

Mobile Green Design in Palliative Care

How can a mobile living wall improve well-being and emotional health in palliative care settings?

Katie Appel

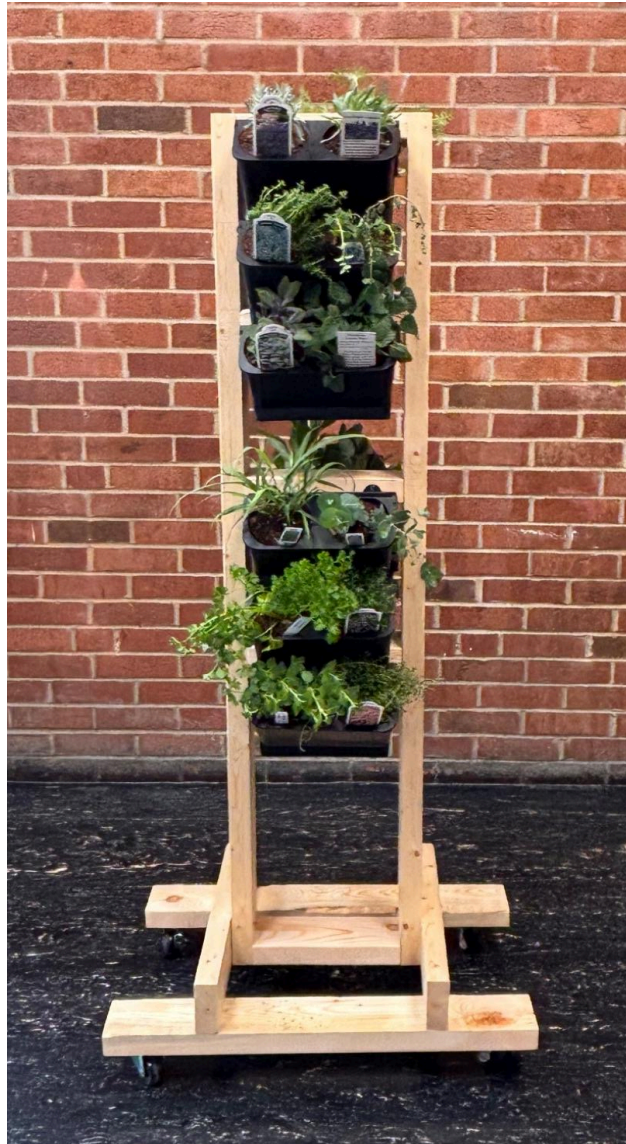


Figure 1 (Appel, Katie. April 11,2025.)



How can a mobile living wall improve well-being and emotional health in palliative care settings?



Figure 2 Patty Appel drinking tea (Appel, Stephen. August, 1987.)

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STUDENT PROFILE

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"Love is how you stay alive, even after you are gone." Mitch Albom, *Tuesdays With Morrie*



Figure 3 (Biren, Joshua. September 6, 2024.)

RELEVANT EXPERIENCE

PIPKIN'S GARDEN CENTER, SINCE SUMMER 2020

LOCAL CINCINNATI GARDEN CENTER THAT SPECIALIZES IN ANNUALS, PERENNIALS, AND HOUSE PLANTS FOUNDED BY STEVE PIPKIN

GREEN CITY RESOURCES, SINCE SPRING 2024

LOCAL CINCINNATI GREEN ROOF COMPANY FOUNDED BY ROSE SEEGER

UNIVERSITY OF CINCINNATI COURSES

HORT 4092 - SENIOR PROJECT IN HORTICULTURE, SPRING 2025

NOTABLE PROJECTS:

SENIOR CAPSTONE

HORT 2031 - WOODY ORNAMENTALS II, SPRING 2025, PROFESSOR STEVE FOLTZ

NOTABLE PROJECTS:

100+ PLANT IDENTIFICATION AND MEMORIZATION VIA WEEKLY QUIZZES

HORT 2041 SUSTAINABLE LANDSCAPE DESIGN II, SPRING 2025, PROFESSOR HYE YEON PARK, Ph.D. MLA

HORT 3042 URBAN LANDSCAPE AGRICULTURE II, FALL 2024, PROFESSOR HYE YEON PARK, Ph.D. MLA AND PROFESSOR BRIAN GRUBB

NOTABLE PROJECTS:

BEARCAT PANTRY GARDEN DESIGN

HORT 2033 HERBACEOUS ORNAMENTALS II, SUMMER 2024, PROFESSOR JIM HANSEL M. En

NOTABLE PROJECTS:

DIEFENBACHER TRIAL BED DESIGN

EXCEL SHEET OF 100+ HERBACEOUS PLANTS AND IDENTIFYING CHARACTERISTICS

HORT 3044 URBAN LANDSCAPES IV GREEN ROOFS AND FACADES, SPRING 2024, PROFESSOR ROSE SEEGER GRP, LEED AP BD&C, ARCSA AP AND PROFESSOR WENDY ELLIS, MLA, GRP

NOTABLE PROJECTS:

GREEN ROOF DESIGN ON SYCAMORE HIGH SCHOOL

HORT 1011 HORT SCIENCE II, SPRING 2023, PROFESSOR JIM HANSEL

HORT 1010 HORT SCIENCE I, SPRING 2022, PROFESSOR BRIAN GRUBB

HORT 3045 URBAN LANDSCAPES V: INTERIORS, SPRING 2022, PROFESSOR FREDERICK LUTT
MLA

NOTABLE PROJECTS:

THREE URBAN INTERIOR LANDSCAPE DESIGNS

ABSTRACT

This project explores the benefits of a calming mobile living wall in improving the well-being and emotional health of individuals with ALS in palliative care settings and those close to them. “ALS, or amyotrophic lateral sclerosis, is a progressive neurodegenerative disease that affects nerve cells in the brain and spinal cord. There is no cure for ALS yet” (The ALS Association, 1998). Palliative care prioritizes enhancing the quality of life for patients with serious illnesses, and the environment plays a crucial role in emotional and psychological health. Biophilic design, which integrates natural elements into built environments, has been shown to reduce stress, lower blood pressure, and promote a sense of calmness (Huntsman & Bulaj, 2022). Green walls, as a form of biophilic intervention, are being used more in healthcare settings; however, little research has specifically addressed the impact of mobile living walls in palliative care spaces.

This capstone evaluates the benefits that a mobile green wall can have as a flexible approach to enhancing patient well-being. By introducing green design in a way that can be adapted to various spaces within a care facility, the research explores its potential to alleviate stress and anxiety among patients. The capstone helps move towards a better understanding of how mobile green walls influence mood and stress levels, as well as insights into their feasibility in palliative care environments.

KEY WORDS

AMYOTROPHIC LATERAL SCLEROSIS (ALS) - a “progressive neurodegenerative disease ALS, or amyotrophic lateral sclerosis, is a progressive neurodegenerative disease that affects nerve cells in the brain and spinal cord” (The ALS Association, 1998).

GREEN DESIGN - “Green design can be differentiated from sustainable design because of its short-term approach to environmental protection. The green design process is optimized to minimize negative impacts without exhausting resources available in the natural environment. The sustainable design process is more directed toward building a better future for the next generations” (Larsen Engineers, 2020).

GREEN INTERIOR DESIGN - There are three fundamental principles to “green” interior design: energy efficiency, resource conservation, and health (Design Institute of San Diego, 2020).

PALLIATIVE CARE - Palliative care and hospice care both focus on the comfort, care, and quality of life of individuals with a serious illness (National Institute on Aging, 2021).

HORTICULTURE THERAPY - Horticultural therapy has been defined as the use of plants and plant-based activity for the purpose of human healing and rehabilitation." (Rutgers, n.d.); Horticultural therapy helps improve memory, cognitive abilities, task initiation, language skills, and socialization (American Horticultural Therapy Association, 1997).

PROJECT STATEMENT

How can a mobile living wall improve the well-being and emotional health of patients with ALS in palliative care settings?



Figure 4 *Organic Wall Art*, bostan.com.sa/en/collections/organic-wall-art. Accessed 13 Apr. 2025.

PROJECT JUSTIFICATION

This project is important to me because my grandma, Patty Appel, was diagnosed with ALS in January of 2025. She introduced me to the world of horticulture at the age of two and has made a lasting impact on my life. I spent a lot of time with my grandmother before I started school and during summer breaks with the majority of it being spent outdoors. Whether we were weeding, planting, or simply enjoying the garden, those moments became the foundation of my love for plants. As I grew older, I initially pursued a degree for industrial design, but during my second year at college, I discovered horticulture, a field I had not known existed by name. Inspired by my grandmother's influence, I switched majors, and embraced a path that had been quietly shaping me all along.



Figure 5 Picture of Katie Appel with grandmother, Patty Appel, on Halloween night (Appel, Susan. October 31, 2005.)

Palliative care environments for individuals with ALS often prioritize pain management and medical treatment because current “treatment options are limited and management is based mostly on symptom control and quality of life optimization” (Gouveia, et al. 2023), but the emotional and psychological well-being of patients is also critical. As ALS progresses, patients face increased physical limitations, communication barriers, and emotional distress, making their surroundings an essential factor in their overall quality of life. Research has shown that biophilic design—integrating living green elements into built spaces—can reduce stress, promote relaxation, and improve mood (Huntsman & Bulaj, 2022). However, current palliative care environments often lack access to nature, especially for patients with mobility restrictions (Zadeh et al., 2017). A mobile living wall offers a flexible, cost-effective, and adaptable solution to this issue, allowing patients to experience the benefits of nature in a controlled and accessible way.

This capstone combines my passions for horticulture and healthcare to create a tangible, real-world solution. Through my work with Special Olympics Gymnastics since 2017 and as a caregiver for dementia patients since 2022, I’ve seen firsthand how environmental design enhances well-being. Thoughtfully designed spaces help promote engagement, reduce anxiety, and improve quality of life. By introducing a mobile living wall into a skilled nursing facility, this capstone solution creates a calming, adaptable space that supports both patients and caregivers, demonstrating the significant beneficial role of horticulture in healthcare.

USER DESCRIPTION

This project is designed for primarily patients with ALS, serious health issues, or other terminal illnesses who are in palliative care settings, including my grandmother. The

secondary users include family and visitors of the patient and palliative care staff.

There are unique components of this design - including designing for different stages of ALS, which affects their mobility, communication, and sensory experiences. Depending on the stage, people with ALS have limited or no ability to move independently, which creates an accessibility-focused design. The majority of patients have some kind of emotional distress and anxiety, therefore making a calming and stress-reducing environment critical. Other physical restrictions of people with ALS include: paralysis, muscle weakness, and respiratory challenges (The ALS Association, 1998). This affects their ability to care for the green design.

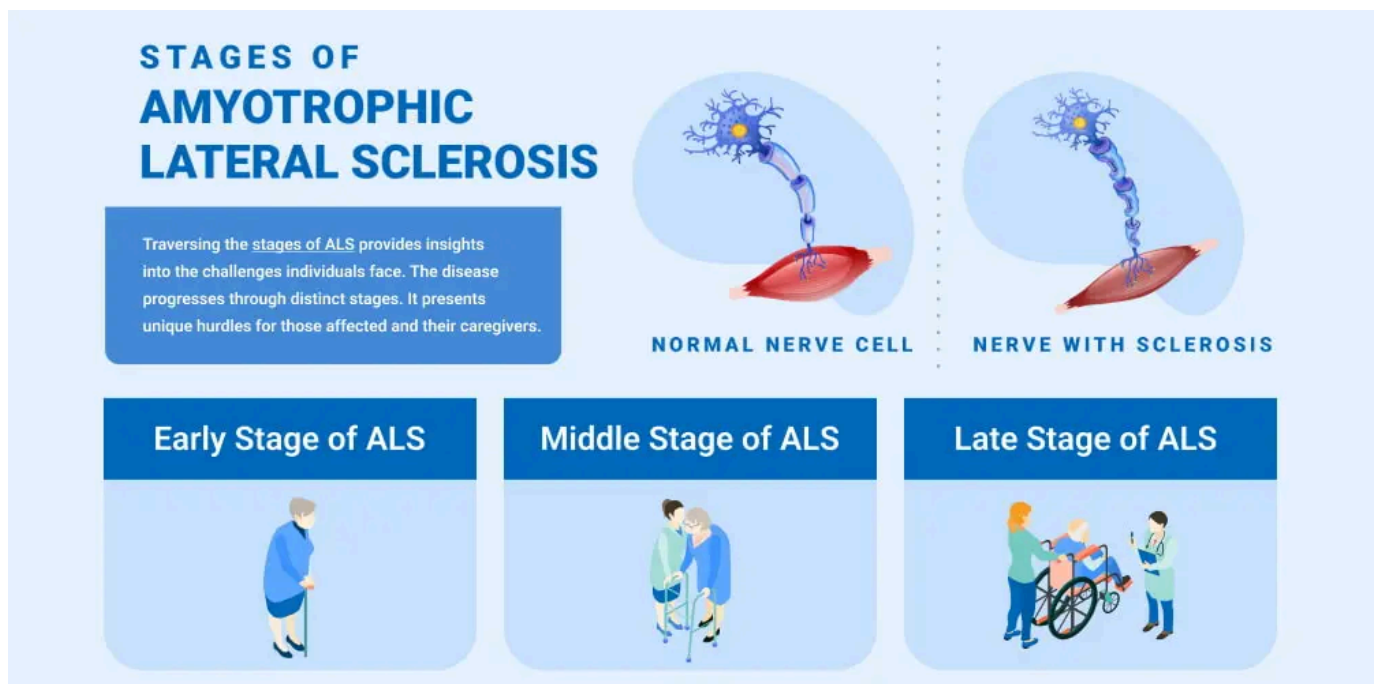


Figure 6. Stages of Amyotrophic Lateral Sclerosis [Graphic]. (Lone Star Neurology, n.d.).

Secondary users: visitors, including immediate family and close friends, seek a comforting environment to spend time with their loved ones. These users may be the caretakers of the green design. Emotional well-being is also a concern for family members coping with the stress of caregiving and anticipatory grief. Tertiary users: palliative care staff members, doctors, nurses, therapists, aides, will interact with the mobile living wall in passing, but it may also serve as a space for calmness in the workplace. Maintenance and spacing considerations are essential, ensuring the structure does not interfere with medical equipment or workflows. Therefore mobility of the green design structure is important.

U.S. Employment in Nursing Homes, May 2020

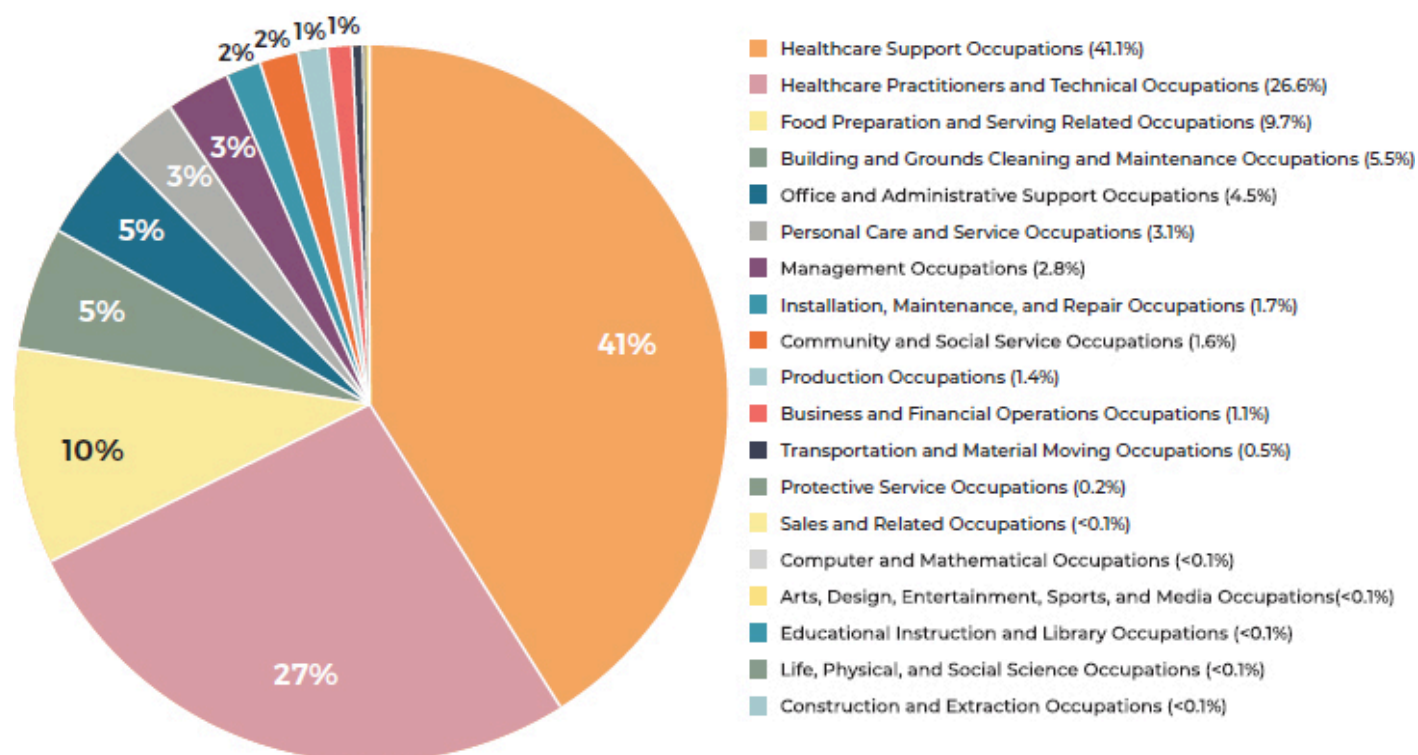


Figure 7 “The national imperative to improve nursing home quality: Honoring our commitment to residents, families, and staff” at [nap.edu](https://nap.nationalacademies.org/read/26526/chapter/7). 5 The Nursing Home Workforce | The National Imperative to Improve Nursing Home Quality: Honoring Our Commitment to Residents, Families, and Staff | The National Academies Press. (n.d.). <https://nap.nationalacademies.org/read/26526/chapter/7>

MAJOR PROJECT ELEMENTS

Interior Mobile Green Design Structure: The structure is a self-contained, mobile living wall system that integrates lighting, electricity, and water to support plant life indoors. Its mobility ensures it can be placed in different areas of a skilled nursing unit, adapting to changing patient needs and spatial constraints. The design is for low maintenance and ease of use, allowing both caregivers and patients to interact with it effectively.

Interior Green Design for People with Different Physical Abilities: This structure is designed with accessibility as a key function, making it adaptable for individuals with varying levels of mobility and dexterity.

Features include:

- Option to add another vertical layer to increase length
- Ergonomic planters for individuals with limited hand strength
- Sensory-friendly elements for individuals with varying cognitive conditions such as dementia
- Automated watering and lighting system to provide consistent plant care but reduce the amount of manual care



Figure 8. Mobile Living Wall [Picture]. (Ginkgo Sustainability, n.d.).
<https://ginkgo-walls.myshopify.com/products/mobile-living-wall?variant=33255817347125>

Focus on Scent, Memory, and Sensory Experiences: Horticultural therapy has therapeutic benefits, particularly for individuals with cognitive impairments such as dementia and Alzheimer's disease. The structure incorporates plants that:

- Sensory stimulation: Touch, smell, sight, and taste
- Cognitive engagement: Interaction, growing, tasting
- Memory stimulation: Lavender, rosemary, basil
- Calming atmosphere: Natural elements, scents

Adaptable Horticultural Therapy for Changing Physical Needs: The mobile living wall is designed to evolve with patients' changing physical abilities, ensuring continuous engagement rather than cessation. This adaptability integrates horticultural therapy at various levels to support physical, cognitive, and emotional well-being throughout aging and illness.

- Early-Stage Engagement (Building & Planting): Patients actively construct, plant, and design the system, fostering a sense of purpose and creativity.
- Middle-Stage Engagement (Guided Maintenance): With some caregiver assistance, patients continue participating in watering, trimming, and tending to the plants in a simplified, structured manner.
- Late-Stage Engagement (Sensory Experience): As abilities decline, the structure becomes a sensory tool, allowing patients to engage through sight, touch, and smell. This stage fosters a sense of achievement, especially for those who contributed to its creation.

By integrating horticultural therapy into each stage, the mobile living wall remains a therapeutic and meaningful tool, adapting to patients' evolving needs and enhancing their quality of life.

TOPIC INFORMATION

This research is significant as it addresses the growing need for sustainable and patient-centered healthcare design. By focusing on emotional and psychological well-being in palliative care settings, this capstone contributes to the broader discussion on how environmental interventions can improve quality of life for individuals facing end-of-life conditions. This project aligns with the societal shifts toward integrating nature into healthcare, providing greater support to primarily the patient's well-being as well as for those close to and caring for the patient. By studying the application and benefits of mobile green walls, this project supports patients in vulnerable conditions and is both professionally and personally meaningful.

This research contributes to a growing body of work advocating for nature-infused care strategies, recognizing that a patient's emotional and psychological state is just as important as their physical condition in palliative settings.

Figure 9 *Green facade*

Radiotherapy Center

Recklinghausen

Sempergreen. (n.d.). *Green facade Radiotherapy Center Recklinghausen* [Photograph]. Sempergreen. Retrieved from



<https://sempergreenwall.com/projects/green-facade-radiotherapy-center-recklinghausen/>

Green Design for People in Palliative Care with Changing Needs: Palliative care provides comfort and quality of life for individuals facing serious, life-limiting illnesses, including terminally ill patients, ALS patients, and those recovering or stabilizing from critical conditions. This project integrates interior green design to enhance their physical and emotional well-being by incorporating nature into their care environment.

Understanding Palliative Care and Its Unique Needs: Palliative care is an umbrella term and includes not just end-of-life care, but also supports individuals who may experience fluctuating health conditions or gradual decline. Patients in this setting may have:

- Progressive diseases (e.g., ALS, dementia, cancer)
- Chronic conditions requiring long-term symptom management
- Recovering conditions where exposure to nature can enhance stress reduction and rehabilitation

Integrating Healthcare and Green Design: This project aligns with societal shifts emphasizing biophilic design in healthcare, reinforcing the concept that nature is a crucial component of healing (National Library of Medicine, 2007). While most medical treatments focus on physical symptoms, exposure to green environments has been shown to:

- Reduce anxiety and depression in patients and caregivers
- Enhance cognitive function in individuals with neurodegenerative conditions
- Improve air quality and overall indoor comfort
- Create a sense of peace, familiarity, and normalcy in sterile medical environments

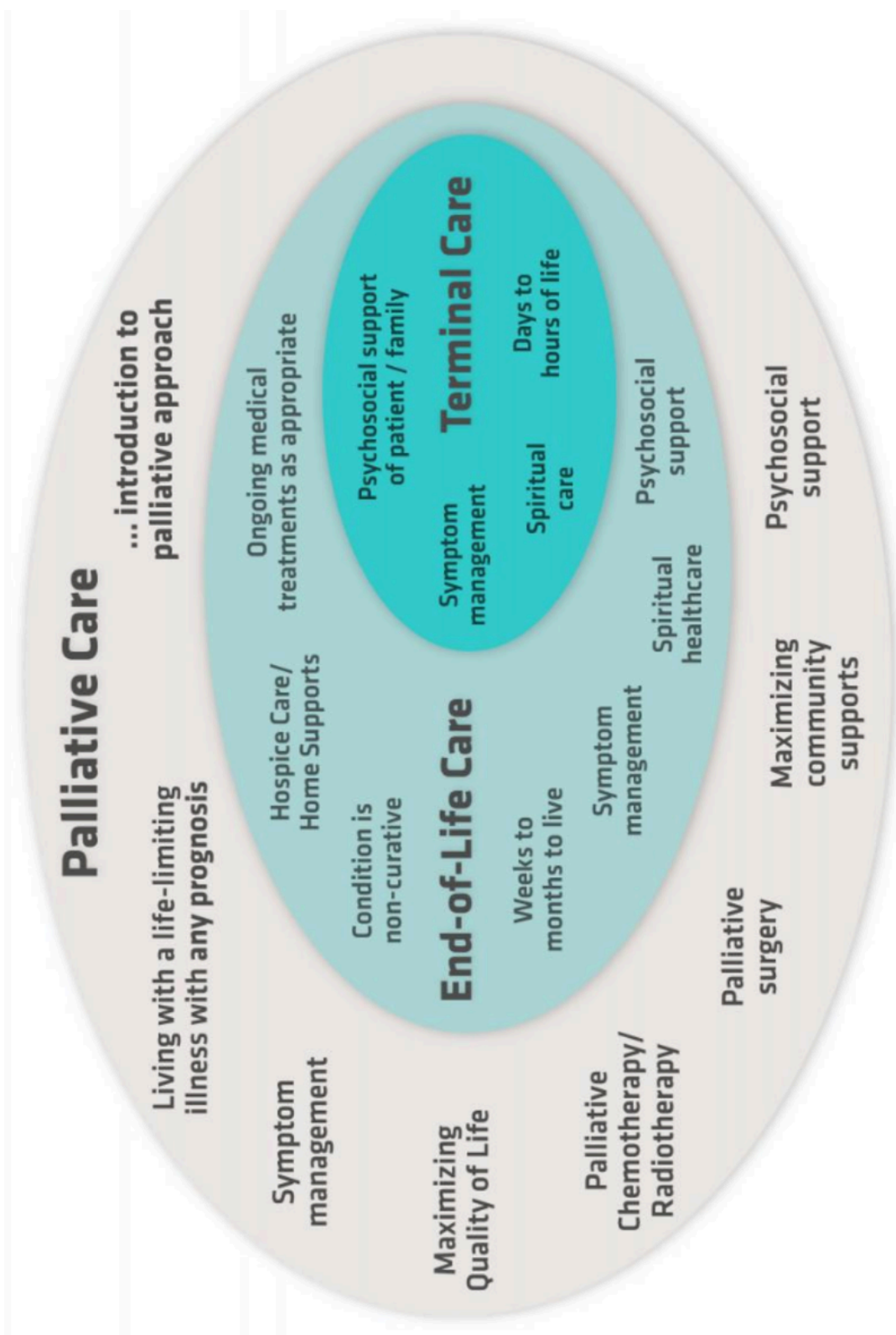


Figure 10 Palliative care graphic. (n.d.). Providence Healthcare. Retrieved from <https://www.providencehealthcare.org/en/health-services/services/health-support-services/hospice-palliative-care>

The goal of incorporating green design into palliative care is to create an adaptable, therapeutic environment that brings comfort, emotional connection, and sensory engagement tailored to the patient's condition and prognosis. Exposure to green design and the therapeutic benefits of integrating plants and green spaces into palliative care settings provides several proven health benefits, which include:

- Emotional support: Nature has a calming effect, reducing stress, anxiety, and depression
- Memory stimulation: Sensory engagement with plants can help patients with cognitive decline reconnect with past experiences
- Physical interaction: Patients with some mobility can engage in horticultural therapy, creating a sense of purpose and routine
- Visual and sensory stimulation: Even patients with severe physical limitations can enjoy the beauty, scent, and textures of plants, improving their overall experience

Figure 11 Accessible outdoor sensory space

Fallon, H. (2024, April 2). Conservancy takes next steps to construct Frick Park Outdoor Sensory Classroom. *Pittsburgh Union Progress*. Published by striking workers at the Pittsburgh Post-Gazette.
<https://www.unionprogress.com>



Time Frame Considerations: Palliative care is unique in that time frames vary based on patient conditions. This project carefully considers how long a patient may remain in care and how their physical and cognitive abilities might evolve over that period. The selection of plants and design elements is therefore:

- Dynamic for short-term stays, ensuring immediate sensory and aesthetic benefits
- Adaptive for long-term stays, allowing for seasonal or growth-based interactions
- Low-maintenance and therapeutic, supporting patients and caregivers without adding extra workload to medical staff

Working with a Time Frame in Mind: Plant Selection Based on Prognosis - The design of the interior green space is influenced by the expected duration of a patient's time in palliative care. Plant choices are selected based on growth rate, maintenance needs, and level of interaction they allow for:

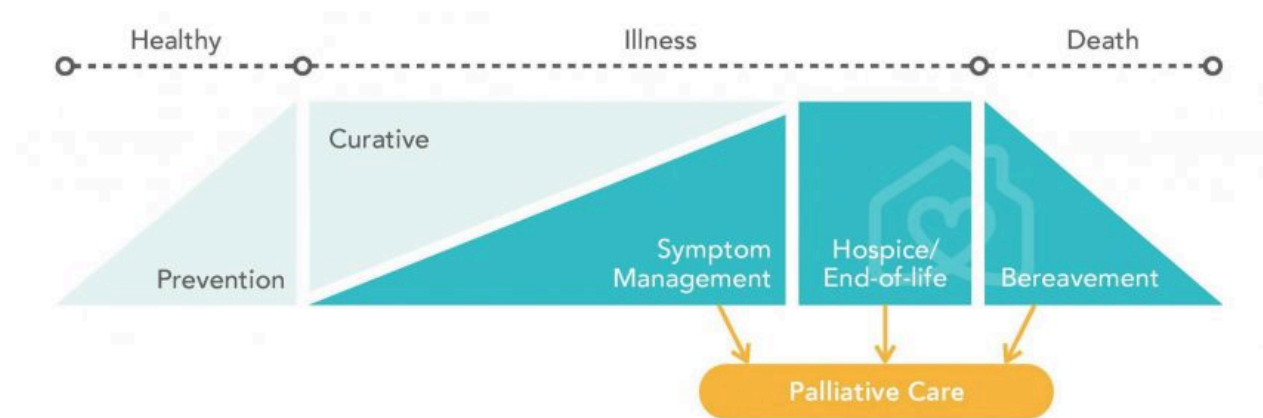


Figure 12. Palliative Care Timeline

Homage. (n.d.). *Palliative Care Timeline* [Graphic]. Homage. Retrieved from <https://www.homage.sg/health/palliative-care/>

1. Short-Term Palliative Care (weeks to months)

- Patients may have advanced terminal conditions with limited mobility
- Plants should require minimal maintenance and offer immediate sensory benefits
- Best plant choices:
 - Fragrant plants (lavender, mint) for aromatherapy
 - Low-maintenance flowering plants (Pothos, orchids) for visual appeal
 - Plants that are already established

2. Medium-Term Palliative Care (months to a year)

- Patients may experience a gradual decline or stabilization for a period
- Plants can be moderately interactive and provide longer-term sensory engagement
- Best plant choices:
 - Small indoor herbs (basil, rosemary) for tactile and olfactory stimulation
 - Compact vegetable plants (cherry tomatoes, lettuce) for horticultural therapy
 - Peace lilies and ZZ plants for air purification and stress reduction

3. Long-Term Palliative Care (multiple years)

- Patients have chronic conditions requiring long-term comfort and gradual engagement
- Plants should be durable, adaptable, and able to grow with the patient's needs
- Best plant choices:
 - Larger, slow-growing plants (snake plant, ZZ plant) for low-maintenance greenery
 - Bonsai trees or succulents for interactive care over time
 - Climbing plants (pothos, ivy) for a living, evolving green space

Adapting Green Design to Patient Needs - The interior green design is structured to evolve as patients' conditions change:

- For active engagement: Patients in earlier stages can participate in planting and tending
- For passive enjoyment: As mobility declines, plants are positioned for easy viewing, scent, and touch
- For non-verbal interaction: Patients in later stages benefit from exposure to nature-inspired visuals, sounds, and scents



Figure 1 Senior in an assisted care facility plants mobile living wall planters with assistance as a form of horticulture therapy.



Figure 2 Senior in an assisted care facility waters and tends to the mobile living wall planters as a form of horticulture therapy.



Figure 3 Senior in assisted care facility enjoys the mobile living wall as a form of horticulture therapy.

Figure 1 Services, L. S. (2024, June 25). *Horticulture therapy blossoms at LSS*. LinkedIn. <https://www.linkedin.com/pulse/horticulture-therapy-blossoms-lss-lutheranseniorservices-vedac>

Figure 2 Admin. (2024, July 11). *Benefits of horticulture therapy for dementia patients*. Terra Vista of Oakbrook Terrace. <https://www.terravista.org/blog/4-benefits-of-performing-horticultural-therapy-for-dementia/>

Figure 3 *Therapeutic horticulture*. Denver Botanic Gardens. (n.d.-a). <https://www.botanicgardens.org/our-impact/therapeutic-horticulture>

SITE INFORMATION

Patty Appel's Room | Mason Christian Village Skilled Nursing Unit

Key Considerations for Green Design

1. Types of Spaces & Needs: A successful interior green design must integrate seamlessly into the existing space while being functional for both Patty and her caregivers. Important factors include:
 - Space Utilization: The mobile living wall should be compact yet impactful, allowing easy access without obstructing movement for staff and visitors.
 - Accessibility: The plants should be positioned at a height and location where they can be easily seen, smelled, and touched, even from a seated or reclined position.
 - Water Access: The bathroom in the room is available for use, but is not able to be used by the patient - plant selections should favor low-maintenance, water-efficient species or a self-watering system.

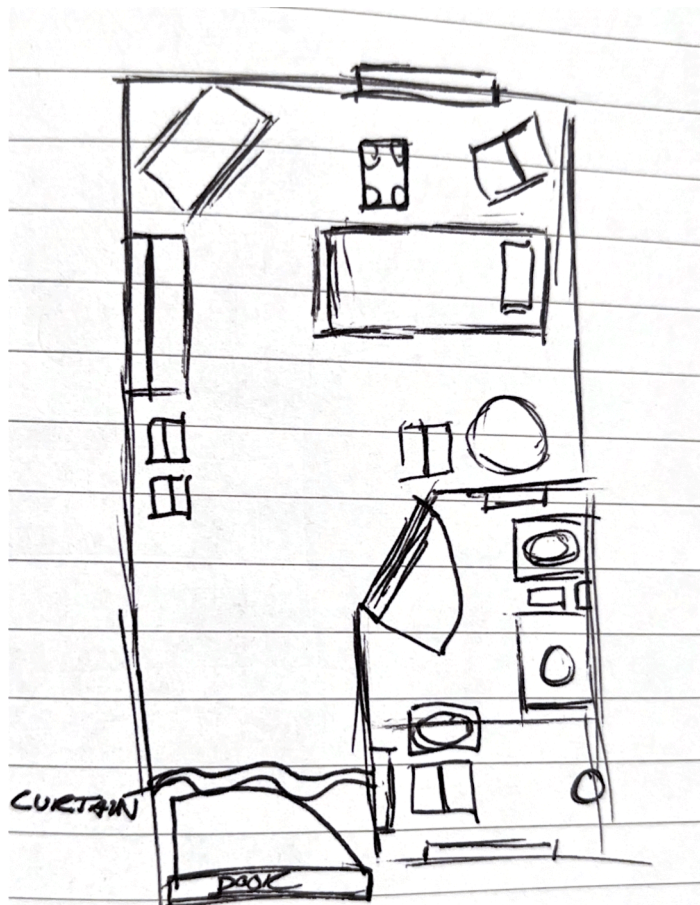


Figure 14 Sketch of main users room layout (Appel, Katie. April 14, 2025.)

2. Caretakers & Family Involvement

- Care Workers: Staff should not have additional plant care responsibilities, meaning the plants should be either low maintenance or require minimal maintenance.
- Family: If family members visit frequently, they may be able to help with watering or light maintenance, making interactive plants an option.



Figure 15

Senior's Guide. (n.d.). *The Christian Village at Mason* [Photograph]. Senior's Guide. Retrieved from <https://www.seniorguide.com/retirement-communities/profile/the-christian-village-at-mason/>

INVENTORY AND ANALYSIS

Palliative Care Design Considerations

1. Interior Room Constraints & Design Implementation: The design must work within the spatial and functional constraints of a skilled nursing unit. The following factors must be considered:

- Room Size & Layout: The 15 x 20 ft room includes furniture such as a bed, recliner, dressers, table, and TV, limiting available space for large-scale green structures.
- Integration with Existing Features: The design should not obstruct movement or interfere with medical equipment, emergency access, or caregiver duties.
- Mobile & Modular Design: Since space is limited, a compact and adjustable green structure is ideal. A vertical garden, rolling planter, or hanging system could allow for flexibility and easy repositioning.

2. Accessibility Considerations: For patients in palliative care, accessibility is key.

Design features should prioritize:

- Height & Positioning: Plants should be visible and reachable from a seated or bedridden position, ideally at a maximum of 60 inches for ease of interaction.
- Ease of Interaction: Patients with limited mobility should be able to engage with the plants through visual, olfactory, or tactile experiences. Raised planters, hanging baskets, or tabletop gardens could be used to meet different needs.
- Hands-Free Enjoyment: Patients with severe mobility restrictions should still experience the benefits of the green design through sensory-rich plant selections.

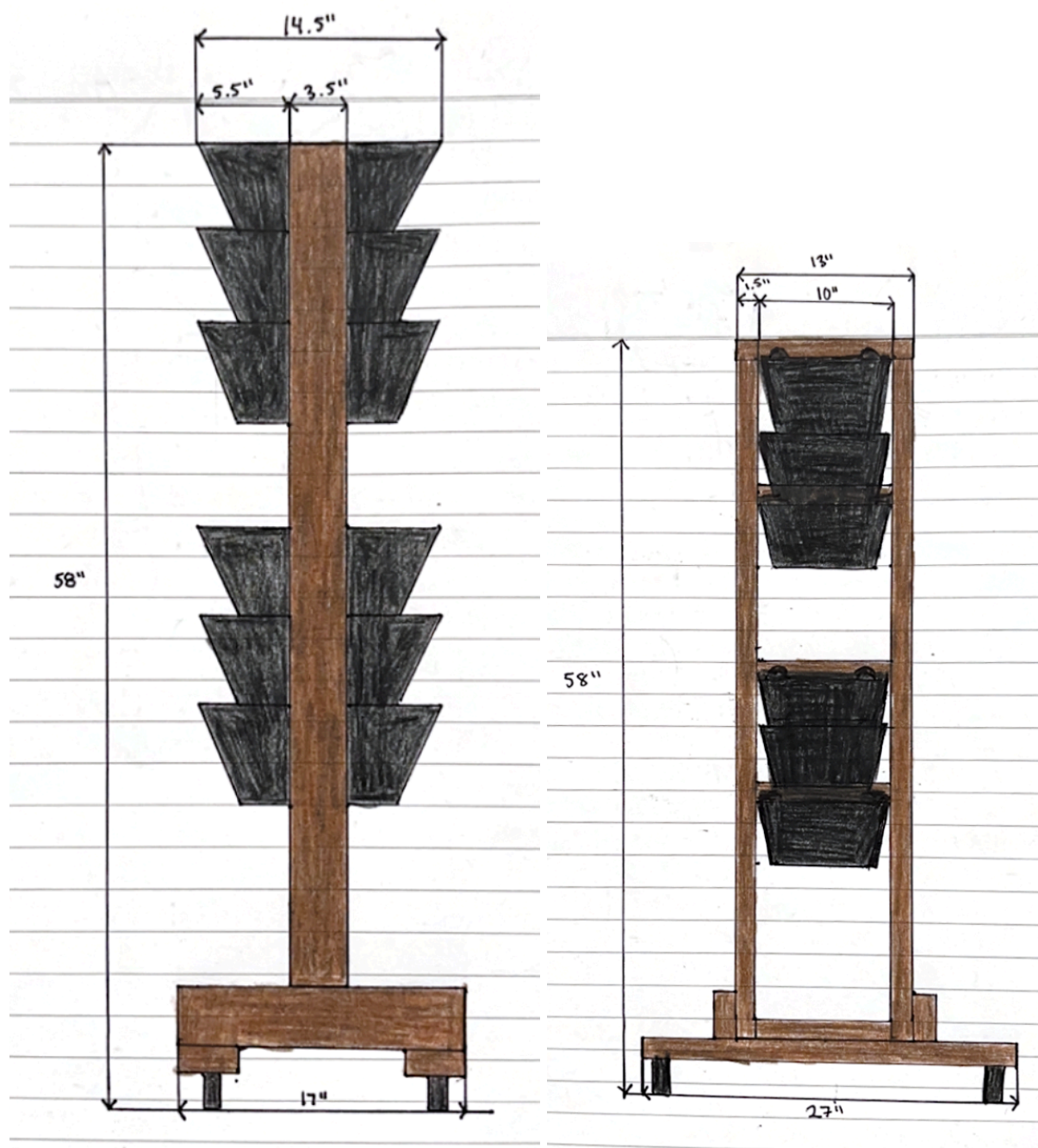


Figure 16 Mobile Living Wall Dimensions. Hand drawn by Appel, Katie. April 16, 2025

3. Lighting Challenges & Solutions

- North-Facing Window Limitations: The lack of direct sunlight restricts the types of plants that can thrive without additional artificial lighting.
- Main user, the patient, prefers the window closed with the shade down at all times.
- Artificial Lighting Needs:
 - o Full-Spectrum LED Grow Lights: Mimic natural daylight and promote plant health.
 - o Soft, Warm-Toned Lighting: Enhances ambiance and reduces harsh hospital-like brightness.
 - o Motion-Activated or Timer-Controlled Lights: Minimize caregiver intervention while ensuring consistent exposure.

4. User Experience & Multi-Benefit Design: The green design should accommodate all individuals interacting with the space:

- Patient: Provides sensory stimulation, emotional comfort, and a connection to nature.
- Family & Friends: Offers a welcoming and soothing presence during visits.
- Caregivers & Healthcare Staff: Enhances the overall care environment, improves air quality, and requires minimal maintenance.



Figure 17 Tending to living wall

Homns. (n.d.). *Living Air: Green Walls Active Planting System*. YouTube.

<https://www.youtube.com/watch?v=5uv2lbQB94w>

5. Given the north-facing window, artificial lighting will be necessary for optimal plant growth. The best plant choices include those that thrive in low-light conditions, improve air quality, and provide sensory benefits.

Plant Selection & Design for Palliative Care: Different types of plants serve specific therapeutic and aesthetic purposes. Fast-Growing & Dynamic Plants (*For patients with limited time or changing needs*)

- Microgreens (e.g., wheatgrass, basil, radish sprouts): Grow quickly, allowing patients to see progress over days.
- Herbs (e.g., mint, thyme, rosemary): Provide scent-based stimulation and mild interaction for those who can touch or tend to plants.
- Philodendron & Pothos: Rapid-growing vining plants that can be trained along a trellis or hanging structure, offering an evolving landscape.

Low-Maintenance, Long-Term Plants (*For extended palliative care stays*)

- Snake Plant (Sansevieria): Thrives in low light, purifies air, and requires little watering.
- ZZ Plant (Zamioculcas zamiifolia): Nearly indestructible, handles low light, and maintains a structured appearance.
- Peace Lily (Spathiphyllum): Filters air pollutants, produces white flowers, and thrives in shade.

Sensory & Therapeutic Plants (*For cognitive stimulation and comfort*)

- Lavender & Chamomile: Calming fragrance, ideal for relaxation and stress relief.
- Jasmine & Gardenia: Pleasant scent known to promote better sleep and mental clarity.
- Aloe Vera: Tactile engagement, cooling gel, and minimal upkeep.

Interactive & Change-Oriented Plants (*For engaging patients in the care process when possible*)

- Succulents & Air Plants: Easy to touch, low-water needs, adaptable to tabletop gardens.
- Bonsai or Miniature Trees: Can be shaped and cared for over time, offering a longer-term engagement option.
- Hydroponic or Water-Based Plants (e.g., Lucky Bamboo, Pothos in water): Minimal soil mess, interactive with light pruning or arrangement.

6. Design Implementation Strategy

- Vertical Garden: Mounted plant panels or hanging baskets allow for plant exposure without taking up floor space.
- Rolling Green Cart: A mobile unit that can be repositioned for better patient access.
- Vertical Sensory Garden: A collection of fragrant and texturally interesting plants.



Figure 18 LiveWall. (n.d.). *LiveScreen* [Photograph]. LiveWall. Retrieved from <https://livewall.com/products/livescreen/>

7. Adaptability for Changing Conditions: As patient needs evolve, the green design must remain functional:

- Short-Term Patients (Weeks to Months): Fast-growing, visually engaging plants with immediate sensory benefits.
- Medium-Term Patients (Months to a Year): A mix of low-maintenance greenery and interactive elements.
- Long-Term Patients (Multiple Years): Durable plants with consistent care needs, offering stability in their environment.

QUANTITATIVE AND QUALITATIVE ASSESSMENT

Dimensions:

- The room is 15 feet long by 24 feet wide, providing a total area of 360 square feet. This size is relatively modest for a skilled nursing room, making efficient use of the available space crucial.

Bathroom:

- The bathroom is 8 feet long by 10 feet wide and placed in a corner of the room. This is a functional layout that allows for easy access but uses up significant space. Its total area is 80 square feet, which leaves the remaining 280 square feet for the living and medical space.



Figure 19 Picture of main users in-room bathroom
(Appel, Katie. February 19, 2025.)

Furniture:

- Hospital bed (twin-size): This essential piece of furniture will take up about 3-4 feet in width and 6-7 feet in length.
- Recliner by the window, which can serve as a secondary seating area.

- Round table with two standard chairs: This piece of furniture could easily be 3-4 feet in diameter.
- TV on the wall: Mounted to optimize space, but it still needs to be accessible from the bed and seating areas by remote control.
- Rolling tray table: Provides flexibility, but needs to be stowed away when not in use to preserve space.
- Two dressers: The large one is 8 feet tall and 2 feet deep, while the smaller one is 3.5 feet tall and also 2 feet deep. These dressers take up vertical space and could be optimized by using wall-mounted storage.

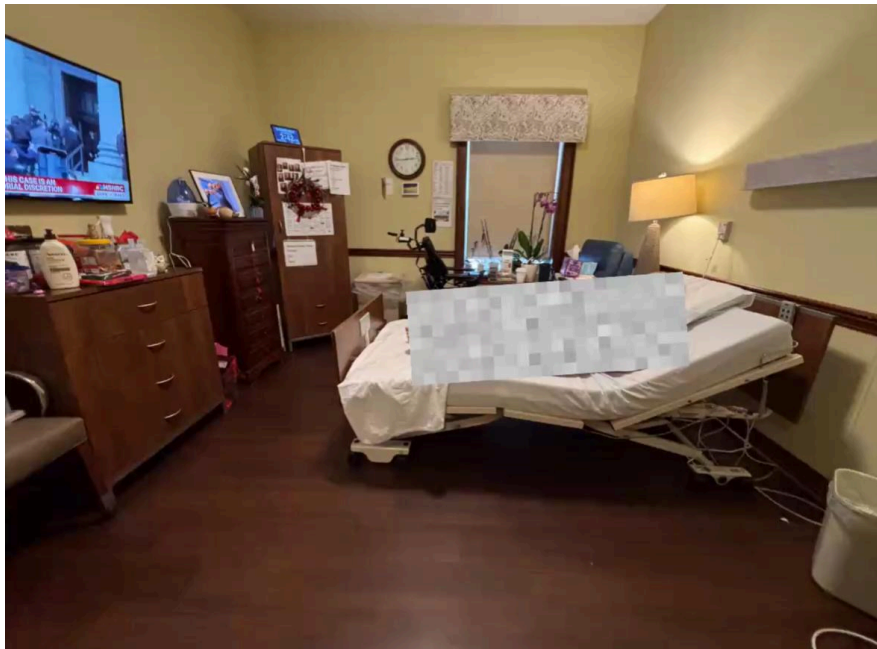


Figure 20 Picture of main users room in skilled nursing unit
(Appel, Katie. February 19, 2025.)

Lighting:

- The room has an overhead light, a lamp, and limited natural light from a north-facing window. The light quality and quantity are crucial to the room's ambiance and functionality, especially considering the minimal natural light. A thoughtful lighting design could help brighten the space without adding clutter.

Physical Space:

- The room accommodates essential furniture and medical equipment like wheelchairs, breathing machines, and vital trackers. This limits the space for non-essential or decorative elements, so any additions need to be adaptable, flexible, and non-intrusive to the primary needs of the patient.

Current Conditions: The presence of furniture, medical equipment, and personal items means that space efficiency is critical. The room must accommodate these items while allowing enough mobility for caregivers and the patient. The use of green design elements that are adaptable and space-conscious is key, with attention paid to the flexibility and versatility of any additional elements.

Potential Design Elements:

Rolling Living Wall:

- The inclusion of a mobile living wall can provide flexibility and adaptability. The maximum height of 5 feet and maximum width of 2.5 feet ensures it remains compact, fitting into tight corners or along walls when not in use. The rolling nature of the design means it can be moved to accommodate the patient's changing needs, such as creating more space for mobility or closer access to natural light.



Figure 21 Double-sided mobile green wall

Mother Earth News. (n.d.). *Mobile Green Wall Double Frame* [Render].

Mother Earth News. Retrieved from <https://store.motherearthnews.com/products/mobile-green-wall-double-frame>

- Qualitative Impact: The addition of plant life can bring nature indoors, creating a calming and therapeutic environment, which is important for relaxation, stress reduction, and overall well-being. The movement of the wall could provide a dynamic feature in the room, changing the room's ambiance when necessary.

Vertical Space Utilization:

- Hanging plants or shelf-mounted plants can help make use of vertical space, keeping floor space uncluttered and preserving the room's functional layout. Plants like succulents or ivy are great for shelf placements, offering low-maintenance options that do not require a lot of care or space.
- Qualitative Impact: By going vertical, the design minimizes the footprint of plants while still adding natural elements to the room. This can enhance air quality, reduce the perception of noise through calming visual and aromatic stimulation, and provide a sense of calm for the patient.

Aromatherapy through Plants or Natural Scents:



- Using plants like lavender, eucalyptus, or chamomile can provide natural aromatherapy, promoting relaxation. Alternatively, essential oil diffusers could be used with gentle, natural scents to foster a soothing atmosphere.
- Qualitative Impact: The addition of natural scents, such as lavender for relaxation or eucalyptus for respiratory benefits, could help improve sleep quality and ease breathing difficulties, making the space more comfortable for both the patient and caregivers.

Figure 22 Better Homes & Gardens. (n.d.). *Hanging indoor plants* [Photograph]. Better Homes & Gardens. Retrieved from <https://www.bhg.com/gardening/houseplants/hanging-indoor-plants/>

Low-maintenance, Non-allergenic Plants:

- Given the healthcare setting, plants that require minimal care and are non-allergenic are ideal. Snake plants, spider plants, and peace lilies are all low-maintenance and are effective at purifying the air.
- Qualitative Impact: The therapeutic effect of plants in a healthcare setting is well-documented. Non-allergenic plants ensure that patients with sensitivities or respiratory conditions are not negatively affected. Additionally, their presence can have a positive impact on mental health by reducing anxiety and improving mood.



Figure 23 Better Homes & Gardens. (n.d.). *Houseplants you can't kill* [Photograph]. Better Homes & Gardens. Retrieved from <https://www.bhg.com/gardening/houseplants/projects/houseplants-you-cant-kill/>

PROJECT SUMMARY

Patients in the further stages of ALS in palliative care are confined to their rooms for extended periods of time due to their limited physical ability, which limits their interaction with natural environments (Rudnicki, 2015). This isolation can lead to increased stress, anxiety, and depression (Brandt, 2022). By introducing a mobile living wall—such as moveable planters, modular vertical gardens, or rolling green partitions—patients can experience the benefits of greenery in a way that adapts to their mobility and medical conditions. This project aims to develop an innovative, effective solution that enhances emotional health while remaining practical for caregivers.

An article from the National Library of Medicine: *The Importance of Greenspace for Mental Health* by Barton & Rogerson, 2017 demonstrates the positive impact of green design on mental and emotional health supports the integration of green design in healthcare environments. A mobile living wall provides an adaptable solution, ensuring that patients can maintain their connection to nature without disrupting medical care routines. This approach also allows caregivers, friends, and family to interact with the greenery, making it a shared and comforting experience.

Understanding the site conditions helps tailor the mobile living wall to fit within spatial constraints and lighting conditions. The layout impacts how easily the green structure can be positioned and accessed, ensuring it remains beneficial for both patients and caregivers.

To ensure the green structure is practical, it must be designed for indoor use and accommodate the needs of individuals who experience the space. Lighting limitations

require thoughtful plant selection as well as added plant lights, and the structure must be positioned at appropriate heights for accessibility and care.

The combination of a rolling living wall, vertical plant placement, low-maintenance plants, and aromatherapy can provide an adaptive, calming, and health-promoting environment. These elements are all chosen with space efficiency, ease of care, and the patient's well-being in mind. The design should aim to not only enhance the physical space but also foster an environment conducive to healing and comfort.

This inventory and analysis ensure that the interior green design supports palliative care patients with changing needs while being practical for caregivers and family members.

Through thoughtful plant selection, accessibility considerations, and lighting solutions, the project creates a sustainable, comforting, and adaptable therapeutic environment.

This assessment ensures that the mobile living wall integrates effectively within the existing layout without interfering with essential functions. The selection of enhancements is informed by both spatial constraints and patient needs, ensuring the design remains functional, accessible, and beneficial for emotional and physical well-being.



Figure 24 Picture of mobile living wall in use
(Appel, Katie. April 14, 2025.)

CASE STUDY ONE - MOBILITY IN HEALTHCARE

The design of hospital facilities, including the use of technology and equipment, significantly impacts patient safety and healthcare outcomes. However, integrating evidence-based design can enhance both caregiver performance and patient well-being.

Human interaction research shows that poorly designed healthcare environments such as inadequate lighting or inefficient medical equipment placement contribute to errors like medication misadministration, patient misidentification, and procedural mistakes. Addressing these conditions through better facility design can reduce cognitive overload and enhance safety (Reiling et al., 2008).



Figure 25 Picture of main hallway in skilled nursing unit
(Appel, Katie. February 19, 2025.)

The key factors influencing the built environment include:

- Patient-centeredness: Single-bed rooms, clear signage, and space for family members.
- Safety: Fall prevention, infection control, and easily sanitized surfaces.

- Effectiveness: Appropriate lighting and noise control.
- Efficiency: Standardized layouts and minimizing patient transfers.
- Timeliness: Reducing inefficiencies in care delivery.
- Equity: Ensuring facilities meet diverse patient needs (Reiling et al., 2008).

Research from the Health Environments Research and Design Journal indicates that improved hospital design can reduce stress, infection rates, medical errors, and overall length of stay while enhancing satisfaction for both patients and staff. Using human-centered design principles, hospitals can create safer, more effective healthcare environments (Ulrich et al., 2008).

The spatial organization of hospital units significantly affects nurses' workflow and efficiency. A study in France analyzed nurses' movement in medical and surgical units, categorizing their work areas into patient rooms, nurses' stations, corridors, and storage

areas. Nurses primarily followed three movement patterns: within the nurses' area, between patient rooms and nurses' stations, and between patient rooms (Gadbois, 1992).

Emergency services concepts. Most contemporary emergency services designs are variations of one of these three organizational concepts.

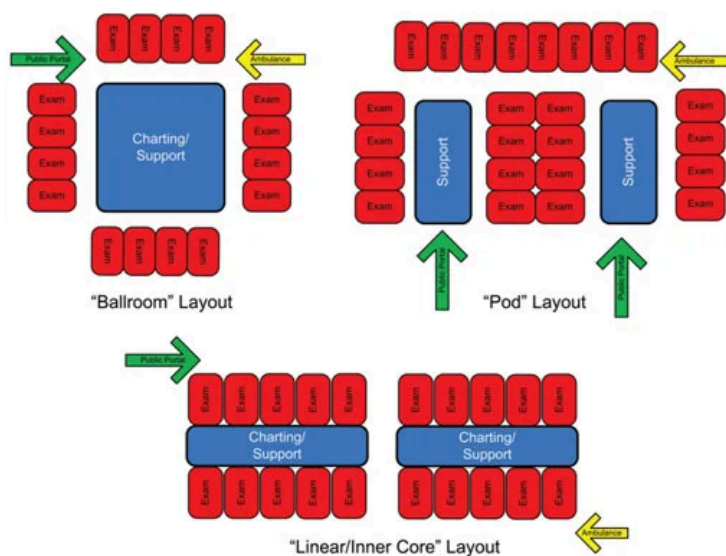


Figure 26

American Society for Healthcare Engineering. (n.d.). *Designing for emergencies* [Photograph]. *Health Facilities Management Magazine*. Retrieved from

<https://www.hfmmagazine.com/articles/1092-designing-for-emergencies>

To improve efficiency and reduce physical strain, hospitals can implement decentralized nursing stations with strategically placed supplies, linens, and equipment. This design would minimize unnecessary movement, reduce fatigue, and increase patient monitoring and interaction. Additionally, single-bed rooms can further enhance surveillance and patient care quality (Brown & Gallant, 2006).

Evidence-based design has influenced acute care settings, improving efficiency, safety, and patient outcomes. Research since the 1970s has shown that unit design, rather than room size or occupancy, determines efficiency. A study of 19 award-winning ICUs highlighted best practices such as single-bed rooms for privacy and safety, strategic bed placement, in-room hand-washing sinks, and natural lighting. However, challenges included unsafe renovation projects, mixed-service units with staffing issues, and poorly designed family spaces (Reiling et al., 2004).

The Pebble Project, supported by the Center for Health Design and the Robert Wood Johnson Foundation, advanced research on healthcare facility design by evaluating safety and quality outcomes (Henriksen et al., 2007).



Figure 27

The Center for Health Design. (n.d.). *Pebble Project* [Photograph]. The Center for Health Design.

Retrieved from <https://www.healthdesign.org/research-services/pebble-project>

Examples of hospitals implementing evidence-based designs include:

- Children's Hospital in San Diego: Designed a convalescent hospital for disabled children with improved ventilation, private spaces for parents, and discreet wheelchair storage.
- Methodist Hospital in Indianapolis: Created a 56-bed cardiovascular critical care unit with private rooms, customizable lighting and temperature, and better nurse visibility, reducing patient falls and transfers.
- Bronson Methodist Hospital in Michigan: Built private rooms with access to nature, natural light, and positive distractions (e.g., music, artwork) to reduce stress.
- Barbara Ann Karmanos Cancer Institute: Renovated hospital areas with better lighting, acoustics, and larger patient rooms, leading to fewer medication errors and reduced pain medication use (Bilchik, 2002).

These hospitals demonstrate the benefits of thoughtful design, showing that private rooms and patient-centered environments lead to improved health outcomes, fewer errors, and greater overall well-being for patients and staff.

As hospitals plan new construction projects to meet the demands of an aging population, evidence suggests that the built environment can improve both patient and provider satisfaction, improve outcomes, and reduce costs. Studies indicate that hospital design influences patient perceptions of care quality and nurse job satisfaction, which directly impact patient care (Henriksen et al., 2007).

Research from 2004 supports the business case for evidence-based design, showing that features like single-bed rooms and decentralized nursing stations can improve safety and healing while being financially viable. A study by the Center for Health Design found that although implementing such designs added approximately \$12 million

to construction costs, the investment could be recouped within a year (Ulrich et al., 2004).

It is effective for hospitals to prioritize a culture of safety when remodeling or building new facilities, integrating cost-effective safety features such as HEPA filters, ultraviolet lighting, and standardized room layouts. Many safety improvements require reordering functions in traditional hospital designs rather than significant capital expenditures, making them practical for improving patient care and overall hospital efficiency.

CASE STUDY TWO - HORTICULTURAL THERAPY

According to the American Horticultural Therapy Association, horticulture therapy is defined as “the participation in horticultural activities facilitated by a registered horticultural therapist to achieve specific goals within an established treatment, rehabilitation, or vocational plan” (American Horticultural Therapy Association, 1997). In horticultural therapy, the active process of the treatment plan is seen as the therapeutic activity rather than the end product.

Horticultural therapy helps participants develop new skills or regain lost ones, improving memory, cognition, language, and socialization. It also aids physical rehabilitation by strengthening muscles, enhancing coordination, balance, and endurance. In vocational settings, it encourages independence, problem-solving, and the ability to follow directions. Trained horticultural therapists use specialized techniques to support therapy and rehabilitation.

Session Title	Session Objectives
Growth with Hope: Transplant Sprouting Seedling Activity	To learn and practice transplantation. To share the objectives and expectations of the HT sessions.
The Lifecycle of Plants: Propagation by Cutting	To learn and practice propagation skills. To reflect on, appreciate nature, and share thoughts about the vitality of plants.
The Lifecycle of Plants (II): Propagation by Division	To learn and practice propagation skills. To reflect on, appreciate nature, and share thoughts about the vitality of plants.
Mindful Eating: Tasting Fruits	To experience mindfulness techniques during the activities. To share thoughts about using this experience in mindful eating, and its potential use as a relaxation activity.
Live Aroma: Introduction to Herbs	To introduce herbal plants to the users. To learn and practice a diaphragmatic breathing exercise. To share thoughts about the experience of using relaxation methods.
Self-Designed Pot Garden: Combination of Plants	To learn to design a pot garden using various plants and decorations. To share thoughts about the feeling of appreciation.
Natural Aroma: Herbal Bag Production	To experience the aromas of various kinds of dried natural materials. To revise the diaphragmatic breathing exercise.
Harvest Time: Vegetable Harvesting	To practice vegetable harvesting and cooking. To share the symbolic meaning of harvesting. To share overall feedback about the HT sessions.
If the therapy setting does not have an outdoor environment for vegetable growth, Sessions 1 and 8 will be changed to sessions entitled "Colorful Nature" and "Colorful World", described below.	
Colorful Nature: Leaf Rubbing	To experience the natural colors of plants through a leaf rubbing exercise. To learn about the characteristics of plants.
8. Colorful World: Pressed Flower Cards	To learn skills using pressed flowers. To share the symbolic meaning of pressed flowers. To share overall feedback about the HT sessions.

Figure 28 Siu, (2020). Table 1: Session titles and objectives of the horticulture therapy program In *Horticultural therapy program for people with mental illness: A mixed-method evaluation. International Journal of Environmental Research and Public Health*, 17(3), Article 711.
<https://doi.org/10.3390/ijerph17030711>



Figure 29 Cesare, A. (2021). *A view of the Rooftop Garden, one of four new gardens, at Cincinnati Children's Hospital Medical Center's new Critical Care Building in Avondale on Friday, Sept. 24, 2021*

[Photograph]. *The Enquirer*.

<https://www.cincinnati.com/picture-gallery/news/2021/09/24/look-inside-cincinnati-childrens-hospitals-new-critical-care-building/5846259001/>.

A therapeutic garden is a plant-focused space intentionally created to promote healing through passive or active interaction with nature. There are various types of therapeutic gardens, including healing, enabling, rehabilitation, and restorative gardens. Key features often include accessible paths, raised planting beds, and sensory-rich plants. While thoughtful design enhances their effectiveness, the presence of a structured horticultural therapy program is crucial for maximizing their benefits.

- Reducing stress and anxiety through calming, meditative gardening activities (Miami Jewish Health, 2022).
- Improving physical health by enhancing strength, coordination, and endurance while lowering the risk of chronic diseases (Miami Jewish Health, 2022).
- Enhancing cognition by boosting focus, memory, and problem-solving skills, especially in those with dementia (Gigliotti & Jarrott, 2010).
- Encouraging social interaction to combat isolation and improve mental well-being (Miami Jewish Health, 2022).
- Boosting mood by fostering a sense of purpose, accomplishment, and overall positivity (Li, 2018).

The ‘Vitamin “G”arden study by the Department of Internal Medicine I, Comprehensive Cancer Center at the Medical University of Vienna, Austria took place between July 2015 and April 2017 to explore the impact of horticultural therapy in a palliative care setting, focusing on both patients and care team members. “In a palliative care setting, the preservation of quality of life is of particular importance” (Masel et al., 2017). This study aimed to assess whether horticultural therapy could improve physical and psychological well-being, reduce anxiety and depression, and foster social interactions in a hospital-based palliative care ward. The study involved 20 semi-structured interviews with 15 advanced cancer patients and 5 palliative care team members. Patients reported positive stimulation, distraction from clinical routines, enjoyment of creative activities, and enhanced social connections. The palliative care team also welcomed horticultural therapy, though the dropout rate was high, with 36% of patients not meeting inclusion criteria and 45% unable to complete all sessions. The study concludes that horticultural therapy is valued by patients and staff, but integrating green spaces into the ward may be more feasible due to the high dropout rate.



Figure 30 Seed Your Future. (n.d.). *Horticultural therapist* [Photograph]. Seed Your Future. Retrieved from https://www.seedyourfuture.org/horticultural_therapist

The 'Vitamin "G"arden' study found that horticultural therapy was highly valued by both patients and palliative care team members, improving patients' well-being, mood, and social connections. Patients enjoyed escaping their daily medical routines, engaging in creative activities, and interacting with other patients. Horticultural therapy led to physical activation, the development of haptic skills, and increased group cohesion. Previous research has shown similar benefits in other patient groups, such as those with dementia, and horticultural therapy was found to reduce anxiety, depression, and stress. The study suggests that horticultural therapy, involving natural materials and group activities, enhances the quality of life in palliative care by addressing physical, emotional, and social needs, making it a promising approach in preserving the quality of life for patients. The therapeutic effects may be linked to the restorative properties of nature, which align well with palliative care principles (Masel et al., 2017).

CASE STUDY THREE - GREEN DESIGN IN HEALTHCARE

Green design in healthcare integrates sustainable principles into the planning, construction, and operation of medical facilities, prioritizing environmental responsibility and patient well-being. The approach fosters eco-friendly, patient-centric spaces while reducing the healthcare industry's ecological impact (Bhada, 2024).



Figure 31

Verde Profilo. (n.d.). *Green hospitals and their benefits* [Photograph]. Verde Profilo. Retrieved from <https://verdeprofilo.com/en/green-hospitals-and-their-benefits/>

Key Benefits:

- Patient & Staff Well-being: Green environments improve patient health outcomes and enhance staff satisfaction (Bhada, 2024).
- Energy Efficiency: Sustainable materials, LED lighting, and eco-friendly technologies lower operational costs.
- Indoor Air Quality: Biophilic design (plant walls, natural ventilation) and HEPA filters improve air purity.

- Waste Reduction: Recycling initiatives and responsible material selection reduce environmental impact.
- Cost Savings: Long-term savings through energy-efficient fixtures and durable materials (Bhada, 2024).

By integrating green design, healthcare facilities improve patient experiences, operational efficiency, and sustainability while setting a precedent for responsible medical spaces.



Figure 32

Tropex. (n.d.). *Living walls in healthcare settings* [Photograph]. Tropex. Retrieved from <https://tropex.com/living-walls-in-healthcare-settings/>

Green healthcare integrates environmentally conscious practices into healthcare delivery, benefiting health professionals and institutions in various ways. It helps protect the environment, lowers costs, and offers leadership opportunities. It also helps promote the health and safety of patients, staff, and visitors by reducing ecological footprints,

and enhancing social well-being. On a local level, green practices such as safe cleaning products and sustainable construction can reduce toxicity and pollution in healthcare settings.



Figure 33

Forest Homes. (n.d.). *How can biophilic hospital design aid mental health and patient recovery* [Photograph]. Forest Homes. Retrieved from <https://www.foresthomesstore.com/blogs/decor-for-wellbeing/how-can-biophilic-hospital-design-aid-mental-health-and-patient-recovery>

Healthcare facilities can implement green practices in daily operations, such as responsible food sourcing and waste management. The design of healthcare spaces, which incorporates natural elements and promotes healthy behaviors, can further enhance well-being. While green healthcare has a number of health benefits, careful consideration is needed to avoid unintended consequences, such as increased energy consumption or increased infection risks (Institute of Medicine U.S., 2007).

This paper by Roger S. Ulrich, Ph.D. for the Center for Health Systems and Design at Texas A & M University reviews scientific research on the benefits of gardens and plants in hospitals and healthcare settings, focusing on their positive effects on patients' health and well-being. The studies from this article show that simply viewing gardens or nature can help reduce stress, improve patient satisfaction, and even contribute to better clinical outcomes.

Historically, gardens were integral to hospital design especially in European countries, but they became less common in the 20th century as medical advancements prioritized functionality and infection control. However, there is evidence suggesting that incorporating nature into healthcare environments can enhance emotional well-being, reduce stress, and support overall health.

Additionally, healthcare administrators are under pressure to balance costs with quality care, and research indicates that gardens can provide cost-effective benefits by improving patient outcomes, staff satisfaction, and even reducing hospital stays. The paper also highlights the physiological and psychological benefits of exposure to nature, such as lower blood pressure, reduced anxiety, and increased positive emotions within minutes of viewing plants or green spaces. This growing body of research supports the resurgence of hospital gardens as a valuable tool in patient care and recovery (Ulrich, 2002).

Studies from this paper show that natural views in hospitals can positively impact clinical outcomes. For instance, patients with natural views, such as trees and water, experience less anxiety, pain, and shorter recovery times. A study with gallbladder

surgery patients found that those with a tree view had fewer complications, needed less pain medication, and had more positive evaluations in their medical records compared to those with a brick wall view. Studies within this paper have shown that users, such as patients in children's hospitals, prefer gardens with more greenery and flowers, avoiding areas with excessive concrete. Other factors that negatively affect garden effectiveness include cigarette smoke, noisy urban sounds, crowding, insecurity, litter, and ambiguous or abstract art. Ambiguous design features, like abstract sculptures, can even aggravate stress in acutely stressed patients.



Figure 34

Forest Homes. (n.d.). *How can biophilic hospital design aid mental health and patient recovery*

[Photograph]. Forest Homes. Retrieved from

<https://www.foresthomesstore.com/blogs/decor-for-wellbeing/how-can-biophilic-hospital-design-aid-mental-health-and-patient-recovery>

One example of this occurred in a hospital that installed a "bird garden" with sculptures instead of greenery. Cancer patients reported negative emotional reactions to the artwork, interpreting some sculptures as frightening, leading to the removal of the art. Overall, gardens that feature clear, restorative nature elements such as greenery and flowers are most effective in promoting stress recovery (Ulrich, 2002).

Natural views in gardens significantly reduce stress within minutes, and longer exposure can improve clinical outcomes, such as reduced pain medication use and shorter hospital stays. Gardens in hospitals can heighten patient and family satisfaction and improve staff morale, making them an important feature for improving medical outcomes, patient satisfaction, and healthcare economics.

LITERATURE REVIEW - BEST PLANTS AND SCENTS FOR HORTICULTURAL THERAPY

Figure 35 Chart of plants to choose from for this project





Snake Plant: Jones, Alexandra. "A Handy Guide to the Snake Plant (Dracaena Trifasciata) to Care for It like a Pro." *The Spruce*, The Spruce, 11 Mar. 2025, www.thespruce.com/snake-plant-care-overview-1982772.

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Peace Lily: Jones, A. (2024, July 23). How to care for your indoor peace lily. MyDomaine. <https://www.myspicer.com/peace-lily-care-indoor-4768807>

Dieffenbachia: Amazon.com: Costa Farms Dieffenbachia Live Plant Indoor, spring decor, giftable plant like, easy grow light and watering houseplant, potted in indoors garden decor pot, soil, Grower's choice, 1 foot tall: Patio, Lawn & Garden. (n.d.). <https://www.amazon.com/Costa-Farms-Dumb-Cane-Dieffenbachia/dp/B0793Y2YPS>

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Jasmine: Jasmine Indoors (Jasminum polyanthum). Jasmine Indoors (Jasminum polyanthum) | Pick Ontario. (n.d.). <https://www.po.flowerscanadagrowers.com/our-products/3641/jasminum-polyanthum>

Mint: Shop The Market Mint (Per Bunch) Image 1 of. (n.d.). Mint (per bunch). Historic Westside Gardens. <https://www.historicwestsidegardens.org/shop/mint-per-bunch>

Chenille: Tannotti, M. (2024, July 1). How to grow and care for chenille. The Spruce. <https://www.thespruce.com/how-to-grow-chenille-1402627>

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Marjoram: Farr, K. (2014, April 11). The history of marjoram: Myspicer.com: Spices, herbs & blends. MySpicer. <https://www.myspicer.com/history-of-marjoram/>

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CASE STUDY SUMMARY

Mobility in medical facilities helps ensure the safety of patients and workers in those facilities. Having a well designed layout within these settings are vital to creating a more efficient environment for patients and staff. This is relevant to this capstone because the patient is in a skilled nursing unit that has similar care staff and machines that were mentioned in the first case study. For this mobile living wall to be implemented into that environment, it must accommodate the needs of the user, those who will interact with it, and the previously built environment. Incorporating the mobile living wall into a skilled nursing unit can help support the practical needs of the staff and patients and can help improve the aesthetic and therapeutic aspects of the environment. But to accommodate the space, it must be built in a manner that blends existing structures.

Horticulture therapy is a type of hands-on therapy that consists of the interaction between a patient and plants where the active process of the treatment plan is considered the therapeutic activity. Through the use of horticultural activities through this therapy, patients are able to achieve specific goals to help improve patients' well-being and mood while reducing anxiety, depression, and stress. It has shown to help preserve the quality of life for patients. This is relevant to this capstone because the users who will utilize the mobile living wall will also be participating in adaptive horticultural therapy as their disease progresses.

Green design in healthcare helps promote health for patients, staff, and visitors, reduces ecological footprints, and enhances social well-being. Green design is a more

ecologically friendly approach to incorporate nature into what could have been a more sterile environment with no additional benefits to users in these facilities. Green design should be more focused and integrated into healthcare environments like what this capstone's goal is.

The plant chart selection is an example of suggested plants patients could use in their mobile living wall with each plant being used to enhance the well-being of individuals in palliative care, specifically individuals with progressive neurodegenerative diseases. The plant chart addresses the key needs and changing needs of these patients. The plants chosen are based on its ability to provide low-maintenance care, sensory stimulation, cognitive engagement, and air purification throughout the different stages of palliative care. The early stage plants focus on engagement, interaction, and memory recall through herbs, microgreens, and visually stimulating plants; the middle stage introduces more sensory-based plants to enhance mood and relaxation while still having moderate engagement through aromatic and visual appealing plants ; the late stage prioritizes easy care, air purification, and passive sensory benefits through slower growing plants that do not need as much care. Each plant has its own unique benefits to fit the changing needs of the palliative care users of which the users have the power to choose the plants they want.

HISTORICAL CONTEXT

A vertical garden is an umbrella term for walls with greenery: green walls, living walls, and vertical hydroponics and have become more recognized and popular since the 20th century. This is due to the rise of urbanization and the scarce amount of horizontal space available. Green walls attach plants to an upright structure, living walls use soil and other mediums, and vertical hydroponics substitute soil for a nutrient-rich solution that plants can grow in. Vertical gardens allow for highly populated areas to maximize the utilization of unused space to cultivate plants, while also creating biodiversity, improving air quality, and increasing the aesthetics of the surrounding area (Green.Org, n.d.).

Interest in therapeutic gardens has grown significantly in recent years, with these gardens being designed for healthcare, rehabilitation, and other therapeutic settings (American Horticultural Therapy Association, 1997).

Palliative care improves the quality of life of patients, their families, and caregivers who are facing challenges associated with life-threatening illness, whether physical, psychological, social or spiritual. Each year, an estimated 56.8 million people are in need of palliative care worldwide. However, only about 14% of people who need palliative care currently receive it. The global need for palliative care will continue to grow as a result of the aging populations and the rising hardships of diseases, both communicable and non communicable diseases.

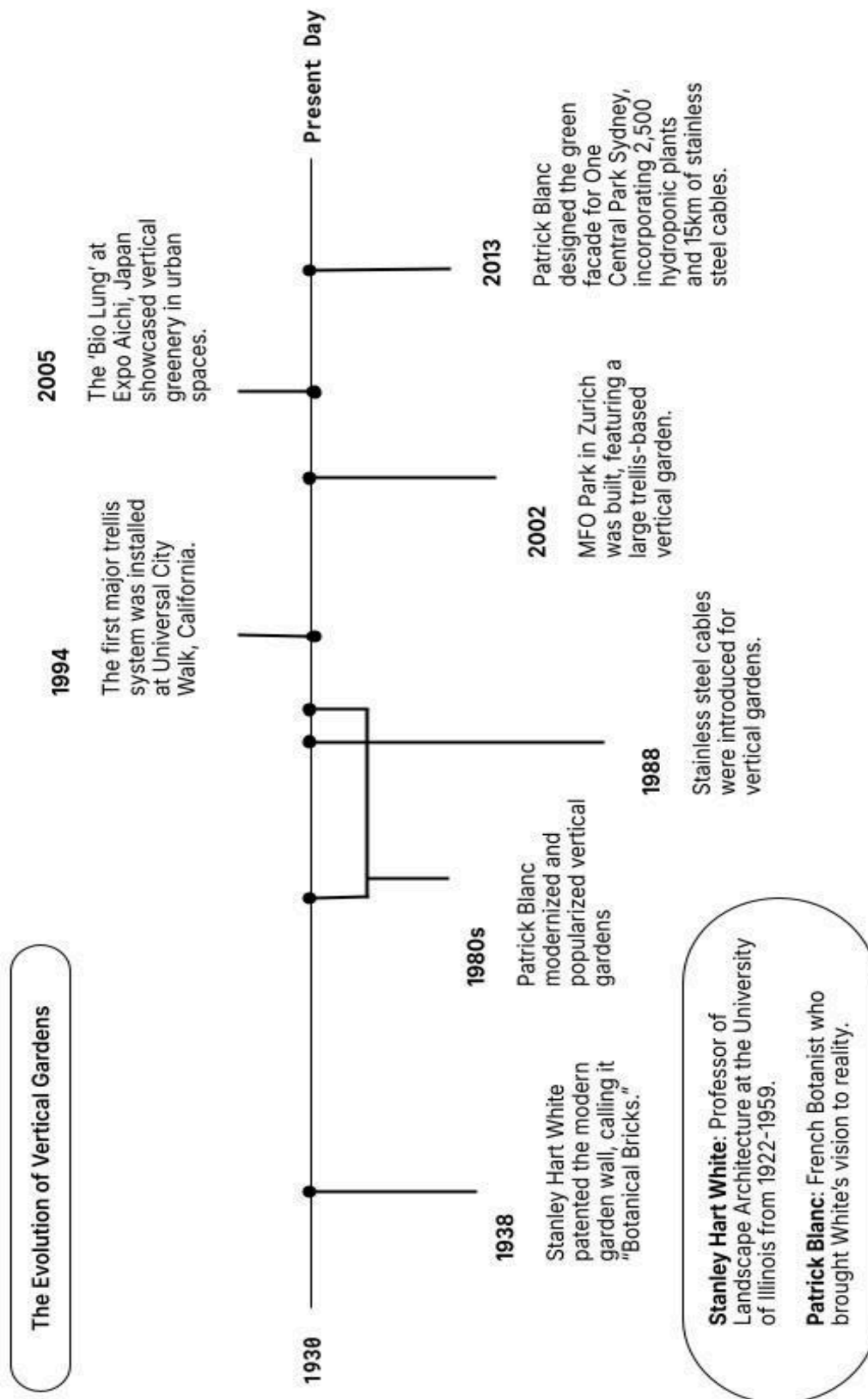


Figure 36
 Appel, Katie
 (2025).
 Timeline.
 Google Slides.
 Information
 from Tensile,
 n.d., and
 Pritchard &
 Pritchard,
 2023.

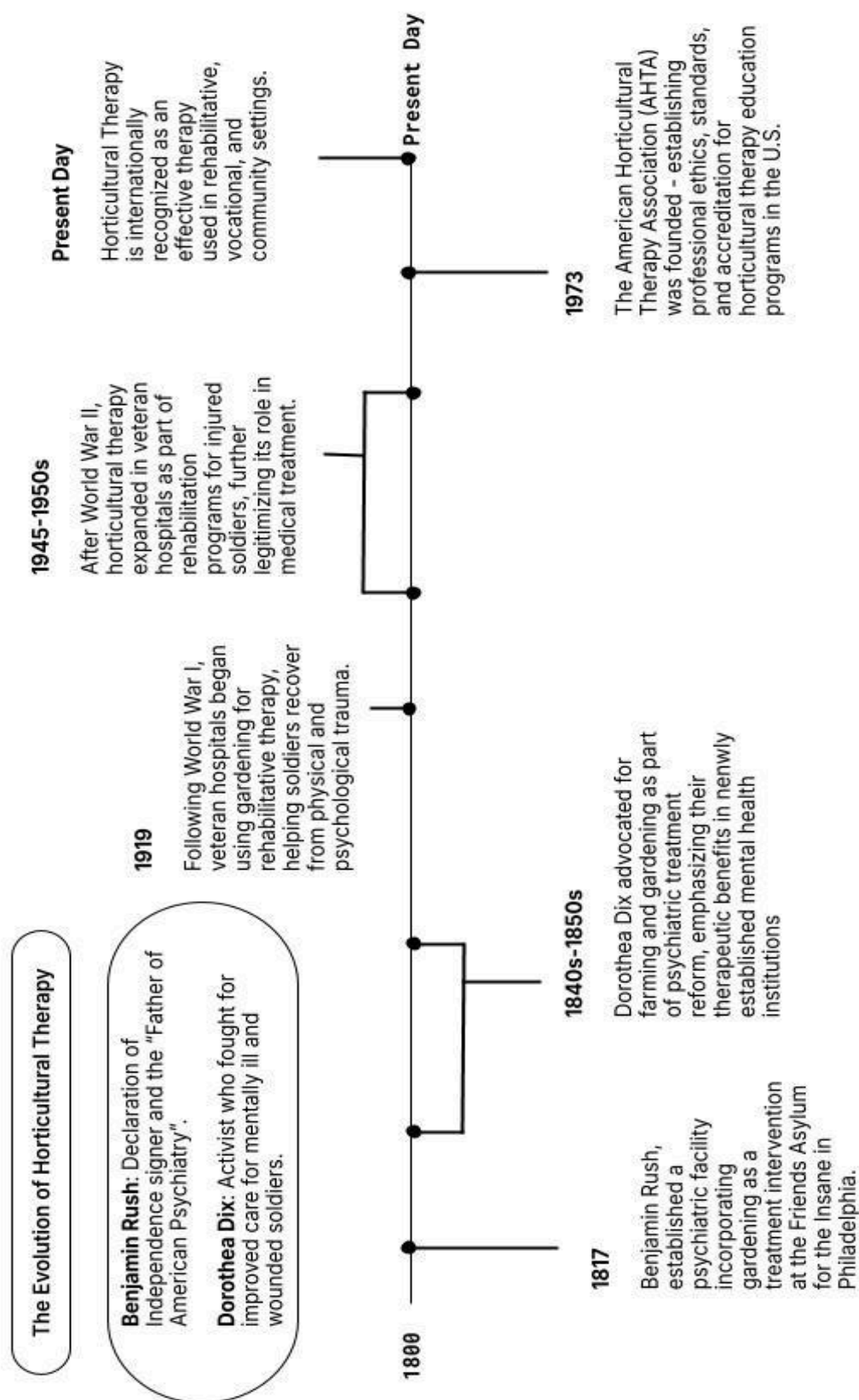


Figure 37 Appel, Katie (2025). Timeline. Google Slides. Information from American Horticultural Therapy Association, 1997.

“Palliative care involves a range of services delivered by a range of professionals that all have equally important roles to play – including physicians, nurses, support workers, paramedics, pharmacists, physiotherapists and volunteers — in support of the patient and their family (World Health Organization, 2020).



Figure 38 Care team graphic. (n.d.). Kaiser Permanente Northern California Hospice. Retrieved from <https://hospice-nca.kaiserpermanente.org/care-team/>

ALS is a progressive neurodegenerative disease that affects motor neurons, located from the brain to the spinal cord which are connected to the muscles throughout the body, which control voluntary muscle movements. As these neurons deteriorate and die, individuals lose the ability to speak, eat, move, and breathe.



Figure 39

Lou Gehrig [Photograph]. (n.d.). University of Pittsburgh Brain Institute.

<https://www.braininstitute.pitt.edu/centers-institutes-and-departments/live-lou-center-als-research/about-lou-gehrig>

ALS was first identified in 1869 by Jean-Martin Charcot, a French neurologist, but became internationally recognized in 1939 when it ended Lou Gehrig's baseball career.

The name "amyotrophic lateral sclerosis" describes the disease's effects: "amyotrophic" where the muscles wastes away, degeneration of nerve signals in the spinal cord "lateral", and scarring or hardening "sclerosis". (ALS Association). Most ALS cases

develop between the ages of 40 and 70, with an average diagnosis at 55. About 90% of cases occur without any known genetic link while the other 5-10% are inherited through familial ALS (FALS) - an inherited mutated gene that has a known connection to ALS.

There is no cure for ALS (The ALS Association, 1998).

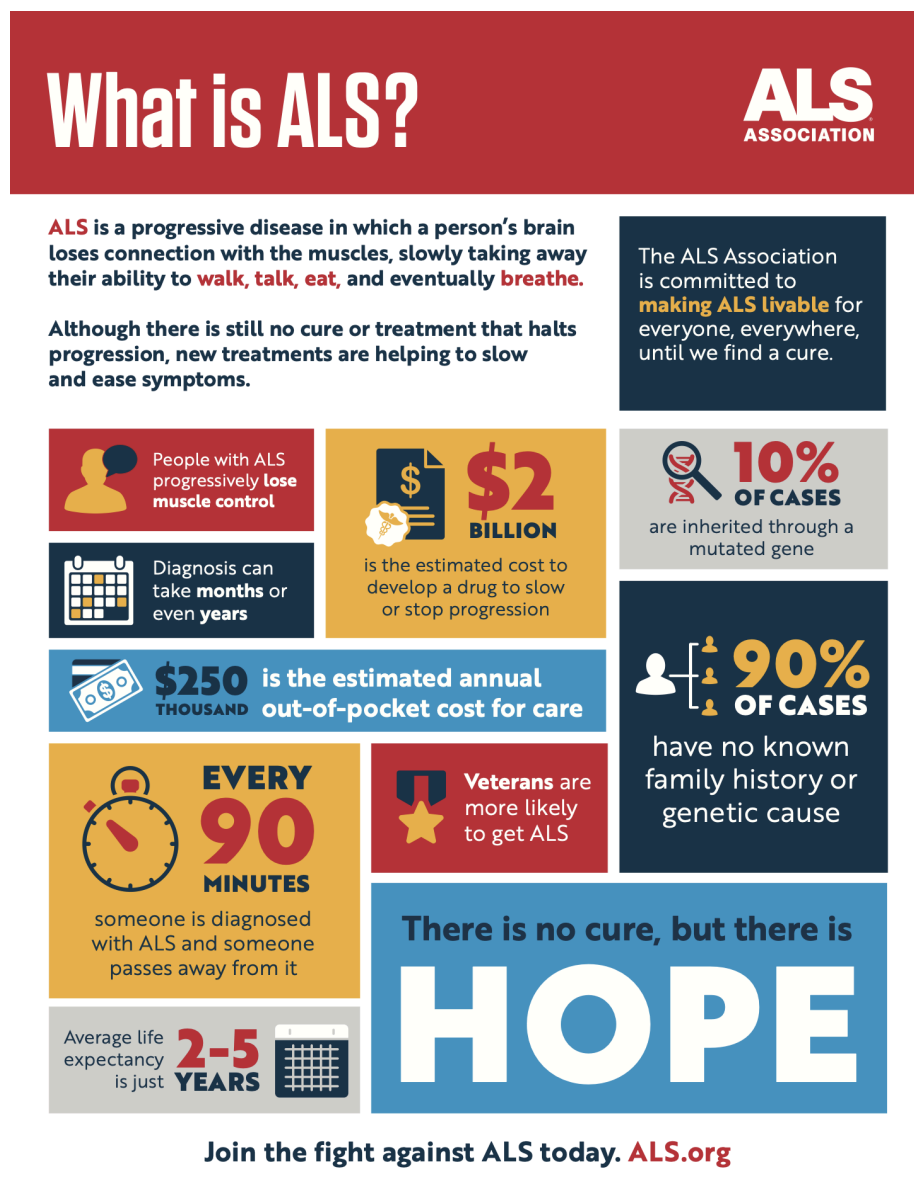


Figure 40 ALS [Grahic]. (n.d.). ALS Association. <https://www.als.org/>

The article “A Palliative Care Approach to Amyotrophic Lateral Sclerosis” by Cláudio Gouveia, a specialist in Internal Medicine at Centro Hospitalar Lisboa Ocidental in Lisbon, Portugal, explores the role of palliative care in managing ALS. Gouveia (2023) states:

Due to the complex management of advanced ALS, guidelines recommend that specialist palliative care should be involved early and throughout the disease, thus making more time for the patient to participate in advanced care planning, which enables them to discuss and be involved in their own plan of care. Palliative care is essential to maximize the quality of life of patients and families by relieving symptoms, providing emotional, psychological, and spiritual support, removing obstacles to a peaceful death, and supporting the family in bereavement.

When it comes to management, ALS symptoms can be treated with pharmacological and non-pharmacological interventions. In the early stages, management focuses on maximizing function, promoting independence, and treating symptoms.

As for the patient’s preferred place of death, this is usually at home, but distressing symptoms, unanticipated crises, or increasing carer burden can make end-of-life care at home challenging.

Literature has shown that there are many advantages in early inclusion of palliative care in ALS management, achieving effective symptom control and greater quality of life, but also reducing caregiver burden. However, in this study, we found that referrals to palliative care were late and included mostly cases of advanced disease with

uncontrolled symptoms. When it comes to ALS, data shows that death is inevitable, thus reinforcing the importance of a timely palliative care intervention in order to reap the most benefits. With this in mind, there should be greater investment in training healthcare professionals to be more aware of the importance of palliative care and to promote early referrals, allowing for better management during disease progression and end of life (Gouveia, 2023).

Stage	Physical Effects	Assistance Needed
Early Stage	- Muscle weakness, stiffness, spasticity - Muscle cramping and twitching (fasciculations) - Loss of muscle bulk (atrophy) - Symptoms may be limited to one region or mild in multiple regions - Fatigue, poor balance, slurred speech, weak grip, or tripping when walking - May occur before diagnosis	- Occasional assistance with physical tasks - Use of a cane, leg brace, or other simple mobility aid - Environmental adaptations for safety and independence
Middle Stage	- Symptoms become more widespread - Some muscles are paralyzed while others are weakened or unaffected - Continued fasciculations and contractures (rigid, painful joints) - Falls may result in inability to stand without help - Loss of driving ability - Swallowing difficulties, risk of choking, increased saliva management issues, breathing muscle weakness causing respiratory insufficiency, especially when lying down - Possible bouts of uncontrolled laughing or crying (pseudobulbar affect)	- Range-of-motion exercises to maintain joint flexibility - Use of leg braces, wrist splints, adaptive equipment - Wheelchairs for mobility and fall prevention - Feeding tubes for nutrition and choking prevention - Noninvasive ventilation (e.g. BiPAP) for breathing support - Adaptive communication tools for speech difficulties - Shower chairs, lift chairs, and rising toilet seats for hygiene and mobility support - Transfer boards and mechanical lifts for safer movement - Medications for pseudobulbar affect, anxiety, and/or depression
Late Stage	- Most voluntary muscles are paralyzed - Severe respiratory compromise leading to fatigue, cognitive fog, headaches, and pneumonia risk - Extreme mobility limitations requiring full-time caregiving - Loss of speech - Inability to eat or drink by mouth	- Power wheelchair, hospital bed, mechanical lift for movement and comfort - Switch-controlled devices for communication and environmental control - Assisted ventilation (noninvasive or invasive with tracheostomy) - Feeding tube for nutrition - Urinary catheters for easier toileting

Figure 41 Appel, K. (2025). Table of ALS Progression Stages . Google Docs. Information from the ALS Association 1998.

Theoretical Goals -

- **Adaptability to Changing Needs:** The project should be grounded in the idea that as individuals' abilities change over time, the environment can continue to support their engagement and well-being. This theoretical goal will focus on how the mobile living wall can evolve and adapt to users' needs throughout different stages of illness or aging.
- **Biophilic Design:** Incorporate principles of biophilic design to emphasize the restorative and calming benefits of nature. This theoretical approach will guide the design towards maximizing the connection between the user and the natural environment to reduce stress, promote healing, and improve quality of life.
- **Integration of Horticultural Therapy:** Explore the role of horticulture in enhancing physical, cognitive, and emotional well-being for individuals with varying health conditions. This theoretical goal will guide the project towards addressing how interaction with plants and green spaces can foster healing and provide therapeutic benefits.

Physical Goals -

- **Accessibility:** Ensure that the design of the mobile living wall is accessible to individuals with varying physical abilities. This will include considerations like height-adjustable features, ease of access for wheelchair users, and tools that support users in their physical tasks.
- **Modular and Adaptable Design:** The physical design should be adaptable to different stages of user engagement, from active planting to sensory interaction. This includes incorporating elements that can be added or adjusted as users' needs change (e.g., moveable planters, sensory elements like aromatics or textures).

Social Goals -

- Building, tending, and enjoying the structure, while also creating a lasting legacy—whether by passing it on to the family, gifting it to another palliative care resident, or contributing the plants to a larger living wall in the facility.
- Use the mobile living wall as a motivator to bring people together, spark conversations, and strengthen relationships within a shared environment.
- Utilize the therapeutic qualities of nature to reduce stress, anxiety, and cognitive fatigue for individuals in care settings or high-stress environments.
- Bridge age gaps and encourage relationship-building between different generations through shared care and appreciation of the living wall.

Programmatic Requirements for Final Project

1. Space Size and Usage:

- Mobile living wall:
 - Dimensions: The mobile living wall is 58 inches tall, 27 inches wide, and 17 inches deep.
 - Usage: The structure will be used for horticultural therapy, sensory engagement, and community interaction. It will serve as a therapeutic tool for patients at varying stages of illness, which allows for engagement and sensory experiences throughout the duration of the illness.
 - Flexibility: The design has locking wheels for ease of movement and adaptability in which the location of the structure can be adjusted, with modular components that can change depending on the stage of engagement.

2. Technical Requirements:

- Environmental Needs:
 - Indoor: The structure is designated to be used inside.
 - Temperature Control: The skilled nursing unit maintains a temperature that the patient can control and stays between 65-75°F (18-24°C) to support plant health and user comfort.
 - Air Quality: High-quality ventilation systems are in place for indoor environments to ensure fresh air and promote a healthy atmosphere for both plants and users.

- **Materials Necessary:**

- **Structural Materials:** Use stained wood, 2.5 inch metal screws.
- **Planting Materials:** Soil, pots, planters with a bottom watering system will be required to maintain plant health. The choice of plants will depend on the therapeutic needs of the patient (e.g., calming herbs, flowering plants, sensory plants).
- **Accessibility Features:** Adjustable modular planters for patients and caregivers, including wheelchair-accessible areas, are integrated into the design.

Figure 42 Watering Diagram

DPROOTS Garden. (n.d.).

<https://dprootsgarden.com/sv>

- **Support Services:**

- **Maintenance Support:**
The mobile living wall requires ongoing maintenance such as plant care (watering, trimming), and technical support (to



ensure the mobility of the structure and functionality of the bottom watering system).

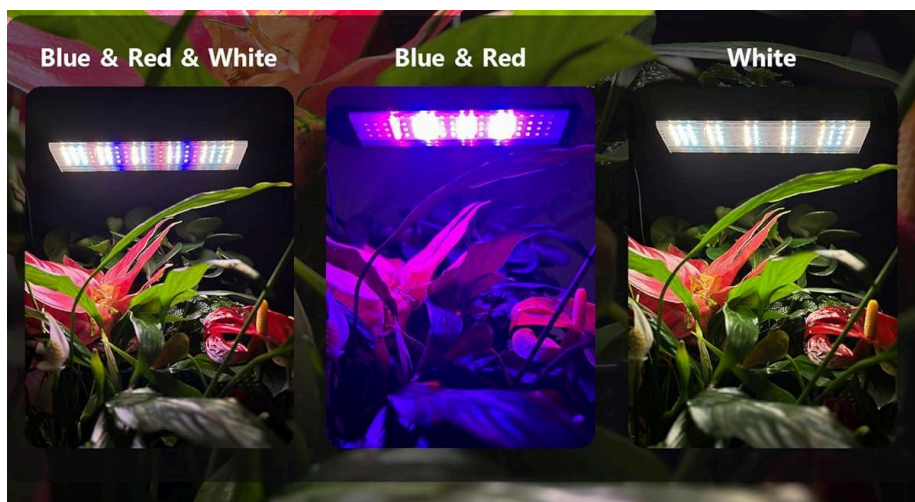
- Horticultural Therapy Assistance: Ideally, certified horticultural therapists will be required for guiding patients through the therapeutic stages.

Caregivers will also be involved in assisting patients during the middle and late stages of engagement.

3. Light Quality and Psychological Impacts:

Figure 43 Lighting Examples

DPROOTS Garden. (n.d.).
<https://dprootsgarden.com/sv>



- Natural Light: The patient does not have natural light in their room, as they have the shade down on the window at all times.
- Artificial Lighting: Soft, indirect, and adjustable lighting with clamps are incorporated in this structure to promote a calm, welcoming atmosphere. LED lights with a color temperature of around 3000K will promote relaxation and comfort.
- Psychological Impact of Light:
 - Natural light and soft, indirect lighting are linked to reducing anxiety, improving mood, and creating a sense of well-being. The structure should

also allow for gentle transitions between light and dark to mimic natural daylight patterns.

- Colors:
 - Green (plants, foliage) and neutral colors such as espresso brown and black will be the main color palette of the design, promoting calmness and promoting a sense of connection to nature.

4. Relationships Between Spaces:

- Mobile living wall and Adjacent Spaces:
 - The structure has flexible connections to surrounding spaces, particularly patient rooms and communal areas.
 - The structure is designed for easy mobility within indoor spaces, providing patients and staff with a continuous opportunity for engagement while allowing medical professionals to maneuver around it without disruption.
- External Connections:
 - The structure should be easily accessible to encourage use by patients, visitors, and caregivers; it should be moved with extreme caution.
 - The mobile structure should be placed in the patient's room out of the way of medical equipment.

Process Documentation for Final Project

1. Design Concept & Schematic:

- Concept Overview: The design focuses on creating a mobile living wall that supports patients' physical, cognitive, and emotional well-being through horticultural therapy. The structure is adaptable, providing engagement at various stages of patient recovery and illness progression.
- Schematic Design: The mobile living wall will feature modular components that can be easily modified or relocated. The design incorporates areas for active planting, maintenance tasks, and sensory engagement with plants, ensuring accessibility and adaptability for patients at different stages of physical abilities.

Figure 44 Bottom Watering System DPROOTS Garden. (n.d.). <https://dprootsgarden.com/sv>

2. Master Plan:

Major Elements:

- Location & Accessibility: The mobile living wall will be placed in Patty Appel's skilled nursing room at Mason Christian Village.
- Core Features:
 - Modular Planters: Allowing for easy



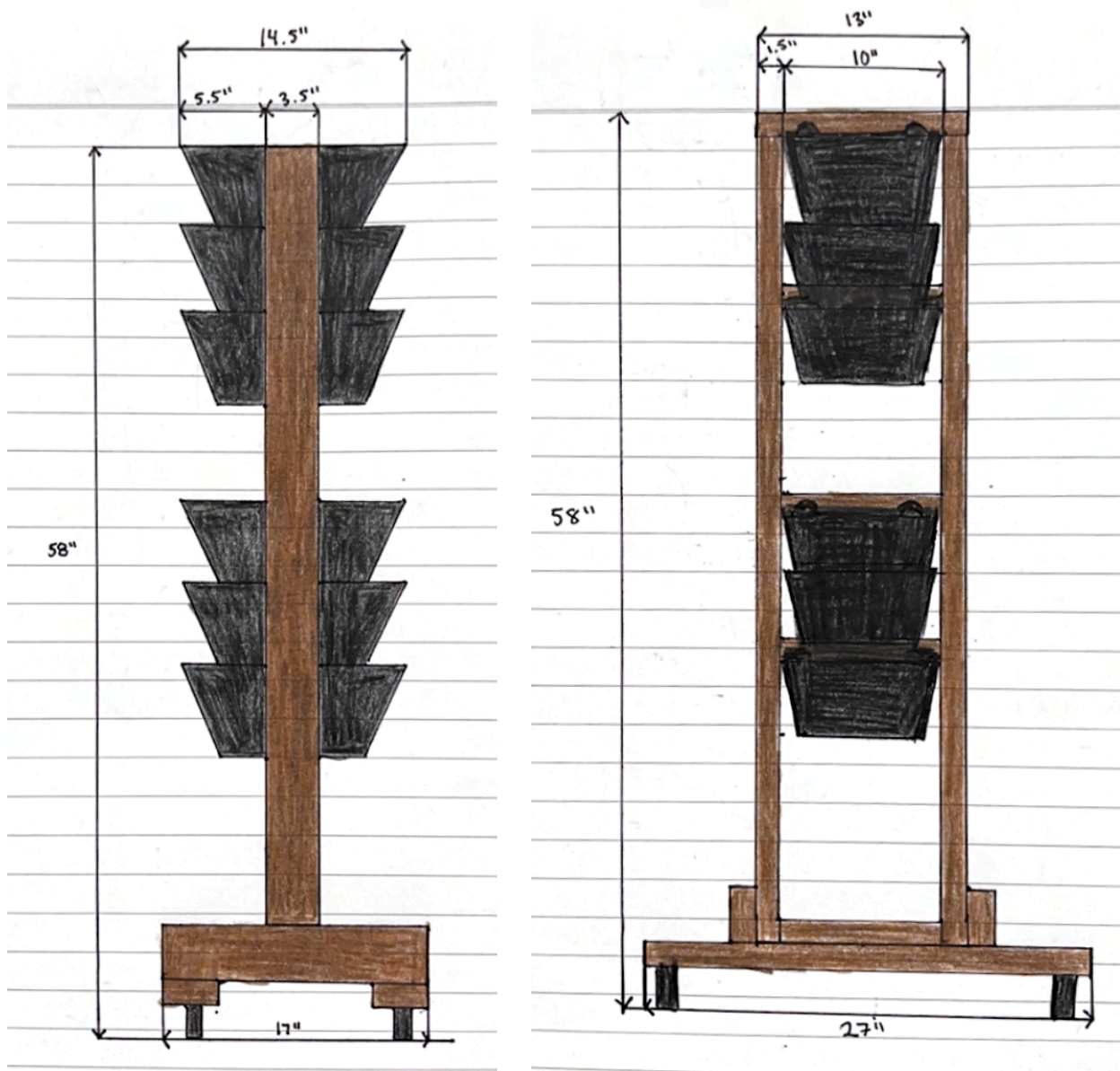
adjustments based on patient wants and needs.

- Bottom watering system that can be drained through the bottom.

Materials List:

- Structural Materials: Stained wood, plastic planters, and metal screws.
- Planting Materials: Soil, planters, bottom watering system with drainage.
- Lighting: LED lighting for indoor use, soft and indirect lighting to create a calm environment.

3. Design Details: **Figure 45** Mobile Living Wall Dimensions. Hand drawn by Appel, Katie. April 16, 2025



4. Materials - Hardscape and Plant List:

- Hardscape:
 - Stained wood for aesthetic value - Espresso 273
 - Plastic planters for easy clean up
 - Locking wheels for safety and mobility



Figure 46 Stained Mobile Living Wall Structure. Photo by Appel, Katie. April 15, 2025

Plant List



Figure 47 Plants for Mobile Living Wall in Modular Planters. Photo by Appel, Katie. April 5, 2025

Common Name	Scientific Name	Benefits for Living Wall
Creeping Thyme 'Pink Chintz'	<i>Thymus serpyllum</i> 'Pink Chintz'	Trailing, drought-tolerant
English Lavender 'Vera'	<i>Lavandula angustifolia</i> 'Vera'	Aromatic, drought-tolerant
English Lavender 'Hidcote Superior'	<i>Lavandula angustifolia</i> 'Hidcote Superior'	Compact, aromatic
Fern Leaf Lavender	<i>Lavandula multifida</i>	Highly aromatic, soft texture, drought-tolerant
'Munstead' Lavender	<i>Lavandula angustifolia</i> 'Munstead'	Aromatic, compact
Lemon Thyme	<i>Thymus citriodorus</i>	Aromatic, culinary use
Rose Scented Thyme	<i>Thymus</i> spp.	Aromatic, culinary, good for texture
Sweet Marjoram	<i>Origanum majorana</i>	Culinary herb, aromatic, soft foliage

German Chamomile	<i>Matricaria chamomilla</i>	Calming scent, small daisy-like flowers
Grove's Friend Sage	Possibly <i>Salvia officinalis</i> cultivar	Aromatic, edible leaves, drought-tolerant
'Purpurascens' Purple Leaf Sage	<i>Salvia officinalis</i> 'Purpurascens'	Bold foliage color, culinary use
Tricolor Sage	<i>Salvia officinalis</i> 'Tricolor'	Ornamental foliage, culinary, pest-repelling
Lemon Grass	<i>Cymbopogon citratus</i>	Aromatic, insect-repellent, edible
Greek Oregano	<i>Origanum vulgare</i> subsp. <i>hirtum</i>	Culinary, Aromatic, attracts pollinators
Italian Oregano	<i>Origanum x majoricum</i>	Culinary, aromatic, easy to grow
Mojito Mint	<i>Mentha x villosa</i>	Aromatic, culinary, refreshing scent
Mandarin Lemon Balm	<i>Melissa officinalis</i> 'Mandarina'	Citrus aroma, calming

Decorative/Foliage Plants

Common Name	Scientific Name	Benefits for Living Wall
Red Vein Fittonia	<i>Fittonia albivenis</i>	Compact, vibrant foliage, air purification
Dieffenbachia 'Amy'	<i>Dieffenbachia</i> 'Amy'	Large variegated leaves, air-purifying
Peperomia	<i>Peperomia obtusifolia</i>	Drought-tolerant, air-purifying
Peace Lily	<i>Spathiphyllum</i> spp.	Excellent air purifier, flowers indoors

Others

Common Name	Scientific Name	Benefits for Living Wall
Silver Dollar Eucalyptus	<i>Eucalyptus cinerea</i>	Aromatic, insect-repellent, ornamental foliage
Nasturtium	<i>Tropaeolum majus</i>	Edible flowers/leaves, trailing
Curly Parsley	<i>Petroselinum crispum</i>	Edible, soft green texture

Figure 48 Appel, K. (2025). Plant Chart. Google Docs.



Figure 49 Planting Station. Photo by Appel, Katie. April 4, 2025

5. Construction Details and Documents:

Figure 50 Appel, K. (2025). Construction Details and Documents. Google Slides.



6. Project Specifications:

- Size and Dimensions: A modular mobile living wall approximately 58 inches tall, 27 inches wide, and 17 inches deep, with adaptable components that can adjust based on user needs.
- Lighting: Soft LED lights with a 3000K color temperature for calming effects.
- Materials: Sustainable materials, including recycled plastic and steel.
- Watering System: Bottom watering system with a built-in water reservoir and drainage holes.

7. Site Plan:

- Location: Patty Appel's skilled nursing room where it can be viewed by users and those who take care of her.
- Access Points: All viewable access points next to a wall so the structure is out of the way of medical personnel.

8. Planting Plan:

- All plants were planted in modular planters by Katie Appel before being installed to the wall.
 - The trailing plants are placed in the bottom and middle planters to create visually appealing trailing features.
 - The upright plants are placed on the top row of each planting section to create upward appeal.

- The majority of the plants are aromatic or herbs with a few house plants to create a calming environment.
- The amount of herbs was requested by Patty Appel, the user.

Plant Maintenance: Schedule for watering, trimming, and replacing plants as needed.

- Katie Appel will visit Patty Appel at her skilled nursing unit to water, trim, and replace the plants as needed and spend quality time with her.

Material Costs

Item	Cost
Wood	\$15
Screws	\$14
Wood Stain Materials	\$30
Planters	\$172
Plants	\$100
Gas	\$20
Total Materials Cost	\$351

Time Investment

Task	Hours
Designing	5 Hours
Sourcing/Purchasing	4 Hours
Construction/Assembly	12 Hours
Total Time	21 Hours

Figure 51 Appel, K. (2025). Material Costs and Time Investment Chart. Google Docs.

Project Solution: Mobile Living Wall in Palliative Care

The mobile living wall serves as a flexible, adaptable solution to meet the needs of patients in palliative care environments. Designed to fit within limited space, it provides sensory and emotional benefits for patients while being easy for staff and visitors to engage with. Its mobility allows it to be moved between rooms or shared among residents, maximizing its impact. The green design also supports social interaction, therapeutic activities, and the potential for legacy, as it can be passed on, donated, or incorporated into a larger, permanent green wall within the facility. It integrates horticultural therapy with a design that evolves to accommodate the varying physical, cognitive, and emotional stages of palliative care patients. This structure will enhance patient experiences, provide therapeutic benefits, and offer a sense of accomplishment, ultimately supporting a more holistic approach to healthcare.

Through this project, I learned how to design a functional, therapeutic green space that meets the unique needs of palliative care environments. I gained insight into balancing aesthetics, mobility, and accessibility while also considering the emotional and social impact on patients, families, and staff. I also developed skills in planning, adapting to constraints, and thinking creatively about sustainability and legacy.

In the future, I can improve by gathering more direct feedback from patients and caregivers to better tailor the design to their daily needs, exploring more durable and lightweight materials for easier mobility, and incorporating a wider variety of sensory plants. Additionally, I hope to enhance the educational component of the project to better engage staff and visitors in the care and value of the living wall.

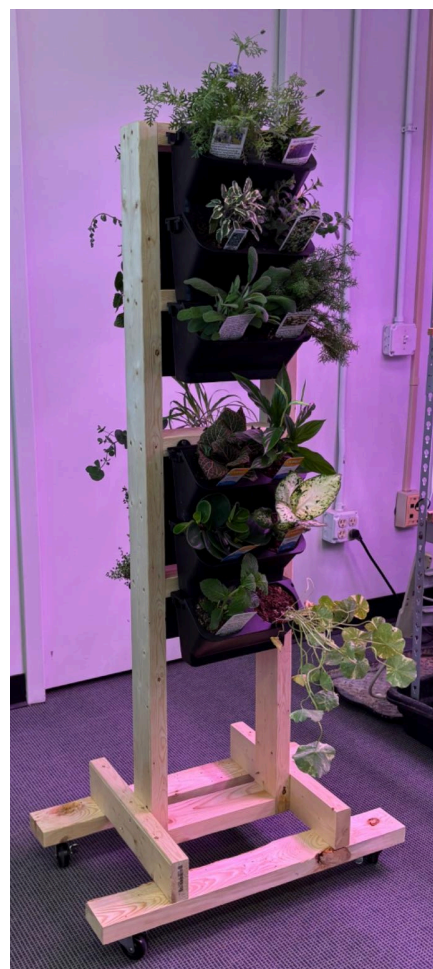


Figure 52 Final Mobile Living Wall Structure. Photo by Appel, Katie. April 11, 2025

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Appendix

HOW CAN A MOBILE LIVING WALL IMPROVE THE WELL-BEING AND EMOTIONAL HEALTH IN PALLIATIVE CARE SETTINGS?

KATIE APPEL
FACULTY ADVISOR: STEVIE FAMULARI
HORTICULTURE CAPSTONE
SPRING 2025



GREEN DESIGN IN PALLIATIVE CARE

ABSTRACT: THIS CAPSTONE EVALUATES THE BENEFITS THAT A MOBILE GREEN WALL CAN HAVE AS A FLEXIBLE APPROACH TO ENHANCING PATIENT WELL-BEING. BY INTRODUCING GREEN DESIGN IN A WAY THAT CAN BE ADAPTED TO VARIOUS SPACES WITHIN A CARE FACILITY, THE RESEARCH ASSESSES ITS POTENTIAL TO ALLEVIATE STRESS AND ANXIETY AMONG PATIENTS. THE CAPSTONE HELPS MOVE TOWARDS A BETTER UNDERSTANDING OF HOW MOBILE GREEN WALLS INFLUENCE MOOD AND STRESS LEVELS, AS WELL AS INSIGHTS INTO THEIR FEASIBILITY IN PALLIATIVE CARE ENVIRONMENTS.

SITE

WHO: PATTY APPEL

WHAT: MOBILE LIVING WALL

WHERE: SKILLED NURSING UNIT AT MASON CHRISTIAN VILLAGE

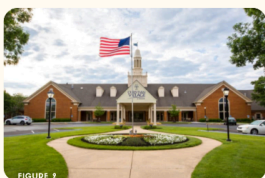


FIGURE 1

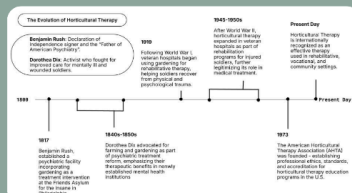


FIGURE 3

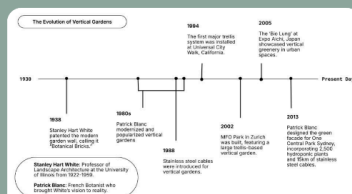


FIGURE 4

SOLUTION



Figure 1 Senior in an assisted care facility plants mobile living wall planters with assistance as a form of horticulture therapy.



Figure 2 Senior in an assisted care facility waters and tends to the mobile living wall planters as a form of horticulture therapy.



Figure 3 Senior in assisted care facility enjoys the mobile living wall as a form of horticulture therapy.

FIGURE 5-7

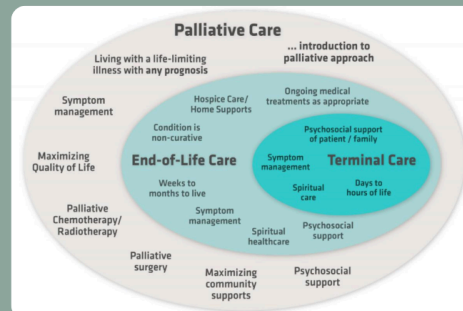


FIGURE 1

CASE STUDY

GREEN DESIGN IN HEALTHCARE PROMOTES THE WELL-BEING OF PATIENTS, STAFF, AND VISITORS BY REDUCING ECOLOGICAL IMPACT AND ENHANCING EMOTIONAL AND SOCIAL HEALTH. BY INTEGRATING NATURE INTO TYPICALLY STERILE ENVIRONMENTS, GREEN DESIGN OFFERS MORE THAN JUST AESTHETICS — IT CONTRIBUTES TO HEALING AND OVERALL WELLNESS. RESEARCH SHOWS THAT EXPOSURE TO NATURE IN HEALTHCARE SETTINGS CAN LOWER STRESS, REDUCE ANXIETY AND BLOOD PRESSURE, AND BOOST POSITIVE EMOTIONS WITHIN MINUTES. NATURAL ELEMENTS LIKE GARDENS AND GREEN VIEWS HAVE ALSO BEEN LINKED TO IMPROVED CLINICAL OUTCOMES, INCLUDING FASTER RECOVERY TIMES, LESS PAIN, AND REDUCED HOSPITAL STAYS, MAKING THEM A COST-EFFECTIVE STRATEGY FOR HEALTHCARE ADMINISTRATORS STRIVING TO BALANCE QUALITY CARE WITH OPERATIONAL COSTS (ULRICH, 2002).

HORTICULTURAL THERAPY

HORTICULTURE THERAPY IS A TYPE OF HANDS-ON THERAPY THAT CONSISTS OF THE INTERACTION BETWEEN A PATIENT AND PLANTS WHERE THE ACTIVE PROCESS OF THE TREATMENT PLAN IS CONSIDERED THE THERAPEUTIC ACTIVITY. THROUGH THE USE OF HORTICULTURAL ACTIVITIES THROUGH THIS THERAPY, PATIENTS ARE ABLE TO ACHIEVE SPECIFIC GOALS TO HELP IMPROVE PATIENTS' WELL-BEING AND MOOD WHILE REDUCING ANXIETY, DEPRESSION, AND STRESS. IT HAS SHOWN TO HELP PRESERVE THE QUALITY OF LIFE FOR PATIENTS.



FIGURE 8



FIGURE 9



FIGURE 10

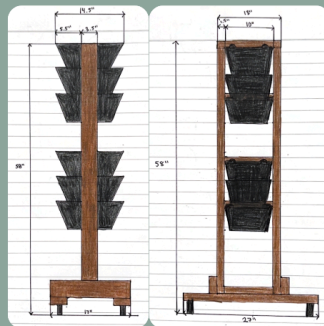


FIGURE 11

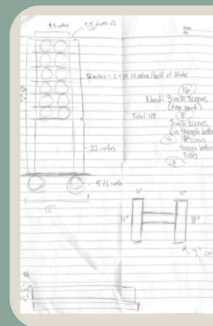


FIGURE 12



SOLUTION

THE MOBILE LIVING WALL OFFERS A FLEXIBLE, ACCESSIBLE SOLUTION FOR BRINGING NATURE INTO PALLIATIVE CARE ENVIRONMENTS. DESIGNED TO FIT WITHIN LIMITED SPACE, IT PROVIDES SENSORY AND EMOTIONAL BENEFITS FOR PATIENTS WHILE BEING EASY FOR STAFF AND VISITORS TO ENGAGE WITH. ITS MOBILITY ALLOWS IT TO BE MOVED BETWEEN ROOMS OR SHARED AMONG RESIDENTS, MAXIMIZING ITS IMPACT. THE STRUCTURE ALSO SUPPORTS SOCIAL INTERACTION, THERAPEUTIC ACTIVITIES, AND THE POTENTIAL FOR LEGACY, AS IT CAN BE PASSED ON, DONATED, OR INCORPORATED INTO A LARGER, PERMANENT GREEN WALL WITHIN THE FACILITY.

THROUGH THIS PROJECT, I LEARNED HOW TO DESIGN A FUNCTIONAL, THERAPEUTIC GREEN SPACE THAT MEETS THE UNIQUE NEEDS OF PALLIATIVE CARE ENVIRONMENTS. I GAINED INSIGHT INTO BALANCING AESTHETICS, MOBILITY, AND ACCESSIBILITY WHILE ALSO CONSIDERING THE EMOTIONAL AND SOCIAL IMPACT ON PATIENTS, FAMILIES, AND STAFF. I ALSO DEVELOPED SKILLS IN PLANNING, ADAPTING TO CONSTRAINTS, AND THINKING CREATIVELY ABOUT SUSTAINABILITY AND LEGACY. IN THE FUTURE, I CAN IMPROVE BY GATHERING MORE DIRECT FEEDBACK FROM PATIENTS AND CAREGIVERS TO BETTER TAILOR THE DESIGN TO THEIR DAILY NEEDS, EXPLORING MORE DURABLE AND LIGHTWEIGHT MATERIALS FOR EASIER MOBILITY, AND INCORPORATING A WIDER VARIETY OF SENSORY PLANTS. ADDITIONALLY, I HOPE TO ENHANCE THE EDUCATIONAL COMPONENT OF THE PROJECT TO BETTER ENGAGE STAFF AND VISITORS IN THE CARE AND VALUE OF THE LIVING WALL.



FIGURE 13



FIGURE 14

Figure 13: A photograph of the completed mobile living wall structure, showing a wooden frame with multiple tiers of plants growing in it. Figure 14: A photograph of the completed mobile living wall structure, showing a wooden frame with multiple tiers of plants growing in it, set against a brick wall.