

# Research Shows Red Light Therapy May Aid Memory Recovery and Prevent Cognitive Decline from Alzheimer's and Dementia

Nearly 6 million Americans struggle with Alzheimer's disease (AD), and worldwide, roughly 50 million people have some form of dementia. [1] Unfortunately, effective treatments have been slow to come. As one team of Alzheimer's researchers wrote in a 2018 study on red light therapy and mice, "pharmacological treatments for Alzheimer's disease have not resulted in desirable clinical efficacy for over 100 years." [2] Another recent study noted there are "no current treatments to prevent the physical deterioration of the brain." [3]

Peer-reviewed research on red light therapy as a potential treatment for Alzheimer's & dementia-related brain degeneration and cognitive decline has been remarkably positive over the last few years in laboratory settings with rodent models. Based on this lab data, several teams of researchers have recommended red and near infrared light therapy for further use in human patients with AD.

We'll look at the solid base of evidence from the laboratory over the past decade, but first here's what the initial human studies on red light therapy and Alzheimer's/dementia have shown in the past few years.

For a more general look at how red light therapy can improve cognitive function for all types of people, check out this post.

## Initial Human Studies Recommend Red Light Therapy for Alzheimer's and Dementia Treatment

Two of the first double-blind, placebo-controlled human trials on dementia/AD and red light therapy were published in 2017, with extremely positive findings. The data showed red light therapy treatments produced positive changes in executive function, clock drawing, immediate recall, memory, visual attention, and task switching, as well as "a trend of improved EEG amplitude and connectivity measures." [3,4]

One of these pilot studies reported that dementia patients treated with a 12-week transcranial light therapy routine experienced these "significant improvements":

- Increased cognitive function
- Better sleep
- Fewer angry outbursts
- Less anxiety
- Less wandering

Of major importance, this study also noted there were **“no negative side effects.”**

The study concluded that light therapy “shows potential for home treatment of patients with dementia and AD.” [4]

## **More Alzheimer’s Trials with Red Light Therapy are in Progress**

The results of these initial human trials are immensely encouraging for AD & dementia patients and families looking for better treatment options, especially natural and non-invasive ones with no drugs, chemicals, or side effects.

As of early 2019, 3 more human trials on red light therapy and Alzheimer’s and dementia are in progress at the University of California and a hospital system in France. With these extremely positive early clinical results in people, more and larger studies and trials are being organized. The hope is that in the coming years, the base of evidence will be large enough to recommend light therapy as a vital treatment strategy to ward off the symptoms of Alzheimer’s and dementia — giving people and their families more quality time together.

The human results from recent years build on a larger base of similarly positive laboratory studies of rodent brains in Alzheimer’s and dementia models, which are outlined below.

## **Lab Dementia Models Show Both Red and Near Infrared Light Reduce Oxidative Stress and Aid Memory**

A 2018 laboratory study assessed mice in an age-related dementia model and found that red light therapy treatments significantly reduced oxidative stress levels and restored memory function. The researchers also praised light therapy for being noninvasive, and having a high rate of tissue penetration and low phototoxicity.

They found red light “not only prevented early-stage memory decline but also rescued late-stage memory deficits.”

The study concluded that red light therapy’s success in lab studies “opens a promising opportunity to translate LED-therapy into clinical treatments for patients with dementia.” [2]

Researchers in a similar 2015 study with a mouse dementia model used near infrared (NIR) light instead of red, like the previous study. The NIR treatments were also effective and at reducing oxidative stress in the cerebellar cortex. The team concluded that NIR light treatments likely had the ability to mitigate degeneration in every region of the mouse brain. [5]

## **Light Therapy Prevents Brain Degeneration in Alzheimer's Models**

Several recent laboratory studies have published strong positive evidence for light therapy as a means to suppress the buildup of Beta-amyloid ( $A\beta$ ), a protein that forms senile plaques in the brains of people with Alzheimer's and dementia. Synaptic dysfunction, due to the disruptive binding of ( $A\beta$ ) in the brain, is one of the first symptoms of AD many patients experience, and is responsible for driving initial cognitive decline. In the medical community, there's a strong consensus that preventing this early synaptic dysfunction would be an effective therapeutic strategy for AD. For patients and families, that means keeping AD at bay so people can continue to live relatively normal lives for longer periods of time. [6]

## **Red Light Therapy Improves Memory, Motor Skills, and Recognition in Alzheimer's Models**

Two separate 2017 laboratory studies assessed the hippocampus of rat brains in an Alzheimer's model with light therapy treatments. Both studies demonstrated significantly reduced  $A\beta$  plaques in the light therapy-treated rats. Both studies also tested the subjects and found that treatments limited hippocampal neurodegeneration, with significantly improved spatial memory, recognition, and basic motor skills in the light therapy groups. [7,8]

Another recent laboratory result also demonstrated significant  $A\beta$  reduction and noted that NIR light can "effectively reduce synaptic vulnerability to damaging  $A\beta$  oligomers, thus furthering NIR light therapy as a viable treatment for AD." [6]

## **Conclusion: Red Light Therapy Shows Major Promise as an Alzheimer's and Dementia Treatment**

The initial clinical studies on red light therapy and Alzheimer's & dementia treatment have been extremely encouraging. Contour Light's devices, and red light therapy in general, are not FDA-indicated for the treatment of Alzheimer's Disease or dementia, but the hope is that more positive human trials will blaze the trail and we'll see light therapy become a key element of Alzheimer's and dementia treatment.

But today, based on the available evidence, red light therapy shows major promise as a natural, noninvasive, drug-free treatment for brain degeneration where pharmacological solutions have long failed.

By reducing oxidative stress and preventing the accumulation of the Beta-amyloid that causes brain plaques and synapse malfunction, light therapy treatments offer hope for a way to delay the onset of Alzheimer's symptoms, and hopefully even reverse or prevent brain degeneration and cognitive decline. Researchers, physicians, and families affected by dementia and Alzheimer's disease will be watching closely in the coming years as more clinical research emerges.

Scientific Sources and Medical References:

[1] Alzheimer's Association, Facts & Figures.

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[3] Berman MH, Halper JP, Nichols TW, et al. Photobiomodulation with Near Infrared Light Helmet in a Pilot, Placebo Controlled Clinical Trial in Dementia Patients Testing Memory and Cognition. *J Neurol Neurosci.* 2017;8(1).

[4] Saltmarche AE, et al. Significant Improvement in Cognition in Mild to Moderately Severe Dementia Cases Treated with Transcranial Plus Intranasal Photobiomodulation: Case Series Report. *Photomed Laser Surg.* 2017 Aug;35(8):432-441.

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