Behavior-Based Circadian Lighting: An Effective Approach for Managing Dementia Symptoms in Residential Care Settings

A CERTUS Institute Pilot Study within the ongoing Glenbrook Study.

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Abstract

This study investigates the impact of circadian lighting on the somatic well-being of individuals with dementia, with a particular focus on the resilience of "the body's memory" amidst cognitive decline. Using a holistic research approach, this case study examines eight distinct residential neighborhoods across four CERTUS Senior Living communities, three of which implemented Healthe Lighting technology. Research methods included dementia simulations, direct observations, interviews with caregiving staff, and conversations with residents, providing a comprehensive and multifaceted understanding of circadian lighting's effects. The findings highlight the influential role of environmental cues in synchronizing intrinsic circadian rhythms, which impact navigational abilities, behavioral adjustments, community engagement, sleep cycles, secondary symptoms, and overall quality of life. Drawing from ethnographic field notes, firsthand observations, personal narratives, and principles of lifestyle medicine, the study underscores the significance of "the body's memory" as a vital factor in enhancing daily experiences and well-being. This pilot study demonstrates how intentionally designed, circadian-aligned environments can support individuals with dementia, offering a pathway to improved quality of life in residential care settings.

Keywords: Circadian Lighting, Residential Design, Dementia Care, Emphasizing "The Body's Memory," Somatic Well-Being, Behavioral Adjustments, Ethnographic Field Notes, Wayfinding, Community Engagement, Sleep Regulation, Quality of Life

Introduction | Lighting Within Residential Memory Care: A CERTUS Case Study

Dementia is one of the most pressing global health challenges of the 21st century, necessitating innovative approaches to improve care and quality of life for affected individuals (National Institute for Dementia Education, [NIDE], 2025). Among the factors influencing the progression and management of dementia, environmental considerations—particularly circadian lighting—play a role in shaping physical and behavioral outcomes.

Behavioral and psychological symptoms of dementia (BPSD) are neuropsychiatric symptoms that accompany the syndrome of dementia. These secondary symptoms can include cognitive symptoms (delusions, hallucinations), motor symptoms (pacing, wandering, repetitive movements, physical aggression), verbal symptoms (yelling, calling out, repetitive speech, verbal aggression), emotional symptoms (euphoria, depression, apathy, anxiety, irritability), and vegetative disturbances (disruption in sleep and appetite; Bessey & Walaszek, 2019). BPSD are commonly recognized as having a negative impact on both the quality of life of the person living with dementia and also on the amount of caregiver burden experienced by the care partner.

For this study, the most important of these BPSD is sleep disruption. Sleep disturbance is common in people living with dementia and may be one of the driving factors that exacerbates or creates other BPSD and contributes to behaviors such as agitation and restlessness. Additionally, efforts to treat sleep disturbance pharmaceutically can lead to other complications in both motor symptoms (balance, gait) and risk of falling.

There are three neurological causes of disruption in circadian rhythms for people with dementia: the degeneration of the suprachiasmatic nucleus (SCN) that regulates circadian rhythms, the plaques and tangles that are hallmarks of the disease, and the inflammation and stress that often accompany dementia. These neurological issues can all be affected in people with dementia. As a result, dementia causes disruptions in circadian rhythms and leads to increased overnight wakefulness, increased daytime sleepiness, and a loss of a clear distinction between day and night (Leng et al., 2019).

In fact, lack of sleep consolidation is very challenging for caregivers and is one of the main reasons for institutionalization in communities like assisted living.

Current State of the Literature | Previous Research Insights: Impact of Lighting on Circadian Rhythm, Sleep Latency and Induction, and Prevention of Falls

While much of the current literature focuses on general patient care, limited research exists that specifically addresses lighting in dementia-focused environments.

History of Lighting in Senior Living Environments

It has been well established by prior research that people with dementia living in residential settings frequently experience disruptions in circadian rhythms that result in sleep disturbances and an increased risk of falls due to disorientation (Blume et al., 2019; Figueiro, 2017; NIDE, 2025).

Despite this, lighting in senior living environments, including assisted-living facilities, often mirror traditional commercial or clinical lighting models. These models, typically reliant on 4000 K bright white lighting with limited dimming options and functionality, lack the subtlety required for advanced lighting solutions tailored to dementia care. Such lighting setups often disrupt circadian rhythms, particularly in communal areas where lights remain on throughout the night (D. A. Conrath, personal interview, September 7, 2024).

Previous research has shown that morning light, particularly within the 460 nm to 480 nm wavelength range, plays a critical role in regulating circadian rhythms (D. A. Conrath,

personal interview, September 7, 2024; see also Meng et al., 2013), while the absence of these wavelengths at night signals the body to rest. This type of somatic lighting directly impacts the body's physiological systems, supporting homeostasis and aligning with natural rhythms (NIDE, 2025).

Prior studies on lighting have shown an improvement in social interactions (Evensen, 2014; Nulty, 2022) and positive behavioral outcomes. For example, in their study Golmohammadi et al. (2021) demonstrated that optimized lighting enhances attention and sociability. Their study showed that the wavelength, color temperature, and light intensity all had a positive effect on responses to cognitive tasks, including attention and reaction time.

Similar findings have been established in studies of adults with dementia. The study by Goudriaan et al. (2021) focused on residential memory care settings within assisted-living environments and identified a link between lighting and increased energy levels for older adults living with dementia. They found that certain lighting conditions had the possibility of diminishing agitation, decreasing feelings of depression, and facilitating spatial orientation.

Many individuals living with dementia in residential settings have difficulty with wayfinding, which results in increased reliance on caregivers. Prior studies have shown that proper lighting can not only reduce falls and accidents, particularly overnight and during navigation (Hall et al., 2016; Park et al., 2018; Glenbrook, 2018), but also reduce episodes of disorientation and improve spatial awareness for people with dementia (Glenbrook Study, 2018).

Most importantly, prior studies have demonstrated that lighting interventions have a positive effect on the well-being of not only the residents but also the staff in long-term care settings (Goudriaan et al., 2021).

For all of these reasons, this study set out to examine whether specifically designed lighting that supports circadian rhythms would have a positive effect on the secondary symptoms of dementia and improve the residents' overall well-being.

Methods

To explore how lighting impacts older adults with dementia, a collaboration of several leading organizations specializing in dementia care and healthcare technology was created, including the following: CERTUS Senior Living, the CERTUS Institute, Healthe Lighting, and the NIDE. These organizations were tasked with designing lighting interventions that could support natural circadian rhythms for older adults with dementia living in assisted-living communities.

Each organization had a specific role. CERTUS Senior Living, which owns and manages several assisted-living memory care communities, provided the research sites for lighting to be installed and programmed according to the study's requirements.

The CERTUS Institute is a research-focused organization committed to investigating the potential of non-pharmaceutical approaches to addressing the symptoms of dementia. The CERTUS engagement program, a research-based dementia care model, is grounded in the principles of lifestyle medicine and integrates core factors—such as nutrition, physical activity, social connection, cognitive engagement, and stress management—to support individuals living with dementia and

enhance their overall well-being. The program aims to minimize the symptoms of dementia through therapeutic lifestyle approaches, reduce responsive behaviors, and foster a higher quality of life for individuals living with dementia (Glenbrook Study, 2018).

Healthe Lighting, through the SunTrac® system, has created tunable lighting programs that create circadian well-being for building occupants with proprietary, engineered spectra.

The CERTUS Institute, in collaboration with Healthe Lighting, designed lighting interventions that were specifically designed for residential dementia care settings.

The NIDE, a leading organization in education and training for dementia, oversaw the study and contributed their expertise on standards of dementia care. NIDE council members strengthened the efforts of CERTUS and Healthe Lighting by leveraging their practitioner insights in the field and by ensuring that proposed interventions were both practical and impactful.

By integrating the insights and resources of these organizations, this case study offers a thorough approach to improving the quality of life for individuals living with dementia through intentionally designed and systematic lighting interventions.

Principles of Lighting Design

CERTUS Institute and Healthe Lighting introduced innovative somatic and behavioral lighting interventions.

These interventions built upon scientifically supported principles of lifestyle medicine, addressing areas such as restorative sleep, positive social connections, and stress management.

The lighting interventions expanded on the importance of tunable lighting. Tunable lighting, which adjusts color temperature and intensity to align with natural circadian rhythms, provided wavelengths between 460 nm and 480 nm, helping residents' bodies differentiate between rest and activity periods (D. A. Conrath, personal interview, September 7, 2024).

Specific Lighting Interventions

Promoting Circadian Rhythms and Sleep Quality: Reduced Secondary Symptoms

CERTUS Senior Living neighborhoods installed the SunTrac® system, which can employ tunable lighting strategies. The SunTrac® system transitions from bright white light during the day to amber light at night. This tunable circadian lighting mimics natural rhythms and can adjust the light spectrum to enhance or reduce specific wavelengths, optimizing its impact on circadian health (D. A. Conrath, personal interview, September 7, 2024). This feature is essential in dementia care, where disrupted circadian rhythms can lead to behavioral challenges, such as agitation or restlessness, and an increased risk of falls, commonly referred to as sundowning syndrome (NIDE, 2025).

The SunTrac® system has two different spectrums. "The GoodDay spectrum is blue-enriched at 480 nanometers (nm), the peak wavelength for the body's circadian sensitivity. GoodDay simulates the blue in natural sunlight, helps increase alertness and has the potential to improve productivity during the day. [Alternatively, their] GoodNight spectrum, which is blue-depleted at 480 nm, promotes the body's natural

response to sunset and ultimately sleep" (Luger Research, 2019, para. 6).

The purpose of using this tunable lighting strategy was to examine its effect on sleep quality and circadian rhythms for people with dementia.

Promote Wayfinding, Enhance Navigation, Reduce Disorientation

Further, CERTUS and Healthe Lighting developed strategies to help with wayfinding and disorientation. The two entities strategically employed lighting to delineate pathways, fostering independent movement and minimizing time-of-day disorientation. This approach drew inspiration from lighting designs used in other settings, such as grocery stores and schools, where lighting guides behavior and facilitates navigation (Berčík et al., 2016; Fernández-Puerta et al., 2023).

Promote Social Engagement/Interaction

Bright illumination was used in areas intended for resident engagement, while spaces posing potential risks, such as exit doors, were minimally lit. These subtle visual cues guided residents' movements and encouraged safe interaction within the environment. The importance of visual cues has been further validated through several small-scale pilot studies at CERTUS, which complemented the circadian lighting system and the research of Goudriaan et al. (2021). The ability of SunTrac® lighting systems to customize individual light settings was identified as a critical factor in fine-tuning the experience for residents.

Increase Safety: Reduce Falls and Accidents

CERTUS communities designed their lighting strategies not only to enhance wayfinding but also to prioritize resident safety. Research suggests that proper lighting can reduce falls and accidents, particularly during navigation (Hall et al., 2016; Park et al., 2018). To address this, CERTUS implemented tubular lighting and other adaptive lighting solutions to illuminate community spaces and resident rooms, helping to identify potential tripping hazards. While much of the existing literature focuses on general patient care, limited research specifically addresses lighting in dementia-focused environments.

Implementation

At CERTUS, these strategies were implemented in two communities, with 37.5% of the total residential real estate allocated for implementation purposes—referred to as the "living environment." This allocation allowed for direct comparisons to be made with other neighborhoods that did not participate in the lighting interventions. In all, four communities participated in the case study, with three of the eight neighborhoods designated for the intervention. The remaining neighborhoods served as comparison groups, enhancing study rigor and the reliability of findings.

Data collection methods included dementia simulation, qualitative observations, metric-based interviews, progress notes, and feedback from staff and residents, offering a comprehensive understanding of the interventions' effects.

An ethnographic framework utilizing first-hand experience was central in data collection methods. To illustrate, coauthor Heiserman and I lived in the community for several weeks (off and on), experiencing the lighting throughout different times of day and under varying conditions. By living in

the environment and observing, we intentionally applied an ethnographic approach with the purpose of gaining deeper contextual insight into how the lighting impacted everyday life.

Dementia simulation techniques were also incorporated to deepen empathy and help us interpret how lighting may impact individuals with dementia—acknowledging that while simulations are not exact, they are a valuable tool for understanding. This lived, immersive approach helped us reflect not just on lighting design, but on how individuals may feel and respond within the space—contributing to a more human-centered and experientially grounded understanding.

Results

Sleep Quality

As residents with dementia often experience poor sleep, we were especially interested in how the lighting configurations would affect the sleeping patterns and quality of sleep for residents in the study. Lighting designs were specifically created to provide sufficient brightness for navigation without disrupting resident's circadian rhythms. The use of specific light colors and intensities ensured that residents could see their surroundings clearly during nighttime or early morning hours without fully waking them, thereby maintaining their natural sleep patterns.

In fact, the caregivers interviewed in this investigation reported improvements in residents' sleep quality, with one noting that "residents seem to be in a deep sleep and sleeping more consecutive hours."

These findings support prior research that has indicated a positive relationship between lighting that supports normal circadian rhythms and improved sleep hygiene.

Engagement

Prior studies have highlighted the connection between sleep quality and social performance (Glenbrook Study, 2018). Our investigation demonstrated similar findings as we found that the tailored lighting interventions were related to noticeable changes in routine and social engagement.

Staff at CERTUS observed residents gravitating toward windows with warm lighting or areas of the building that were well lit at night. Based on training from the NIDE, this behavior aligns with research showing that attention is often drawn to well-lit spaces, as seen in neurotypical individuals in environments like grocery stores where lighting influences focus. Conversely, residents tended to avoid dark spaces, a behavior explored further in the wandering and wayfinding section of the CERTUS staff survey we did.

As many in the industry know and as our interviews showed, engagement is crucial for individuals living with dementia (NIDE, 2025). With this in mind, we observed that residents in neighborhoods equipped with SunTrac® lighting explored more areas throughout the day compared to those in other neighborhoods. One staff member noted that residents on the SunTrac® side transitioned from waking to breakfast more quickly. Although anecdotal, this observation was confirmed through staff interviews and surveys.

Residents exposed to SunTrac® lighting also showed increased engagement with the CERTUS Town Center, a streetscape designed to promote purposeful daily living. Staff reported that these residents actively participated in programs and explored the community independently. This increased

activity highlights how thoughtfully implemented lighting systems can encourage residents to engage more fully with their surroundings, promoting enhanced involvement in both structured and self-directed activities.

Similarly, Goudriaan et al. (2021) identified a link between lighting and increased energy levels, which CERTUS staff corroborated through observations of greater physical activity, participation in community events, and engagement in activities.

Sociability

Our findings also supported those of Golmohammadi et al. (2021) who demonstrated that optimized lighting enhances attention and sociability. CERTUS communities reflected these findings, with staff observing heightened daytime alertness and improved interactions.

This study also observed an improvement in social interactions, building upon the research findings of Evensen (2014) and Nulty lighting consultants (Nulty, 2022). Furthermore, our observations align with Evensen's (2014) study within the framework of dementia care at CERTUS, highlighting the comfortable ambiance and positive mood created by the lighting, which encouraged residents to engage more socially.

Navigation/Wayfinding

This research served a noticeable role in supporting the navigation abilities of individuals with dementia in the CERTUS communities with the new lighting strategies. Episodes of confusion and disorientation are common in people with dementia (Glenbrook Study, 2018), making it more difficult for them to navigate their environment. By creating visual landmarks and cues, our study showed that lighting served as an effective tool for enhancing spatial orientation and wayfinding and reducing episodes of disorientation. This was evidenced by the fact that, after the new lighting was implemented, previously underutilized spaces, such as TV rooms and themed indoor front porches (designed to simulate an outdoor feel), became more inviting and functional as it intentionally drew attention to places where residents could be intentionally engaged.

Lighting was strategically employed to delineate pathways, fostering independent movement and minimizing time-of-day disorientation. Bright illumination was used in areas intended for resident engagement, while spaces posing potential risks, such as exit doors, were minimally lit. In our study, these subtle visual cues guided residents' movements and encouraged safe interaction within the environment. These findings underscore the importance of visual cues, which have prior been substantiated by several other pilot studies at CERTUS and by the research of Goudriaan et al. (2021).

Further, our study found that these lighting strategies not only reduced confusion but also fostered a sense of autonomy by enabling residents to navigate their surroundings more independently. For many individuals living with dementia in residential settings, wayfinding challenges can lead to increased reliance on caregivers. By implementing strategically placed lights and clear visual cues, our study showed that CERTUS provided residents with the ability to move through their environment with greater confidence and less reliance on caregiver support.

We found that these lighting strategies supported residents' autonomy and confidence by fostering a sense of security and reducing the fear of walking in poorly lit areas. This was achieved through lighting designs that provided sufficient brightness for navigation without disrupting residents' circadian rhythms. By striking a balance between safety and independence, these lighting adjustments created a harmonious environment that minimized risks while encouraging residents to move freely. Staff observations and feedback emphasized how these interventions empowered residents, reinforcing a sense of control while ensuring their safety. Regular evaluations through staff input and nighttime observational check-ins ensured that these interventions continued to meet the evolving needs of residents.

Safety

For this study, CERTUS communities designed their lighting strategies not only to enhance wayfinding but also to prioritize resident safety. Research suggests that proper lighting can reduce falls and accidents, particularly during navigation (Hall et al., 2016; Park et al., 2018). To address this, CERTUS implemented tubular lighting and other adaptive lighting solutions to illuminate community spaces and resident rooms, helping to identify potential tripping hazards. CERTUS staff surveys revealed that optimized lighting configurations significantly improved safety outcomes, with fewer incidents of falls and accidents reported, particularly during nighttime wayfinding.

Additionally, personalized adjustments available through SunTrac® lighting allowed staff to tailor lighting conditions to each resident's specific needs, further empowering them to engage in daily activities safely and with minimal assistance.

Reducing Sundowning and Aggressive Behaviors Through Strategic Lighting

One notable finding of this case study was the reduction in symptoms of sundowning and aggressive behaviors observed among residents after the implementation of the somatic and behavioral lighting system. Sundowning, characterized by increased confusion, agitation, and restlessness during late afternoon and evening, is a common symptom in individuals living with dementia (NIDE, 2025).

Interestingly, a serendipitous misprogramming of the lighting system in two study neighborhoods inadvertently provided an opportunity to examine behavioral changes associated with these adjustments. By fine-tuning and synchronizing the lighting sequences with observed behavioral patterns, a noticeable decline in sundowning symptoms and aggressive behaviors was observed. These positive effects extended beyond residents' rooms to communal areas, enhancing the overall atmosphere of the community.

Moreover, the lighting system promoted stress management by reducing overstimulation and fostering a calming atmosphere. Depending on the time of day, the lighting design supported transitions between activities, such as meals, rest periods, and social engagements, further enhancing daily routines. This holistic approach aligns with broader principles of lifestyle medicine by addressing multiple aspects of well-being.

By promoting synchronized circadian rhythms, these lighting systems help manage symptoms of sundowning, reduce risky

behaviors, and support overall behavioral stability.

Support for Eating Habits

Additionally, our study found that lighting strategies can enhance alertness during meals, supporting healthy eating habits, and provide cue-based guidance to encourage physical activity and independence. Caregivers and support professionals observed greater alertness at lunchtime and increased calmness during dinner—a period often complicated by sundowning. Dining staff reported a modest yet noticeable increase in food intake, evidenced by cleaner plates and fewer leftovers, which may be linked to the sustained focus and calm atmosphere fostered by the new lighting. Within several weeks of implementation, residents appeared more engaged at midday and more relaxed in the evening. By providing calming illumination throughout the day, the lighting intervention also encouraged positive social interactions and improved the dining experience, thereby contributing to residents' overall quality of life.

The lighting design supported positive social interactions and meal experiences by providing calming and consistent lighting throughout the day, enhancing residents' eating patterns and overall quality of life.

Discussion

This study evaluated the impact of Healthe SunTrac® tunable lighting interventions on dementia care, focusing on sleep quality, fall prevention, social engagement, wayfinding, sensory stimulation, resident quality of life, and staff well-being. These lighting strategies demonstrated their ability to complement lifestyle medicine by promoting restorative sleep, reducing behavioral risks, and fostering stress management through improved environmental cues.

This evolving case study highlights the significant potential of somatic and behavioral lighting interventions in enhancing dementia care. The findings demonstrate a myriad of benefits, including improved sleep quality, fall prevention, wayfinding abilities, social engagement, and overall quality of life for individuals living with dementia. Importantly, these interventions align with CERTUS's commitment to empowering the potential of circadian lighting and scientifically proven lifestyle medicine by fostering therapeutic environments that address the symptoms of dementia through restorative sleep, stress management, and positive social engagement.

Key findings highlight the broad-reaching benefits of circadian lighting in dementia care environments. By aligning lighting with natural rhythms, the interventions were shown to improve sleep hygiene, reduce nighttime agitation, and enhance wayfinding, contributing to better safety and independence for residents. Additionally, the lighting facilitated positive social interactions, supported meal-related alertness, and encouraged cue-based physical activity, aligning with the pillars of lifestyle medicine. These results demonstrate the potential for lighting interventions to serve as an accessible tool for improving dementia care environments.

Additionally, the interventions positively impacted staff well-being, enhancing their observational abilities, reducing stress, and improving overall job satisfaction. These outcomes emphasize the transformative effects of lighting not only for residents but also for caregivers, reinforcing the

importance of a holistic approach to dementia care.

By utilizing systematic and programmed lighting, we fostered socialization among residents and built upon research from other fields.

For example, building upon the research of Jao et al. (2022), we found that with the right systematic approach to lighting within dementia-friendly environments, risks could be minimized while reducing agitation and confusion.

Further, our case study validated the findings of Nulty (2022) lighting consultants and Evensen (2014) that thoughtfully designed lighting can improve social interaction and create positive behavioral outcomes.

By strategically manipulating lighting conditions, these interventions influenced residents' circadian rhythms, moods, and behaviors—contributing to an improved quality of life for individuals living with dementia (Hanford & Figueiro, 2013).

Based on observations and feedback from staff, we heard reports of improved sleep, enhanced alertness, and increased energy levels that culminated in a vibrant social environment, offering a hopeful narrative in the ongoing story of dementia care.

The findings of this case study underscore the potential of systematic and behavior-based lighting interventions as a powerful, non-pharmacological strategy for managing challenging dementia symptoms.

Illuminating the Path Forward in Dementia Care: Positive Impact on Staff and Residents Alike

The benefits of the lighting system extended beyond the residents to the caregiving staff. With the reduction in sundowning and aggressive behaviors, staff members reported experiencing less stress, improved job satisfaction, and an increased ability to provide person-centered care. This positive shift in staff well-being further emphasizes the role of lighting interventions as a tool for enhancing dementia care and management (Goudriaan et al., 2021).

The therapeutic impact of these lighting interventions highlights their potential to enhance dementia care environments, as validated by staff feedback and observations of residents. By fostering a sense of safety, supporting restorative sleep, and improving overall behaviors, this case study found that these lighting strategies and interventions benefited both residents and staff. The somatic influence of the lighting was visually noticeable through direct observation and the calming effects were experienced by those involved.

The Need for Ongoing Research and Future Funding

The noticeable outcomes of this pilot study underscore the critical need for ongoing research and dedicated funding in the field of lighting and dementia care.

One of the most impressive components of the SunTrac® lighting system is the ability for staff to tailor lighting conditions to each individual resident's specific needs. This customization provides specific behavioral cues and adjustments based on ability and mood that could be even more impactful with further research.

Despite promising results, there is a need for further exploration into how tunable circadian lighting impacts individuals living with different types of dementia and at various stages of the condition.

Future investigations should also consider individual personality traits and chronotypes to better understand and personalize lighting interventions.

While lighting systems like those used at CERTUS demonstrate marked potential, cost often becomes a barrier for wider implementation. Many individuals and families may not have access to these technologies without external financial support. Securing funding from insurance providers or other available resources could make these advanced lighting systems more accessible, allowing more people to benefit. Furthermore, large-scale research studies could provide the validation needed to justify broader adoption and encourage funding agencies to prioritize these interventions.

Additionally, while the adverse effects of sleep deprivation are widely recognized, there remains a notable gap in training for caregivers on sleep hygiene practices and awareness of sleep architecture. The natural progression through multiple stages (including lighter NREM sleep stages, deeper NREM sleep stages, and REM) during sleep underpins essential physiological and cognitive processes (D. A. Conrath, personal interview, September 7, 2024). As a result, more attention to sleep hygiene in residential settings is crucially important to improve quality of life for people with dementia.

Lighting the Way: Transformative Interventions and Future Directions in Dementia Care

The advantages of appropriate lighting interventions extend beyond improving the well-being and quality of life for individuals living with dementia. These interventions significantly enhance the entire dementia care ecosystem by fostering a supportive and nurturing work environment for staff, which improves performance, retention, and overall caregiving quality.

The findings also highlight the potential for lighting interventions to extend beyond residential care settings. Applications in private homes, hospitals, and emergency rooms present opportunities to tailor lighting strategies to individual needs, creating personalized and effective approaches to care. By accommodating unique personality traits, stages of dementia, and environmental factors, lighting interventions can address diverse challenges faced by individuals living with dementia in a variety of settings.

These transformative interventions align with the principles of scientifically proven lifestyle medicine, providing therapeutic benefits that span restorative sleep, minimized agitation, reduced stress, and enhanced social engagement. By fostering a sense of safety and promoting autonomy, these lighting strategies redefine care standards for individuals with dementia.

Conclusion

The implications of this study prompt us to recognize lighting not merely as an environmental factor but as a significant therapeutic tool in dementia care. The implementation of systematic and behavior-based lighting interventions at CERTUS Senior Living has unveiled new possibilities for improving the lives of individuals living with dementia. These findings also demonstrate how leveraging circadian lighting and lifestyle medicine principles—such as sleep hygiene, stress management, and promoting positive social interactions—can result in meaningful improvements in dementia symptom management.

This case study also highlights the potential to expand these insights beyond residential care to private homes, hospitals, and emergency rooms, emphasizing personalized approaches that address individual needs and stages of dementia.

However, cost remains a critical consideration in making these technologies widely accessible. Large-scale studies are essential to validate the effectiveness of lighting interventions and provide the evidence needed to secure support from insurance providers or other funding sources. Such efforts could enable broader implementation of these systems, helping more individuals and families benefit from their therapeutic potential.

The CERTUS Institute is committed to advancing this important work through a second phase of research and welcomes partners to join in this endeavor. Contributions of services, funding, or industry insights will enable deeper exploration into the therapeutic power of circadian lighting and lifestyle medicine, paving the way for even greater advancements in dementia care. Collaborations with industry leaders such as Healthe SunTrac® and guidance from the NIDE further strengthens the CERTUS Institute's commitment to innovation in care.

By embracing the empowering potential of circadian lighting and scientifically proven lifestyle medicine, we can enhance the quality of life for individuals with dementia, support caregivers, and set new standards for care. Together, through research, collaboration, and compassion, we can illuminate a brighter future for dementia care.

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