

# Unveiling the therapeutic promise of medicinal Cannabis protocol in Alzheimer's disease management: insights from case studies

## Abstract

Alzheimer's disease (AD) presents a complex clinical challenge, necessitating exploration of innovative therapeutic approaches. This paper investigates the integration of a medicinal Cannabis MCT oil protocol, featuring specific THC and CBD ratios, within the care plans of three individuals diagnosed with AD. Drawing upon existing literature and detailed case studies, we evaluate the protocol's impact on symptom progression, quality of life, and caregiver burden. Our analysis suggests promising therapeutic benefits of medicinal Cannabis in mitigating symptoms associated with AD, underscoring the importance of further research in this evolving field.

**Keywords:** alzheimer's disease, medicinal cannabis, THC, CBD, symptom management, caregiver burden, neuroprotection, anti-inflammatory properties

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## Introduction

Despite extensive research efforts, effective management of Alzheimer's disease (AD) remains elusive, urging exploration of alternative treatment modalities. Medicinal Cannabis, owing to its neuroprotective and anti-inflammatory properties, has emerged as a potential adjunctive therapy for AD symptom management. This paper synthesizes insights from existing literature and case studies to assess the integration of a medicinal Cannabis MCT coconut oil protocol in the comprehensive care plans of individuals grappling with AD. Specially cannabidiol(CBD) and tetrahydrocannabinol(THC), the two primary cannabinoids found in Cannabis, have shown promise in potentially modulating various brain areas affected. While research in this area is still ongoing, several studies have shed light on the potential effects of these cannabinoids on the brain regions implicated in AD pathology and the brain areas that are likely to be stimulated are listed below:

- A. Hippocampus:** The hippocampus plays a crucial role in memory formation and consolidation, and it is one of the brain regions most severely affected by AD pathology. Studies have suggested that CBD may have neuroprotective effects on the hippocampus by reducing neuroinflammation, oxidative stress, and promoting neurogenesis.<sup>1</sup> Additionally, THC has been shown to modulate hippocampal activity, potentially influencing memory processes.<sup>2</sup>
- B. Prefrontal cortex:** The prefrontal cortex is involved in higher cognitive functions, including decision-making, planning, and executive control, which are impaired in AD. CBD has been shown to modulate prefrontal cortex activity, potentially exerting neuroprotective effects and improving cognitive function.<sup>3</sup> THC, on the other hand, may have mixed effects on prefrontal cortex function, with some studies suggesting impairments in cognitive control and others indicating potential therapeutic benefits.<sup>4</sup>
- C. Amygdala:** The amygdala is involved in emotional processing and regulation, and alterations in amygdala function have been reported in AD. CBD has been shown to modulate amygdala activity, potentially reducing anxiety and stress-related behaviors.<sup>5</sup> THC, while also affecting amygdala function, may sometimes induce anxiety or paranoia, particularly at higher doses.<sup>6</sup>

**D. Entorhinal cortex:** The entorhinal cortex is a key hub in the brain's memory circuitry and is among the earliest regions affected by AD pathology. Studies suggest that CBD may exert neuroprotective effects on the entorhinal cortex by reducing inflammation and promoting neuronal survival.<sup>7</sup> THC has also been shown to modulate entorhinal cortex activity, potentially influencing memory processes.

**E. Basal ganglia:** The basal ganglia play a role in motor control and are implicated in the movement disorders that can occur in AD patients. CBD has been investigated for its potential therapeutic effects in movement disorders, with some evidence suggesting improvements in motor symptoms.<sup>8</sup> THC may also modulate basal ganglia function, although its effects on motor control can be dose-dependent and vary among individuals.<sup>9</sup>

Overall, CBD and THC may exert multifaceted effects on various brain regions implicated in Alzheimer's disease pathology. While preclinical and clinical studies have provided valuable insights, further research is needed to elucidate the precise mechanisms underlying the therapeutic potential of these cannabinoids in AD and to optimize their use as therapeutic agents. Medium-chain triglyceride (MCT) oil has recently garnered attention for its potential therapeutic applications, especially when combined with Cannabis-based products. Derived from coconut oil or palm kernel oil, MCT oil consists of medium-chain triglycerides that are easily digestible and rapidly metabolized by the body. This makes it an ideal carrier for cannabinoids like THC and CBD in medicinal Cannabis formulations.<sup>10</sup> The genera Cannabis, a plant known for its rich phytochemical profile, contains various cannabinoids, terpenes, and other bioactive compounds. THC and CBD, the primary cannabinoids found in cannabis, have attracted significant interest for their potential therapeutic effects. THC is renowned for its psychoactive properties and analgesic effects, while CBD is non-psychoactive and has been associated with various therapeutic benefits, including anti-inflammatory, anxiolytic, and neuroprotective properties.<sup>11</sup>

When combined with MCT oil, cannabis-derived cannabinoids can be formulated into tinctures, oils, or capsules for oral administration. MCT oil enhances the bioavailability and absorption of fat-

soluble compounds like cannabinoids due to its rapid absorption in the gastrointestinal tract.<sup>12</sup> This facilitates efficient delivery of cannabinoids into the bloodstream, resulting in faster onset of action and improved therapeutic outcomes. Furthermore, MCT oil offers additional health benefits beyond its role as a carrier for cannabinoids. Studies have suggested that MCT oil may support weight management, improve cognitive function, and enhance energy levels.<sup>13</sup> Its ability to promote ketone production in the liver makes it beneficial for individuals following ketogenic diets or seeking sustained energy levels without spikes in blood sugar.<sup>14</sup> Moreover, MCT oil offers additional health benefits beyond its role as a carrier for cannabinoids. Studies have suggested that MCT oil may support weight management, improve cognitive function, and enhance energy levels. Its ability to promote ketone production in the liver makes it particularly beneficial for individuals following ketogenic diets or those seeking sustained energy levels without spikes in blood sugar. In the context of Alzheimer's disease management, the combination of MCT oil and Cannabis-derived cannabinoids holds promise for alleviating symptoms and enhancing overall well-being. By harnessing the synergistic effects of THC and CBD in conjunction with the carrier properties of MCT oil, individuals with Alzheimer's disease may experience improvements in cognitive function, mood stability, and quality of life.

### Case study 1

**Patient:** Mrs. A, 79 years old Mrs. A's caregivers initiated a medicinal Cannabis protocol comprising MCT oil with 25mg THC + 12.5mg CBD twice daily, supplemented by 12.5mg CBD at night. Subsequent assessments revealed improvements in Mrs. A's mood stability and a reduction in agitation levels, consistent with findings suggesting cannabinoids' anxiolytic properties. Furthermore, caregivers observed enhancements in Mrs. A's sleep quality, aligning with evidence of cannabinoids' potential to modulate sleep-wake cycles and improve sleep architecture.<sup>15</sup> Mrs. A's overall quality of life exhibited modest enhancement, echoing recent studies advocating for cannabinoid-based interventions in AD management.<sup>16</sup>

### Case study 2

**Patient:** Mrs. B, 78 years old Integration of the identical medicinal Cannabis protocol into Mrs. B's care plan yielded encouraging outcomes. Over time, Mrs. B exhibited subtle yet discernible improvements in cognitive function, particularly in memory retention and verbal fluency, reminiscent of findings from preclinical models.<sup>17</sup> Caregivers also noted a reduction in Mrs. B's repetitive behaviors and an uptick in her engagement in social activities, suggesting cannabinoids' potential to alleviate behavioral symptoms and enhance social interaction.<sup>18</sup> Mrs. B's mood stability showed improvement, reinforcing the notion of cannabinoids' therapeutic role in mood regulation.<sup>19</sup>

### Case study 3

**Patient:** Mr. C, 84 years old Mr. C's caregivers introduced the medicinal Cannabis protocol to address his symptoms of agitation and aggression. Following treatment initiation, Mr. C displayed a noticeable reduction in aggressive outbursts and improved cooperation during daily activities, aligning with observations from previous studies.<sup>20</sup> Caregivers reported a decrease in caregiver burden and heightened satisfaction with the quality of care provided to Mr. C, suggesting the potential for medicinal Cannabis to alleviate caregiver stress and enhance overall caregiving experiences.<sup>21</sup>

## Discussion

The integration of a medicinal Cannabis protocol into the care plans of individuals with AD holds promise in ameliorating symptoms and enhancing overall well-being. Balanced THC and CBD ratios in the MCT oil formulation appear to exert beneficial effects on mood stability, behavioral symptoms, and caregiver burden. These findings resonate with emerging evidence highlighting cannabinoids' neuroprotective and anti-inflammatory properties, underscoring their potential therapeutic utility in AD management.

## Conclusion

Medicinal Cannabis, administered within a tailored protocol, emerges as a promising adjunctive therapy for managing symptoms associated with Alzheimer's disease. While further research is warranted to elucidate the long-term safety and efficacy of medicinal Cannabis in AD, our case studies offer compelling insights into its potential benefits in improving patient outcomes and alleviating caregiver burden. Collaborative efforts among healthcare providers, researchers, and caregivers are imperative to optimize the therapeutic use of medicinal Cannabis in AD management. In conclusion, the integration of MCT oil with cannabis-derived cannabinoids represents a promising avenue for therapeutic intervention in Alzheimer's disease and other neurodegenerative conditions. Through continued research and clinical exploration, we can unlock the full potential of this synergistic combination to improve patient outcomes and enhance quality of life. In the context of Alzheimer's disease management, the combination of MCT oil and cannabis-derived cannabinoids holds promise for alleviating symptoms and enhancing overall well-being. By harnessing the synergistic effects of THC and CBD in conjunction with the carrier properties of MCT oil, individuals with Alzheimer's disease may experience improvements in cognitive function, mood stability, and quality of life. However, it is important to note that further research is needed to elucidate the long-term safety and efficacy of medicinal cannabis protocols, including those incorporating MCT oil. Additionally, individual responses to cannabis-based treatments may vary, emphasizing the need for personalized therapeutic approaches and close monitoring by healthcare providers.

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## Conflicts of interest

The author declares that there is no conflicts of interest for this article.

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