MASONICARE AT MYSTIC

A Legacy of Care. A Commitment to Innovation.

More Good Days
In Memory Care

How 40 Hz Light Therapy Improved Sleep, Mood, and Daily Life for Memory Care Residents at Masonicare at Mystic

A 6-Week Pilot Study | 10 Residents | 280 Caregiver Assessments | 5 Domains of Daily Life

In partnership with

OPTOCEUTICS

EVY LIGHT® | 40 Hz Multi-Sensory Platform

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Executive Summary

Memory care communities face a compounding crisis: residents living with cognitive decline need more support each day, while the staff providing that care are stretched thinner than ever. Non-pharmacological approaches have long been sought as a complement to traditional care, but few have demonstrated measurable impact on both resident quality of life and staff burden in real-world settings.

In the fall of 2025, Masonicare at Mystic and Optoceutics partnered to evaluate whether 40 Hz light therapy could make a meaningful difference. For residents, for staff, and for daily life in a memory care environment. Over 6 weeks, 10 residents received 1 hour of daily therapy with the EVY LIGHT® device. Trained caregivers completed weekly assessments across five domains of daily functioning: Sleep, Mood, Focus, Energy, and Memory.

The results exceeded expectations across every measure.

90%	5 of 5	0
Retention Rate 9 of 10 completed all 6 weeks	Domains Improved Sleep, Mood, Focus, Energy, Memory	Decline After Week 2 Zero “Worse” ratings from Week 3 on

Staff burden decreased for 89% of participating residents. Caregivers reported reduced emotional exhaustion, improved sense of control, and residents returning to activities they had abandoned months earlier. Based on these outcomes, Masonicare has elected to expand EVY adoption to all residents in its Mystic memory care unit and to continue formally tracking resident and staff outcomes over time.

The Crisis in Memory Care

The Human and Economic Burden

The numbers are staggering, but memory care professionals don’t need statistics to know the weight of what they carry. They live it every shift.

Nationally, 7.2 million Americans aged 65 and older are living with Alzheimer’s dementia. Health and long-term care costs exceed $360 billion annually and are projected to reach $1 trillion by

2050. When indirect costs (unpaid caregiving, lost productivity, family financial strain) are included, the total societal burden reaches an estimated $832 billion annually.

Within memory care communities, the pressure intensifies. Residents experience disrupted sleep, shifting moods, reduced engagement, and diminished quality of life. These changes ripple outward, to families who feel helpless and to staff managing increasingly complex care demands with limited resources. Nursing homes face annual turnover rates exceeding 53%, with replacing a single CNA costing $3,000 to $5,000 in recruitment, onboarding, and training.

The Intervention Gap

Pharmacological treatments remain limited in their effect on disease progression, and many carry significant side effects. Non-pharmacological interventions have gained focus (music therapy, cognitive stimulation, exercise programs), but a gap persists. Very few have demonstrated measurable impact across both resident outcomes and staff burden simultaneously. Economic evaluations of sensory therapies remain largely absent from the literature. And many promising interventions require specialized staff or complex scheduling, making sustained implementation difficult.

What memory care communities need is an evidence-based, low-burden intervention that integrates into existing daily routines, improves residents' lives in observable ways, and simultaneously eases the demands on staff.

The Science Behind 40 Hz

In healthy brains, gamma oscillations (neural activity at roughly 30–100 Hz) play a critical role in cognitive processing, memory formation, and communication between brain regions. Research spanning two decades has consistently shown that individuals living with Alzheimer's disease demonstrate significantly reduced gamma activity, particularly in areas associated with memory and executive function. This gamma deficit is not simply a marker of decline. Emerging evidence suggests it may actively contribute to the progression of neural disruption.

The core principle behind 40 Hz therapy is straightforward: rhythmic sensory stimulation delivered at 40 Hz (through light, sound, or both) can synchronize the brain's own neural oscillations to that frequency. This process, known as gamma entrainment, effectively restores functional gamma activity from outside the brain. Published preclinical and clinical research has shown that this entrainment triggers measurable biological responses, including activation of microglia (the brain's immune cells) toward a protective, clearance-promoting state, reduction of amyloid-beta plaques and phosphorylated tau proteins, enhanced glymphatic clearance

(the brain's waste-removal system, active during sleep), and improved neural connectivity between critical brain regions.

Human clinical trials have translated these preclinical findings into measurable outcomes: 30–40% slower functional decline compared to controls, preserved brain structure (specifically the corpus callosum, a white matter region critical for cognitive function), and improvements in sleep quality, mood, and behavioral metrics. Combined multisensory stimulation (light and sound delivered together at 40 Hz) has been shown to produce stronger and more sustained effects than either modality alone.

It was against this backdrop that Masonicare at Mystic chose to evaluate 40 Hz light therapy through a structured pilot program with Optoceutics.

The Partnership

About Masonicare

Masonicare is Connecticut's largest not-for-profit senior care organization and the state's only fully integrated senior care continuum. With residential communities, skilled nursing and rehabilitation, a senior behavioral health hospital, home health care, and hospice and palliative care services, Masonicare serves nearly 5,000 patients and residents daily across the state. For more than a century, Masonicare has been guided by a mission-driven commitment to enhancing quality of life for older adults, delivering compassionate, best-in-class care designed to maximize independence and dignity at every stage.

About Optoceutics

Optoceutics Inc. was founded out of a research partnership between the University of California, Berkeley, and the Danish Technical University (DTU) in Denmark. The company is composed of neuroscientists, engineers, and technologists united by a single focus: advancing non-pharmacological, light-based brain technologies to support cognitive health. That mission is personal. Optoceutics' CEO, Dr. Mai Nguyen, founded the company after watching her own father experience cognitive decline. That experience shaped a company culture where scientific rigor and personal compassion are inseparable and where every team member uses the technology they build.

In choosing to evaluate 40 Hz therapy in a structured memory care setting, Masonicare became one of the first senior living organizations in the country to bring this emerging science into real-world clinical practice. When Masonicare's leadership evaluated EVY, they

approached it with the rigor their reputation demands: a defined protocol, clear success criteria, and commitment to honest assessment.

The pilot agreement, executed in October 2025, established a collaborative framework between Masonicare at Mystic and Optoceutics. The program was designed to be low-burden by intention. Optoceutics provided all devices, onboarding, and technical support at no cost. Masonicare appointed a dedicated Pilot Lead, identified appropriate residents, obtained informed consent, and facilitated weekly caregiver assessments.

The partners agreed upfront on two measurable success thresholds: at least 70% session adherence and a positive trend in at least two of five assessment domains. The program substantially exceeded both.

Pilot Design

The Residents

Ten residents from Masonicare's memory care unit were enrolled, including individuals living with Alzheimer's disease, vascular dementia, mixed dementia, and other forms of cognitive decline. The majority were classified at Stage 5 (Moderately Severe) on the Global Deterioration Scale, with two at Stage 6 (Severe). Time since diagnosis ranged from approximately six months to two years.

The Daily Routine

Each resident received an EVY LIGHT® device and completed at least 1 hour of daily 40 Hz light therapy for 6 consecutive weeks. The therapy was integrated into residents' existing daily routines rather than layered on top of them. This was a deliberate design choice: for any intervention to be sustainable, it must work within the rhythms of a care environment, not against them.

What We Measured, and Why

Quality improvement framework

This pilot was conducted as a structured quality improvement initiative within Masonicare at Mystic. The care team followed a predefined protocol covering resident eligibility, daily session targets, weekly caregiver assessments, and a simple, predefined analysis plan. All measures (sleep, mood, focus, energy, memory, and staff burden) were drawn from domains already familiar to Masonicare's clinical and operations teams, and the intent was to evaluate

and improve day-to-day care in a real memory care environment, not to replace formal clinical trials.

Trained caregivers (the staff members who see residents throughout their daily activities) completed weekly assessments across five domains of observable daily functioning: Sleep, Focus, Mood, Energy, and Memory. For each domain, caregivers rated observed changes from baseline as "Improved," "Stable," or "Worse."

This caregiver-assessed methodology was chosen deliberately. In populations living with cognitive impairment, self-reported measures can be unreliable. But caregivers who interact with residents every day are uniquely positioned to detect the changes that matter most: Is she sleeping through the night? Is he more willing to participate in group meals? Did she pick up her coloring book again after months?

At the conclusion of the six weeks, caregivers also completed a separate staff burden assessment evaluating changes across four domains: Emotional Exhaustion, Sense of Control, Team Resource Strain, and Overall Job Impact for each resident.

What Changed for Residents

Across 280 individual assessments collected over six weeks, the pilot produced consistently positive outcomes across every measured domain. Nine of 10 residents (90%) completed all six weeks. This is an exceptional retention rate for any wellness program, and especially notable in a memory care population.

For readers who want the full statistical methods and plots behind these summary findings, see the companion technical report referenced in the Appendix.

The Pattern: Stabilization, Then Improvement

In Week 1, caregivers reported predominantly stable observations: 82% of all assessments, with 8% rated as "Improved" and 10% as "Worse." By Week 2, the shift was unmistakable. "Improved" assessments rose to 46%, and staff began commenting independently on observed changes.

From Week 3 through the end of the study, caregivers recorded zero "Worse" assessments across any domain, for any resident. Every resident either maintained their baseline or showed observable improvement.

Domain-by-Domain Findings

Domain	Net Improvement	First Significant Week	Cumulative (Wk 6)
Mood	+67.9%	Week 3	4.33
Sleep	+64.3%	Week 2	4.11
Focus	+44.6%	Week 3	2.89
Energy	+28.6%	N/A	1.89
Memory	+25.0%	Week 4	1.67

Net Improvement = percentage of "Improved" minus "Worse" caregiver assessments across all weeks (matches the algebraic scoring used in the technical appendix). Cumulative Score = average per-resident improvement score by Week 6 (maximum possible: 6.0).

Mood and Sleep were the strongest and earliest responders. Caregivers noted tangible changes within the first two weeks: calmer evenings, fewer nighttime disruptions, and more pleasant interactions during daily activities. These are the domains most directly tied to quality of daily life.

Focus showed robust improvement starting in Week 2. Residents were more engaged in conversations, more present during group activities, and more willing to participate in tasks they had previously avoided.

Memory showed a delayed-onset pattern, becoming consistently positive from Week 3 onward. This is an important expectation-setting insight for communities considering implementation.

The Moments That Matter

Data captures trends. But in memory care, the moments that matter most happen in hallways, at mealtimes, and in rooms where someone quietly picks up something they haven't touched in months.

> *"Staff and myself have noticed a great change in resident. He is more pleasant and willing to perform simple tasks with the aides when asked. Definitely overall more engaging."*
>
> - Caregiver, Week 2

> *"Over the past few weeks I have noticed that resident has been coloring in room, she hasn't done it in many months. This was once her favorite pastime that gave her joy. It's great to see her revisiting her past interest!"*
>
> - Caregiver, Week 5

> *"Private aide reports that the resident sleep has improved greatly. When she first started working with the resident she was up every few hours."*
>
> - Caregiver, Week 5

> *"Resident has been wearing lipstick daily, something she hasn't done in months."*
>
> - Caregiver, Week 6

These are the moments families search for: a parent returning to a hobby. A spouse sleeping through the night. Someone reaching for lipstick. A quiet act of identity that says more than any assessment score ever could. For the families watching from the outside, these are the signals that their loved one is still in there, still present, still themselves.

When families see these moments, trust in the community deepens. They stop wondering whether their loved one is receiving the best possible care. They know.

The Staff Experience: Less Burden, More Good Shifts

For memory care administrators, this may be the most operationally significant section of this whitepaper.

Any new intervention that adds workflow complexity or supervision requirements is unlikely to survive past a pilot, no matter how promising the data. Masonicare's leadership needed to know: would staff embrace this?

The answer came faster than expected. Within the first week, staff noticed changes in residents and began asking whether the light could be responsible. By Week 2, the team had become believers. Not because anyone told them the technology worked, but because they could see it in the people they care for every day.

What Changed on the Floor

Residents who slept better meant fewer nighttime disruptions: fewer calls, fewer incidents, fewer moments of escalation at 2 AM. Residents who were more cooperative during daily activities meant less time spent on redirection and de-escalation. Residents who were more pleasant and engaging meant shifts that felt less like survival and more like caregiving.

The technology was not adding to staff burden. It was reducing it.

Measurable Burden Reduction

Finding	Detail
Average composite burden change	+1.52 on a –2 to +2 scale (p = 0.012)
Residents with substantial reduction	8 of 9 (89%) showed improvement of +1 point or more
Residents with worsened burden	Zero
Strongest improvements	Emotional Exhaustion (+1.67)

A +1.52 composite change on a 5-point scale means that caregivers moved, on average, more than a full point toward "significant relief" across all four dimensions of their experience. All four domains showed statistically significant improvement ($p < 0.05$), with Emotional Exhaustion showing the largest gain at +1.67.

Less agitation. Less aggressive behavior. More cooperation. This is the ripple effect that administrators need to see: when residents do better, staff do better. When staff do better, they stay. When they stay, continuity of care improves, and the entire community benefits.

In a field where annual CNA turnover exceeds 53% and replacing each one costs thousands, an intervention that makes the work itself less intense is not a luxury. It is an operational imperative.

The Whole Picture: A Cascade of Value

The Masonicare pilot was not conducted under laboratory conditions. It was conducted in a real memory care unit, with real residents at varying stages of cognitive decline, assessed by the caregivers who know them best. The protocol was simple: one hour of daily therapy, integrated into existing routines.

The results tell a story in three layers:

- Residents experienced observable improvement across sleep, mood, focus, energy, and memory. Residents returned to activities they had abandoned, engaging more fully with people and daily life
- Families gained visible evidence that their loved ones were receiving innovative, evidence-based care. This builds trust, strengthens confidence, and deepens their relationship with the community
- Staff experienced reduced burden across emotional exhaustion, sense of control, team resource strain, and overall job impact. This makes shifts more sustainable and the work itself more rewarding

For administrators, this cascade is the story. Improved resident outcomes drive family confidence. Reduced staff burden drives retention. Together, they create differentiation in a market where families are choosing communities based on who is doing the most for the people they love.

This is why Masonicare's leadership elected to expand EVY to all residents in the Mystic memory care unit. That decision represents one of the earliest facility-wide commitments to 40 Hz therapy in U.S. senior living, positioning Masonicare at the forefront of a shift toward evidence-based, non-pharmacological innovation in memory care.

What This First Pilot Sets Up Next

This six-week pilot at Masonicare at Mystic was intentionally designed as a first, low-burden step: a way for leadership, staff, and families to see for themselves whether EVY LIGHT® could make a noticeable difference in daily life. It did.

Because of these results, Masonicare has:

- Chosen to purchase devices for all remaining residents in the Mystic memory care unit, and
- Begun planning a larger-scale follow-up project to track additional outcomes such as falls, emergency transfers, level-of-care changes, and long-term staff retention.

Those next-step projects will build on the same foundations as this pilot: simple routines, caregiver-centered assessments, and a focus on the outcomes that matter most to residents, families, and staff.

Bringing 40 Hz Therapy to Your Community

The evidence from Masonicare's pilot tells a clear story: 40 Hz therapy can improve resident quality of life, reduce staff burden, and create measurable differentiation for communities willing to lead. The question for other memory care organizations is not whether this science works. It is whether they will be among the first to offer it.

Optoceutics provides EVY LIGHT devices and implementation support to senior living and memory care communities ready to integrate 40 Hz therapy into their care environments. Optoceutics works with facility leadership to design an implementation approach that fits their operational model, resident population, and strategic goals.

- Flexible deployment: from targeted implementation to full community integration
- Staff onboarding and structured assessment frameworks included
- Dedicated support with a 24-hour response window

- Outcome reporting to support marketing, family engagement, and board presentations

For administrators and executive directors ready to explore what 40 Hz therapy could mean for their residents, families, and staff, the first step is a conversation.

Bring 40 Hz Therapy to Your Community

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Appendix: Statistical Summary

This section provides additional quantitative detail for readers seeking deeper context.

Key Statistical Findings

Measure	Result
Overall global improvement (Wk 6)	Mean: +0.54 (SD: 0.17)
Statistical significance (global)	Achieved at Week 3 ($p = 0.004$)
Effect size (Week 3)	Cohen's $d = 2.40$ (very large)
"Worse" assessments (Weeks 3–6)	0 of 180 assessments (0.0%)
Highest individual cumulative score	5.33 of 6.0 possible
Average staff burden reduction	+1.52 composite change on –2 to +2 scale ($p = 0.012$)
Residents with burden change of +1 or more	8 of 9 (88.9%)

Limitations

This was a single-site observational pilot with 10 participants and no control group. The caregiver assessment methodology, while ecologically valid and appropriate for this population, involves subjective judgment. Assessors were not blinded to the intervention. These findings should be interpreted as preliminary evidence supporting further investigation in larger, controlled studies. They do not establish causation.

A full technical analysis of this dataset, including detailed methods, progression plots, and domain-specific results, is available on request as "*Caregiver-Assessed Outcome Measures Demonstrate Multi-Domain Improvements: A Pilot Study at Masonicare (n=10).*"

EVY LIGHT® is a general wellness product manufactured by Optoceutics Inc. EVY is not a medical device and is not intended to diagnose, treat, cure, or prevent any disease or medical condition. Individual results may vary. The findings described in this whitepaper reflect the results of a specific pilot program and should not be generalized beyond this context without further research.

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