ELDERLY CARE

White Paper on BioCentric Lighting™
BIOCENTRIC LIGHTING IN ELDERLY CARE

Demographic changes have made the need for professional and appropriate residents more important. The elderly have different needs in their homes compared to younger individuals. In care facilities, it is usual for people to spend the majority of time indoors. The need for light increases with age as the pupil gets smaller and the lens thickens absorbing more light. People with an advanced age need more intensive light to aid vision, and exposure to sufficient daylight is important in stimulating the diurnal rhythm. Inadequate lighting has been found to be a contributing factor to accidental falls causing hip fractures and damaging head injuries. Inadequate light increased the risk of a fall by 1.5 times1. Fall prevention where light is one part is thus an important consideration for the design of the homes of the elderly and in care facilities.

The circadian rhythm with an active daytime and a good night sleep is essential for a healthy and good life. The older we get the less time we spend outside in daylight. The opportunity for institutionalized elderly to synchronize their circadian clock to the solar day by daylight is often small.

The circadian rhythm directs the endogenous sleep hormone melatonin and the activation hormone cortisol which boosts energy androus sleep hormone melatonin and the activation hormone cortisol which boosts energy and appetite. The intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.

A positive effect of a restored circadian rhythm through appropriate light has shown an expected preventive effect through a decrease of depressive symptoms. This seems to be a result of direct mood enhancing effects of light and indirect mood preventing effects through a restoration of the sleep-wake cycle8.

Light therapy has been used for many years in the treatment of seasonal affective disorder. Studies are also being published showing a positive effect also for treatment of non-seasonal depression.

This is in line with a recent report by Chang where the researchers analyzed eight different studies investigating the efficacy of light treatment for depression among older adults. In this systematic review they found that depression severity significantly decreased after light therapy. As light therapy before consisted of intense white light treatment with up to 10,000 lux, the discovery of the intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.

In a 12-week study involving 77 patients with dementia, one group was actively exposed to increased daylight between 8-10 am each day, sitting minimum 3 m from the windows. They were compared with another group that was taken to a similar area but without active daylight exposure. Participants in the daylight intervention group experienced a decrease in depressive symptoms during the study11.

In another study where bluish-white light was installed in 14 nursing home resident rooms designed to deliver circadian stimulation during the daytime, a significant reduction of depressive symptoms as well as increased total sleep time was seen. The authors conclude that lightening can be used to increase sleep quality and improve behavior in patients with ADRD3.

Effect on cognition in ADRD

Light also seems to have an effect on cognition. One study with 15 seniors in long term care showed that 400 lux of blue light administered in the morning led to significant cognitive improvements12.

Studies comparing healthy adults with patients with ADRD have revealed that the circadian rhythm is more disrupted among those with ADRD and that this disruption is more pronounced during the winter months3.

In a medline search Figureo et al. found several studies showing improved sleep-wake patterns and sleep duration following either light therapy (6,000-8,000 lux) or increased illumination in the living environment52. A couple of studies also showed reduced agitation and nighttime activity among ADRD patients following exposure of morning light and yet another study showed greater effect of light than prescription of sleep medicines.

Depression and light

Depression and light appears to have a positive effect on mood. A positive effect of a restored circadian rhythm through appropriate light has shown an expected preventive effect through a decrease of depressive symptoms. This seems to be a result of direct mood enhancing effects of light and indirect mood preventing effects through a restoration of the sleep-wake cycle8.

Light therapy has been used for many years in the treatment of seasonal affective disorder. Studies are also being published showing a positive effect also for treatment of non-seasonal depression.

This is in line with a recent report by Chang where the researchers analyzed eight different studies investigating the efficacy of light treatment for depression among older adults. In this systematic review they found that depression severity significantly decreased after light therapy. As light therapy before consisted of intense white light treatment with up to 10,000 lux, the discovery of the intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.

A positive effect of a restored circadian rhythm through appropriate light has shown an expected preventive effect through a decrease of depressive symptoms. This seems to be a result of direct mood enhancing effects of light and indirect mood preventing effects through a restoration of the sleep-wake cycle8.

Light therapy has been used for many years in the treatment of seasonal affective disorder. Studies are also being published showing a positive effect also for treatment of non-seasonal depression.

This is in line with a recent report by Chang where the researchers analyzed eight different studies investigating the efficacy of light treatment for depression among older adults. In this systematic review they found that depression severity significantly decreased after light therapy. As light therapy before consisted of intense white light treatment with up to 10,000 lux, the discovery of the intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.

A positive effect of a restored circadian rhythm through appropriate light has shown an expected preventive effect through a decrease of depressive symptoms. This seems to be a result of direct mood enhancing effects of light and indirect mood preventing effects through a restoration of the sleep-wake cycle8.

Light therapy has been used for many years in the treatment of seasonal affective disorder. Studies are also being published showing a positive effect also for treatment of non-seasonal depression.

This is in line with a recent report by Chang where the researchers analyzed eight different studies investigating the efficacy of light treatment for depression among older adults. In this systematic review they found that depression severity significantly decreased after light therapy. As light therapy before consisted of intense white light treatment with up to 10,000 lux, the discovery of the intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.

A positive effect of a restored circadian rhythm through appropriate light has shown an expected preventive effect through a decrease of depressive symptoms. This seems to be a result of direct mood enhancing effects of light and indirect mood preventing effects through a restoration of the sleep-wake cycle8.

Light therapy has been used for many years in the treatment of seasonal affective disorder. Studies are also being published showing a positive effect also for treatment of non-seasonal depression.

This is in line with a recent report by Chang where the researchers analyzed eight different studies investigating the efficacy of light treatment for depression among older adults. In this systematic review they found that depression severity significantly decreased after light therapy. As light therapy before consisted of intense white light treatment with up to 10,000 lux, the discovery of the intrinsically photoreceptive ganglion cell with wave-length peak at around 450-480 nm opens up the way for lower more targeted light intensities.
Summary

- Older people often do not get enough light to entrain their circadian rhythm
- Sleep related problems are common among elderly, especially among patients with ADRD
- Light can sustain the natural circadian rhythm leading to better night sleep and improved wellbeing
- Light may prevent development of depression
- Bright light at daytime can promote sleep at night and alleviate depressive symptoms among ADRD patients
- Blue light in the morning can besides promoting sleep at night also improve daytime cognition in ADRD patients

One of the biggest challenges with light in healthcare is the adaptability of the light solution to a workplace where multiple activities require different solutions for different rooms.

The BioCentric Lighting™ (BCL™) system is easily customized according to the unique needs of the individual workplace. The light environment provides patients and residents as well as the staff with the light that they need each day, regardless of season. Emerging research provide new understandings of the beneficial effects of light for improving sleep and wellbeing. The BCL™ system is easily adaptable to meet these new insights.

References


Eager to learn more about light for health? We’re here for you!

BrainLit AB
Medicon Village
Scheelagetorget 1
223 63 Lund
SWEDEN
+46 46 37 26 00

BrainLit North America Inc
900 Third Avenue, 29th Floor
New York, NY 10022
USA
+1 800 868-8961

BrainLit Oy
Innovation House
Hämeentie 135 A
00560 Helsinki
FINLAND
+358 44 243 4951

info@brainlit.com • www.brainlit.com

BIOCENTRIC LIGHTING IN ELDERLY CARE