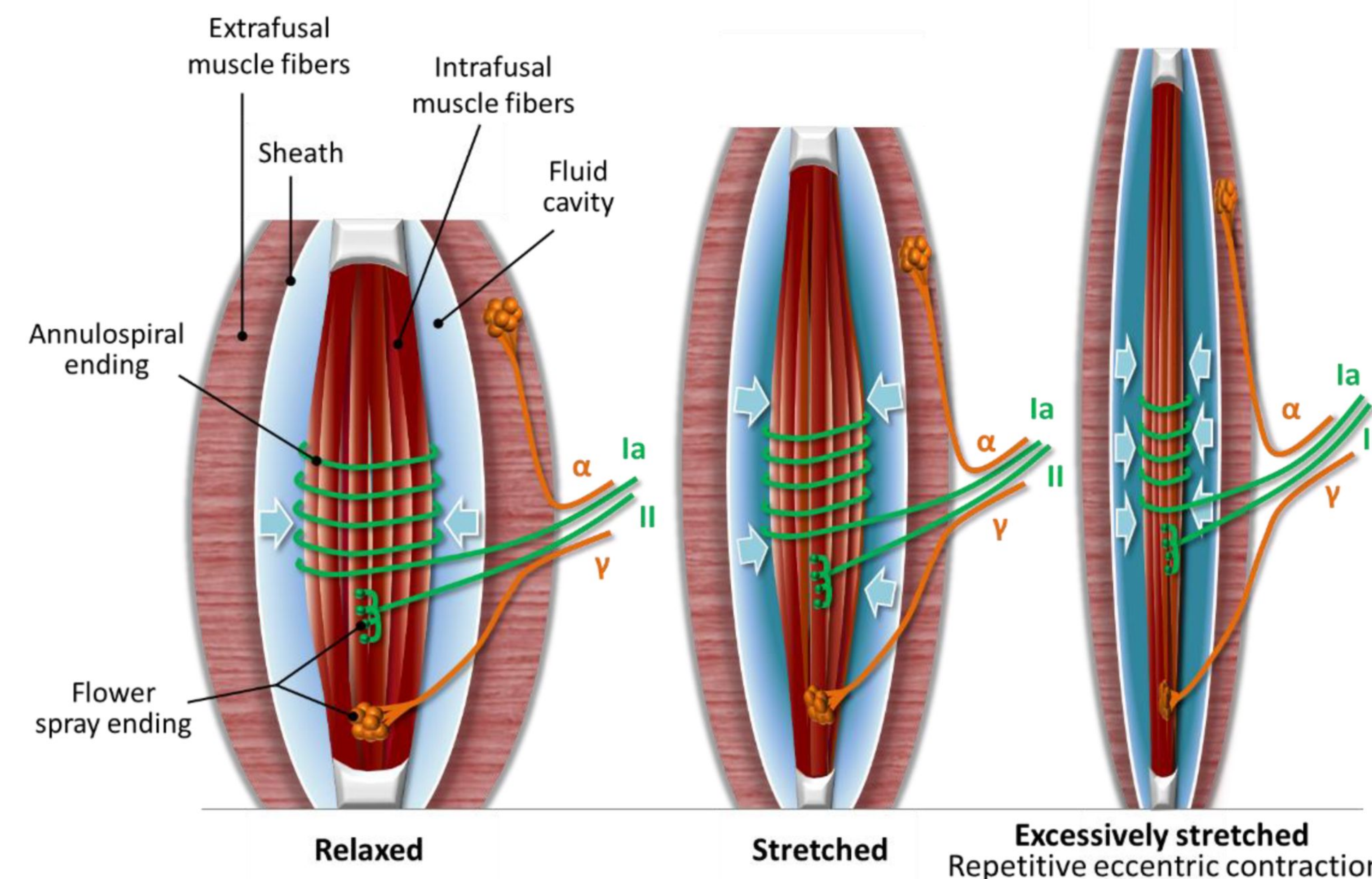


Figure 1. Muscle spindle during eccentric contractions linked to DOMS¹³

RESULTS

- **CBD:** no significant improvements in muscle inflammation, soreness, or recovery from DOMS.^{2,6-7,8-9}
 - **Topical CBD Creams:** No significant soreness reduction vs. placebo ($p=0.531$, $p=0.46$)^{7,9}
 - **Oral CBD:** No significant differences in inflammation ($p=0.522$) or pain perception ($p=0.633$) vs. placebo^{6,8}
 - **CBD beverage powder:** Slight soreness reduction at 48 hrs ($p=0.014$) but no recovery benefits²
- **NSAIDs:** short-term soreness relief, but no improvement in muscle function or long-term recovery¹⁰⁻¹²
 - **Etoricoxib:** Reduced inflammation ($p=0.0203$) but no soreness relief vs. placebo¹⁰
 - **Ibuprofen:** Reduced soreness at 24 hrs ($p<0.05$) but no effect beyond 24 hrs^{11,12}

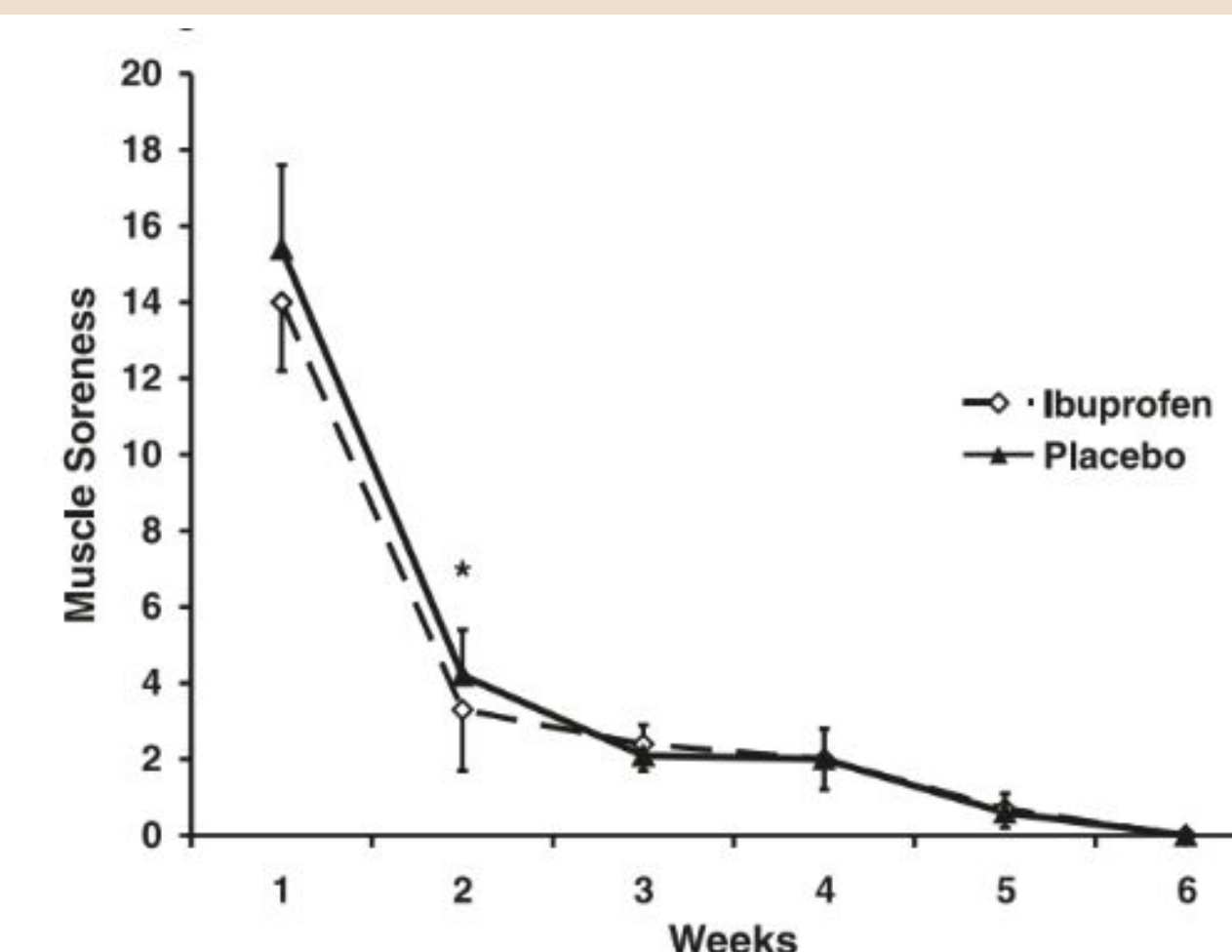


Figure 2. Perceived muscle soreness over six weeks following eccentric exercise, showing a slight short-term benefit of ibuprofen compared to placebo ($p<0.01$).¹¹

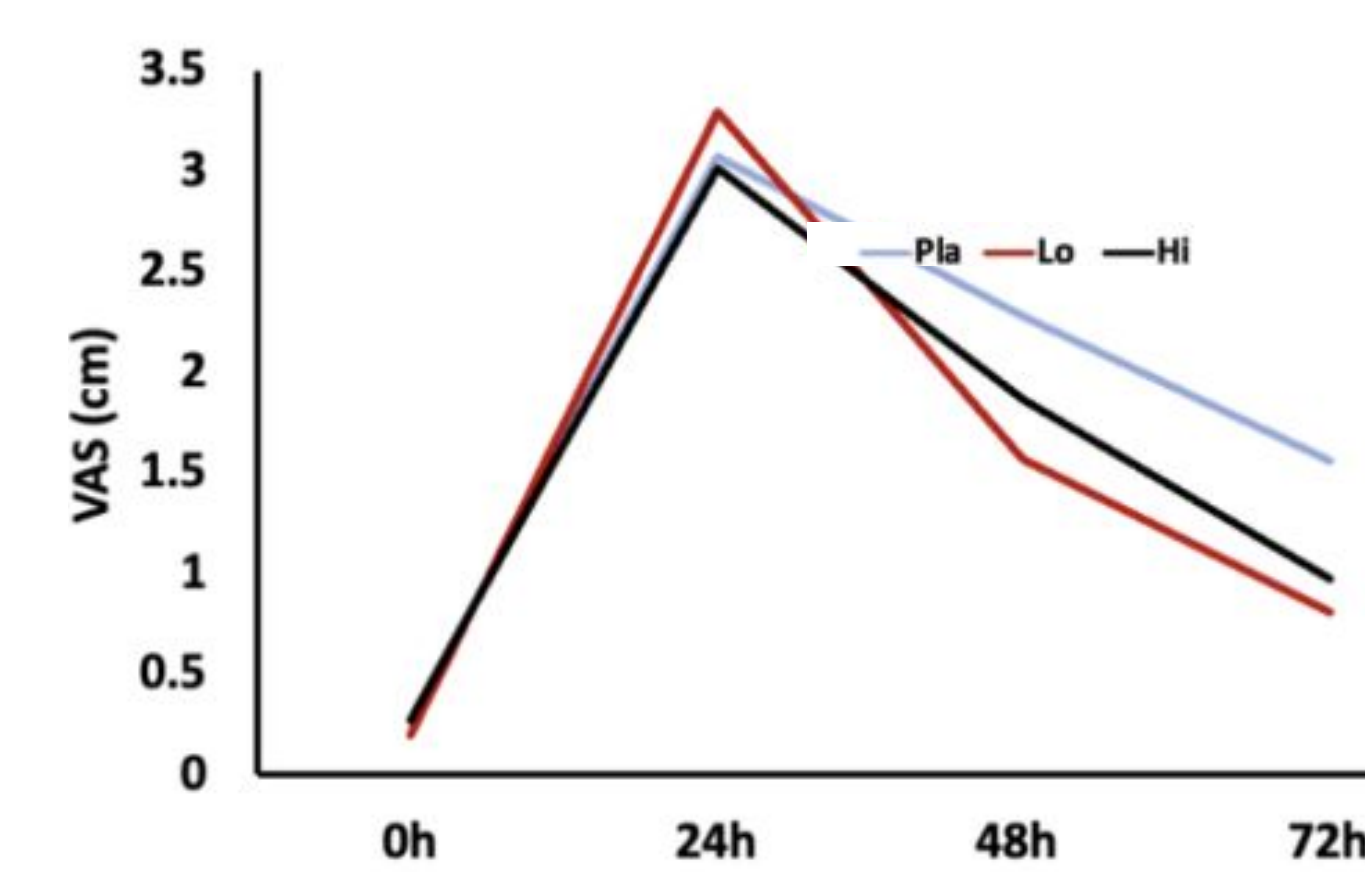


Figure 3. Perceived pain over 72 hrs following eccentric exercise showing pain lower at baseline than at 24 and 48 hours ($p<0.001$), but no significant difference at 72 hrs⁶

DISCUSSION

- **Key Findings:**
 - ★ CBD consistently failed to improve inflammation, soreness, or recovery from DOMS^{2,6-9}
 - ★ NSAIDs provided short-term soreness relief but no improvements in long-term recovery or muscle function¹⁰⁻¹²
- **Strengths:** All studies were randomized controlled trials (low bias)^{2,6-7,8-12}
- **Limitations:** limited number of studies available, variability in methods, reliance on self-reported pain
- **Further Research:** Larger trials with standardized dosages, consistent exercise protocols, and objective recovery measures
- **Conclusion:**
 - ★ CBD is not a viable alternative to NSAIDs for DOMS relief based on current evidence
 - ★ NSAIDs remain the more effective option for temporary soreness relief, but neither CBD nor NSAIDs improve long-term recovery

ACKNOWLEDGEMENT

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