

## Amyotrophic Lateral Sclerosis

Amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease, is a fatal neurodegenerative disorder that is characterized by the selective loss of motor neurons in the spinal cord, brain stem, and motor cortex. An estimated 30,000 Americans are living with ALS, which often arises spontaneously and afflicts otherwise healthy adults. The average life expectancy of ALS patients is three to five years post diagnosis.

Preclinical models indicate that cannabinoids hold the potential to delay ALS progression, lending support to anecdotal reports by some patients that cannabinoids may be efficacious in moderating the disease's development and in alleviating certain ALS-related symptoms, such as pain, appetite loss, spasticity, depression, and drooling.<sup>1</sup>

For example, investigators at the California Pacific Medical Center in San Francisco reported in the journal *Amyotrophic Lateral Sclerosis & Other Motor Neuron Disorders* that the administration of THC both before and after the onset of ALS symptoms staved off disease progression and prolonged survival in animals compared to untreated controls.<sup>2</sup> In another study, University of Arkansas researchers reported that the administration of the cannabinoid agonist AM-1241 more than doubled survival rates compared to controls. "[T]he magnitude of effect produced by AM-1241 initiated at symptom onset rivals the best yet reported for any pharmaceutical agent, even those given pre-symptomatically," authors concluded.<sup>3</sup> A study of plant-derived cannabis extracts also documented delayed ALS progression during early stages of the disease in a mouse model.<sup>4</sup> Most recently, scientists have also concluded that CBD may possess disease-modifying potential for ALS.<sup>5</sup>

To date, however, there remains an absence of clinical data documenting the efficacy of cannabinoids in ALS patients.<sup>6</sup> A randomized, placebo-controlled trial failed to find that twice-daily administration of 5 mg of synthetic THC mitigated cramp intensity in a cohort of 22 ALS patients.<sup>7</sup> A placebo-controlled trial assessing the potential of plant-derived extracts to delay ALS progression and extend patients' survival is currently ongoing.<sup>8</sup>

Experts in the field have theorized, "Based on the currently available scientific data, it is reasonable to think that cannabis might significantly slow the progression of ALS, potentially extending life expectancy and substantially reducing the overall burden of the disease."<sup>9</sup>

Others have echoed these opinions, affirming, "[T]here is a valid rationale to propose the use of cannabinoid compounds in the pharmacological management of ALS patients."<sup>10</sup>

### REFERENCES

<sup>1</sup> Amtmann et al. 2004. [Survey of cannabis use in patients with amyotrophic lateral sclerosis](#). *The American Journal of Hospice and Palliative Care* 21: 95-104.

<sup>2</sup> Raman et al. 2004. [Amyotrophic lateral sclerosis: delayed disease progression in mice by treatment with a cannabinoid](#). *Amyotrophic Lateral Sclerosis & Other Motor Neuron Disorders* 5: 33-39.

<sup>3</sup> Shoemaker et al., 2007. [The CB2 cannabinoid agonist AM-1241 prolongs survival in a transgenic mouse model of amyotrophic lateral sclerosis when initiated at symptom onset](#). *Journal of Neurochemistry* 101: 87.

<sup>4</sup> Moreno-Martet et al. 2014. [Changes in endocannabinoid receptors and enzymes in the spinal cord of SOD1\(G93A\) transgenic mice and evaluation of Sativex-like combination of phytocannabinoids: Interest for future therapies in amyotrophic lateral sclerosis](#). *CNS Neuroscience and Therapeutics* 20: 809-815.

<sup>5</sup> Dash et al. 2021. Emerging potential of cannabidiol in reversing proteinopathies. *Ageing Research Reviews* 65 [online ahead of print].

<sup>6</sup> Lim et al. 2017. A systematic review of the effectiveness of medical cannabis for psychiatric, movement, and neurodegenerative disorders. *Clinical Psychopharmacology and Neuroscience* 30: 301-312.

<sup>7</sup> Weber et al. 2009. Tetrahydrocannabinol (THC) for cramps in amyotrophic lateral sclerosis: A randomized, double-blind crossover trial. *Journal of Neurology, Neurosurgery, and Psychiatry* 81: 1135-1140.

<sup>8</sup> Urbi et al. 2019. Study protocol for a randomized, double-blind, placebo-controlled study evaluating the efficacy of cannabis-based medicine extract in slowing the disease progression of amyotrophic lateral sclerosis or motor neurone disease: The EMERALD trial. *BMJ Open* 11 [open access journal]

<sup>9</sup> Carter et al. 2010. Cannabis and amyotrophic lateral sclerosis: hypothetical and practical applications, and a call for clinical trials. *American Journal of Hospice & Palliative Medicine* 27: 347-356.

<sup>10</sup> Giacoppo and Mazzon. 2016. Can cannabinoids be a potential therapeutic tool in amyotrophic lateral sclerosis? *Neural Regeneration Research* 11: 1896-1899.