

"THERAPEUTIC INTERVENTIONS FOR THE SUPPORT OF THOSE WITH ALZHEIMER'S DISEASE."



LIGHT THERAPY

Worldwide, an estimated 47 million people are living with dementia, the most common cause of which is Alzheimer's disease. By 2050, this number is expected to reach 132 million.

While the exact causes of Alzheimer's are unknown, scientists know that those affected undergo complex, toxic changes in the brain - such as the formation of beta-amyloid plaques - that can begin a decade or more before memory and thinking problems appear.

Despite decades of research on high-tech drugs, diets, and crossword puzzles, scientists have yet to discover a highly effective treatment for patients with Alzheimer disease. Alzheimer's disease and related dementias are neurodegenerative disorders that primarily damage the brain's memory centers, the temporal lobe and the hippocampus. Typically symptoms appear in people over 65 years of age. These include problems with thinking and remembering, changes in mood, and bouts of confusion. Behavioral symptoms such as disturbed sleep-wake patterns, nocturnal wandering, agitation, and physical or verbal abuse are among the most prevalent reasons why individuals with Alzheimer's Disease and Related Dementia (ADRD) transition to more controlled environments.

What is bright light therapy?

One of the main symptoms of dementia after impaired cognition is that of sleep disturbances. Bright light therapy has been shown to work effectively in treating impaired circadian rhythms and may be a beneficial adjuvant therapy in treating sleep disturbances in dementia.

Bright light therapy is a form of therapy in which patients are exposed to daylight or the equivalent of daylight by using a special lamp. Most commonly, bright light therapy is used in the treatment of seasonal affective disorder (SAD), a form of seasonal depression that occurs primarily during the winter months and is characterised by sleep and mood disturbances when the daylight is reduced.

Usually, hypnotic medications are prescribed for the treatment of sleep disturbances, however, these usually come with common negative side effects (including additional amnesia and increased rates of falling).

Most people function on a wake-sleep cycle that corresponds to our 24 hour day, a special biological 'clock'. The mechanism that controls that cycle is known as circadian rhythm.

The suprachiasmatic nucleus (SCN) is the part of the brain that controls circadian rhythms. The SCN is located within the hypothalamus, in the base of the brain. In dementia, when the suprachiasmatic nucleus is destroyed completely, the sleep/awake cycle will be totally disrupted.

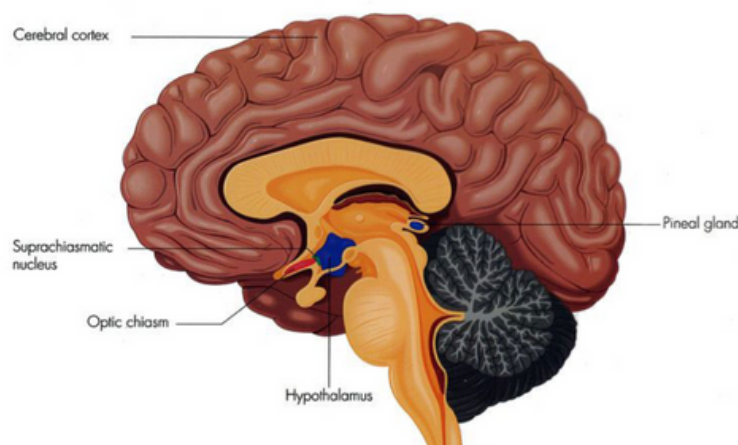
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Researchers at the Netherlands Institute for Brain Research found a marked decrease in the total cell mass of the suprachiasmatic nucleus in older people (80 to 100 years), and an even more pronounced reduction in people with Alzheimer's disease (mean age 78). This shrinkage could account for the sleep disorders that many people experience as they age (waking in the night or too early in the morning, daytime napping, etc.). These and other disorders common in the elderly are more common and more pronounced in people with Alzheimer's disease and many related forms of dementia. There is a direct neural connection between the eye and the suprachiasmatic nucleus. The light-dark cycle controls our circadian rhythms, and light can be used to reset those rhythms when they get out of kilter.

Natural sunlight is the best light therapy for Alzheimer's or anyone else whose sleep cycle may be off. However, sufficient exposure to sunlight is not always possible. This is especially true in cold, winter months, and for people with limited mobility, and limited access to the outdoors. A therapy light that meets the requirements (full-spectrum, 10,000 LUX, etc.) is a suitable substitute.

The use of light therapy for Alzheimer's disease can help lessen the sleep disorders that can be so much a part of that and other types of dementia.

Recent findings indicate that bright light therapy may be beneficial for people with dementia. However, there is a limited number of studies, and most are small in number. Therefore, more research is needed before we can come to any definitive conclusions.



The suprachiasmatic nucleus is responsible for regulating our circadian rhythms.

Gamma oscillations reduced beta amyloid in hippocampus.

Changes in brain waves called gamma oscillations have been observed in several brain disorders, including patients with Alzheimer's disease. These brain waves – in the 25-80 hertz or cycles per second range – are thought to be necessary for normal functioning of processes such as memory, perception, and attention. One of the characteristic symptoms of Alzheimer's disease is the formation of defective protein deposits called beta-amyloid plaques, which are thought to be toxic to brain cells and interfere with normal brain function. Bathing patients in flashing light and pulsing sounds both tuned to a frequency of 40 hertz might reverse key signs of Alzheimer's in the brain.

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After an hour of stimulation at 40 hertz, the researchers found hippocampal (a brain region important for forming and retrieving memories) levels of beta-amyloid proteins fell by 40-50 percent. This did not happen at other frequencies they tried. In tests on mice in more advanced stages of Alzheimer's disease, the researchers found a marked reduction in beta-amyloid levels and plaque deposits.

The researchers also found that gamma oscillations reduce another hallmark of Alzheimer's disease – abnormal tau proteins that form tangles in the brain.

Overall, light therapy shows promise as a non-invasive treatment for Alzheimer's disease.

If you want to know more, watch the video: https://youtu.be/O_p4QWkE2Ls

Light Therapy for Alzheimer's

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