LIBERTY UNIVERSITY

Design Considerations of The Aged as it Applies to Senior Housing
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Abstract

This poster explores the unique needs and considerations required to successfully design housing for the elderly. The community, known as the aged, the elderly, or senior citizens is a community of people who are 65 years old or greater. This community is very fragile, vulnerable, and typically is under some form of geriatric care to sustain proper well-being. Geriatric care can consist of in-home care, hospice care, nursing homes, independent living, assisted living, and memory care facilities. This poster examines how three major health concerns of diminished vision, memory care, and ambulatory means can pose several challenges in the interior. These challenges can be mitigated or improved upon by design through the proper use of objects, furnishings, materials, and finishes. Such research integrates advanced design for spaces that will better suit clients with diminished vison and considers the three principles of lighting, texture, and contrast. The quality of life for those in memory care is also explored in involving greater sources of familiarity, sensory enhancers, and opportunities for creative freedom. Design considerations for the aged lastly regard the apprehension of expanding freedoms to be mobile while maintaining methods of safety and fall prevention. Through proper research about the elderly's needs, a designer who works with this niche in clientele can adequately serve them and create innovative functional design solutions. These findings illustrate the frailty of the aged, the lack of suitable interiors, and how new design solutions can adhere to geriatric care.

Background

The human lifespan consists of several different stages of life that each introduce new challenges. Late adulthood or old age is the last stage in the human life cycle. Those 65 or older experience many health conditions as their bodies age. Physical aging and the need for assistance puts numerous individuals into care facilities. There is a wide gap between efficiently aiding the elderly's needs and the services or living conditions they receive. Examining previous research, the most mentioned issues for the elderly included poor mobility, vision, hearing, difficulty eating or digesting food properly, a decline in memory, lack of control over physiological functions, and a variety of chronic conditions (Chen, 2018; Engineer, 2018). The form and function of a space can greatly decrease or increase the well-being of any person. Research suggests a link between the characteristics of the health care environment to the patient, visitor, and staff outcomes. Facilities that care for the elderly frequently lack the proper design and resources to sustain a lifestyle that puts its patients at the utmost ease. The United States health care is precipitously changing, and innovators are constantly seeking the best way to serve both patients and health care providers. Care must be financially and physically accessible for all people. The Americans with Disabilities Act (ADA) upholds a set of requirements and regulates all renovations and constructions to comply with the code. When designing facilities for the elderly, interior designers contribute to a large portion of the overall well-being of patients through balancing the agreement with ADA code, satisfying the needs and wants of the elderly, and integrating new technology. This research therefore seeks to specifically understand the capacities and demands of the aged and find design solutions that would ideally fit this vulnerable demographic of people.

Methods

Means of concern for the aged and suggested implementations have been examined through previous scholarly research. The three main categories of diminished vision, memory care, and ambulatory needs were sought out to collect opinions, facts, and statistics. With in-depth examination of each of these categories, information was first collected to gain a basis of knowledge in this field. Next, specific information that would be helpful in designing a theoretical elder care facility was explored. The common issues of housing for the aged that had been found then were sought out to brainstorm possible solutions. Many design considerations were suggested by previous research, but through new technology, this study reorients ideas into cutting-edge resolutions. The demonstration of gathered research was expressed through the entire design process, including concept sketches, bubble diagrams, blocking plans, preliminary and refined floor plans, and a furniture and fixtures schedule. In creating a mock assisted living and memory care facility, the needs of the elderly were expressed in a realistically and visually. This poster seeks to show the major considerations that were found and apply them to practical solutions. A floor plan is used as the central collaboration of all results put together in a cohesive design. Such theoretical retirement and graduated care facility inhibits researched-backed suggestions for interior designers to consider.

I: Diminished Vison

The Problem and Need: Diminished vison is a predominate health concern among the elderly. Statistics have found that "285 million people are estimated to have a visual impairment, with 39 million classified as blind and 246 million as low vision. Low vision is defined as the grouping of moderate and severe visual impairments. Approximately 65% of these individuals are aged 50 years and older" (Rooth, 2017, p.119). The following solutions are preposed for such individuals.

Solution 1: Lighting Design

Increased lighting would help those who struggle with glaucoma, macular degeneration, and diabetic retinopathy. However, people who suffer with cataracts will not benefit from this solution. They need special lighting that reduces glare rather than the addition of bright light because their eyes have difficulty adjusting to brightness fluctuations and become additionally sensitive to glare from natural and artificial light sources.

Considerations to Implement:
- Having well-lit areas while still being mindful of glare. Using specialized lamps/bulbs to increase contrast, reduce glare, and cover reflective surfaces when possible.
- Using task lighting in addition to general lighting (e.g., small gooseneck or clip-on lamp, under-counter lighting in work areas).
- Avoiding large discrepancies in lighting, such as a bright lamp shining into a dark room. Keeping lights on during daytime hours helps to equalize lighting from both indoor and outdoor sources.
- Implement sundowning controlled lighting mechanisms.

Solution 2: Use of Texture and Contrast

The two principles of texture and contrast also improve the design of spaces for those with diminished vision. For individuals who struggle with seeing, depth changes can look intimidating. What may just be a small plane change in flooring could appear as a full upward step for them. Therefore, areas must be designed well for easier mobility for the elderly.

Considerations to Implement:
- The juxtaposition of light and dark colors helps those with remaining vision. Monotones can make it difficult for those with visual impairments to detect doorways, stairs and furniture, and especially smaller objects that blend into their surroundings. Select materials that contrast sharply with the color of the tub/shower, counters, and flooring. Painting door jambs a contrasting color and using brightly colored tape to highlight the edges of steps are other modifications that can be used to improve safety.
- Use of a tactile system by placing rubber bands, felt, raised plastic dots, or sandpaper cutouts on items to mark their placement or differentiate similar objects. Visual systems make use of any remaining vision to identify and organize things. Common examples include large labels, colored stickers, or tapes to differentiate individual items or identify collections of items.

II: Memory Care

Memory care services take particular care of people who struggle with forms of dementia like Alzheimer's disease. Many aspects of the environments these residents live in can contribute to their mental well-being. To improve the quality of life for those in memory care, there are three implications to be considered. These consist of involving greater sources of familiarity, sensory enhancers, and opportunities for creative freedom.

Figure 3.1 Concept Sketch of "home-like" doors and hallways (Image by Amanda McNally)

Solution 3: Sensorial Elements
The addition of sensorial elements could include moving features, environmental exposers, or vibrant surfaces. One researcher suggested that plants or natural elements be placed in high traffic pathways in facilities' interiors and to include sensory stimuli such as water features and colorful surfaces (Engineer et. al, 2019). See application on the right.

Solution 4: Creative Outlets
Offering outlets for creative freedom has been proven to increase memory by researcher Wong Lee (2019) and his colleagues. Expressions of creative freedom could include letting the aged decorate their space or doors with memorabilia or pictures of themselves and loved ones, as it can spark recognition of which room is theirs and remind them who they are. Likewise, letting the elderly express their personality and feelings through the arts can help improve quality of life.

Implement Art/Music Therapy Room with locked access to Memory Care unit

Art therapy is one of these mechanisms and is composed of the physical creation of art pieces and the cognitive evaluation of paintings. In Dr. Lee's (2019) study of determining the effectiveness of art therapy in improving cognitive decline, he found that with the use of art therapy there was a significant improvement that way for nine months. Therefore, implementing art pieces to view in hallways or in a gallery forum and offering the elderly a space where they can make physical art would be effective.
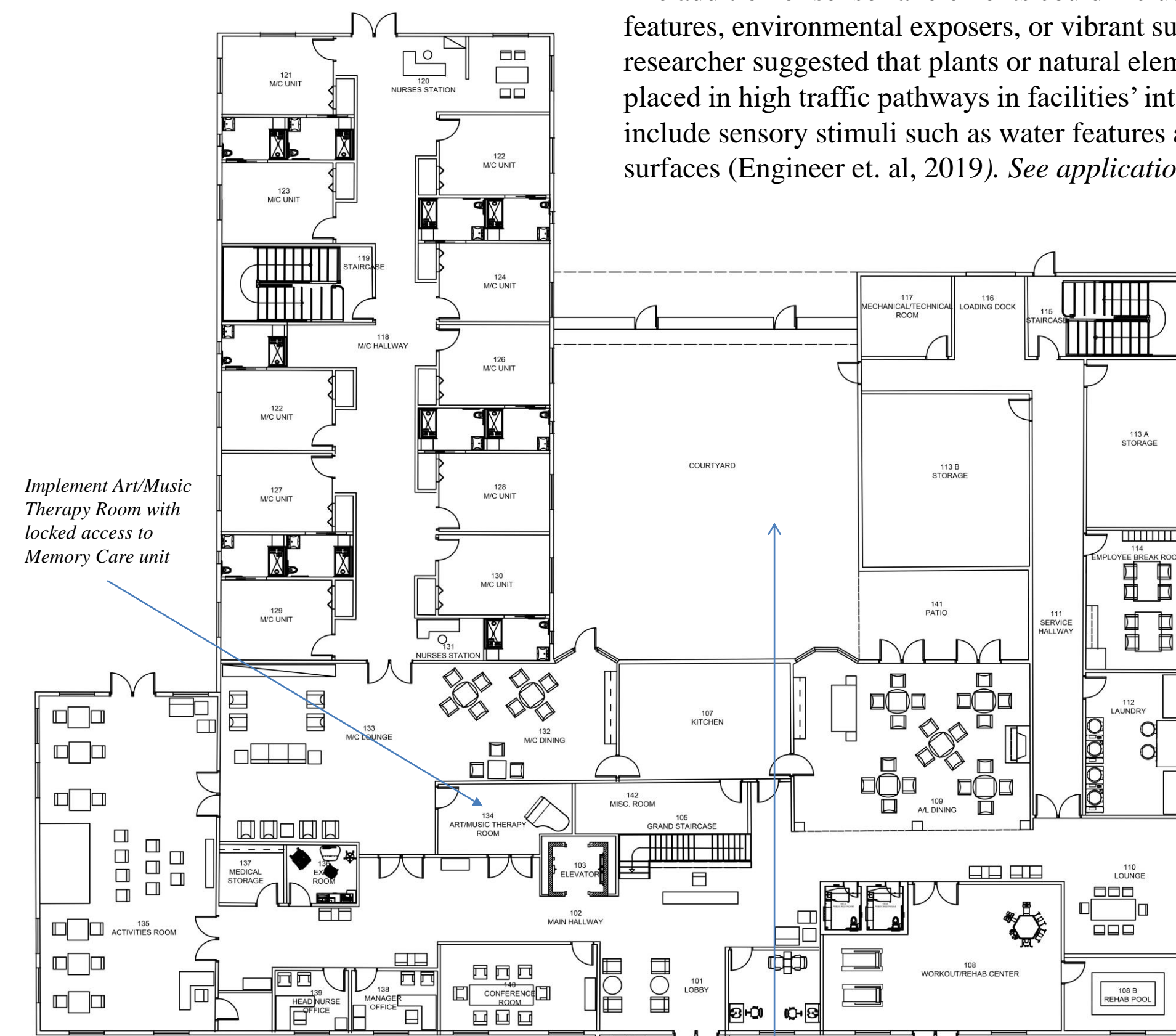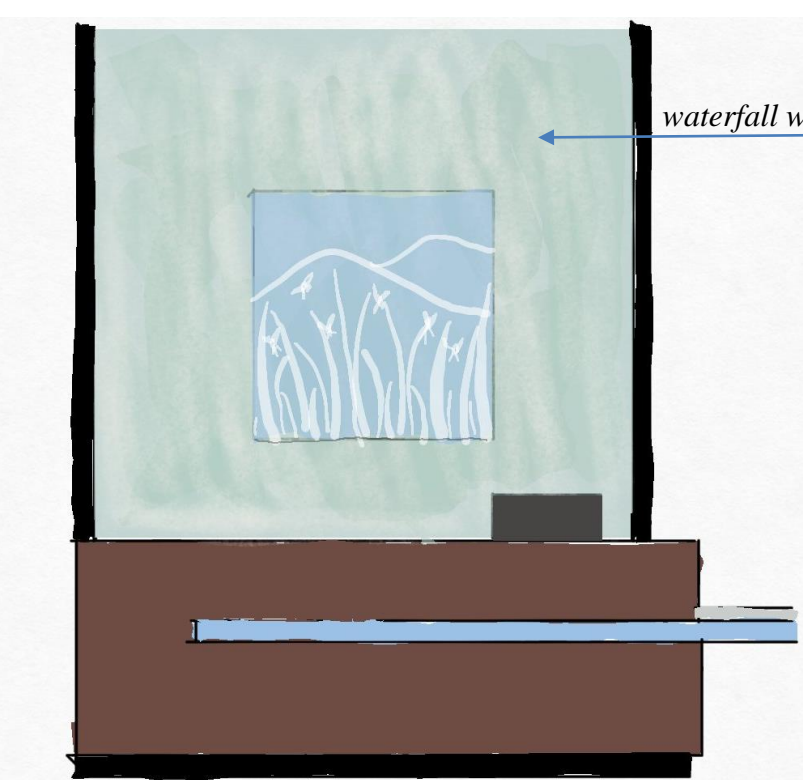
Figure 1.1 Concept sketch of reception desk with sensorial waterfall backwall (Image by Amanda McNally)

Figure 2.1 First Level Floor Plan
(*Image made in AutoCAD by Amanda McNally*)

Figure 6.1 Rendering of Independent Living Apartments on Level 2 (*Image made in SketchUp by Amanda McNally*)

III: Ambulatory Concerns

Those with ambulatory concerns have a disability of some matter that hinders safe movement. Due to their incapacity to walk or bedridden state, many elderly patients lack freedom. Limitations can range from using a wheelchair, walking device, or having no mobility aids at all depending on care from family members and medical staff. There are two key factors for ambulatory concerns which should be considered in design for the aged. These factors include the safety of spaces and fall preventative design and having a suitable mobility design.

Solution 5: Safety of Spaces and Fall Preventative Design
The safety of spaces and their means for fall prevention should also be considered in design. For the elderly, loss of balance and motor function directly correlate with the vast fear of falling and losing independence. To prevent incidences, it is vital to provide safety through the provision of design features and their placement, such as the following:
- Handrails, grab bars, and lean bars to be placed in areas where the aged are standing and waiting (e.g., elevators, registration desks, waiting lobbies, etc.).
- Handrail design should include rounded edges and smooth finishes to prevent bruising/scratches to skin.
- Bars or rails should be in a contrasting color to the wall.
- Flooring choices to incorporate slip-free materials such as rubber flooring to increase friction and reduce falls.
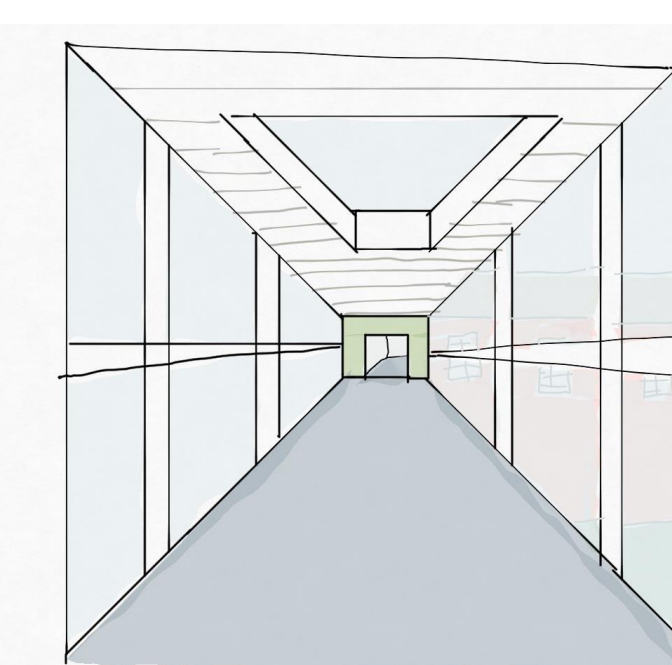
Figure 4.1 Concept Drawing of the Connecting Footbridge on Level 2 that displays a safe way for residents to walk laps (Image by Amanda McNally)

Solution 6: Suitable Mobility Design
The elderly community who are under ambulatory care rely on mobility devices or help from others to exercise basic human needs every day. Whether they want to go use the bathroom, walk to the dining room, or go outside, most of these activities are not easy for ambulatory patients to do on their own. The aged struggle to find a sense of freedom once they reach a certain point of weakened mobility. One study in China aimed to identify and correct the pervasiveness and risk factors of unmet needs among the disabled elderly (Chen, 2018). In the study, over 50% of patients in care facilities have an unmet need to ambulate and many patients talked about wanting to be able to go outside and enjoy the environment. Due to restrictive measures, unsuitable exteriors, or lack of staff, they could not . Design should involve suitable arrangements for the elderly to be able to do such things in a safe manner and allow a greater sense of freedom.

Figure 5.1 3D Rendering of Courtyard
(*Image made in SketchUp by Amanda McNally*)

Conclusion

The aged community, consisting of those 65 years or older, is a vulnerable people group that endures the concerns of physical aging and often need medical care or assistance. Many individuals are put into care facilities, and although residents are in these facilities for aid, many of them still lack the treatment they need. There often is a gap between efficiently aiding the elderly's needs and the services or living conditions they receive. Through analyzing the most common health conditions among the elderly, this research determined what problems needed to be addressed that would help a wide majority if a solution was found.

The elderly has unique needs which mainly consist of diminished vision, memory care, and ambulatory difficulties. The design of a space should facilitate these areas of concern. Each main issue that has been studied has then been applied to an appropriate solution. These solutions were demonstrated in a complete plan of a theoretical nursing home that would perfectly suit all these needs. This design used research for all aspects from the material choices to the layout. Such research examined the integration of advance design for greater suitability in spaces meant for clients with diminished vison. Corresponding solutions considered the three principles of lighting, texture, and contrast. The quality of life for those in memory care was also explored with a resolution of involving more sources of familiarity, sensory enhancers, and opportunities for creative freedom. Design considerations for the aged lastly regarded the expansion in freedom of mobility and in methods of safety and fall prevention. When interior designers thoroughly apply what the elderly need in their homes and facilities, families can trust that care facilities are best for the well-being of their loved ones in their last stage of life.

Future Work

1. Implement designs into actual facilities and homes and follow through with a means to measure success of designs.
2. Conduct survey with care facility residents to determine success of designed solutions.
3. Identify new technological mechanisms that could be used to decrease the diminished vison, memory care, and ambulatory concerns of the elderly.

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