WHITE PAPER

Rooted in Care

The Biophilic Case for Senior Living Environments

Neuroscience, Clinical Evidence, and the Case for Evidence-Based Specification

Executive Summary



garden on the wall®

THE ART OF PRESERVED NATURE

gardenonthewall.com

©RMW Architecture & Interiors
Photography by Garrett Rowland

Executive Summary

The Design Question: Housing Residents vs. Serving Them

The United States senior living sector is at a demographic inflection point with no modern precedent. The oldest baby boomers turn 80 in 2026. Assisted living occupancy reached 87.2% nationally in Q3 2025, while new unit supply grew just 0.7%. [1] The incoming cohort carries wellness expectations that prior generations did not bring - and the peer-reviewed literature that once supported biophilic design as aspiration now supports it as clinical evidence.

Senior living residents spend over 90% of their time indoors, in environments whose every material and spatial decision participates in their cognitive trajectory, sleep quality, pain experience, emotional state, and social connection. The built environment is not a neutral container for care. It is part of the care - and randomized controlled trials now confirm it.

87.2%
Assisted living occupancy, Q3 2025 NIC / Leading Age 2026 [1]

3x
Cognitive gain: enriched garden vs. control, 6 months Bourdon & Belmin, 2021 [2]

1 in 4
Older adults socially isolated; mortality risk equal to tobacco WHO, 2025 [3]

9 wks
For nature-based group activities to reduce loneliness significantly Univ. of Helsinki RCT, 2026 [4]

Six Domains Where Nature Changes the Experience of Aging

The evidence spans six clinically meaningful outcome domains, each supported by randomized controlled trials, systematic reviews, or meta-analyses. The aging nervous system amplifies nature deprivation: diminished melatonin production, reduced directed attention capacity, lower pain thresholds, and weakened immune function each increase dependency on the restorative mechanisms that natural environments provide. Dementia changes but does not eliminate these responses - the amygdala retains emotional memory function in many subtypes.

Documented Outcomes in Aviation Environments

Cognitive Function & Dementia Enriched gardens: 3× MMSE cognitive gain vs. controls, improved ADL independence, reduced fall risk over 6 months. A 9-RCT meta-analysis (655 patients) confirmed horticultural therapy improves cognition, depression, and quality of life. [25]	**Mood & Emotional Well-Being** Serotonin, dopamine, and endorphin release with simultaneous cortisol reduction documented through nature exposure. Long-term care residents isolated during COVID-19 showed measurable anxiety and depression reductions via nature-simulating environments. [6]	**Circadian Regulation & Sleep** Dynamic daylight-simulating lighting RCT in a dementia care home: statistically significant improvements in positive affect, feeling at home, and rest-activity stability after 5–10 weeks - directly addressing sundowning syndrome. [7]
Social Connection & Loneliness Botanical installations in common areas function as social catalysts. University of Helsinki RCT: 9 weeks of nature-based activities reduced loneliness, improved sleep and memory in 319 care home residents, avg. age 83. [4]	**Physical Health & Pain** Ulrich (1984): nature views reduced narcotic pain medication requirements and shortened hospital stays. Botanical presence has documented potential to increase pain thresholds and reduce analgesic need in aging populations. [8]	**Staff Retention** Biophilic design attributes in hospice and care settings significantly predicted caregiver emotional well-being and workplace attachment (2024). In a sector with 50%+ annual staff turnover, design quality is a staffing strategy expressed in square footage. [9]

Findings synthesized from peer-reviewed research. Superscript numbers reference citations in the full white paper. [1] NIC/LeadingAge EPIC 2026. [2] Bourdon & Belmin, Alzheimer's Research and Therapy (2021). [3] WHO (2025). [4] Pitkälä et al., Age and Ageing (2026). [5] Journal of Clinical Nursing systematic review (2024). [6] PMC8493949. [7] JMIR mHealth (2024). [8] Ulrich, Science (1984). [9] Untaru et al., Environment and Behavior (2024).

Documented Research Outcomes

Outcome	Source/Context
3× greater cognitive improvement	Enriched garden vs. standard care; MMSE gains, ADL improvement, reduced fall risk over 6 months; Bourdon & Belmin, Alzheimer's Research and Therapy (2021) [2]
Loneliness significantly reduced in 9 weeks	319 care home residents, avg. age 83; nature-based group activities; University of Helsinki / RECETAS RCT, Age and Ageing (2026) [4]
Circadian stability & mood improvement	Dynamic daylight-simulating luminaire RCT; significant positive affect, social isolation, and rest-activity gains; JMIR mHealth (2024) [7]
1.2 years cognitively younger	Women in greener residential areas vs. lower-green; NIA-funded study, JAMA Network Open [10]
Reduced pain medication requirement	Nature views vs. no nature; Ulrich (1984); Perkins Eastman senior living research [8]
Caregiver well-being & workplace attachment	Biophilic design attributes in hospice and care settings; Environment and Behavior (2024) [9]

The Specification Answer: Comparing the Options for Senior Living

Criterion	Living Plants & Walls	Artificial/Faux	Preserved Botanical Systems
Biophilic Benefit	✓Authentic - when maintained	x None - no neurological activation[11]	✓Authentic - same neurological pathways
Infection/Allergen Risk	x Soil pathogens, pollen risk in immunocompromised	x VOC off-gassing; electrostatic allergen buildup	✓No soil, no VOCs - CDPH 01350 certified
Fire Rating (full systems)	x Variable; species-dependent	x Many products untested at system level	✓ASTM E84 Class A - whole system
Maintenance Burden	x 8–12% of install cost/yr; conflicts care scheduling	Minimal - regular dusting required	✓ Zero - no irrigation, pruning, or scheduling
Memory Care Suitability	Moderate - constraints in high-acuity settings	x No clinical benefit; petroleum-derived materials	✓Non-toxic, allergen-free - all care levels
Lifecycle	x Variable; mortality-dependent	x 6-8 years	✓20+ years documented field performance

Garden on the Wall® - The Only Fully Verified Option

Garden on the Wall® is the pioneer and leader in preserved garden, moss wall, planter insert, and preserved draping foliage installations for commercial interiors - trusted by Google, Microsoft, Amazon, Mayo Clinic, Memorial Sloan Kettering, Hilton, Marriott, and hundreds of others. With 1,900+ installations across 186,000+ square feet and 60+ Fortune 500 clients, Garden on the Wall® is the only preserved garden provider in the world with a published EPD (Environmental Product Declaration) with complete lifecycle environmental impact data, as of 2026.

7-year Warranty
Healthcare-grade performance guarantee

20+ yr Lifecycle
Lowest total cost of ownership

Zero Maintenance
No water, light, or care required

Full Verification
Complete third-party certification stack

Complete Third-Party Verification Stack
ASTM E84 Class A (whole system, without fire retardants) | HPD v2.3 full ingredient disclosure (100 ppm) | Cradle-to-grave EPD with negative cradle-to-gate embodied carbon | CDPH Section 01350 VOC compliance | Declare Label Red List Free | ASTM D6866 100% bio-based | AIA Materials Pledge signatory

Download the full white paper with complete research citations, detailed ROI calculations, and implementation guidance at gardenonthewall.com. Request samples through Material Bank · CEU available through Architectural Record's Continuing Education Center (AIA/IDCEC/GBCI accredited)